TWENTY FIFTH MEETING OF COMSTECH EXECUTIVE COMMITTEE

January 7-8, 2007
Zil Hajja 16-17, 1427 Hijri
Muscat, Sultanate of Oman

WORKING PAPER

Item-1: Adoption of the Provisional Agenda of the meeting

The Provisional Agenda as prepared by the secretariat may be adopted by the Executive Committee.

Decision required: **The Executive Committee may adopt the agenda**

Item-2: Confirmation of the decisions of Twenty-fourth Executive Committee meeting

Decisions of the Twenty fourth meeting of the Executive Committee held at Marriot Hotel, Islamabad on February 21, 2005 presented as **(Appendix-I)** may be considered for approval**.**

Decision required: **The Executive Committee may kindly approve the decisions of the Twenty-fourth meeting of the Executive Committee.**

Item 3: Resource position of COMSTECH and contributions from member states

Resource mobilization and contributions from its member states to COMSTECH program and budget has always been an important issue. Inadequate resources and lack of even voluntary contributions from majority of the member states has kept COMSTECH from realizing its full potential. This is a recurrent problem that continues to hurt every aspect of proper planning.

The resource position of COMSTECH has been discussed during every General Assembly. The major effort was mounted after the eighth General Assembly meeting. Ever since, the matter of mandatory contributions has been progressively brought on centre stage. The Chairman COMSTECH has been in the fore front for regular contributions to COMSTECH and a massive R & D fund for the development of science and technology has to be established if rapid decline of S&T infrastructure in the Islamic World is to be halted. As a consequence of persistent pressure from the Chairman COMSTECH and unrelenting effort by the Coordinator General COMSTECH, the voluntary contributions did register some increase in the past few biennia. However, the flow of funds from OIC member states other than the Islamic Republic of Pakistan has again dropped to a trickle during the year 2006.Thus, the position of contributions to COMSTECH remain insufficient. Consequently,

compared to US$1,529,960 in the year 2004, COMSTECH received only US$1,258,870 during the year 2006 out of which Pakistan contributed US$ one million and all the remaining fifty-six member states of the OIC sent US$258,870 to COMSTECH. This is sad as some of the member states including, Sultanate of Oman, Kingdom of Saudi Arabia, State of Qatar, United Arab Emirates, and Kazakhstan that had sent their contributions in the year 2004 remitted no funds during the year 2006. These five member states had remitted US$ 485,000 during the year 2004.

COMSTECH received contributions in the year 2006 from the following seven member states:

S. No.	Member state	Amount received
1	**Brunei Darussalam**	**25,000**
2	**Indonesia**	**100,000**
3	**Iran**	**54,385**
4	**Malaysia**	**50,000**
5	**Pakistan**	**1,000,000**
6	**Senegal**	**9,484**
7	**Turkish Republic of Northern Cyprus**	**20,000**
	Total	**1,258,869**

Effort must therefore be mounted to encourage the remaining member states to send their contributions to COMSTECH for the current biennium. The Executive Committee may also deliberate on ways of bringing the member states to realize their responsibility and come forward with their contributions as early as possible to enable COMSTECH to implement its approved program.

Decision required: ***The Executive Committee may like to deliberate on the critical issue of insufficient contributions so far during the current biennium and devise a strategy to overcome the problem.***

Item 4: Review of COMSTECH activities implemented since Twelfth General Assembly meeting held in Islamabad

The present plight of science and technology in the Muslim world has been repeatedly documented and published in the print media. The new millennium has brought with it new challenges which certainly require fresh commitments and firm determination on part of the leaders of the OIC member states.

There is no denying that the new century has placed a great deal of emphasis on science and technology which will serve as the driving force and will be a crucial element for the future economic prosperity of the nations. Progress will largely depend on ability of nations to use modern science and technology in areas like

industry, agriculture, environment and human health. It is also essential to appreciate the importance of basic education and human resource development for achieving excellence in science and technology.

The world has undergone dramatic changes during the last century. The revolutionary breakthroughs in the fields of microelectronics, information technology, genomic and other physical sciences have transformed our lives in a multitude of ways. The world is now sharply divided by the "technology boundary". The technologically advanced countries are today blessed with great economic strength on account of their ability to manufacture sophisticated equipment, machinery and other goods, which have a high value-added export potential. In contrast, the OIC member states have, in general, failed to appreciate the critical role that science and technology plays in economic development today. OIC member states have been confined to the export of raw materials such as agricultural goods and oil that after value addition returns to them as high value oil products and textile goods. This is resulting in a rapidly increasing gap between the economies of the advanced Western countries in comparison to those of OIC member states. What is required is the realisation at the highest political level that progress in this day and age is not possible without a massive investment in human resources through the up gradation of colleges and universities to a high level of excellence and through the establishment of Centres of Excellence in key fields of science and technology, which can become the focal points of creative research. It is only through this "knowledge-based growth" that we in the Islamic world can rid ourselves of the shackles of ignorance and poverty under which we are presently tormenting.

The advanced Western countries are spending between 3-5% of their much larger Gross National Products (GNPs) on science and technology while we in the Islamic world, on average, spend less than 0.5% of our almost trifling GNPs in this vitally important area. The economic disparity between them and us therefore continues to grow with every passing day. The little science and technology we find today in most of the OIC member states is largely a transfer of existing technologies from the West and is not focused at utilising the creativity of our own vast human resource. Progress in this manner would not claim us independent existence.

The Science and Technology efforts should accordingly be directed to meet national needs and promote rapid industrialization and development of adequate basic infrastructure. This is possible only if we achieve self-reliance in crucial areas of science and technology. Areas like biotechnology, engineering sciences, and microelectronics and other vital technologies must be developed and further expanded to attain take-off levels. These S&T efforts have to be deployed in a mission-oriented and time-targeted mode for achieving a substantial increase in the Gross Domestic Product within a reasonable time frame.

COMSTECH took note of these developments and keeping in mind its close association with other international organizations, agreed to develop a joint strategy to counter the problems faced by the Ummah. The outcome of these efforts has started to bear fruit and scientific community has begun to benefit for COMSTECH endeavors.

COMSTECH formulates its strategy to best suit the current events on the science and technology front and since its Twelfth General Assembly meeting in Islamabad, COMSTECH has moved steadily towards its goals. We are particularly pleased to

report that the fresh approach adopted by COMSTECH has won support from scientific community of the OIC region. Consequently, COMSTECH initiated programs that include research project support for young scientists, exchange of professors, training of scientists, and provision of spare parts for scientific equipment, launching of a scientific literature search service, creation of a database of active scientists in OIC member states, establishment of information technology centers and holding of symposia/workshops in frontier fields. In the field of research support for young scientists alone, COMSTECH financed more than one hundred sixty-six research projects in twenty-seven OIC member states to help bright young scientists to continue their research in economically important projects.

Unfortunately the voluntary aspect of funding for COMSTECH program is not allowing it to develop its programs as it should. Success of COMSTECH wholly depends upon the commitment of OIC member states to pledge liberal amounts of money to let it implement its full program approved in any given biennium. Because it is imperative to understand that without the required funds the implementation of COMSTECH program will be just another abortive effort.

COMSTECH in its programme assigned priority to key scientific areas that have the potential of exerting a significant impact on agricultural and industrial development. The areas mainly selected for are biotechnology, information technology, human resource development, and training and support for scientists. In addition to initiating new research and training proposals in some of these important areas. The COMSTECH Program of action for the year 2006-2007 has been directed in the light of these priorities.

As COMSTECH has so far realized less than 12% of the funds against the approved budget of US$10.75 million for its core programs during the biennium 2006-2007. The Coordinator General therefore had no option but to delay full program implementation until more funding was received from the COMSTECH member states. Also like that of the previous many biennia, he put into action a program implementation strategy according to which the secretariat provided him with an update every time a new contribution was realized from its member states. The Coordinator General then chose more programs from the approved list and the secretariat undertook implementation in accordance with his advice within the overall framework of activities and budget approved by the COMSTECH General Assembly. The list of COMSTECH programs implemented until going to the press is as under:

I. COMSTECH DIRECTORY OF ACTIVE SCIENTISTS IN OIC MEMBER STATES AND THEIR RECENT SCIENTIFIC PUBLICATIONS

The project was first approved by the Seventh General Assembly Meeting during the biennium of 1996-97. It was originally called *"Who's Who of Scientists in the Muslim World"* and its scope was later widened and it was renamed as "*Database of Active Scientists and Institutions in OIC Member States"* by the Executive Committee. The project was submitted to the Eighth General Assembly for its approval. The project included scientists' names, countries, and their fields of research. The volumes are being published under the editorship of Dr. Ahsana Dar and Prof. Atta-ur-Rahman.

In the beginning ISESCO joined this endeavor and the publication was initially called *COMSTECH-ISESCO Directory of Active Scientists in OIC Member States and Their Recent Scientific Publications.* Four volumes of the directory covering **Afghanistan,**

Albania, Azerbaijan, Algeria, Bangladesh, Bahrain, Benin, Brunei Darussalam, Burkina Faso, Cameroon, Chad, Comoros, Djibouti, Egypt, Guinea, Guinea Bissau, Gabon, Gambia, Iran, Iraq, Indonesia, Jordan, Kazakhstan, Kuwait, Kyrgyzstan, Lebanon, and **Libya** were published and circulated by the end of the year 2000. At that stage, ISESCO decided to withdraw its support due to budgetary constraints. However, in view of the importance of the publication COMSTECH decided to go it alone and continued its effort from its own resources. The directory was also renamed as "*COMSTECH Directory of Active Scientists in OIC Member States and Their Recent Scientific Publications"*.

This is an important COMSTECH effort that, despite of lack of resources remains active on account of its wide acceptability and active role that the publication is now playing in creating joint programs and collaborations among the OIC scientific community. With the publication of revised addition of its first volume the project has also entered in its second cycle.

The work is continuously growing and COMSTECH has so far completed sixteen volumes covering **forty-one** member states. In the past few years COMSTECH has added **Malaysia, Maldives, Mali, Mauritania, Mozambique**, **Morocco, Nigeria, Niger, Oman, Pakistan, Palestine** and **Qatar,** and **Saudi Arabia** has been added during the last three months to the list of countries that have been covered by this publication. COMSTECH has also completed revision of the first volume of this massive work and the Directory is now spread over **12,990** pages. All volumes of the database are available on Internet with electronic search facility and can be accessed on the COMSTECH website http://www.comstech.org The Directory which is also available for free on a CD includes the following volumes:

Vol. I (A-D) (Afghanistan, Algeria, Albania, Bahrain, Bangladesh, Benin, Burkina Faso, Brunei Darussalam, Cameroon, Comoros)	**pp, 244**
Vol. I (A revised*)* (Afghanistan, Albania, Algeria, Azerbaiján)	**pp, 1142**
Vol. II (E) (Egypt)	**pp, 632**
Vol. III (G-I) (Gabon, Gambia, Guinea, Guinea Bissau, Indonesia, Iran, Iraq)	**pp, 589**
Vol. IV (J-L) (Jordan, Kuwait, Kazakhstan, Kyrgyz Republic Lebanon, Libya)	**pp, 921**
Vol. V (M) Part A (Malaysia)	**pp, 616**
Vol. V (M) Part B (Malaysia)	**pp, 664**

Vol. V (M) Part C (Malaysia)	**pp, 566**
Vol. VI (M) Part A (Maldives, Mali, Mauritania, Mozambique, Morocco)	**pp, 703**
Vol. VI (M) Part B (Morocco)	**pp, 843**
Vol. VII (N) Part A (Nigeria)	**pp, 866**
Vol. VII (N) Part B (Nigeria)	**pp, 794**
Vol. VII (N-O) Part C (Nigeria, Niger, Oman)	**pp, 677**
Vol. VIII (P) Part A (Pakistan)	**pp, 878**
Vol. VIII (P-Q) Part B (Pakistan, Palestine, Qatar)	**pp, 659**
Vol. IX (R-S) Part A (Saudi Arabia)	**pp, 1216**
Vol. IX (R-S) Part B (Saudi Arabia)	**pp, 995**
	Total pp, 12,990

The contents of the Directory include internationally abstracted information in the fields of agriculture, biology, chemistry, environmental sciences, medical technology and other important fields from several thousand leading scientific journals. The information is arranged according to fields and sub-fields with facilities of intra-and inter-country searches of specialists in various disciplines. This is an important compilation that is expected to increase the interaction between scientists in the OIC region and promote active collaboration between them. It offers a particularly valuable library search facility in the relevant fields by way of the electronic version of the database.

All volumes of the database are now available on Internet with electronic search facility. They can be accessed on the COMSTECH website www.comstech.org.

II. E-MAIL DIRECTORY OF SCIENTISTS, ACADEMICIANS, ENGINEERS, RESEARCH INSTITUTIONS, AND UNIVERSITIES OF THE OIC REGION

COMSTECH runs a variety of programs for the benefit of the scientific community of the member states. Apart from that, COMSTECH now and then launches new initiatives to help improve the science infrastructure of the OIC region. To swiftly communicate and to make all the stake holders aware of COMSTECH programs and activities, the Coordinator General, at the end of 2003, advised the COMSTECH

secretariat to begin compiling an E-mail Directory of Scientists, Academicians, Engineers, Research Institutions, and Universities of the OIC region. He also wrote almost a thousand letters to various institutions and individuals to convey their e-mail addresses to COMSTECH. As there was a very good response from the scientific community, COMSTECH therefore went on to compile a large address base of OIC scientists and institutions and decided to place it online on its website www.comstech.org. So as to trigger, not only an inter-OIC communication amongst the scientists but also to initiate a "find thy colleague" sort of forum for the OIC scientific community. The database has already grown to 7,954 e-mail addresses and more addresses are still flowing in. As the search parameters on online version provide information on a variety of feature including expertise, country, institution, therefore it is proving a boon for researchers as well as organizations to tap into this resource for contacting the right individual/organization and initiate cooperation. This is apparent from the e-mails that COMSTECH receives from those who benefit from the database. COMSTECH intends to further refine and increase its utility as more addresses are received to further inflate the database**.**

III. COMSTECH SCIENTIFIC LITERATURE SEARCH SERVICE

One of the major challenges before COMSTECH today is to promote scientific research and develop a certain level of indigenous capability to solve problems facing the OIC region. For an environment to be conducive to research activity, it is important for scientists to keep abreast with what is happening around the world as well as keep others informed of what they are doing. Information is the key to the growth of knowledge and dissemination of information is crucial for the scientific enterprise. In today's world there is a tremendous proliferation of journals and many of them, especially those published by commercial firms, are expensive and out of reach for most of the OIC universities and research establishments. Our inability to arrange easy access to current scientific literature places OIC scientists at a great disadvantage and contributes to the deterioration in the quality as well as the quantity of scientific research. The increase in subscription prices of journals and databases have further jeopardized the ability of OIC libraries to procure journals for their scientific community. Keeping in view the difficulties of the OIC research community, COMSTECH decided to address the problem by initiating a free scientific literature search service with an electronic database covering a large number of journals. At present it covers Agricultural Sciences, Biology and Environmental Sciences, Life Sciences, Physical, Chemical and Earth Sciences and Engineering and Computing Technology. The procedure has been constantly refined and it now meets requests received at the COMSTECH normally within one working day. The service has proved so popular that by the end of December 2006, COMSTECH had processed requests from 13,397 researchers and transferred 26.484 GB (13.242 million pages) of abstracts/references to researchers in **twenty** member states including People's Republic of **Bangladesh**, Republic of **Bosnia and Herzegovina**, Sultanate of **Brunei Darussalam**, **Djibouti**, Republic of **Indonesia**, Islamic Republic of **Iran**, Republic of **Iraq**, Hashemite Kingdom of **Jordan**, **Malaysia**, Kingdom of **Morocco**, Republic of **Mozambique**, Sultanate of **Oman**, Islamic Republic of **Pakistan**, Kingdom of **Saudi Arabia**, Republic of **Sudan**, **Syrian Arab** Republic, Republic of **Tajikistan**, Republic of **Turkey**, **United Arab Emirates** and **Yemen**.

IV. COMSTECH TRAVEL ASSISTANCE TO SCIENTISTS ATTENDING SEMINARS, WORKSHOPS AND CONFERENCES ABROAD

Science conferences, meetings, workshops and seminars are a major activity, which allows scientists to acquire knowledge, exchange information and correlate each other's research progress. It is in the conferences and other scientific gatherings that new ideas are harvested on topics of novel research and unexpected discoveries. With the expanding scientific base in the OIC region COMSTECH receives many requests for travel grants. During the last biennium COMSTECH approved eighteen travel grants and facilitated scientists from Arab Republic of **Egypt**, Islamic Republic of **Iran**, Hashemite Kingdom of **Jordan**., Republic of **Kazakhstan,** Sultanate of **Oman,** Islamic Republic of **Pakistan** and Republic of **Sudan to** benefit from COMSTECH travel assistance. Apart from travel within the OIC region, some scientists were given assistance to participate in events held in **Austria, China, France, Germany, India, Italy, New Zealand, Spain** and **Yugoslavia**. However, delay in contributions from member states compelled Coordinator General to approve only the most worthy requests. Since Twenty-fourth Executive Committee meeting held in February 2005, COMSTECH has disbursed seven travel grants in three member states including Islamic Republic of **Pakistan**, **Syrian** Arab Republic and Republic of **Turkey**.

