



**SZABIST**

Shaheed Zulfikar Ali Bhutto Institute of Science & Technology

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**Research  
&  
Development**

**Annual Report  
2012-2013**



## **Shaheed Zulfikar Ali Bhutto**

Former Prime Minister of Pakistan  
January 5, 1928-April 4, 1979

*“We will give science and technology requirements the highest priority and our attention. To implement any program of scientific and technological development, the country needs to train scientific manpower. In this, the schools, colleges and universities have to play their role. I desire that vast number of people of Pakistan should acquire technological skills. I want first-class science in Pakistan because nothing less is acceptable, and I wish Pakistan to be increasingly self-reliant in all aspects of technology.”*

Address at the Inauguration Ceremony of Karachi Nuclear Power Plant, Karachi, Pakistan, November 28, 1972

### **Vision**

*Shaheed Zulfikar Ali Bhutto Institute of Science and Technology shall be a world class institute recognized globally for its excellence in education, scholarship in research and distinction in service.*



## **Shaheed Mohtarma Benazir Bhutto**

Former Prime Minister of Pakistan  
and Founding Chancellor of SZABIST  
June 21, 1953-December 27, 2007

*“You have a great role to play in the development of the country. Pakistan is neither a resource-rich nation nor endowed with instant wealth such as oil. We can therefore, hope to solve our problems of underdevelopment and compete with other countries only through technological skill and brain power.”*

Address at the 10<sup>th</sup> Annual Convention of  
Pakistan Engineering Council, Islamabad, March 12, 1989.





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## Editorial Board

Manager QEC  
Faryal Shahabuddin



Marketing Designer  
Syed Bashir Ahmad



# Chancellor's Message



It is gratifying to commemorate one more flourishing year of SZABIST's Centre for Renewable Energy Research (CRER), Stem Cell Research Centre (SCRC), Sustainable Development Research Centre (SDRC) and Institutional Research Department/Quality Enhancement Cell (IR/QEC) and their contribution to invent and advance optimal solutions for energy, water, health, and education sustainability.

In 2012-2013, the prominent activities of CRER and SDRC were purely dedicated towards social development of Jaffer Jokhio Goth in Gharo, Sindh. Now, electricity is readily generated at the village using Wind Turbine and Solar Panels.

Also, the focus of SCRC on the newly added field of Metabolomics developed metabolic profile of Orchids and bioactivity profiling of Ocimum.

In addition, the IR/QEC to further strengthen the effectiveness of various SZABIST's academic and administrative functions, prepared Self Assessment Reports (SARs) of the four programs in faculties of Management and Social Sciences, and undertook four Institutional Research Studies.

I am convinced that the intelligence, proficiency, and devotion of SZABIST staff will amplify and promote the resolve for sustainable development.

**Dr. Azra Fazal Pechuho**  
**Chancellor**  
**SZABIST**

# President's Message



The Research and Development Annual Report 2012-2013, produced yearly by IR/QEC, is a compendium of research activities and achievement of SZABIST's Research Centers in renewable energy, biomedics, sustainable development, and education quality enhancement in 2012-2013.

During the year, SZABIST's Centre for Renewable Energy Research (CRER) and Sustainable Development Research Centre (SDRC) made an innovative contribution to the village community of Jaffer Jokhio Goth in Gharo Sindh. Now villagers enjoy sufficient supply of electricity through various sources, and lead healthy and hygienic lives.

In addition, the rigorous research activities at Stem Cell Research Centre (SCRC) gained national and international recognition via Anti-Microbial manuscript publications and escalated the production of exotic ornamental plants, such as Orchids and Lillies.

The Institutional Research Department/Quality Enhancement Cell (IR/QEC) conducted various qualitative and quantitative reviews and analysis to further refine academic and administrative operations, strengthen existing policies, and propose formulation of new policies. Furthermore, Quality Assurance Agency (QAA)-Higher Education Commission (HEC) recognized the department's effectiveness by awarding 90% plus in the bi-annual quantitative assessment of the year.

SZABIST ascribes all the initiatives, strengthened institutional mechanism, and attainments to the intellectual commitment, devotion, passion and adeptness of our brilliant staff.

I firmly believe the uniqueness of our research activities and their application through the knowledge and experience of our students and faculty will contribute in addressing the challenges of our current and future generations!

**Shahnaz Wazir Ali**  
Acting President  
SZABIST<sup>1</sup>

1. Dr. Saqib Rizavi was associated with SZABIST till November 2013.

# Center for Renewable Energy Research (CRER)

## I. Introduction

Centre for Renewable Energy Research (CRER) provides a platform for researchers and academicians to explore and introduce practical and reliable energy solutions by conducting cutting-edge research in renewable energy technologies. This state-of-the-art research facility will greatly contribute to the important issues of the country's economic sustainability.

## II. Aim and Purpose of Research

SZABIST's CRER aims to conduct original scientific research in the field of renewable energy, development and application or design. The purpose is to develop indigenous commercially viable, renewable energy technologies in wind, solar, biomass and wood gas stove.

Team-CRER, instead of following commonly adopted route of reverse engineering the imported wind turbine, is involved in developing technology indigenously from local resources and talent. While this objective is challenging, success in achieving it will significantly boost the confidence of the researchers at SZABIST-CRER.

## III. Infrastructure and Lab Facilities

A brief description about the functions of five laboratories being operated at CRER is given below:

- 1. Composite Lab:** It is a glass manufacturing facility where wood work and fiber glass are fabricated for wind turbine blades.
- 2. Wind Turbine Generator Testing Rig:** The tests for wind turbine induction and permanent magnet generators are conducted at the custom built test rig. It consists of 5HP inverter, power transmission link, sturdy bed, and up to 5kVA load bank to check its power capacity.
- 3. Electronics Circuit Designing Lab:** The lab includes instruments for designing/troubleshooting electronics and electrical circuits.
- 4. Embedded System Lab:** The lab is used to control a device through programming using embedded hardware for automation purpose.

- 5. Design