V. COMSTECH ASSISTANCE FOR CONFERENCES, WORKSHOPS AND SEMINARS

A large number of scientific conferences and workshops and seminars are held every year in the OIC region for which COMSTECH receives requests for sponsoring these events. The Coordinator General evaluates the requests and approves assistance for only those events that offer best value to the scientific community of the OIC region. Since Twelfth General Assembly meeting of COMSTECH, Republic of **Egypt**, Republic of **Indonesia**, State of **Kuwait**, Republic of **Lebanon**, **Malaysia**, Sultanate of **Oman**, Islamic Republic of **Pakistan,** Republic of **Senegal,** Republic of **Sudan,** and Republic of **Turkey** benefited from the following COMSTECH sponsored events:

- 15th IAS International Scientific Conference on "Higher Education Excellence for Development in the Islamic World", 07-10 November 2006, Ankara, Turkey
- International Seminar on "Trade and Transfer of Technology for the OIC Member Countries, 27-29 November 2006, Islamabad, Pakistan
- 12th Asian Symposium on Medicinal Plants, Spices and Other Natural Products (ASOMPS XII) during 13-18 November 2006, Padang - West Sumatra, Indonesia.
- International Training Course on "Technology Transfer Policy and Industry Level Perspectives", 12-18 July 2006, Islamabad, Pakistan.
- Thematic Workshop on "The Use of Bio-informatics in Genomics Research", August 19 – September 02, 2006, Islamabad, Pakistan.
- COMSTECH-CIIT International Mini Symposium on "Nano Science & Technology", 02-03 November 2006, Islamabad, Pakistan

- Thematic Workshop on "Industrial Biotechnology: Connecting Business, Academia", 6-17 November 2006, Islamabad, Pakistan.
- COMSTECH-Arab Academy of Sciences Joint Research Project "Perspectives of Water Resources Management in the Arab Word", Beirut, Lebanon.
- Thematic Workshop on "The Use of RNAi in Therapeutics", November 25 to December 08, 2006, Islamabad, Pakistan.
- International Training Course on "Technology Transfer Policy and Industry Level Perspectives", 12-18 July 2006, Islamabad, Pakistan.
- **INWRDAM** Regional Training Workshop on "Participatory Integrated Water Resources Management", 12-17 February 2005, Beirut, Lebanon.
- **INOC** International Workshop on "The Protection of Marine and Coastal Environment", 09-11 November 2005, Izmir, Republic of Turkey.
- **INOC** International Conference on "Coastal Oceanography and Sustainable Marine Aquaculture (ICCOSMA), Confluence and Synergy", 02-04 May 2006, Kota Kinabalu, Sabah, Malaysia.
- **INWRDAM-COMSTECH-ISESCO** International Workshop on "Integrated Water Management (IWRM)", 21-24 May 2006, 6th October City, Arab Republic of Egypt.
- **INWRDAM** International Workshop on "Flash Food in Urab Areas and Risk Management", 4-6 September 2006, Muscat, Sultanate of Oman.
- **ISNET** International Seminar on "Space Technology & Applications", 11-15 September 2006, Islamabad, Pakistan
- **INOC-COMSTECH-ISESCO** International Seminar on "Coastal Water Management & Sustainable Use of Marine Resources", 14-16 November 2006, Dakar, Republic of Senegal.
- **COMSTECH-Arab Academy of Sciences** Joint Research Project "Perspectives of Water Resources Management in the Arab Word", Beirut, Lebanon.

Institution Building Programs of COMSTECH

In its Institution Building Program, COMSTECH has established Inter-Islamic Networks on a number of important subjects in eight member states of the OIC, including Egypt, Jordan, Malaysia, Niger, Pakistan, Sudan, Turkey, and UAE while; five Computer Centers in OIC member states including Maldives, Pakistan, Sierra Leone, Sudan and Syria; and **I**slamic **W**orld **A**cademy of **S**ciences (**IAS**) in Jordan are already functioning since almost two decades now. Latest addition to COMSTECH institutions is recently established **N**etwork of the **A**cademies of **S**ciences **i**n the **C**ountries of the Organization of Islamic Conference **(NASIC).**

A short introduction and accomplishments of COMSTECH institutions is as follows:

VI. ISLAMIC WORLD ACADEMY OF SCIENCES

Islamic **W**orld **A**cademy of **S**ciences (**IAS**) is a COMSTECH established institution that is non-political, non-governmental, independent body, comprising of eminent scientists committed and dedicated to the promotion of science and technology in the OIC region. COMSTECH has been a generous supporter of the IAS activities and has so far provided US$ 666,000/- to the Academy for running its programs. Since the last meeting of the Executive Committee, COMSTECH provided US$ 25,000/- to IAS for holding its 15th annual conference in Ankara.

Islamic **W**orld **A**cademy of **S**ciences is a very active COMSTECH institution that has so far arranged the following fifteen annual thematic conferences:

- First international conference on "Food Security in the Muslim World", Amman, Jordan (1987).
- Second international conference on "Science and Technology Policy for Self-Reliance in the Muslim World", Islamabad, Pakistan (1988).
- Third international conference on "New Technologies and Development of the Muslim World", Kuwait (1989).
- Fourth international conference on "Technology Transfer for Development in the Muslim World", Antalya, Turkey (1990).
- Fifth international conference on "Science and Technology Manpower For Development in the Islamic World", Amman, Jordan (1991)
- Sixth international conference on "Environment and Development in the Islamic World", Kuala Lumpur, Malaysia (1992).
- Seventh international conference on "Health, Nutrition and Development in the Islamic World", Dakar, Senegal (1993)
- Eighth international conference on "Water in the Islamic World: An Imminent Crisis", Khartoum, Sudan (1994).
- Ninth international conference on **"**Science and Technology Education for Development in the Islamic World**",** Tehran, Iran (1999).
- Tenth international conference on "Information Technology for Development in the Islamic World", Tunis, Tunisia) (2000).
- Eleventh international conference on "Biotechnology and Genetic Engineering for Development in the Islamic World", Rabat, Morocco (2001).
- Twelfth international conference on "Materials Science" and "Culture of Science", Islamabad, Pakistan (2002).
- Thirteenth international conference on "Energy for Sustainable Development" and "Science for the Future of the Islamic World and Humanity", Kuching, Sarawak, Malaysia, (2003).

- Fourteenth international science conference on “Science, Technology and Innovation for Socio-economic Development of OIC–Member Countries: Towards Vision 1441”, Kuala Lumpur, Malaysia, (2005).

- Fifteenth international science conference on “Higher Education Excellence for Development in the Islamic World” Ankara, Turkey (2006).

VII. NETWORK OF THE ACADEMIES OF SCIENCES IN THE COUNTRIES OF THE ORGANIZATION OF ISLAMIC CONFERENCE (NASIC)

The Network of the Academies of Sciences in the countries of the Organization of Islamic Conference **(NASIC)** was established on 17 March 2004 at Islamabad during the Inter-Academy Panel meeting of National Science Academies of the OIC member states. This historic event brought together fifteen founder Academies of Sciences including (Academy of Sciences of **Afghanistan**, **Bangladesh** Academy of Sciences, Academy of Sciences and Arts, **Bosnia and Herzegovina**, **Egyptian** Academy of Sciences, **Indonesian** Academy of Sciences, Academy of Sciences, **Iran**, Arab Academy of Sciences, **Jordan**, **I**slamic **A**cademy of **S**ciences (**IAS**), **Jordan**, National Academy of Sciences, **Kazakhstan**, Akademi Sains **Malaysia**, **Nigerian** Academy of Sciences, **Pakistan** Academy of Sciences, **Senegalese** Academies of Sciences, Academy of Sciences of the Republic of **Tajikistan** and the **Uganda** National Academy of Sciences.

Pakistan Academy of Sciences, Islamabad was selected as the Secretariat of the network and COMSTECH agreed to provide support to Pakistan Academy of Sciences in running the secretariat. Prof. Atta-ur-Rahman, Coordinator General COMSTECH was unanimously elected as the first President of the NASIC. The Network has been constituted with the purpose of catalyzing the development of collaborative programs among the OIC member states.

This COMSTECH institution was established with the following objectives in mind:

- *Develop collaboration in scientific research between members of the network and the scientific communities on OIC.*

- *Promote cooperation between Academies in OIC countries by exchanging information on programmes and experiences and sharing common visions;*

- *Assist in building the capacities of Academies in OIC countries to improve their role as independent expert advisors to governments and to strengthen their national, regional and international functions;*

- *Assist science communities in OIC Countries to set up national independent Academies where such bodies do not exist;*

- *Organize conferences, workshops and symposia and issue statements or reports on topics of major concern to OIC countries.*

- *Develop common stands and make common statements on major issues relevant to OIC countries.*

- *Assist science communities in OIC Countries to set up national Academies where such bodies do not exist;*

- *Organize conferences, workshops and symposia and issue statements or reports on topics of major concern to OIC countries.*
- *Set up of standing or* ad hoc *committees, programmes of the work of the Network;*
- *To develop Rules of Procedures of the Network for the efficient management of the Network and for the issue of Statements.*
- *Dissemination of relevant information to the Network Member Academies.*
- *Establishment of close cooperation with the Network officers and other Members of the Executive Committee and operation under the Guidelines of the President of the network*

Within a month of its establishment, NASIC succeeded in distributing MIT open course materials to 21 Science Academies of OIC member states and within three months of its establishment, its first newsletter started publishing. NASIC has also launched its monthly E-Newsletter. To make information about the activities of member academies, NASIC intends to launch a website of its own and pursue the following activities:

- Publish newsletter of the Network
- Provide travel grants to young scientists of member academies
- Explore the possibility of distant learning
- Collaborate in bilateral research programs
- Initiate visiting teachers programme
- Help prepare OIC region for IPR and Patent Laws
- Develop collaboration in scientific research
- Assist its member academies to strengthen their national, regional and international functions
- Help set up science academies in countries lacking such institutions
- Distributed MIT open course materials to 21 Science Academies of OIC member countries
- Established close contact with the Network Members.
- Promote cooperation between Academies in OIC countries by exchanging information on programs and experiences and sharing common visions;
- Disseminate useful scientific information to the Network's Member Academies.

Achievements

- Publishing the e-newsletter of the Network; the aim of publishing the e-newsletter is to provide information to its members which are usually available to limited community of a specific academy. But NASIC is attempting to spread it among all members.
- Has attempted to develop collaboration in scientific research between members of the network and the scientific communities of OIC;

- Published a book on "Islamic Biomedical Ethics: Issues and Resources" with collaboration of COMSTECH.
- Organized conferences with collaboration of COMSTECH & IDB on strengthening science in Africa.
- Initiated project on Intellectual Property Rights with Egyptian Academy of Science playing the role as the lead Academy.
- Has tried to promote cooperation between Academies in OIC countries by exchanging information on programmes and experiences and sharing common visions;

VIII. COMSTECH INTER-ISLAMIC NETWORKS

COMSTECH initially established the following six **I**nter-**I**slamic **N**etworks:

i. **G**enetic **E**ngineering and Biotechnology (**INOGEB**) at Cairo, Egypt

ii. **R**enewable **E**nergy **S**ources (**INRES**) at Islamabad, Pakistan

iii. **Oc**eanography (**INOC**) at Izmir, Turkey

iv. Space Sciences and Technology (**ISNET**) at Karachi, Pakistan

v. **Tro**pical **M**edicine (**INTROM**) at Kuala Lumpur, Malaysia

vi. **W**ater **R**esources **D**evelopment **a**nd **M**anagement (**INWRDAM**) at Amman, Jordan

Following two new **I**nter-Islamic **N**etworks also approved by the Tenth General Assembly held in December 2001 are now on line:

i. **B**iosaline **A**griculture (**INBA**) in Dubai and

ii. **I**nformation **T**echnology (**INIT**) in Islamabad

Inter-Islamic **N**etworks on **V**eterinary **S**cience **R**esearch (**INVSR**) and **E**nvironment (**INE**), both located in Sudan were also approved by the Tenth General Assembly and were given final go-ahead by the Twenty-first Executive Committee meeting held in July 2003. These two networks unfortunately remained dormant since their inception on account of delay in release of funds by the host government. The funds have finally been released **(Appendix-II)** and these two Networks have also become functional from the year 2006.

Inter Islamic Networks executed the following activities since the 12th General Assembly meeting of COMSTECH:

- **INOC** International Conference on "Coastal Oceanography and Sustainable Marine Aquaculture (ICCOSMA), Confluence and Synergy", 02-04 May 2006, Kota Kinabalu, Sabah, Malaysia.
- **INWRDAM-COMSTECH-ISESCO** International Workshop on "Integrated Water Management (IWRM)", 21-24 May 2006, 6th October City, Arab Republic of Egypt.

- **INWRDAM** International Workshop on "Flash Food in Urab Areas and Risk Management", 4-6 September 2006, Muscat, Sultanate of Oman.

- **ISNET** International Seminar on "Space Technology & Applications", 11-15 September 2006, Islamabad, Pakistan

- **INOC-COMSTECH-ISESCO** International Seminar on "Coastal Water Management & Sustainable Use of Marine Resources", 14-16 November 2006, Dakar, Republic of Senegal.

IX. ISLAMIC CENTER FOR SCIENCE POLICY FOR TECHNO-ECONOMIC STUDIES (ISTEC)

The S&T Plan of action that was approved by the Fourth Islamic Summit held in Casablanca in January 1984 included establishment of "Islamic Center for Science Policy and Techno-Economic Studies" **(ISTEC)** to help the OIC member states prepare their S&T plans and policies. The Islamic Center for Science Policy and Techno-Economic Studies is a COMSTECH institution that has remained dormant on account of financial constraints ever since its approval by the Summit Conference. In view of recent interest by some member states from Africa, the Coordinator General has decided to revive this institution and the Twelfth General Assembly approved a small budget for this centre to become functional to help interested member states benefit from its activities. The Centre is initially proposed to start functioning with seed money from funds earmarked in COMSTECH budget proposal for 2006-2007 and it reported during the Twelfth General Assembly that the ISTEC will prepare and submit a detailed project to international donor organizations for sustaining its activities once it gets going. A project for funding has now been submitted to the Islamic development Bank **(Appendix-III)** and another project has been submitted to the Government of Pakistan through Higher Education Commission of Pakistan. The centre is proposed to be fully equipped to perform its advisory role in the field of S&T policy formulation, implementation and management. It has the following objectives:

1. To identify S&T priorities for the Islamic World and to examine alternative plans and strategies for speedy development.

2. To advise, review, evaluate and recast on request the national science policies of the OIC Member States and to help them prepare operational plans if they so desire,

3. To undertake perspective techno-economic futuristic and state-of-the-art studies in different fields of S&T,

4. To undertake studies on future trends in the important S&T fields and their application and to draw projections for R&D tasks and requirements for the Islamic World.

5. To identify thrust areas in the Islamic World vis-à-vis the rest of the world in S&T and objectively analyze future trends in those fields.

Bringing ISTEC to life is expected to promote a coherent and integrated approach to the development of the individual countries as well as the Ummah as a whole. ISTEC is being developed to assist in the formulation of the national S&T policies

within a determined set of development objectives and priorities which will promote complementary technological self-reliance in the Muslim countries.

This COMSTECH institution is now active and has already organized an important training course namely: International Training Course on "Technology Transfer Policy and Industry Level Perspectives", 12-18 July 2006, Islamabad, Pakistan.

X. COMSTECH COLLABORATIVE PROGRAMS WITH ISLAMIC DEVELOPMENT BANK (IDB)

The **I**slamic **D**evelopment **B**ank (**IDB**) has, from its inception, realized the importance of Science & Technology for the economic and social development of its member states. As a result, it gives both explicit and implicit support to its applications through various operational programs and specific activities designed to improve its member countries capabilities in this field.

Over the years, the **I**slamic **D**evelopment **B**ank (**IDB**) has sustained and consolidated its role in the field of Science & Technology for the development and made efforts to catalyze science & technology advancement of the Islamic countries.

To implement its science and technology related agenda, IDB has developed cooperation mechanisms with major S&T institutions including the OIC Standing Committee on Scientific and Technological Cooperation (COMSTECH). This cooperation between COMSTECH and IDB has further intensified during the recent years. Consequently, IDB has emerged as a major contributor to a variety of COMSTECH programs and COMSTECH established institutions including the **I**slamic **W**orld **A**cademy of **S**ciences, COMSTECH Inter-Islamic Networks program, COMSTECH assisted M.Sc Scholarships program, Centers of Excellence Cooperation Scheme, COMSTECH Institute of Advanced Training WAQF and project assistance to member states through COMSTECH recommended projects.

A. COMSTECH Institute of Advanced Training WAQF

Coordinator General COMSTECH in July 2003 requested the President IDB for financial assistance to complete the under construction COMSTECH Institute of Advanced Training that ensued discussions with IDB on this subject. The Coordinator General later visited the IDB and apprised the President of the importance of the COMSTECH proposal and requested for his assistance. As a result, the matter received sympathetic consideration and in February 2004, the President submitted the proposal before the IDB Executive Directors recommending establishing WAQF of US$10,000,000 for COMSTECH with a contribution of US$ 2,000,000 from the IDB. The balance amount of US$8,000,000 was proposed to be raised from other donors. The Executive Directors eventually empowered the President IDB to allow COMSTECH to proceed with the establishment of the WAQF.

The WAQF documents were prepared and sent to the IDB for its initial approval. The IDB then called the first meeting of the WAQF in Jeddah on January 04, 2005 in which the following decisions were recorded:

- Approved the proposed By-Laws after some modifications
- Authorized COMSTECH to open a bank account in the name of CIAT-WAQF in Meezan Bank Islamabad

- Approved transfer of US$ 2 million in two annual installments in accordance with the terms specified in the By-Laws
- Authorized COMSTECH to borrow funds from CIAT-WAQF in accordance with the conditions laid down in the By-Laws for completion of the COMSTECH civil construction project

It was agreed that COMSTECH will initiate the effort of resource mobilization for making up the balance amount under the guidance of Mr. Faisal Abdulaziz Al-Zaimi of IDB. While the resource mobilization under Mr. Faisal Abdul Aziz Al-Zaimi remains to be initiated, the COMSTECH in the meanwhile has managed to set aside about US$ one million so far to add to the WAQF fund to enable the WAQF to attain its approved target.

B. IDB's COMSTECH Inter-Islamic Network Support Program

One of the major reasons for slow development of COMSTECH Inter-Islamic Networks was the lack of resources for their proper growth during the early period. Consequently these institutions remained stagnant until about four years ago when the Coordinator General succeeded in securing financial support from IDB. Thus, IDB has been regularly supporting the Network activities up to US$150,000 annually to the six original networks that include:

- Water resources (INWRDAM); Jordan;
- Renewable energy sources (INRES); Niger;
- Space sciences and technology (ISNET); Pakistan;
- Oceanography (INOC); Turkey;
- Genetic engineering and biotechnology (INOGEB; Egypt;
- Tropical medicine (INTROM); Malaysia;
- Information Technology, (INIT); Pakistan; and
- Biosaline Agriculture (INBA), UAE.

IDB's Network support program is now completing sixth cycle and it is expected that with the addition of two new Networks in Sudan, the IDB support will increase in future.

XI. COMSTECH COLLABORATIVE PROGRAMS WITH ISESCO

COMSTECH and ISESCO have conducted joint development of science and technology in the OIC region for almost two decades now. Their first agreement for undertaking joint activities was signed in April 1989. Ever since, they have focused on the development of scientific activities and human resource development in a large number of sectors to improve quality of scientific self-reliance. This sense of partnership has registered excellent cooperation and growth except for a short period during 2003-2004 when on budgetary constraints and other reasons these two important S&T organizations of the OIC failed to achieve a joint program implementation. Nevertheless, the matter has received a forward push with a meeting in September 2004 between the Coordinator General COMSTECH and the Director General ISESCO who signed Sixth Cooperation Agreement with a renewed determination to overcome all the hurdles and turn a new chapter in joint S&T

development of the OIC region.

Keeping in view their keen interest in the development of science and technology in the OIC region and their excellent cooperation in implementing their joint activity; The Coordinator General COMSTECH and the Director General ISESCO met in September 2004 at the COMSTECH Secretariat in Islamabad to apprise each other of joint programs executed during the past and to work out details of a joint action program for the future. The Sixth joint cooperation agreement between COMSTECH and ISESCO was thus signed and it was agreed that during 2005-2006, eighteen activities at a budgeted cost of US$430,000/- would be implemented. It was further agreed that US$192000/- would be set aside for joint programs during 2005 and US$237,000/- would be spent during the year 2006. Of the eighteen joint activities agreed by the two organizations, four were for implementation during 2005, six for the year 2006 and the remaining eight at any time within the biennium of 2005-2006. Almost all the activities were completed by the end of 2006 and except for one workshop planned in Bangladesh that has suffered delay on account of elections in Bangladesh all other activities have been successfully concluded as planned.

COMSTECH-ISESCO joint Research Grants program

COMSTECH-ISESCO joint Research Grants program was announced in May 2005 and five successful applicants in the fields of Agricultural Biotechnology, Health Biotechnology, Frontier Areas of Science and Technology, Engineering Sciences, and Medicinal Plants respectively were awarded for the year 2005. This is a new program that will be fine tuned in the coming years. This joint Research program will expand in the years to come. Thus, COMSTECH-ISESCO managed to implement almost all of the activities listed in the Sixth joint agreement and the following research projects received financial support under the joint support program until the end of 2006,

A summary of the projects supported under this program is as follows:

1. Bangladesh

Dr. M.D. Tozammel Hoque
Institute of Biological Sciences, Rajshahi University, Rajshahi

Novel Bioactive Compounds from Sewage Microbes

Sewage is the home microbes which contains not only harmful microbes but it may harbor friendly microbes. The environment i.e. temperature, pH, humidity etc. of sewage of Bangladesh is very much optimum for microbial growth. So there is a great possibility to search newer and safer secondary microbes or natural bioactive compounds from microorganisms isolated from sewage. The present study is designed to isolate purity and characterize bioactive compounds from sewage microbes.

2. Cameroon

Dr. Gisele Yolande Nganou
Institute of Medical Research and Medicinal Plants Studies (IMPM)
P.O. Box 6163, Yaounde

Evaluation of androgenic and aphrodisiac properties of two Cameroonian medicinal plants *Carpolobia alba* and *Carpolobia lutea* (Polygalaceae)

WHO data in 1987 and 2000 revealed that male infertility present about 50% of couple infertilities. Male factors usually diagnosed are: oligozoopermia, endocrine causes, sexual ejaculatory dysfunctions, iatrogenic causes…. Modern therapy recommends in some cases, the administration of testosterone of his analogous, anto-estrogens and sexual stimulant such as Viagra. Treatment with androgens while improving male fertility, in some cases presents disadvantages due to secondary effects at the level of liver. On the other hand treatment of erectile dysfunction with Viagra has a major disadvantage due to it hypotensive effect through nitrite oxide derivatives. Poverty has induced African population to have recourse to traditional medicine to solve their health problems in general and their reproductive problems in particular. For all these reasons, the major aim of this project is to bring a scientific base for frequent prescription given by traditional doctors to their patients. For this study, androgenic and aphrodisiac activities of extracts of two Cameroonian medicinal plants: *Carpolobia alba* and *Carpolobia Lutia* (Polygalaceae) will be carries out.

3. Egypt

Dr. El-Rashdy Moustafa Redwan
Protein Research Department, BEBRI, Mubarak Scientific Research and Technology Applications, New Bor El Arab 21934, Alexandria

Recombinant anti-AB blood groups antibody

Shore we know the high cost of monoclonal antibody production, maintenance, and running. So from approximately decay the trend is to conversation into recombinant version of these antibodies using phage display technology and recombinant protein. Our proposal will employ phage display and expression technologies to produce antibody against A and B blood groups for diagnostic purposes. We will amplified, cloned and expression the specific antibody gene from prepared cDNA of hyberidoma mRNA. The resulted antibodies will chick for its agglutination potential.

4. Jordan

Dr. Raeed Attiyat, P.O. Box 425362, Amman-11140

Biodiversity Assessment and Genetic Conservation of Jordan indigenous (Baladi) cattle breeds using DNA fingerprinting and PCR based markers

5. Malaysia

Dr. Md. Zahangir Alam
Department of Biotechnology Engineering, Faculty of Engineering, International Islamic University, Kuala Lumpur

Production of lignin peroxidase enzyme from organic residues as new substrates by liquid state bioconversion

A lab-scal study will be carried out to produce ligninolytic enzyme: Lignin Peroxidase, from white-rot fungi Phanerochaete chrysosporium using organic residues seage treatment plant (STP) sludge and palm oil mill effluent (POME) as substrates. Production of these ligninolytic enzymes offers wide potential applications especially in the pulp and paper industry, wastewater treatment and textile industry. A stirred tank bioreactor will be used to optimize the operating conditions: aeration rate and agitation speed to achieve maximum productivity. The optimum process conditions: temperature, pH, substrate and co-substrate concentration and size of inoculum from previous study will be used for this research study. Downstream processing will be carried out to separate biosolids of fermentation broth and ligninolytic enzymes using conventional chromatographic method and cross-flow micro/ultra-filtration. The molecular weight of respective enzymes then will be determined by SDS-PAGE. Several parameters will be optimized during cross-flow micro/ultra-filtration processes to increase the recovery of the products (ligninolytic enzymes). In fact, the whole process may offer to achieve zero waste strategies in the sewage plant and provides and alternative environmental biotechnological approach for further research in waste management through value added products.

6. Nigeria

Dr. Ibrahim Adebayo Oladosu
Department of P/A Chemistry, Ladoke Akintola University of Technology Ogbomoso-23401

Development of new MDR-TB Drugs Candidates from Nigerian Plants

The challenges in preventing and controlling TB are further complicated by the deadly rise of MDR-TB. Recognizing the seriousness of the situation, program to screen new agents especially from plants origin, which would satisfy these unmet needs and have a favorable safety profile, is initiated. Because of the chronic nature of TB, a logical approach for developing a chemotherapy agents against tubercle bacilli will include; screening of secondary metabolites that could inhibit and contained a novel chemical structure to ensure improved efficiency.

7. Pakistan

Dr. Muhammad Raza Shah
HEJ Research Institute of Chemistry, International Centre for Chemical Sciences, University of Karachi

Design, Synthesis and Characterization of *p*-octiphenyloctacalix [4]arene a supramolecular multifunctional pore having practical applications in medicine and mechanics

Oral goal is to synthesize a highly functionalized supramolecular pore, which is capable to mimics the natural systems. These artificial supramolecular multifunctional pores are expected to self-assemble via non-covalent interactions and will be having a whole range of applications such as drug carriers, metal transporter, and visionary gene sequencer. Furthermore can be use to make molecular advices. The objective of the present proposal is to

Synthesize p-octiphenyloctacalix[4]arene

Characterize Rigid-Rod calyx[4]arene barrel

Charecterize Rigid-Rod calyx[4]arene barrel as supramolecular entity

Explore applications of envisioned barrel in numerous fields

Calix[4]arene and octiphenyle rod will generate two pores respectively, which can be utilized for several functions as describes above, diversity in the barrel can be obtained by the introduction of different functionalities at the upper rim, lower rim and methylene carbon of calix[4]arene. The envisioned rigid rod barrel stave will be self assemble via hydrogen bonding and can be characterized by ion exchange chromatography, size exclusion chromatography, patch clamp technique, vapor phase osmometry, spectroscopy (NMR, ESR, IR, UV/Vis), and spectrometry etc.

8. Palestine

Dr. Moundeer Fanoun, Faculty of Science and Technology, Jerusalem 20002

Packing of ailment and medical substances

9. Sudan

Dr. Ilham Abdelkader Eldaw, Assistant Professor, Biotechnology and Genetic Engineering Body, NRC, Kartoum

Use of Genetic Marketing in improvement of some Sudanese's Maize

Country-Wise Distribution of COMSTECH-ISESCO Grantees from 2005-2006

S. No.	Country Grantees	No. of Grantees
1.	Bangladesh	01
2.	Cameroon	01
3.	Egypt	01
4.	Jordan	01
5.	Malaysia	01

6.	Nigeria	01
7.	Pakistan	01
8.	Palestine	01
9.	Sudan	01
	Total	**09**

COMSTECH-ISESCO joint Research Grants program have received a total of one hundred ten applications of which nine have already been financed during the year 2006 and a final list of sixty-five applications is under process at the time of going to the press.

COMSTECH-ISESCO Seventh Joint Agreement for year 2007-2008 **(Appendix-IV)** signed recently in Kuwait envisages an outlay of US$ 445,000/-

XII. COMSTECH-EMRO JOINT PROGRAM FOR RESEARCH GRANTS IN APPLIED BIOTECHNOLOGY AND GENOMICS IN HEALTH (RAB&GH)

A. COMSTECH-WHO/EMRO Joint Program:

COMSTECH-EMRO Grant for Research in Applied Biotechnology & Genomics in Health (RAB&GH)

1. The World Health Organization is the United Nations specialized agency for health. WHO's objective, as set out in its Constitution, is the attainment by all peoples of the highest possible level of health WHO is governed by 192 Member States through the World Health Assembly.

2. WHO divides its member states into seven regions including Eastern Mediterranean region known as EMRO comprising of the following 21 countries:

3. **Afghanistan, Bahrain, Djibouti, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libyan Arab Jamahiriya, Morocco, Oman, Pakistan, Qatar, Saudi Arabia, Somalia, Sudan, Syrian Arab Republic, Tunisia, United Arab Emirates, and Yemen.**

4. WHO supports hundreds of research projects on a variety of health topics world wide and collaborates with many international organizations for joint activity. To benefit from WHO's experience and expertise in the field of health, the Coordinator General COMSTECH decided to open dialogue with WHO's Eastern Mediterranean section known as EMRO is more relevant to COMSTECH because all its member states are also the member states of COMSTECH. Thus, COMSTECH's Adviser Science visited EMRO in June 2004 and worked out an outline of COMSTECH-WHO/EMRO joint proposal for funding research in health related applied genomics and biotechnology

with initial outlay of US$200,000/- with equal contributions of US$100,000/- by EMRO and COMSTECH.

The Coordinator General gave his blessings after vetting the proposal and agreed to establish a joint research support in COMSTECH/EMRO countries in applied Biotechnology and Genomics. The joint effort is required to promote research, encourage networking, generate new knowledge and stimulate the application of biotechnology and genomic driven interventions in health care.

Following several Regional level consultations with experts in health related biotechnology and genomics; four priority areas have been identified for research and development in the OIC/EMRO Region. These include; diagnostics, pharmaceuticals, vaccine development and bioinformatics. The focus of the research grant will therefore generally remain on application of biotechnology and genomics within the fields described above. Research into common diseases, interventions and issues with the likelihood of strong public health impact will have the highest priority. COMSTECH and WHO therefore agreed to set 1st January 2005 as dead line for applications for applied research in the following areas:

- Diagnosis of Infectious and Communicable diseases
- Development and production of pharmaceuticals, recombinant proteins and products
- Vaccine development
- Bioinformatics and proteomics
- Social, ethical, legal and cultural issues with Gene databases
- Issues of patenting and use of biotechnology and genomics

ELIGIBILITY CRITERIA

- Researchers working in the regional institutes, centers and departments, engaged in health related research in molecular biology, biotechnology and genomics have been made eligible both, in private and public sectors.
- Joint multi-centre research proposals submitted by different research centers have been assigned selection preference.
- Research proposals submitted jointly by the member countries have also received higher selection criteria.
- Research proposals are required to mention clarity in purpose and statement of how the use of results will

support application of research, information sharing, and collaborative partnership building processes.

FINANCIAL SUPPORT

Proposals are normally required to be within US$18,000/-.

- In case of multi centre or inter-country joint research projects it has been agreed to allow a separate grant of up to US$18,000/- for each participating institution or country
- Restriction of US$18,000/- can be waved for research projects of exceptional quality.

Funding for research will be for a period of up to 18 months. Re-entry grants for follow up projects will have to be applied for afresh at the time of the next call for proposals.

Proposal Review Process

Technical review panel: The Technical Review Panel will be an independent, impartial team of experts appointed to guarantee the integrity and consistency of an open and transparent proposal review process.

Review criteria: successful proposals should in general demonstrate:

The deadline for receiving of first set of applications was set at January 1, 2005.

Summary of projects under COMSTECH-WHO/EMRO joint program during the year 2005-2006

1. Egypt

Dr. El Rashdy M. Redwan
Genetic Engineering and Biotechnology Research Institute (GEBRI)
Alexandria Protein Research Department, GEBRI, Mubarak City, NEW Borg EL Arab. Alexandria, Egypt

Production of human recombinant anti-tetanus Fab suing high throughout of phage display and Pichia pastoris

Assembling of human antibody display library, expression of Fab-anti-tetanus gene fragment in E.coli and in Pichia pastoris, and fermentation optimization of recombinant P.pastoris, and fermentation optimization of recombinant P. pastoris to yielded safer, inexpensive antitetanus Fab product, to improvement the adult and /or childhood health performance.

2. Egypt

Dr. Mona K. Marei
Tissue Engineering Laboratories, Osteoporosis Clinic, Faculty of Dentistry, Champolion St., Azarita, Alexandria, Egypt

Bioinformatics in tissue Engineering Science and Technology

Firstly, mining the databases for relation between different factors and the proteins involved in the dentingenesis process. Then a biological association network (BAN will be developed based on different bioinformatics tool to build a possible relation between all the parameters in dentingenesis.

Secondly, this BAN will be tested in our laboratory to stand on its validity.

Thirdly, using bioinformatics in 3D structure modeling, one or several proteins will be chosen to study their structure and how it can affect the dentinogeneis process in normal and pathogenic cases.

3. Egypt

Dr. Mohamed Abdel Hamid
10 Kasr El-Eini Street, Cairo – Egypt

Use of cDNA microarray for discovery of prognostic Markers for Squamous Cell Carcinoma of the Bladder.

The objective of this proposal is to use cDNA Microarray technology to identify clinical prognostic indicators for squamous cell carcinoma of the bladder. The end aim of this proposal is to provide clinicians with better tools for better-informed clinical decision-making. This, thus aims to bring the advances of the laboratory to the bedside for the betterment of patient care for a problem that is heavily concentrated in the Eastern Mediterranean Region (EMRO). This summary includes the objectives of both collaborating projects.

4. Egypt

Dr. Hussain Khaled
National Cancer Institute, Kasr El-Eini St. Fom-Elkhalig, Cairo – Egypt

Use of immunohistochemistry to validate cDNA microarray results for prognostic markers of squamous cell carcinoma of the bladder.

The objective of this proposal is to use immunohistochemistry to confirm the results of the cDNA Microarray (to be done in the collaborating project) on the protein level. This will then identify clinical prognostic indicators for squamous cell carcinoma of the bladder. The end aim of this proposal is to provide clinicians with better tools for better-informed clinical decision- making, This, thus aims to bring the advances of the laboratory to the bedside for the betterment of patient care for a problem that is heavily concentrated in the Eastern Mediterranean Region (EMRO). This summary includes the objectives of both collaborating projects.

5. Egypt

Mohamed Abdel Hamid
10 Kasr El Aini St., National Hepatology and Tropical Medicine Research Institute Cairo, Egypt.

The role of selected gene mutations in the pathogenesis of congenital heart disease in Egypt.

Rationale of the study: Congenital cardiovascular malformations (CCVM) are defects of the heart and the great vessels present at birth. They are a major and growing public health problem in Egypt, where prevention and control strategies are urgently needed to relieve the burden on individuals, families, and society. Environmental chemical exposures and genetic susceptibility to their effects on cancer occurrence are currently under investigation by our research team, and we are prepared to expand the focus of this program to CCVM. The proposed 18 months project will build upon our existing epidemiological and laboratory-based infrastructure in research office at the National Hepatology and Tropical Medicine Research Institute with collaborators from epidemiology, pediatric cardiology, and molecular genetics. **Methods:** We will recruit patients from the Pediatric Cardiology clinic at Cairo University, and controls from the vaccination program at the Center for Social and Preventive medicine, Cairo University during a period of 15 months. Eligible patients are infants and children up to the age of 2 years who have a confirmed diagnosis of conotruncal malformations (CTM). We will ask mothers of case and control subjects for their signed and/or verbal consent for us to conduct a brief interview review their medical records, obtain blood spot and a sample of cells from inside the mouth (buccal cells) of the mother and baby. **The goals of the project are:** 1) to recruit infants with and without CCVM, and their mothers; (2) to interview the mothers about their medical, familial, behavioral, and occupational history; (3) to collect oral cell samples and blood spots from the mother-infant pairs, using cytology brushes or blood spot cards respectively for DNA extraction; (4) to probe for genetic mutations in candidate genes BMRP2, ZFPM2/FOG2, and TBXI from CTM cases; (5) to analyze the data for evidence of associations between CCVM risk and these genetic and environmental factors; (6) to train a young Egyptian scientist(s) in these research methodologies where the technology in molecular genetics will be applied to achieve these objectives. **The expected outcome:** The results will help to target future strategies aimed at reducing the burden of CCVM in Egypt. **Main beneficiaries of the research:** 1) Create knowledge about possible environmental and genetic risk factors for congenital cardiovascular malformations in Egypt, information that is completely unknown at present. 2) Applying technology in genomic and molecular biology including the high-throughput genetic techniques that are considered a revolutionary advance in the field of genetics.

6. Iran

Dr. Hamideh Ofoghi
Iranian Research Organization for Science and Technology, No. 71, Forsat St., Engelab Ave., P.O Box 15815/3538,Tehran, Iran

Improving human recombinant calcitonin Expression level in Transgenic Potato Tuber by using Patatin class Promoter

Investigation for high level organ specific expression of recombinant human calcitonin gene in transgenic potato plant as eukaryotic system; trial to increase the production of hormone in safe expression system as plant, by using organ specific promoter like patatin class I promoter and organ or organelle signal peptide like chloroplast and amyloplast signal peptide that accumulate recombinant protein in tuber or the signal sequences direct protein to chloroplast. Such transgenic plant to simplify recombinant clacitonin extraction and purification.

7. Iran

Dr. Haleh Hashemi Sohi
National Research Centre for Genetic Engineering and Biotechnology, No. 19, Shahid Shafiee Alley, Qods St., Enghelab Ave., P.O. Box 14155-6343, Tehran, Iran

Production of pharmaceutical proteins in semi-desert plants

Production of two highly valuable pharmaceutical proteins-human growth hormone and full-length antibody PIPP which is used for pregnancy detection and contraception – in semi-desert plant.

8. Iran

Dr. Sedigheh Zakeri
Malaria Research Group, Biotechnology Department
Pasteur Institute of Iran, Tehran

Collaborative Research: Genome Analysis of *Plasmodium Falciparum* for Antimalarial Drug Monitoring in Baluchistan Iran

To make a preliminary evaluation of *P. falciparum* single Nucleotide Polymorphisms as valuable markers for Antimalarial drug resistance in Iranian malaria settings.

9. Iran

Dr. Masoud Salehi
Zahidan University of Medical Sciences, Behdasht Avenue, Zahidan

Collaborative Research: Genome Analysis of *Plasmodium Falciparum* for Antimalarial Drug Monitoring in Baluchistan Iran

To make a preliminary evaluation of *P. falciparum* single Nucleotide Polymorphisms as valuable markers for Antimalarial drug resistance in Iranian malaria settings.

10. Iran

Dr. M. Hussain Sanati
Genetic Disease Department, National Institute for Genetic Engineering and Biotechnology, No. 15, Abbas Shafiee Alloy, Quds Street, Inqilab Avenue, Tehran

Genetic Basis of Vision Impairment (Glaucoma) in Iran

To improve the methods for early diagnosis as well as better management of hearing and vision impaired. The results will be used in genetic counseling for the prevention of hereditary hearing/vision impairment in the population.

11. Iran

Dr. Navid Dinparast Djadid
Malaria Research Group, Biotechnology Dept., Pasteur Institute of Iran

Collaborating Research: Developing a molecular kit for monitoring insecticide resistance in four major malaria vectors of Eastern Mediterranean region (EMR).

Anopheles species in Eastern Mediterranean, especially Iran, Pakistan and Afghanistan constitute a common fauna, including the main vectors in this region; An. culicifacies, An. stephensi, An. fluviarilis, An. puicherrimus. Common malaria vectors and parasites, high prevalence of malaria, especially in Afghanistan, and immigrants moving between three neighboring countries, have been the main reason for establishment of resistant malaria vectors and parasites to insecticides and drugs. Our previous studies on molecular key to Iranian anophelines and molecular mechanism of insecticide resistance (kdr, GST) in main vectors provided baseline data for a regional study. Current project has been designed in order to develop and introduce a molecular tool for monitoring insecticide resistance in main malaria vectros of Iran-Pakistan-Afghanistan border areas and some inland areas in Iran and Pakistan. This will be achieved by cloning and sequencing of main insecticide resistance genes (VGSC, GST, EST, PY450) in those vectors. The out coming results from this project will define the molecular mechanisms of insecticide resistance and also will provide a distribution map for resistance in prevalent malaria vectors, which could be used for regional malaria control programs, especially border malaria. This will also provide a molecular baseline data for implementation of Eastern Mediterranean network for monitoring insecticide resistance, as has been announced in the frame of regional complementary infrastructure for Roll Back Malaria (RBM) strategy.

12. Iran

Zahra Zamani
Biochemistry Dept. Pasteur Institute of Iran, Tehran – Iran

Collaborative project on research on structural and mechanistic studies of merozoite surface protein – 1 (MSP-1) for preparation of recombinant MSP-1 malaria vaccine – The study on C19 – terminal of MSP-1.

The human malaria is a major parasitic disease of the developing countries and is characterized by the invasion of host erythrocytes resulting in malarial pathology. Invasion of erythrocytes by merozoites is a sequence of events i.e., recognition, attachment, orientation, internalization, survival and multiplication on erythrocytic materials utilizing combinatorial metabolism. Merozoite surface proteins, MSP-i is a key determinant of erythrocytes invasion by parasite. The protein is glycosylated and phosphorylated on polypeptide chains and on their C-terminus as glycosylphosphatidylionisitol (GPI) anchored within the membrane. Sugar residues on the protein are in 0-linked manner. In addition to their possible role in invasion, merozoite glycoproteins are antigens that are exposed to host immune system during merozoite release, evasion and invasion. These glycoproteins, MSP-i, is therefore potential candidate for the development of viable malarial vaccine. In more recent studies, it has been established that merozoite utilizes the metabolism or enzymes of erythrocyte to ensure survival and multiplication by establishing links with erythrocytic membrane and cytoplasmic domains to perform multiplication-survival activities. Besides glucosamine and mannose, it has been shown that galactose is incorporated in MSP-1 either on the surface or in the anchor. Furthermore, as yet there is no evidence to suggest whether the galactose residues are incorporated on the protein surface or in the GPI anchor. It is, however, known that the antigenicity of these malarial proteins is significantly decreased by eliminating galactose residues from the glycoprotein by ci-galcotisidase. This suggests that galactose has specific antigenic character to the glycoprotein rendering this sugar of specific importance. This research programme will define the role of carbohydrates in immune response to malaria with particular reference to stage specific modification of protein by PTMS. Programmes based on artificial neural network shall be utilized to predict the possibility of protein modifications by sugar residues and phosphate groups for protein multifunctional properties.

This programme project is based on utilizing theoretical knowledge coupled to experimental skills.

13. Iran

Dr. Sima Rafati
Pasteur Institute of Iran

Preparation of diagnostic kit using L. infantum C-terminal extension of type I cysteine proteinase for early detection of human visceral leishmaniasis

Leishmaniasis is considered by the World Health Organization to be one of the six major tropical diseases of developing countries. Among them, visceral leishmaniasis (VL) is a chronically debilitating disease characterized by splenomegafy, prolonged fever, anemia, pancytopenia and weight loss. This type is endemic in both Iran and Morocco. Since untreated VL is invariably fatal and as the currently available treatment options are expensive, an accurate diagnosis is

mandatory. In addition, diagnosis of VL cannot be made solely on the basis of clinical signs because of its resemblance to other diseases such as malaria, typhoid fever and tuberculosis. Therefore, initial symptoms are confirmed through culture of parasites from aspirates of spleen, bone marrow, or lymph node. The aspiration procedures are invasive; in particular, spleen aspiration needs to be carried out by experienced clinicians, as it can be a risky procedure. The development of serological tests has helped to improve the diagnostic procedures. However, immunodiagnostic methods using whole parasites as the source of antigen are often limited by the problem of cross reactivity between species. Thus, there is a need for specific antigens in diagnostic tests, particularly in the case of visceral leishmaniasis. Advances in molecular biology and recombinant gene expression have permitted the identification and recombinant expression of important L. infantum antigen genes. Among them, cystein proteinase type I (CPB) is good target antigen for vaccine development. One of the main features of this type is their C-terminal Extension (CTE) which is highly variable between different Leishmania species. The exact function of the CTE is not known, however, there is some evidence to suggest that the CTE has a role in immune evasion. It is postulated as being highly immunogenic and, therefore, may play a role in diversion of the host immune response. In view of these data and our previous investigation, we would like to evaluate and compare the active and recovered cases of L. infantum infected individuals from Northwest of Iran and Morocco for rCPB and its C tenninal extension (CTE) in addition to eight overlapping peptides in the form of highly pure synthetic peptide. In order to reach these points, we will express and purified the rCPB and rCTE (the clones are already obtained in our previous WHO grant AlOl 15). Through the sequence of CTE which is available, eight overlapping synthetic peptides will be designed. Sera from five different groups will be obtained in both Iran and Morocco (as described in part 12). By ELISA, we will measure total IgG and IgG subclasses in both recovered and active visceral leishmaniasis individuals. The specificity and sensitivity of the kit will be considered. We hope by designing and testing this kit, we could overcome the cross reactivity which is often observed when crud antigen is used. An improvement in the quality of the antigen for the ELISA with the use of species specific antigens for the immunodiagnosis of visceral leishmaniasis may moderate the false positive results. The rapid development of molecular biology techniques in the last decade has opened the way for the use of highly specific antigens in the form of purified and recombinant antigens. Synthetic peptides have proven to be valuable tools in the diagnosis of a variety of infections. In this project we would like to test this idea using rCPB, rCTE and eight overlapping synthetic peptides for early diagnosis of VL in two different countries: Iran and Morocco.

14. Iran

Mohammad Reza Pourshafie
Pasteur Institute of Iran, Dept. of Microbiology, Tehran, Iran

Molecular diagnosis of vancomycin resistant genes in enterococci and Staphylococcus aureus strains isolated in municipal and hospital wastewater in Iran

Enterococci and Staphylococcus aureus with multidrug-resistance are increasing and have become the leading cause of hospital-acquired infections. It is known that the environmental populations of bacteria may develop resistance when consistently exposed to antibiotics. Enterococci have shown an extraordinary skill to acquire genes that confer antimicrobial resistance. The potential transfer of vancomycin resistance genes toS. aureus has also been shown to occur in vitro. In the event methicillin-resistant S. aureus were to acquire vancomycin resistance capability, this pathogen would become virtually untreatable with current antibiotics, The sludge in wastewater treatment plants could, therefore, be where bacteria can overcome antibiotics through a natural process of genetic exchange.

The molecular techniques in this investigation will permit advancement in diagnosis and the knowledge of the numbers and types of resistant strains of vancomycin resistant enterococci (VRE) and vancomycin resistant S. aureus (VRSA). The generated data will be useful for design of plans for prevention and control of the emergence of vancomycin resistance bacteria.

The Genomic-based analysis, i.e. ribotyping, DNA sequencing, vanA transposon, Tn 1546, analysis will be performed for determination of differences among VRE and VRSA.

15. Iran

Mahmood Chamankhah
Shahid Beheshti Medical Sciences University, Tehran, Iran

Proteomics analysis of immunologic infertility: detection of immunodominant sperm surface antigens in Iranian infertile patients.

Rationale of the study: The correlation of antisperm antibodies (ASA) with some cases of unexplained infertility suggests a role for these antibodies in blocking fertilization. ASA are thought to impair fertility by inhibiting sperm motility, sperm penetration of the cervical mucus, capacitation, or the acrosome reaction, or they may invoke the complement cascade resulting in sperm lysis. A complete understanding of the mechanism behind immunologic infertility, as well as improved diagnosis and treatment, depends on knowledge of the identities of specific sperm antigens capable of eliciting the production of functionally relevant sperm antibodies, A variety of approaches has been taken to study the molecular composition of the sperm surface. Most of the earlier studies used one-dimensional gel electrophoresis for the separation of sperm proteins. As there have been very few studies that have employed proteomic approaches to

examine male infertility, in this study, we aim at a comprehensive study of these potential antigens in Iranian patients using a proteomics approach.

Objectives: The main objective of this study is to identify sperms surface proteins recognized by antibodies that exist in the serum of imnumoinfertile patients. These proteins could serve as desirable antigen candidates for the development of irumunocontraceptive vaccines. In addition, as proteomics is employed as a high throughput technique to cover all possible targets, one important objective of this study is to discover new key biomarkers with diagnostic value in immunologic infertility compared to other unexplained infertilities. As an aid to basic researchers in the field of sperm-egg interaction, this study has a potential in finding new proteins with functions in sperm motility, sperm penetration of the cervical mucus, capacitation, or the acrosome reaction.

Methodology: In this study, a two-dimensional gel electrophoresis technique combined with mass spectrometry is employed to facilitate protein identification. As a first step, semen fluid is collected from fertile healthy men to prepare the profile of normal sperm surface proteins. Sera are also collected from women with unexplained infertility. The presence of anti-sperm antibodies (ASA) in the sera of infertile women subjects is confirmed using an indirect immunobead test (IBT). Samples with high levels of ASA will be used in Western blotting and immunofluorescence experiments, In Western blotting, human sperm surface antigens are resolved using a two-dimensional gel electrophoresis technique prior to blotting. This allows high resolution separation of protein spots which facilitates the target identification in the following steps. Localization of target antigens on the surface of sperms is accomplished using an immunofluorescence technique. The spots for identified sperm surface proteins are excised from the gel and are subjected to protein sequencing and peptide mapping.

Expected outcomes and main beneficiaries of the research: This study is expected to lead to the discovery of human sperm surface antigens with immunodominant antigenic activity. As these antigens could have potential applications as immunocontraceptive vaccines, this can benefit those authorities dealing with population control. In addition, those patients with immunologic infertility will benefit from diagnostic values of this study as it may lead to important biomarkers useful in fast and reliable diagnosis of such a disease. Basic science researchers interested in sperm-egg interaction will also benefit from this study as it may lead to discovery of new targets that are involved in the above mentioned process. Finally, human proteome map is now the focus of proteomics community and in this regard, this study can add up to the existing information on human sperm proteome map. Therefore it can benefit those who are involved in generating proteome map of human sperm surface antigens.

16. Iran

Marjan Mohammadi
Biotechnology Department, Pasteur Institute of Iran

Determination of toxicity of Iranian Helicobacter pylori strains: From Gene to Protein to Function: Application to diagnostics and patient screening.

We will study whether functional assays will determine true toxicity of HP strains and reveal the validity of genotyping assays and patient screening methods.

Objectives: (1) Establishment of mammalian tissue culture and the related bioassays. (2) Identification of genotype of isolated strains for cagA, cage and vacA. (3) Analysis of protein expression for cagA, cage and vacA genes. (4) Determination of functional cytotoxicity of cagA and vacA by cellular bioassays. (5) Analysis of the association between genotype, phenotype and function of vacA and cagA and relationship analysis between genotype, protein and function of vacA and cagA with the associated disease.

17. Jordan

Dr. Wail A. Hayajneh
Department of Biotechnology and Genetic Engineering, Jordan University of Science and Technology, P.O. Box 3030, Irbid, Jordan 22110

Invasive Streptococcus pneumonia serotypes: genotypic and phenotypic characteristics in North Jordan

To identify phenotypic and genotypic characteristics of invasive streptococcus pneumonia serotypes in North Jordan, especially in Children.

18. Lebanon

Dr. Hala Ghali Muhtasib
American University of Beirut

Collaborative Research on the Anti-Inflammatory Anti-cancer Effects of Gallotannin in Human Colon Cancer Cells: Anti-cancer Effects of Gallotannin

To investigate the anti-cancer effects of GT and the mechanism(s) of its anti-tumor effects in human colon cancer cells.

19. Lebanon

Dr. Raghida Abou Merhi
Science Faculty, Section-1, Lebanese American University
Hadath,

Collaborative Research on the Anti-inflammatory and Anti-Cancer Effects of Gallotannin in Human Colon Cancer Cells: Anti-Cancer Effects of Gallotannin

To investigate the Anti-inflammatory effects of GT and the mechanism(s) of its anti-inflammation in human colon cancer cells

20. Morocco

Prof. Rajae El Aouad
National Institute of Hygiene, 27 Avenue Ibn Batouta, BP 789, Rabbat-11400

Collaborative Research on Tuberculosis in Morocco: Evaluation of the Performance of Antigenic Epitomic Peptides for the Development of a new test allowing the different Diagnosis between the Active Tuberculosis and the Latent Tuberculosis Infections

To promote the development of a new test based on multiepitopic peptide antigens allowing a different diagnosis between the active tuberculosis and the latent tuberculosis infection particularly when fast mycobac erium tuberculosis identification is no available.

21. Morocco

Prof. Ghali Iraqi
Department of Tuberculosis and Lung Diseases, Faculty of Medicine of Rabat, Hospital Monlay Youssef of Rabat, University Hospital, Ave Mohammed Ben Abdelllah Akkari, B.P. 1017 RP, Rabat-10,000

Tuberculosis in Morocco: Diagnosis of the active Tuberculosis when fast Mycobacterium tuberculosis identification is negative

To compare the cost-effectiveness and the cost benefit of two diagnostic algorithms: the first using traditional laboratory tests with the current national TB control programme and the second incorporating a new repic test (ELISpot)

22. Morocco

Mohammed ATTALEB
B.P. 1382 R.P. 10001-Rabat

The assessment of epidermal growth factor receptor (EGFR) abnormalities as a prognostic marker in cervical cancer.

With about 400 000 new cases and nearly 250 000 deaths each year, cervical cancer (CC) contributes significantly to worldwide cancer-related morbidity and mortality. The high morbidity of advanced CC is related to the low effectiveness of current treatment protocols which lack a fair understanding of the tumor biology at the molecular level. Further, although it is becoming increasingly evident that there are variations in tumor therapy efficacy among patients, the molecular basis of patient's response to treatment, and the knowledge about the gene(s) or signaling pathways that are responsible for treatment success or failure remain unknown. Of a number of potential molecular tumor markers, genomic alterations (gene amplification, point mutations, over-expression) in EGFR ('7pl I) have been observed in several tumors, including CC and an association with poor prognosis has been made.

Recent unraveling of the molecular aspects of cancer biology and improvements in biotechnology and clinical pharmacology have

permitted the development of novel drugs against specific targets associated with oncogenic drive as part of the new therapeutic armoury. An example is inhibition of the epidermal growth factor receptor (EGFR) system. To date, two classes of drugs have been licensed in this area: small molecule tyrosine kinase inhibitors (TKI) and monoclonal antibodies to the EGFR. The clinical studies however, show only modest numbers of clinical responders. One area of current research focuses upon the identification of distinguishing factors between those who derive benefit from those who do not information which will aid patient selection. The last twelve months have seen a flood of publications documenting mutations within the EGFR gene and their correlation with tumor sensitivity to TM.

Tyrosine kinase inhibitors have shown promising results in improving patient response to treatment in lung cancer. This type of response has been linked to the presence of point mutations in EGFR which are the target of the TM. In these studies, 98% of patients who underwent a durable reduction in the size of their tumors had EGFR mutations affecting the kinase domain of the protein but none of patients who disease progressed on therapy did. It is therefore clear that molecular target dependence and patient selection based on specific molecular markers should be central to the development of molecular therapeutics in human cancers. It can be suggested that if this approach is used in the right group of patients, better clinical responses will be observed, and patients will avoid exposure to drugs unlikely to produce any clinical benefit. In this study we propose that success or failure in clinical response may be linked to specific alterations in EGFR. To this end, we will perform molecular analyses of EGFR alterations in biopsy material derived from untreated patients diagnosed with invasive CC who have been follow-up for 5 years. This study is designed to investigate the association between gene expression evaluated by immunohistochemistry (II-IC), gene status evaluated by point mutation analysis, and gene copy number assessed by fluorescence in situ hybridization (FISH) techniques to evaluate whether these gene target alterations are associated with prognosis in 50 patients diagnosed with invasive CC who have been treated and followed-up for 5 years. Molecular finding will be correlated with clinico-pathologic data to assess whether the alterations in EGFR may be used as prognostic markers.

Analysis of EGFR alterations may help explaining the difference in patient's response to clinical treatment. Knowledge about the molecular status of this marker in CC will allow us to assess the feasibility to carry out clinical trials with TKI such as Gefitinib, Erlotinib or Cetuximab in patients positive or negative to specific EGFR molecular alterations. Furthermore, since CC is a complex disease, other targets might be responsible for the success or failure to patient treatment. This study will give us insight into the role of EGFR in CC as a prognostic marker and will serve as the foundation for a wider application to study in collaboration with the different centers involved other relevant molecular targets as prognostic markers in CC.

23. Morocco

Meriem KHYATTI
1, Rue Abou Kacem Ez-Zahraoui, 20 100, Casablanca

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24. Morocco

Dr. Meryem lemrani
Pasteur Institute of Morocco

Preparation of diagnostic kit using L. infantum C-terminal extension of type I cysteine proteinase for early detection of human visceral leishmaniasis

Leishmaniasis is considered by the World Health Organization to be one of the six major tropical diseases of developing countries. Among them, visceral leishmaniasis (VL) is a chronically debilitating disease characterized by splenomegafy, prolonged fever, anemia, pancytopenia and weight loss. This type is endemic in both Iran and Morocco. Since untreated VL is invariably fatal and as the currently available treatment options are expensive, an accurate diagnosis is mandatory. In addition, diagnosis of VL cannot be made solely on the basis of clinical signs because of its resemblance to other diseases such as malaria, typhoid fever and tuberculosis. Therefore, initial symptoms are confirmed through culture of parasites from aspirates of spleen, bone marrow, or lymph node. The aspiration procedures are invasive; in particular, spleen aspiration needs to be carried out by experienced clinicians, as it can be a risky procedure. The development of serological tests has helped to improve the diagnostic procedures. However, immunodiagnostic methods using whole parasites as the source of antigen are often limited by the problem of cross reactivity between species. Thus, there is a need for specific antigens in diagnostic tests, particularly in the case of visceral leishmaniasis. Advances in molecular biology and recombinant gene expression have permitted the identification and recombinant

expression of important L. infantum antigen genes. Amohg them, cystein proteinase type I (CPB) is good target antigen for vaccine development. One of the main features of this type is their C-terminal Extension (CTE) which is highly variable between different Leishmania species. The exact function of the CTE is not known, however, there is some evidence to suggest that the CTE has a role in immune evasion. It is postulated as being highly immunogenic and, therefore, may play a role in diversion of the host immune response. In view of these data and our previous investigation, we would like to evaluate and compare the active and recovered cases of L. infantum infected individuals from Northwest of Iran and Morocco for rCPB and its C tenninal extension (CTE) in addition to eight overlapping peptides in the form of highly pure synthetic peptide. In order to reach these points, we will express and purified the rCPB and rCTE (the clones are already obtained in our previous WHO grant AlOl 15). Through the sequence of CTE which is available, eight overlapping synthetic peptides will be designed. Sera from five different groups will be obtained in both Iran and Morocco (as described in part 12). By ELISA, we will measure total IgG and IgG subclasses in both recovered and active visceral leishmaniasis individuals. The specificity and sensitivity of the kit will be considered. We hope by designing and testing this kit, we could overcome the cross reactivity which is often observed when crud antigen is used. An improvement in the quality of the antigen for the ELISA with the use of species specific antigens for the immunodiagnosis of visceral leishmaniasis may moderate the false positive results. The rapid development of molecular biology techniques in the last decade has opened the way for the use of highly specific antigens in the form of purified and recombinant antigens. Synthetic peptides have proven to be valuable tools in the diagnosis of a variety of infections. In this project we would like to test this idea using rCPB, rCTE and eight overlapping synthetic peptides for early diagnosis of VL in two different countries: Iran and Morocco.

25. Oman

Zakiya M.N. Al Lamki
Sultan Qaboos University, Dept. of Child Health, College of Medicine & Health Sciences, Sultanate of Oman

Social, Cultural, Legal and Ethical Issues related to Gene in a developing country.

26. Pakistan

Dr. Shaheen N. Khan
Senior Research Officer, Centre for Applied Molecular Biology, University of the Punjab, 87-West Canal Bank Road, Thokar Niaz Baig, Lahore-53700

Studies on the Genetic & Molecular Basis of Hearing and Vision Impairment

To improve the methods of early diagnosis as well as better management of hearing impairment. The results will be used in genetic counseling for the prevention of hearing impairment in the population.

27. Pakistan

Dr. Syeda Azra Qamar
A-271, Sector 11/B, North Karachi, Karachi – Pakistan

Collaborating Research: Developing a molecular kit for monitoring insecticide resistance in four major malaria vectors of Eastern Mediterranean region (EMR).

Anopheles species in Eastern Mediterranean, especially Iran, Pakistan and Afghanistan constitute a common fauna, including the main vectors in this region; An. culicifacies, An. stephensi, An. fluviarilis, An. puicherrimus. Common malaria vectors and parasites, high prevalence of malaria, especially in Afghanistan, and immigrants moving between three neighboring countries, have been the main reason for establishment of resistant malaria vectors and parasites to insecticides and drugs. Our previous studies on molecular key to Iranian anophelines and molecular mechanism of insecticide resistance (kdr, GST) in main vectors provided baseline data for a regional study. Current project has been designed in order to develop and introduce a molecular tool for monitoring insecticide resistance in main malaria vectros of Iran-Pakistan-Afghanistan border areas and some inland areas in Iran and Pakistan. This will be achieved by cloning and sequencing of main insecticide resistance genes (VGSC, GST, EST, PY450) in those vectors. The out coming results from this project will define the molecular mechanisms of insecticide resistance and also will provide a distribution map for resistance in prevalent malaria vectors, which could be used for regional malaria control programs, especially border malaria. This will also provide a molecular baseline data for implementation of Eastern Mediterranean network for monitoring insecticide resistance, as has been announced in the frame of regional complementary infrastructure for Roll Back Malaria (RBM) strategy.

28. Pakistan

Prof. Dr. Abdul Rauf Shakoori
School of Biological Sciences, University of the Punjab, Lahore – Pakistan

Collaborative research on structural and mechanistic studies of merozoite surface protein-1 (MSP-1) for preparation of recombinant MSP-I malaria vaccine – experimental aspects.

The human malaria is a major parasitic disease of the developing countries and is characterized by the invasion of host erythrocytes resulting in malarial pathology. Invasion of erythrocytes by merozoites is a sequence of events i.e., recognition, attachment, orientation, internalization, survival and multiplication on erythrocytic materials utilizing combinatorial metabolism. Merozoite surface proteins, MSP-I is a key determinant of erythrocytes invasion by parasite. The protein is glycosylated and phosphorylated on polypeptide chains and on their C-terminus as glycosylphosphatidylinositol (GPI) anchored within the membrane. Sugar residues on the protein are in 0-linked manner. In addition to their possible role in invasion, merozoite glycoproteins

are antigens that are exposed to host immune system during merozoite release, evasion and invasion. The glycoprotein, MSP-I is, therefore, potential candidate for the development of viable malarial vaccine. In more recent studies, it has been established that merozoite utilizes the metabolism or enzymes of erythrocyte to ensure survival and multiplication by establishing links with erythrocytic membrane and cytoplasmic domains to perform multiplication-survival activities. Besides glucosamine and mannose, it has been shown that galactose is incorporated in MSP-I either on the surface or in the anchor. Furthermore, as yet there is no evidence to suggest whether the galactose residues are incorporated on the protein surface or in the GPI anchor. It is, however, known that the antigenicity of these malarial proteins is significantly decreased by eliminating galactose residues from the glycoprotein by a-galactosidase. This suggests that galactose has specific antigenic character to the glycoprotein rendering this sugar of specific importance. This research programme will define the role of carbohydrates in immune response to malaria with particular reference to stage specific modification of protein by PTMS.

This project proposal is based on utilizing theoretical knowledge coupled to experimental skills. Programmes based on artificial neural network shall be utilized to predict the possibility of protein modifications by sugar residues and phosphate groups for protein multifunctional properties.

29. Pakistan

Dr. Nasiruddin
Institute of Molecular Sciences & Bioinformatics, NISBET Road, Lahore – Pakistan

Collaborative research on structural and mechanistic studies of merozoite surface protein-1 (MSP-1) for preparation of recombinant MSP-I malaria vaccine – computational studies

The human malaria is a major parasitic disease of the developing countries and is characterized by the invasion of host erythrocytes resulting in malarial pathology. Invasion of erythrocytes by merozoites is a sequence of events i.e., recognition, attachment, orientation, internalization, survival and multiplication on erythrocytic materials utilizing combinatorial metabolism. Merozoite surface proteins, MSP-I is a key determinant of erythrocytes invasion by parasite. The protein is glycosylated and phosphorylated on polypeptide chains and on their C-terminus as glycosylphosphatidylinositol (GPI) anchored within the membrane. Sugar residues on the protein are in 0-linked manner. In addition to their possible role in invasion, merozoite glycoproteins are antigens that are exposed to host immune system during merozoite release, evasion and invasion. The glycoprotein, MSP-I is, therefore, potential candidate for the development of viable malarial vaccine. In more recent studies, it has been established that merozoite utilizes the metabolism or enzymes of erythrocyte to ensure survival and multiplication by establishing links with erythrocytic membrane and cytoplasmic domains to perform multiplication-survival

activities. Besides glucosamine and mannose, it has been shown that galactose is incorporated in MSP-I either on the surface or in the anchor. Furthermore, as yet there is no evidence to suggest whether the galactose residues are incorporated on the protein surface or in the GPI anchor. It is, however, known that the antigenicity of these malarial proteins is significantly decreased by eliminating galactose residues from the glycoprotein by a-galactosidase. This suggests that galactose has specific antigenic character to the glycoprotein rendering this sugar of specific importance. This research programme will define the role of carbohydrates in immune response to malaria with particular reference to stage specific modification of protein by PTMS.

This project proposal is based on utilizing theoretical knowledge coupled to experimental skills. Programmes based on artificial neural network shall be utilized to predict the possibility of protein modifications by sugar residues and phosphate groups for protein multifunctional properties.

30. Pakistan

Saifullah Khan
HEJ Research Institute of Chemistry, University of Karachi, Karachi-Pakistan.

Application of the biotransformation techniques to produce value added compounds using plant cell cultures.

The medicinally important plants such as Catharanthus roseus, Azadirachta indica and others could be used to transform the cheap compounds by making cell suspension cultures.

Cheap or non-valuable compounds could be transformed into valuable compounds.

Transformed compounds may have high market value, which may bring about the development of the industry and lead to economic improvement.

31. Pakistan

Dr. Sheikh Riazuddin
National Centre of Excellence in Molecular Biology, Lahore, Pakistan.

Studies on the IL-8 levels and mutations in E2 and NS5A genes of Hepatitis C virus in resistance to antiviral therapy.

32. Syria

Dr. Walid Al Ashkar
Atomic Energy Commission of Syria (AECS), Damascus

Genetic Basis of Hearing Impairment in Syrian Population

The identification of genes responsible for vision impairment will help define the underlying biochemical abnormalities responsible for the disease. A better understating of the underlying molecular defects,

may lead to more effective and specific therapies. Defining gene defects that predispose to glaucoma will help identity individuals at risk for the disease, thus allowing for appropriate treatment and prevention of blindness. The knowledge will also be useful in genetic counseling.

33. Syria

Mouna Alkhatib
Molecular biology Lab. St. Alghassani – PHLs, Aleppo, Damascus, Syria.

Diagnosis and genotyping HCVB RNA in Syria by applying molecular biology techniques.

HCV patient is diagnosed in Syria by clinical symptoms, liver enzymes, HCV Abs detection (ELISA) and liver biopsy. HCV was a priority for molecular biology lab as the mentioned ways of investigations need confirmation, reliability, saving money and time, not enough to distinguish between chronic and recovered case, and do not cover the window period. The diagnosed patients are undergone to treatment on the cost of MOH.

Confirmation diagnosis of hepatitis C by molecular biology techniques, and determination of genotype(s) prevalent in Syria.

This study will apply in house PCR to confirm 150 samples and genotyping 40 samples from different geographical regions, 25 pools of serum will be collected from the blood bank each of them consists of 20 samples, these pools are negative by EIA and will be tested by HCV PCR to detect any false negative case, every positive pool will be tested separately.

34. Tunisia

Dr. Mohamed Mousli
Pasteur Institute of Tunisia, 13, Place Pasteur-BP 74, 1002,
Tunis- Belvedere Tunis

Green Fluorescent Recombination Antibody: novel in vitro tools for detecting the rabies virus antigen

To design a novel class of “Artificial and antibodies” based on a green fluorescent protein-labeled recombinant flu body to develop a simple flouroimmunoassay method for detective in vitro the rabies virus glycoprotein in an environmental sample.

35. Tunisia

Dr. Souha Ben Abderrazak
Institut Pasteur de Tunis, Laboratoire d’Epidémiologie et d’Ecologie Parasitaire, 13 Place Pasteur, BP74, 1002 Tunis Belvédère

Integrated biochemical, bioinformatic, genomic and molecular biology approaches for the development of novel tools for the diagnosis of leishmaniases in Humans

The general objectives of this study are related to the development and improvement of molecular diagnosis of leishmaniases in order to improve the management of patients and to provide a more accurate reporting alert or counseling to the Leishmaniases control program. More specifically, the aims are to:

1- Install and validate isoenzyme typing using cellulose acetate for the biochemical typing of the *Leishmania* parasites.

2- Install molecular diagnosis for leishmaniases in a central clinical facility for parasitological diagnosis in central Tunisia.

3- Develop diagnostic PCR- and biochips- based assays for the *Leishmania* species identification using targets identified upon the comparative analysis of *L. major* and *L. infantum* genomes and experimental screenings for species specific sequences

4- Validate these tools for the diagnosis of the disease in human patients

Country-Wise Distribution of COMSTECH-EMRO/WHO Grantees from 2005-2007

S.No.	Country Name	No. of Grantees	Grant in US$
1.	Egypt	5	**66,000**
2.	Iran	11	**138,300**
3.	Jordan	1	**18,000**
4.	Lebanon	2	**26,500**
5.	Morocco	5	**53,000**
6.	Oman	1	**17,700**
7.	Pakistan	6	**71,900**
8.	Syria	2	**28,500**
9.	Tunisia	2	**33,300**
	Total	**35**	**453,200**

XIII. COMSTECH COLLABORATIVE PROGRAMS WITH INTERNATIONAL FOUNDATION FOR SCIENCE (IFS)

International **F**oundation for **S**cience (IFS) is located in Stockholm, Sweden. Its overall objective is to contribute to the strengthening of capacity in developing countries to conduct relevant and high quality research on the management, use and conservation of biological resources and the environment. To achieve its objectives IFS has developed a highly organised network and identified a large group of experts to identify, through competitive grants and careful screening, young promising researchers with a potential for becoming future lead scientists. Once identified, arrangements are then made to support their early research to enable them to get

established and recognised, nationally and internationally. In this way IFS supports a large number of research projects throughout the world and has the means and a strong infrastructure to monitor projects and devise strategies to maximize utilization of funds.

Because of the similarity of mandates and strong common interests in the field of science capacity building, COMSTECH opened a channel of communications and initiated contacts with IFS to consider the possibility of joint financial support for further strengthening research in the OIC region. It was considered that by joining hands with IFS, COMSTECH would not only invest its funds in effective research within the OIC region but it would reap a rich harvest by obtaining matching grants from IFS for OIC scientists and institutions, thus, doubling the amount of grants to its scientific community.

An agreement was therefore signed and program parameters were defined as follows:

- Small research grants (up to a maximum amount of US$ 12,000 each) are awarded on a competitive basis to young (below the age of 40) promising scientists in the six research areas namely aquatic resources, animal production, crop science, forestry/agro forestry, food science and natural products,
- The grants are awarded to nationals of OIC member states to conduct their research in an OIC country while in the employment of a non-profit institution or organisation that also guarantees basic research facilities for the research project.
- The grants are used for laboratory and field equipment, supplies, local travel, literature and daily labour, but not for permanent salaries or vehicles.
- The IFS Scientific Advisory Committees responsible for the final screening of grant applications are composed of senior scientists that now include scientists from COMSTECH countries. The members that are mutually agreed upon by COMSTECH and IFS have the in-depth knowledge of the IFS grant procedure because they have served as Advisers or were former grantees of the IFS programmes.
- In the event that there are fewer small research grants recommended for approval during the first year than there are funds available, COMSTECH and IFS mutually agree on whether the balance is to be paid back to the two organisations (50% each) or whether it should be carried forward to be used in the following year.
- If, on the other hand, there are more recommendations than the funds then, COMSTECH and IFS jointly decide which grants to fund under the programme.

COMSTECH has so far funded one hundred and twenty two projects in twenty-seven member states of the OIC region. The total value of these projects is US$1,257,620/- and the disbursements to young scientists from various member states are as follows:

Country-wise Distribution of COMSTECH/IFS grantees

S. No.	Country Grantees	No. of Grantees	Grant in US$
1.	Algeria	1	**12,000**
2.	Bangladesh	4	**41,250**
3.	Benin	6	**60,245**
4.	Burkina Faso	6	**52,750**
5.	Cameroon	8	**85,400**
6.	Cote d'Ivoire	4	**31,500**
7.	Egypt	6	**67,080**
8.	Gabon	1	**11,500**
9.	Gambia	2	**19,534**
10.	Indonesia	9	**110,100**
11.	Iran	5	**55,395**
12.	Jordan	2	**19,500**
13.	Lebanon	2	**23,500**
14.	Malaysia	6	**54,600**
15.	Mali	3	**26,360**
16.	Mauritania	1	**12,000**
17.	Morocco	5	**42,500**
18.	Mozambique	3	**31,000**
19.	Niger	3	**29,740**
20.	Nigeria	9	**90,267**
21.	Pakistan	9	**97,550**
22.	Senegal	4	**36,380**
23.	Sierra Leone	3	**35,920**
24.	Sudan	5	**56,800**
25.	Togo	5	**56,549**
26.	Tunisia	4	**40,800**
27.	Uganda	6	**57,400**
	Total	**122**	**1,257,620**

Summary of twenty-two projects that COMSTECH–IFS program funded during the year 2006 is as follows:

1. Bangladesh

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Bangladesh Agricultural University (BAU)
Faculty of Fisheries, Department of Fisheries Management
Mymensingh

Promotion of mola (*Amblypharyngodon mola*) and freshwater prawn (Macrobrachium rosenbergii) culture integrated with rice in farmers field and its livelihood impacts

The research work will be carried out in the farmers' rice fields in a village of Mymensingh district of Bangladesh. Five experiments will be performed in the proposed research work. Such as: (a) Growth and production performance of mola (Amblypharyngodon mola) and fresh water prawn (Macrobrachium rosenbergi) in concurrent method. (b) Growth and production performance of mola and fresh water prawn in alternate method. (c) Determination of appropriate stocking ratios of mola and fresh water prawn. (d) Effects of different diets on the growth and production of mola and fresh water prawn in alternate method. (e) Impact of mola-prawn culture integrated wit rice on the livelihood of rural formers

Monitoring of water quality parameter such as transparency, water temperature, pH DO, NO2-N, NO3-N, Po4-P, total alkalinity and Chlorophyll-a will be done fortnightly. Quantitative and qualitative study of plankton will be done once in a month. For socio-economic analysis, data will be collected using a prescribed form and be analyzed by using Ms Excel and SPSS 12.0 software.

2. Benin

Dr. Serge Eric Kokou Attignon
Laboratoire d'Ecologie Appliquee (LEA)
Faculté des Sciences Agronomiques (FSA) Unversité d'Abomey Calavi (UAC)
01 BP 526, Cotonou

Termite assemblages and functional diversity in agriculture and forest ecosystems in southern Benin.

Termites (Isoptera) are often regarded as pest of crops, tree and buildings, and farmers actively eliminate termites from their fields, plantations and pastures. But there are also recognized as performing important ecosystem processes. There are key actors in maintaining and improving soil characteristics such as nutrient status, organic matter stabilization and water balance. The positive ecological role of termite is some how under perceived or hidden due to negative impact of the few termites pest occurring in agriculture and forest ecosystems. The diversity and composition of termites, and their associated functions vary between ecosystems. Although their important role of these is undertaken, thus this issue received little scientific attention. This study aims to assess the diversity of termites in agriculture and surrounding forest ecosystems in collaboration with

farmer and foresters and thereby suggest sustainable measures of their conservation. Collection and identification of termites will be made, and species richness, abundance and composition data will be collected in permanent defined transects. Species accumulation curves will be constructed and different habitat will be compared in order to perceive the need of termite diversity conservation. This research will serve as a model for other invertebrate's species ecologically important to be conserve in African ecosystems and provide sustainable conservation measures and better understanding of the ecological role of termite. This fits into the strategic plan of the International Foundation for Science (IFS) to promote the development of well trained young scientists in developing countries, in order to conduct relevant and high quality research on the sustainable management of biological.

3. Benin

ALAVO, Thiery B Charles
Université d'Abomey-Calavi (UAC)
Faculté des Sciences et Techniques, Département de Zoologie
Cotonou

Investigations on eco-friendly compounds for the control of Helicoverpa armigera on cotton

Cotton is produced on moer than 1.8 million ha in West Afica by more than 2 millions small-scale farmers. It provides more that 50% of the cash to the agricultural propulations, thus contribtution considerably to the anti poverty struggle in the contries of the African Cotton Belt. Cotton produciton loss atributable to perts in West Farica averages about 40% of thr protential yeild, and may rach 70% in some araes. The cotton bollworm, Helicoverpa armigera, is the msot damaging cotton insect pest in West Africa. To control this pest in sub-sahgaran Africa, intensive chemical sprayings including pyrethroid are applied, every year. Intensive use of chemical insecticides against cotton bollworm has led to the developemtn of resistance to the major chemical families of insecticides. Thus, management of that isnsect perst using convernrtional checmial insecticides is increasingly difficult. The present research proposal is aimed at developing alternative tactics to control H. arimigera on ctotton in Benin, a sub-saharan coutnry, where conton is produced on about 400 thousands ha. Investifations will incude laboratotry assays and fields trials on kaoline-basied parrical film formulation , as well as RH-2485 (a new non-steroidal ecdysone agonist). The present resrach proposal will help elaborate efficient intergrated Pst Management programme against the cotton bollworm, by reducing significantly the use of chemical insecticides.

4. Burkina Faso

Dr. M. Kiendrebeogo Martin
Laboratoire de Biochimie et de Chimie Appliquees (LABIOCA), Department of Biochemistry/ Microbiology, UFR SVT, University of Ouagadougou
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Cowpea preservation against Callosobruchus Maculatus: detoxification enzymes and acetlyocholinesterase inhibitors from calotropis procera and annona species

Cowpea has a prominent place in daily diet of rural populations in Burkina Faso. It constitutes for them the most available and less costly source of vegetable proteins. Nevertheless, cowpea seeds suffer important damage during storage due mainly to Callosobruchus maculates (Fab.) (Coleoptera: Bruchidae) attack. Infestations begin in the field but serious damage is done on the seeds during storage by eggs developing in larval stages into the cowpea. Chemical insecticides are used to control such infestations.

This project attempt to evaluate the potentiality of the leaves, stem bark and root bark extracts of Calotropis procera, Annona senegalensis, Annona muricata and Annona squamosa to control the cowpea weevil Callosobruchus maculates. In vivo bioassay on insects as well as in vitro bioassays on an insecticide enzymatic target and on two insecticides detoxification enzymes will be carried out. The in vivo bioassays will evaluate the effects of extracts on adults, eggs, emergence and oviposition. The inhibitory bioassay on acetylcholinesterase will be used to characterize the neurotoxic mode of action of the insecticidal extracts. Their inhibitory effect on carboxylesterase and glutathione-s-transferase will be used to evaluate their potentiality to overcome or prevent insects resistance or to be used as insecticides synergistics. Commercial enzymes will be used for this study. The most active extracts will be submitted to bio guided fractionation in order to isolate the enzymes inhibitors. Pure compounds will be identified through spetral studies and their efficacy evaluated in vivo (on insects) and in vitro (on enzymes).

5. Burkina Faso

OUÉDRAOGO, Elisée
Albert Schweitzer Centre for Ecology, Agroecology Department
Ouagadougou

Improving crop, water and nitrogen use efficiencies using soil and water conservation techniques in the Semi-arid West Africa

Agricultural systems in semi-arid West Africa face erratic rainfall conditions. Rainfall distribution during the shortcropping period determines the success in crop production. Soil and water conservation (SWC) measures such as ston rows, grass strip or mulching have been proposed to secure crop production by improving soil water storage when reducing at a same time soil erosion. Previous studies showed that the extent to whic SWC measures affect cropproductivity depends on the efficiency of the physical barrier and the soil nutrient status, as nutrient uptake and crop water use efficiency are inherently linked. However, it is not clear to what extent the improved crop water use efficiency and soil water storage can be attributed to the physico-chemical impact of these measures alone, and to what extent beneficieal effects on soil macrofauna

activity play a decisive role. Recent research has pointed out the soil macrofauna play a key role in improved crop water use efficiencies. Therefore, this research project aims to assess the interactions between SWC measures and soil macrofauna on soil water storage and crop water and N use efficiency in agroecosystems located between red and white Volta basin in Burkina Faso. We hypothesize that the beneficial effects of SWC measures on soil water conditions and crop water and N use efficiency can be more fully exploited when soil macrofauna diversity/activity is stimulated at the same time. We will evaluated the effect of different (integrated) management options (stone rows, mulching, tillage, nitrogen input) on soil macrofauna diversity and soil physical and biochemical conditions In addition, we aim to quantify the impact of SWC management options on improved crop water and N-use efficiencies, and the role of soil macrofauna in order to develop sustainable management options for cropping systems In the Volta Basin.

6. Cameroon

Dr. Venasius W. Lendzemo
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Sustainable onion production in north Cameroon: the role of arbuscular mycorrhizal fungi in improving seeding survival, biological yield, and storability of bulbs

Onion (Allium cepa L.) is one of the popular market gardening crops in north Cameroon (Africa) but its production is limited by prevalent biotic and abiotic constraints. Seeding survival is poor whereas harvested bulbs rot in storage due to infection by pathogenic fungi in the field. Farmers in this area are cash-strapped and cannot afford chemical control whose sustainability and environmental friendliness is more and more being questioned. Development of biological control for plant diseases is accepted as a durable and environmental friendly alternative. In this study we propose to investigate the effect of preinoculating onions in the nurseries with arbuscular mycorrhizal (AM) fungi; a specialized group of fungi that form beneficial associations with the roots of most land plants. In focus will be the effect of inoculation on the tolerance of onion seedlings to pathogenic diseases, productivity of the seedlings and the possible carry over of the bioprotective effect to bulbs during storage especially as a result of improved bulb firmness with AM fungal inoculation, against rots. Inocula of indigenous AM fungi that occur in onion nurseries in north Cameroon will be built up and their effects on productivity and disease tolerance of seedlings and bulbs compared with the effects of other known AM fungal inocula, at varying phosphorus levels in spot and field experiments. It is hoped that such low cost technology would prove effective and should be widely adopted by subsistence farmer, since, for instance, relatively small amounts of inocula are needed for nursery inoculation.

7. Cameroon

Dr. Azefack Leon Tapondjou
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Isolation, Structure Elucidation and Pharmacological Studies of Potential Anti-inflammatory and Anti-tumoral triterpenoidal and steroidal Saponins from Six Cameroonian Medicinal Plants

Plant saponins are a group of naturally occurring triterpenoid or steroid glycosides which include a large number of biologically and pharmacologically active compounds. Although a lot of work has been done and many articles published on Cameroonian medicinal plants up to date, only very few reports have been made on saponins and their bioactivities from these plants. The present research work deals with the photochemical and pharmacological studies of some Cameroonian medicinal plants containing potential anti-inflammatory and anti-tumoral triterpenoidal and steroidal sponins. Our main objective within this research work is the isolation, identification and biological testing of extracts, fractions and pure compounds mainly triterpenes, steroidal and triterpenoidal saponins from six medicinal plants used traditionally to treat cancer and/or inflammatory diseases. These plants included Dioscorea batatas, wild local variety of Dioscorea bulbifera (Dioscoreaceae), Paullinia pinnata (Sapindaceae), Entada rheedi (Mimosaceae), Dracaena arborea and Dracaena mannli (Agavaceae). The methods and programme of the work shall be centred on the preparation of different plant materials (collection, cutting into pieces, drying and puverzation), extraction and fractionation, chromatography and purification, structural elucidation and biological screenings (cytotoxicity, anti-tumoral tests, in vivo and in vitro anti-inflammatory tests) of extracts, fractions and pure compounds.

8. Côte d'Ivoire

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Reproduction en milieu contrôlê de Labeo coubie et Distichodus rostratus pour le repeuplement des petitis barrages du Nord de la Côte d'Ivoire

L'objectif principal de ce projet est de rêaliser la reproduction artificielle des poisons herbivores/dêtritivores et d'intêrnêt halieutique, Distichodus rostratus (Characiformes; Distichodontinae) et Labeo coubie (Cypriniformes; Cyprinidae) en vue du repeuplement des petitis barrages (entre 0,02 et 6 km^2) du Nord de la Côte d'Ivoire. Les alevins produits serviront à empoissonner ces petities et moyennes retenues d'eau don't les niches trophiques des herbivores/dêtritivores sont vacantes. Cette action vise donc l'accroissement de la production halieutique de ces petitis rêsvoirs, et par consequent, l'amêlioration des moyens d'existence durable des communautês reveraines. Afin de corner les implications êcologiques d'une telle

operation, on êtudiera la biologie et l'êcologie des poisons cite dans le barrage de Taabo (60 km^2) (Bandama ; Côte d'Ivoire). La maîtrise de la reproduction artificielle de ces deux espêces permettra donc de dêvelopper une pisciculture de repeuplement dans les petits barrages et l'introduction de ces espêces dans le êlevages aquacoles conventionnels. Les researches à mener seront exêcutês en partenariat avec le Laboratoire d'Environment de Biologie Aquatiques de l'Universitê d'Abobo-Adjamê (UAA).

9. Côte d'Ivoire

Mr. Yeo T. Martial
Centre Régional pour l'Eau Potable et l'Assainissement à faible coût-Réprésentation Nationale de Côte d'Ivoire, 18 BP 80 Abidjan 18

Influece des caractéristiques physico-chimique, biochimiques et microbiologique des sables et des boues de vidange sur les performances d'un lit de sechage fonctionant en regime non sature.

Traditionnellement, la technique du lit de séchage à écoulement en milieu poreux saturé est utilisée pour le traitement des bouses en générale et des boues de vidange des fosses septiques en particulier (VANDE VENNE, 1977; BEN AIM, 1982; ANONYME, 1992, STRAUSS et al, 1997). Ici, le lit ne joue qu'un role de préfiltre. L'innovationapportée est l'utilisation de lit de séchage en écoulement non saturé avec maîtrise des flux d'apport. Là, en plus de role de filteration, l'élimination des polluants se fait par des mécanismes biochimiques et microbiologiques. Dans le cadre de ce projet, il s'agit d'évaluer l'influence des caractéristiques physico-chimiques, biochimiques et microbiologiques des sables et des boues de vidange sur les performances d'un lit de sechage fonctionnant en regime non sature. De facon spécifique, il s'agit d'abord dee determiner les parameters granulométriques (à partir des formulas de FOLK) et les parameters hydrodynamiques à partire de la loi de DARCY pour la conductive hydraulique à saturation qui est une constante et des formulas de BROOKS pour la conductivité qui varie en function du temps. Dans un second temp, on suivra l'élimination des KOP (Kystes OEufs Parasites) à la surface du lit, dynamique microbienne (dénombrement et sysématique), les mécanismes enzymatiques à l'intérleur du réacteur de meme que le bilan des parameters physico-chimiques par des analysis de Laboratoire.

10. Egypt

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Estimation of the natural background of nitrate and arsenic in arid zones groundwater (Application on Sinai groundwater, Egypt)

Estimation of nitate and arsenic is vry improtant for drinking water quality especiallly in arid regions. Most of arid regions depend on grounwater for their drinking water supply nevertheless these

groundwater have relatively high concentration of these two elements and their species. The previous studies in groundwater of arid regions had reffered to the presence of nitrate and arsenic in higher concentrations that in humid regions. Some researchers hav thought it could be due to pollution activiteis nevertheless these high concentrations have been obseved in remote areas, far from any potential source of contamination. Through this research I expect to decipher the processes that lead to such high concentations and estimate the nature background for these elements. The ecosystem in Sinai is still vergin with the minimum humain activiteis so it will be suitable for this kind of study. Moreover, since this study will be done on local sourcs for drinking water in Sinai, Egypt. The drinking water soucres that constitute potential hazrad for local inhabitanst (Bedouins) will be flagged and alternative safe sourcs will be designed. Groundwater and soul samples and available aquifer materieals will be collected from different parts in Sinai Peninsula for the analysis of these two elements and their associated species. Concentrtions in the precipitation and runoffwater will be analyized also. In addition complete physical and chemical analysis for major oions will be measured in the groundawater samples. They yield from different wells and their source aquifer will be estimated. All thee information will be comliled in groundwate database and statistically analyized to estimate the natureal bacground of the considered elements. The potential processes which could cause this relative high concentrations will be simulated in the laboratory. I expect the findings formthis research to be new world wide.

11. Indonesia

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Quality improvement of Balinese rice wine, brem

Brem is an alcoholic beverage brewed traditionally in Bali Island, Indonesia, from a mixture of black and white glutinous rice. The rice wine play important role in Balinese Hindu and the only alcoholic beverages produced by local industry to support the tourims industries in Bali. Brem is produced utilizing the traditional techniques using ragi tape as a dry starter. Though this rice wine has been produced for centuries through successive generations, but still not much attention have been given to improve its quality. The problem in brem fermentation is the unstable quality of the product.

The brem fermentation is completed by three main microbes; amylolytic fungi, lactic acid bacteria, and ethanol producing yeasts. The amylomyces rouxii was found to be the principal amylolytic mirobe. Since all the fermentation processes; saccharification and liquefaction, lactic acid production, and ethanol production take place almost simultaneously, producing a brem containing high glucose (20-27%). The observation suggests either the ethanol producing yeasts do not grow properly or it is no good ethanol yeasts present in the ragi

tape. Therefore the possible technology for improving brem quality either by addition a good ethanol producing yeasts or application of pure culture. The later should provide a controllable fermentation and therefore will produce brem with better quality.

12. Indonesia

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Deforestation Dynamics in Indonesia: A Household Level Analysis of the Role of Poverty and Wellbeing Change

Small scale farmers, who tend to be poor, have been considered one of the main causes of deforestation in Indonesia, although their exact share of deforestation, compared with large scale forest clearing by plantation and transmigration projects, remain controversial. Yet, understanding the forces driving the rural poor people to clear forestland is crucial if policy makers wish to minimize natural forest conversion without worsening the welfare of these people. To attain this goal, it is important to investigate to what extent poverty and efforts to improve wellbeing encourage people to clear or conserve forestland. The linkage between poverty and deforestation is a complex interaction between economic incentives and constraints, and empirical examinations of this relationship remain rare.

The objective of this research is to examine the degree of, and factors associated with, that part of Indonesian deforestation caused by the small scale farmers. The study asks if the forest clearing decision is strongly influenced by the forest products the households derive, an aspect generally neglected in deforestation studies. Data on the full range of forest products relied on is therefore needed to fully understand the decision making process. The data will be collected through a survey of 260 rural households in East Kalimantan, Indonesia. Baseline data from 1999 already exist for these households, providing a unique opportunity for panel data analysis of the wellbeing – deforestation interface. The research will include a descriptive analysis of the role of forests in the household economy. The main part of the analysis is, however, to examine the effect of various facets of poverty and wellbeing change on deforestation. To analyse this dynamic relationship, econometric models of deforestation and land use will be estimated using the panel data generated.

13. Iran

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Teheran

Spatial variability and estimation of forest plantation stock using geostatistical analysis in the Caspian region of Iran

Forest plantations are one of the important soucrse for wood and paper industries. Accurate estimation of the stock volume is one of challenges in the factories and private sectors who involved in timber production. This research is accomplished in a forest plantation in the Caspian region of Iran, in order to examine the potential of geostatistics and its interpolation method (Kriging) for estimation the forest growing stock that is so important for management and planning. The study domain has a surface area of around 120 hectares. Sampling procedure is based on a 50*200 m systematic rectangular grid. The surface area of each plot, based on plantation distance (3*3 m), will be 200m2. The interested variable is forest stem basal area. A part of forest (around 30 hectares) will inventory as full callipering in order to compare its results with the results of geostatistical and classical approaches.

For geostatistical analysis, first, experimental variogram is calculated using sample plots to find out the spatial variability of the interested variable. Then a suitable model will fit to it for block kringing interpolation at unsampled location based on neighborhood samples. At the last stage the results of classical method and kringing interpolation will campare to the real mean of 100% inventory to judge about the geostatistics application. Before that using geostatistics validation methods, the results of kringing interpolation is evaluated to measure the amount of biasedness.

Its expected that geostatistics be able to capture and describe the spatial variability and can estimate the forest plantations stock accurately and also the results of kringinf interpolation will be near to real mean stock (Taken by 100% inventory).

14. Lebanon

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Juvenile pelagic fish assemblages in the coastal waters of Lebanon: biodiversity, biological characteristics, landings, and stock assessment

Available information on the Levantine ichthyofauna concerns mainly necto-benthic fish species, while pelagic ones remain moslty uncharacterized. Lebanesse waters aare situated in this unstudied region and two-third of fish landings in Lebanon are complosed of juvenile pelagic fishes. The proposed reseech project aims to investigate pelagic fish biodiversity and tepporal changes using species compostion and trhe aundance of pelagic communities as indicators. For this purpose, a large nu,mber of fish (around 300, 000 specimens) wil be collected with purse seines and processed. Biodiversity and purse seine landings of pelagic fish assemblages will be studied in details over this 240-month field work study. The main benefits of this project are to contribute to the study of eastern Mediterranean biodiversity and provd the substantial data necessary to estalish, in the future, a proper sustaibale fishery in the eastern

Mediterranean. No similar sutdies have been carried out in the ara nad preliminary results are very promising.

15. Malaysia

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Towards the cleaning of Klang river: Identifying the polluted area by GIS application

Geography Information System (GIS) is a powerful tool for environmental management and planning. In this proposed project, GIS will be used to identify the accumulation spots for water pollutant with reference to the discharge by industrial and residential wastewater into specific locations of Klang River. The river flows through out the Klang Valley which is the most developed area in Malaysia. This study will concentrate along the smaller section of Klang River that passes through the jurisdiction of Petaling Jaya Municipal Council (MPPJ). MPPJ has committed to the implementation of Local Agenda (LA) 21 during Rio Declaration 1992. Therefore, this collaboration will offer assistance to MPPJ in achieving the LA 21 objectives. Research and remediation of Klang River have been initiated by the government agencies. However, not much of information pertaining to such activities by the governing bodies and other research institutions are being published. Therefore, it is proposed that the result of this project will be shared and published using the conventional hard copy publication and up-to-date means of communication, the internet. High resolution satellite imagery will be utilized to provide the present drainage system, monsoon drain, river tributaries and water sump locations in the study area. Spatial analysis undertaken within GIS environment will enable the identification of discharge points along the river with various pollutants from the drainage lines. The accumulation of pollutant at specific points derived from GIS analysis will be verified with chemical analysis of its water sample. Estimation of hotspot area for pollutants accumulation points and laboratory verification will assist the management and planning of Klan River.

16. Nigeria

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Microbial Culture from Nigerian Polluted Soil Biodegradation of High Molecular Weight Polycyclic Hydrocarbon and Enhancement

Tropical bacteria and fungal isolates would be isolated from crude oil polluted soil, coal mining site, power generator and wood processing site in Nigeria, evaluated for their potential ability as single and mixed culture to biodegrade high molecular weight polycyclic aromatic hydrocarbon (PAH). PAHs are major concern as anthropogenic

pollutants in environment. They arise from diverse sources, including petrochemical products and combustion of fossil fuels. Concern arises because of their wide spread, low solubility, recalcitrant and carcinogenic nature. High molecular weight PAH to be evaluated are chrysene, pyrene and fluoranthene. Objectives of this projects are 1) Isolation and identification of tropical bacteria and fungal culture from PAH contaminated sites. 2) Evaluate single culture potential over mixed culture on biodegradation of the high molecular weight PAH. 3) Trend in inorganic nutrient requirement by bacteria in biodegradation of high molecular weight PAH. 4) Role of biemulsifier in increasing bioavailability of high molecular weight PAH for biotransformation. Approach to undertake this project entails isolating and identifying microbes from possible PAH polluted soil, evaluating role of inorganic nutrient utilization and bioemulsifer production on proliferation of the identified microbes. Expected outputs includes understanding factors that determine the fate of high molecular weight PAH in the environment, provide some predictive power for the concentrations that may be bioavailable for human and environmental exposure, clues to bioremediation strategies that will be environmentally sound and cost effective. Formulate commercial microbial package to remediate health and economic effects of PAH on local region and the populace.

17. Nigeria

Dr. Benjamin Ewa UBI
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Amplified fragment length polymorphisms: diversity of drought tolerance of rice at the seeding stage and performance under an upland field agro-echology in Cross River State

Cross River State is the highest rice producing state in Nigeria. However, rice cultivation is mainly restricted to swamp conditions. The potential of drought tolerance rice and its cultivation under upland agroecologies would tremendously boost rice productivity, as many of the resource poor farmers lack swamp land for rice cultivation. Particularly among the densely populated area of Ugep in Cross River State, the use of improved, drought-tolerant cultivativars with adaptation to the predominantly upland conditions would help to alleviate hunger, poverty and general assure food security. Recently some rice cultivars including NERICA have shown promise for cultivation under upland conditions. Therefore, the objective of the present work is to identify drought-tolerant rice cultivars based on molecular markers and evaluate their yield potential under upland conditions.

18. Pakistan

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Molecular Characterization of RNA and DNA viruses infecting melons in Pakistan and RNAi based genetically engineered resistance

Geminiviruses are single stranded DNA viruses infecting a wide range of crop species throughout the world. In Pakistan, these viruses have been found to be associated with the devastating diseases in cotton, tomato, chilies and cucurbits. Among cucurbits, melon us a very important crop for the economy of the country. For the last two years a particularly devastating disease is causing up to 100% yield losses on melon has appeared in melon growing areas of Pakistan. Initial analyses of samples has identified a strain of Tomato leaf curl New Delhi virus (ToLCNDV), a bipartite begomovirus and Zucchini Yellow Mosaic virus, a potyvirus associated with the disease. In this project, molecular characterization, which include cloning and sequencing of full-length components of the begomovirus and two genes of ZYMV (the coat protein and HcPro) will be done. As we are already utilizing RNA interference to develop resistance against geminiviruses in cotton and tomato, so in this proposal we have also planned to silence both DNA and RNA viruses simultaneously through RNAi. The gene constructs will be developed in a dsRNA binary vector (pFGC941) based on replication gene (Rep/AC1) of ToLCNDV and coat protein (CP) and HcPro genes of ZYMV. The gene constructs will be transformed in melons through Agrobactrium-mediated plant transformation. The transgenic plants will be screened for virus resistance by inoculation of ToLCNDV isolated from melon and ZYMV.

19. Pakistan

Dr. Amir Jamil
Department of Chemistry, University of Agriculture, Faisalabad

Purification, Characterization and hyperexpression of antifungal proteins/peptides from potential medicinal plants

Fungal infections have recently emerged as a growing threat to human health, spatially due to development of drug resistant fungi against antifungal drugs. Scientists have diverted their attention towards antifungal peptides and proteins against fungai infections for the last few years. Ultimate objective of the present project is to find novel antifungal peptides and proteins with potential pharmaceutical utility. We have found, in our lab., high antifungal activity in seven medicinal plants viz Hygrophia acuriculata, Abrus precatorius, Morniga oleifera, Withania Somnifera, Croton tiglium, Solanium nigum and Psoratae corylifolia, against several pathogenic fungi. The antifungal peptides/proteins will be isolated and purifies from these plants with the help of different chromatographic and electrophoretic procedures. Antifungal activity will be determined by the disc diffusion method. The peptides and N-terminal pf proteins so purified will be sequenced by Edman degradation method. Molecular mass will be determined by gel filtrations and gel electrophoresis. For isolation of the genes for peptides and proteins, mRNA will be isolated from various tissues of the plants. cDNA will be made and

amplified with the help of RT-PCR using degenerate primers generated from the N-terminal and internal sequence of the antifungal proteins and peptides. The full length cDNA will be obtained with the help of RACE (random amplification of cDNA ends) and cloned into expression and sequencing vectors. Hyperexpression of the genes will be done in heterologous hosts using string promoters. The antifungal proteins and peptides so expressed will be isolated and checked for antifungal activity. This project will lay a foundation of commercial production of antifungal peptides and proteins in future for use against fungal infections.

20. Togo

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Biodiversité, fragmentation et dynamique spatio-temporalle dans les forêts tropicales humides du Togo

Bastion de la biodiversité, les forêts tropicales humides du Togo sont actuellement manacées par la fragmentation. En m'appuyant sur mes recherché antérieures en écologie forestière (zone subhumide du Togo), je propose de caractériser le paysage fragmenté en son évolution afin de fournir des indicateurs écologiques indispensables à la gestion durable des reliques forestières et à la conservation des ressources phtogénétiques au Togo. Les objects du projet sont ;1) identification et localizer les espèces rares et endémiques en vue de leur protection ;2) identifier les espèces nouvelles ou peu connues dans la flore du Togo afin d'établr une collection ;3) dresser un bilan floristique global de la region afin d'évaluer l'effet de la fragmentation sur la deiversité alpha ;4) mettre en evidence, decrier, classer et localizer les groupes fonctionnels à l'aide de programmes spéciaux ;5) caractériser la fragmentation et la dynamique spato-temporelle des forêts à l'aide des modéles mathématiques adéquats ;6) developer une rechershe en partenariat : II s'agira d'une part diffuser les information scientifiques acquises, mais aussi d'autre part de mettre en perspectives les resultants écologiques avec les enjeux de development des acticités humaines sur la zone. Les données floristique, écologiques et géographiques seront recueillies et anlysées par les methods phytosociologiques et techniques de simulation basées sur les chaînes de Markov. Les resultants attendus de l'étude sont :1) information sur l'état de conservation de la biodiversité dans la zone ;2) information sur l'écologei et la repartition des espéces et groupes fonctonnels, 3) information sur l'importance biogéographiques (étendue et repartition) des reliques forestières ainsi que leurs evolutions futures ;4) information sur les effets écologiques des projets de reboisement et d'aménagement en cour dans la zone ;5) un herbier de la flore sera disponsible ;6) le projet debouche sur une these et la redaction de plusieurs articles scientifiques.

21. Uganda

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Spatial Soil Variability and its Effect on Maize Yield in the Lake Kyoga Basin, Uganda

Interpretation and dissemination of land productivity enhancing research findings in the Teso farming system of Uganda is constrained by the ubiquitous fine scale systematic soil variation in the horizontal direction Establishment of site-specific plant performance and yield responses to external inputs are thus indispensable faces along the path to improved land productivity in this area. In an earlier piece of work funded by Sasakawa Global 2000, we hypothesized that soil N and P level are the overriding causes of spatial variability in maize yields and we consequently used parametric statistical tools to analyze a spatial dataset of Soil N and P to explain this variability across a set of 45 x 45 m plots. To assess the real effect ascribed to N an P, we accounted for topographic effects and local variation in soil moisture levels. Although the coefficients of determination from ordinary least squares regression were good (R2=0.63) the residuals of the resultant regression models were highly spatially auto correlated rendering the derived relationship to be flawed. A recourse to spatial statistical analysis greatly improved the R2 value to 0.78 and also enabled derivation of spatially differentiated N and P fertilizer recommendations. Intriguingly, only a small portion of the variation derived from soil N and P levels while a large portion of the yield differences was explained by spatial dependence i.e. by the yield values of neighbouring observations. I seek funding from IFS to answer the question: which are those variables that vary systematically in space and cause the autoregressive term to be highly significant. Findings from this research will be used to identify promising low external input technologies that will be verified through experimental research.

22. Uganda

OMEJA, Aria Patrick
Makerere University
Faculty of Forestry and Nature Conservation
Kampala

Restoration potential of trees on degraded Forest Lands in and around Kibale National Park; An alternative means for meeting Rural Household needs and Conservation.

Until recently, protection, and management of natural forest areas have been major components of conservation practice, while the role of explicit restoration as a conservation strategy has been minor or nonexistent. In Kibale National Park, which is internationally recognized for exceptional primate diversity and abundance, and with incredible potential for attracting econourists and generating revenue, there has been spatially heterogeneous habitat disturbance of various

types. The overall objective of this project is to quantify woody vegetation restoration from historic land use and management interventions in this park and surrounding areas. I will specifically collect data on tree species, percentage vegetation cover, and tree biomass. These will be form the following sites; logged pine plantation area, UWA/FACE reforestation project, naturally regenerating forest with the exclusion of fire, and in the agricultural lands (super pixels) outside the park. I will use Analysis of Variance (ANOVA) to compare variables between landuse categories, multiple regression approach to predict response and other tests will also be carried out on results. Yield models developed from the data will provide useful tools to guide conservation and management of disturbed areas both within and outside Kibale National Park. Appropriate management of these areas could offset carbon emissions, restore vegetation which offer shelter and food for the animals, and facilitate fuel wood accumulation.

Decision required: ***Members of the Executive Committee may like to offer advice on the program implementation effort by the Coordinator General and provide counsel on how to overcome the lack of resource during the current constraint has been the major issue as COMSTECH received contributions from only seven member states during first half of the current biennium.***

Item-5: Implementation of OIC Ten-Year Program of Action

Following the adoption of the Kuala Lumpur Declaration on Science and Technology for the Socio-Economic Well-Being of the Ummah Vision 1441 **(Appendix-V)** at the 10th OIC Summit Conference, the OIC Secretary General established "OIC Task Force for Vision 1441" to evolve strategy for implementing relevant Islamic Summit resolutions.

The inaugural Meeting of the OIC Task Force for Vision 1441was held in Kuala Lumpur, Malaysia during 23-25 March 2005 to deliberate the issues and come up with recommendations in this regard. Details of the first meeting and its decisions are given in **(Appendix-VI)**

The second meeting of the Task Force was held on 20 February 2006 in COMSTECH Secretariat to consider several issues including Strategic Plan of Action to imolement Vision 1441. Complete details of the second meeting, including its decisions are shown in **(Appendix-VII).**

The Third meeting of the Task Force was held in the OIC General Secretariat Jeddah with the OIC Secretary General and the Malaysian Minister of Science Technology and Innovation in the lead **(Appendix-VIII).**

Right at the outset, the Secretary General stressed the importance of the meeting as part of the overall effort to help the Muslim Ummah to face the challenges of the 21st

century. He mentioned the earlier efforts on science and technology and drew attention to the meetings held in Casablanca in 1984, in Tehran in 1998, and more comprehensive Makkah Declaration of 7-8 December 2005 in which the OIC Ten-year Program of Action was born. In the light of these developments, Vision 1441 required to be harmonized he declared.

The Malaysian Minister of Science Technology and Innovation emphasized on the need for member states to co-operate in the development of science and technology and necessity to help the less developed member states of the OIC. To facilitate such co-operation, and to ensure the successful implementation of the recommendations of Vision 1441, he suggested a mechanism consisting of a tripartite structure involving: (i) An informal grouping of about 10 S&T Ministers from selected OIC countries (ii) the OIC Task Force for Vision 1441, and (iii) a technical committee to be formed to carry out the ground work and provide a more detailed action plan for the recommendations of Vision 1441.

The outcome of the third meeting was birth of the OIC Technical Committee and beginning of the idea of Early Harvest Projects (EHP). As the concept of EHP offered a good warm up exercise to arrive at a comprehensive fruition of the OIC Ten-year Program of Action, therefore on behest of the Malaysian minister, the General secretariat arranged a high level one day meeting between its Secretary General, the Coordinator General COMSTECH, the President Islamic Development Bank and the Secretary General of the Islamic Chamber of Commerce and Industry to meet in Jeddah on September 25, 2006 to formulate an appropriate strategy of action to bring OIC Ten-year Plan of Action to bloom and bear fruit.

The OIC 10 Year Plan of Action has set the tone of implementation and of action collectively among OIC Member Countries, the Ummah and human development for the world. The OIC S&T Vision 1441H Task Force have begun its efforts to focus on implementation and have begun the Early Harvest Project (EHP). Similarly, the Islamic Development Bank (IDB) is now implementing its IDB Vision 1440H starting with its Quick Win initiative.

While acknowledging significant other efforts, programs and talents in S&T for development in the OIC region one has to accept the lack of effective coordination and partnership programs and the ability of the OIC membership to deploy proven working models to make S & T programs effective. It is also realized that there is lack of adequate information both in the form of ‘suppliers’ of solutions as well as the ‘demand’ or market need. Comprehending the need for a total solution approach and not a piece-meal or technically driven solutions to implement the full impact of S & T development; It was decided to bring the various efforts and platforms established by existing OIC organs like IDB, COMSTECH, ISESCO, ICCI and COMCEC to leverage in EHP program to help make it more effective and successful.

Early Harvest Project (EHP):

The primary goal of the EHP is to leverage on existing proven programs and initiatives. This way it could provide immediate or short-term impact with a minimal incremental effort for collaboration and expansion for deployment to another OIC member state. Accelerating the targeted country’s development program and scaling it as OIC wide program would then be implemented. The features of the EHP would include:

a. An already proven working solution of a member state with S&T as a strategic element that could be deployed to other OIC member states or communities;
b. Clearly defined deliverables to be realized within 2 years or less;
c. Demonstrate significant and measurable social-economic-national-sovereignty impact;
d. Provide as a total solution that is contextualize to the targeted community or market; and
e. Demonstrate viability and appeal to investors and partners for sustainability and scaling (private sectors, development agencies, community and governments)

As a mean to seed EHP as an effective working mechanism, a voluntary special working group was formed under the OIC S&T Vision 1441H Task Force. The initial members are IDB, MOSTI, COMSTECH, KACST, ICCI and OIC General Secretariat. The intention is to 'pilot' and prove the EHP before scaling and expanding the initiatives in scope, magnitude and participation. It is therefore anticipated that in future there would be need to establish other specific or thematic working groups EHP and that the EHP itself will evolve in its scope and scale to retain its common approach of creating action oriented project driven working groups.

Thus so far the various S&T for Development EHP have been, classified as follows:

a. S&T collaboration among advance entities of member states to strengthen the OIC S&T community and program of the OIC member states in global platforms and programs
b. Development deployment program with S&T element to accelerate OIC member states development programs
c. Development infrastructure, enabling, coordination platform, resource sharing and capacity building program across OIC member states enabled or powered by S&T; and
d. Technology ventures for accelerated business expansion and commercialization.

It is envisaged that the EHP is to be formulated from target community (market) needs based on their capacity to innovate with S&T solutions to be proposed. In this initial phase, focus will be primarily on proven S&T projects for immediate deployment and accelerated commercialization with significant economic growth, communal well being and enhanced national sovereignty of the targeted population. However, the proposed solution(s) will be future driven and phased along and aligned to the overall development and capacity building process of the targeted community. The approach would be one of partnership with the private sector and entrepreneurship assuming a pivotal role in the course of the project implementation, especially in deployment and commercialization type EHP.

As the EHP would have proven solutions, only incremental investment would be required for the proposed expansion and deployment. The promoting partner would be expected to continue to champion the EHP for deployment and source the appropriate funding from various funding sources. Partners to the EHP would be

among the key partners to help co-fund and co-deploy the projects. A key partner to the EHP, including as a 'funding or co-investor' partner would be the targeted community of member government or private sector.

The Technical Committee:

Once constituted, the Technical Committee started to plan for its first meeting that was held in Karachi. Sponsored by the IDB, the meeting in Karachi broke ground under the insightful leadership of Prof. Atta-ur-Rahman who laid bare the initial strategy and guiding principles as envisaged by the meeting held in Jeddah on September 25, 2006. The Technical Committee then heard the presentations describing dozens of Early Harvest Projects for the next two days. At the end of its meeting on the second day, the Technical committee in its deliberations came to the conclusion that seven EHPs had sufficient merit for further development and next step.

To approach the problem on the fast track, members of the Committee have continued to exchange emails and during the ensuing period and carried out their deliberations by holding a video Conference on December 18, 2006 and a full meeting in Muscat as recently as yesterday. Outcome of their deliberations and recommendations are available in separate document for the consideration of the current meeting.

Decision required: ***Members of the Executive Committee may like to deliberate EHP approach to development and discuss how best to mobilize resources for financing OIC Ten-year Program of Action***

Item-6: New Initiatives and Policy Guidelines from the Executive Committee

COMSTECH was launched by the member states to achieve collective strength in science and technology for solving problems at national and regional levels. The main objective was to boost the indigenous capability of the OIC region through cooperation and coordination. The task requires assessment of human and material resources in science and technology. It also requires creation of an effective institutional structure for planning research and development. These functions can only be effectively undertaken provided finances, skilled and talented workforce, and world-class facilities for scientific research are made available in the OIC member states. However, at present most of the member states are beset with internal problems like lack of trained human resources in the fields of science and technology and incoherent policies for scientific development. Paucity of finances and almost total absence of indigenous expertise in planning a well coordinated and forward looking development plan is another major hurdle in the growth and development of scientific apparatus and a credible scientific infrastructure in the OIC region. Under these circumstances OIC member states cannot individually create a scientific base that may be compatible with modern standards. However, collectively OIC member states can pool resources to achieve quick progress and attain a credible level of capability in science and technology. However, this requires development of effective mechanisms for cooperation in key areas of science and technology and an

adequate level of joint funding to make science and technology a priority area in the development strategy of the OIC region.

To realize these goals, President Pervez Musharraf, Chairman COMSTECH presented his vision during the Tenth General Assembly meeting and on his guidelines COMSTECH Secretariat prepared a proposal for creating a Pan Islamic Fund for Science and Technology development of the OIC member states. The document was later circulated in the Islamic Summit held in Putrajaya for obtaining consensus of the member states. However, in view of comments by two member states during the discussions in the committee for economics and science, it was decided to further deliberate the matter before placing it before the Summit meeting.

The proposal has undergone modifications since its first presentation before the COMSTECH General Assembly and it has been renamed as "OIC Fund for Science and Technology". COMSTECH continues to promote the proposal from OIC as the. Chairman COMSTECH has also put his full weight for his vision and instructed Pakistan Foreign Office to rally support from the member states. During a visit of the Secretary General OIC at the beginning of 2005 to the COMSTECH Secretariat in Islamabad, the Coordinator General briefed him on this important issue and the Secretary General agreed to rally his support behind the efforts by the Chairman COMSTECH to establish such a fund if science and technology is to develop properly in the OIC region.

If COMSTECH has to play an effective role for making science and technology the engine for development of OIC member states, then the leadership of OIC member states must show the vision and political will to invest in science and technology like the advanced countries are doing. Most advanced countries at present are investing 3% to 5% of their budgetary GNP on the development of science and technology. This is the only way, if the widening gap between the OIC region and the technologically advanced nations of the world is to be reduced.

The Coordinator General COMSTECH in consultation with the Executive Committee decided to reset some of the goals of COMSTECH and develop a program that is more realistic and is better suited to the existing financial realties and the limited COMSTECH budget. Hence, COMSTECH intensified its efforts to obtain whatever participation can be acquired from the OIC member states in executing cost effective research and human resource development programs from the limited funds available with COMSTECH. The Executive Committee in its 23rd meeting held in Almaty, Kazakhstan has vigorously debated and strongly endorsed COMSTECH's new initiatives that are primarily aimed at enhancing support to the scientific community of the OIC region and achieving active cooperation between scientists and research institutions of the member states.

In order to have a meaningful impact on the developmental needs of OIC member states, there exists a need to commence well-conceived programs in each of the important areas. Accordingly, several new programs have been proposed in the past by the Executive Committee under this agenda item and some new programs have already been launched during the earlier bienniums. The following new initiative, launched in 2006, is submitted by the Coordinator General before the Executive Committee for its consideration and approval:

CENTRE FOR QUANTUM PHYSICS

Quantum mechanics in its non-relativistic as well as relativistic forms has been a most successful and revolutionary theory of physics of the last millennium. Not a single experimental observation of microscopic or sub-microscopic phenomenon has hitherto been found to contradict quantum mechanics ranging from atoms and nuclei to quarks, leptons and field particles as ultimate constituents of matter and the forces of interaction between them. The methods of quantum mechanics combined with statistical mechanics when applied to the study of a whole range of physical phenomena which falls in the realm of atomic and molecular physics, nuclear physics, condensed matter physics, solid state electronics, laser and atom laser physics, super cooled atoms, astrophysics, particle physics, etc., is generically called quantum physics. Physics of the quantum world has not only helped unravel the mysteries of nature by developing basic and conceptual understanding of the underlying phenomenon and focusing on and discovering new knowledge but also helped achieve much needed rapid technological breakthrough.

An important aspect of this highly powerful framework is quantum optics, which rests so crucially on the idea of coherence which itself is derived from the superposition principle of quantum mechanics, and whose exponent Roy J. Glauber shared last year's Nobel Prize in Physics. Quantum optics itself has resulted in discoveries of lasers, masers and interesting physical applications related with it. The Bose-Einstein condensate (BEC) and atoms and ion trappings using crossing laser beams and magnetic fields to hold aggregate of atoms together at super cool temperatures depicting coherent and collective wave picture, is a more recent discovery and holds immense technological promise apart from being a new state of matter. The discovery of BEC which is quantum mechanical macro limit of super atoms resulted in a Nobel Prize in Physics a few years back.

Realizing that systematic and intensive study of quantum mechanics and related physics of the quantum world is the need of the hour, COMSTECH in collaboration with the COMSATS Institute of Information Technology (CIIT) (now COMSATS University) established a Centre for Quantum Physics. A Joint Agreement **(Appendix-IX)** was signed between COMSTECH and the CIIT enabling the Centre of Quantum Physics (hitherto called the Centre) to become operational on July 1, 2006 in the former premises of the COMSTECH secretrait.

In this endeavor, the Centre has been fortunate to enlist the help and support of Prof. M. Suhail Zubairy, (holder of COMSTECH Award in Physics) who is an internationally well-known Pakistani physicist. He is presently a Professor of Physics and Associate Director of the Centre for Quantum Studies at Texas A&M University, USA. He has invited several foreign visiting scientists and has been able to put together a team of local younger faculty consisting of some of his erstwhile students in this effort. Prof. Zubairy has already initiated several research projects at the Center in the state of the art on Quantum Optics and Quantum Informatics: quantum-entanglement, - teleportation, -cryptography, - error correction, quantum noise, etc. Three foreign visitors, two Chinese Professors, Dr. Fu-Li Li and Dr. Gao-xiang Li, and one German physicist Dr. J. Evers have joined in this research work and have successfully collaborated with local faculty and a student at the Centre. The Centre in about six months since its inception has already a faculty of eight including foreign short term visitors. More foreign visitors are expected to visit the Centre in next several months and a Symposium on Quantum Optics is being planned in early

January, 2007. Sponsorship by COMSTECH of this institution opens a way for visiting faculty from OIC member states and is expected to crystallize collaboration by quantum physics researchers from COMSTECH countries.

Aims and Objectives of the Centre

The aims and objectives of the Centre are to carry out research of international caliber in the state of the art in quantum optics and quantum computing in particular and relevant areas to quantum physics in general, subject to availability of high quality human and substantive material resources. For that purpose, interaction with foreign well-known physicists, foreign young and talented scholars and linkages with foreign universities and institutions to develop indigenous capacity for research of international standard is the main aim and objective of this endeavor. We would need to harness all resources available locally or internationally in this connection. Training of young faculty and students in research projects and problems of current research interest is one of the major goals of the Centre. The Centre aspires to offset a great paucity of manpower in human resource in this vital area of research in the OIC region. Main aim includes human resource development and bringing out talent in the area of quantum physics in the OIC region.

The Centre has recently announced positions to take young graduates as research assistants or more experienced amongst them as research associates in order to work with more senior faculty available or expected at the Centre.

Resources are being tapped for the full scale development of the Centre both locally or internationally.

Research at the Centre

Although the Centre is in its embryonic stage, yet, it has initiated a number of problems and projects. Thus, several papers are already in the pipeline for publication. The following resercah papers have been published or are in the pipeline:

1. The influence of laser fluctuations on entanglement generation in a non degenerate parametric amplifier", K. Ahmed, H. Xiong, and M. S. Zubairy, Opt. Commun. **262**, 129 (2006).
2. Influence of pump phase fluctuations on entanglement generation using correlated emission laser", Shahid Qamar, H. Xiong and M. S. Zubairy, Physical Review A (submitted).
3. Atom localization and measurement of an atomic wave function using quadrature field measurement", Shahid Qamar, J. Evers and M. S. Zubairy, Physical Review A (to be submitted).
4. Application of correlated spontaneous emission laser to the quantum non-locality", Fazal Ghafoor, Fu-Li Li, and M. S. Zubairy, Physical Review A (to be submitted).
5. Quantum teleportation via entanglement amplifier", Fazal Ghafoor, Gao-Xiong Li, and M. S. Zubairy, Physical Review A (to be submitted).
6. Entanglement between side modes of a quantum beat laser", Manzoor Ikram, Gao-Xiong Li, and M. S. Zubairy, Physical Review A (to be submitted).

7. Autler-Townes triplet spectroscopy", F. Ghafoor, Sajid Qamar, S.-Y. Zhu, and M. S. Zubairy, Physical Review A (submitted).
8. Time dependent Autler-Townes microscopy", Sajid Qamar and M. S. Zubairy, Journal of Modern Optics (to be submitted).
9. Atom microscopy via Autler-Townes doublet in Bragg regime", Sajid Qamar, Fu-Li Li, and M. S. Zubairy, Physical Review A (to be submitted).
10. Quantum disentanglement via spontaneous decay", Manzoor Ikram, Fu-Li Li, and M S Zubairy, Physical Review A (to be submitted).

Decision required: ***The Executive Committee may consider extending its approval to this new initiative by the Coordinator General and authorize him to further develop the program.***

Item-7: Inter Islamic Networks

The S&T plan of action proposed the progressive establishment of high technology institutions in the OIC region in selected areas of science and technology. Accordingly, COMSTECH established the following six **I**nter **I**slamic **N**etworks in 1988:

I. **G**enetic **E**ngineering and Biotechnology (**INOGE**) at Cairo, Egypt
II. **Oc**eanography (**INOC**) at Izmir, Turkey
III. **R**enewable **E**nergy **S**ources (**INRES**) at Islamabad, Pakistan
IV. Space Sciences and Technology (**ISNET**) at Karachi, Pakistan
V. **Tro**pical **M**edicine (**INTROM**) at Kuala Lumpur, Malaysia
VI. **W**ater **R**esources **D**evelopment **a**nd **M**anagement (**INWRDAM**) at Amman, Jordan

The following two **I**nter Islamic **N**etworks were approved by the Tenth General Assembly held in February 2003:

VII. **B**iosaline **A**griculture (**INBA**) in Dubai and
VIII. **I**nformation **T**echnology (**INIT**) in Islamabad

Two more **I**nter Islamic **N**etworks on:

IX. **V**eterinary **S**cience **R**esearch (**INVSR**) and
X. **E**nvironment (**INE**),

both located in Sudan were also approved by the Tenth General Assembly and given advised by the Twenty-first Executive Committee meeting held in July 2003 to complete the prescribed conditions if they were to join the list of COMSTECH institutions. These two networks unfortunately remained dormant since their inception on account of delay in release of funds by the host government. The funds have finally been released and these two Networks have also become functional from the year 2006.

Decision required: ***Having satisfied the required conditions of the General Assembly, the Executive Committee may formally declare the two Inter Islamic Networks namely INVSR and INE hosted by Sudan to be the regular COMSTECH institutions to qualify for IDB and COMSTECH assistance in future.***

Item-8: Status of Construction of the COMSTECH Secretariat and Training Complex Building, Islamabad

COMSTECH has maintained a small secretariat at Islamabad since 1st July 1988. The secretariat was located in a rented premises near the Prime Minister's Secretariat. Ever since the establishment of a permanent secretariat, the COMSTECH had strived to have its own building in Islamabad. The proposal for COMSTECH Secretariat was approved by the Ninth General Assembly in 1999. Subsequent years were spent in acquiring land, preparing the building plans, hiring contractors and obtaining approval from the Capital Development Authority. Islamabad. The Coordinator General also felt at certain stage that instead of having a mere secretariat building it would be prudent and cost effective to build a well designed research and training facility for the OIC region. A place where scientists and researchers from all over the OIC member states could regularly train, and be trained to update their knowledge in cutting edge technologies.

The actual construction started in May 2003. The building consists of two basements, a ground plus five floors, and a two hundred fifty-four seat auditorium, all under a 12,435 sq m (133,850 sq ft) of covered space. The civil construction is now complete at last and COMSTECH has occupied the building since September 2006. COMSTECH Secretariat has already fitted the upper most three floors and the guest house. The third floor is now fully functional for holding training workshops and on line conferences. As a matter of fact COMSTECH has already held three major events including a training course in this facility. A self service cafeteria is catering for the needs of COMSTECH guests and staff and is serving more than hundred-fifty meals a day.

The secretariat is now fully focused on completion of 254-seat auditorium which is expected to be functional by the end of 2007.

Decision required: ***As the COMSTECH Secretariat Building is expected to be fully functional well before the Thirteenth General Assembly meeting therefore the Executive Committee may empower the Coordinator General to request the Chairman COMSTECH to inaugurate the facility in association with the General Assembly of COMSTECH.***

Item-9: Actions taken by the Coordinator General since the last Executive Committee meeting held in February 2005

- As COMSTECH Building project nears completion and parts of the building become available for use. The Coordinator

General diverts more COMSTECH programs to be held at the COMSTECH Building. This is to save funds and implement workshops and training programs as in-house activity at much lower cost. Thus, in the past four or five months COMSTECH secretariat organized three training courses and workshops in the COMSTECH building. To bring this to implementation, COMSTECH secretariat readied a properly furnished quality guest house of thirty rooms to accommodate foreign participants in comfort and ease. A fully functional cafeteria has also been established to serve about 150 meals and refreshments daily. To make this possible, the Coordinator General authorized appointments of new employees including Janitors, kitchen staff and guest house staff.

- To keep COMSTECH project namely Status of Scientific Research in OIC Member States moving steadily, the Coordinator General authorized to hire part-time and full-time staff to maintain good progress on this project.
- The appointment of a consultant, originally hired for a few months was extended and allowed on annual contract basis to push forward several programs that have been entrusted to the Consultant.
- In accordance with the Item 12 of the minutes of the Fifteenth Executive Committee meeting, Coordinator General had abolished all the permanent appointments since January 1997. During the year 1998, the Coordinator General offered new salary packages commensurate with the qualifications, efficiency, and work output of the employees. This procedure had made employees more accountable and improved their efficiency and their work output. Keeping in view with this policy, the Coordinator General now reviews performance of all the employees and approves new contracts on the basis of their past performance and efficiency. New contracts for the year 2007 were therefore offered on these basis and the Coordinator General allowed increase in salary ranging from 3-7%.

Decision required: ***The Executive Committee may approve actions of the Coordinator General.***

Item-10: Date for holding the Thirteenth General Assembly meeting of COMSTECH

COMSTECH General Assembly in accordance with Article-9(1) of COMSTECH Statute and Rules of Procedure is normally required to meet in Islamabad in regular sessions at least once every two years. Twelfth General Assembly was originally scheduled to have been held in November 2005 but in consideration of the massive earth quake in Kashmir, the Chairman COMSTECH decided to postpone the meeting to February 2006. The next COMSTECH meeting could be held at the end of 2007. However, Pakistan is expected to hold its national elections in 2007, albeit, the government has yet to decide on the exact date. Keeping in view these

developments and the approach of holly months of Ramadan and Hajj that are expected to fall in the later half of the year 2007, the Coordinator General feels that it would be appropriate to convene the Thirteenth General Assembly meeting in the month of January 2008. As COMSTECH submits two sets of dates for the kind consideration of its Chairman therefore the Coordinator General suggests 16-18 or 23-25 January 2008 as appropriate dates for holding the Thirteen General Assembly meeting of COMSTECH.

Decision required: ***The Executive Committee may decide on appropriate dates to be submitted to the Chairman COMSTECH for his kind consent to holding the Thirteenth General Assembly meeting of COMSTECH.***

Item-11: Draft Provisional Agenda for the Thirteenth General Assembly meeting of COMSTECH

Draft Provisional Agenda for the Twelfth General Assembly meeting has been prepared by the COMSTECH Secretariat **(Appendix-X)**. It is placed before the Executive Committee for its consideration and approval. After its endorsement by the Executive Committee, the COMSTECH secretariat would prepare the Annotated Provisional Agenda and it would be sent to the heads of member states as an enclosure with the invitation letter from the President of the Islamic Republic of Pakistan/Chairman COMSTECH.

Decision required ***The Executive Committee may discuss the proposed draft Provisional Agenda and give its consent***

Item-12: Schedule for Twenty-sixth Executive Committee meeting proposed to be held in Islamabad in January 2008

A meeting of the COMSTECH Executive Committee is held one day prior to the General Assembly to review the documents and to approve the arrangements. As the General Assembly is hosted by the Government of the Islamic Republic of Pakistan, the Minister of Science and Technology usually briefs the Executive Committee on the arrangements of the meeting and arrival of the delegations from member states of the OIC. The Executive Committee then gives its formal approval and sets the scene for holding the meeting.

The Executive Committee meeting on eve of the Twelfth General Assembly was held at 1800 hrs because members of the Executive Committee usually arrive before this time. If it is convenient to the members, the Twenty-sixth meeting of the Executive Committee may be scheduled at 1800 hrs one day before the Thirteenth General Assembly meeting of COMSTECH.

Decision required ***The Executive Committee may deliberate and choose a time that best suits the members***

Item-13: Any other matter with permission of the Chair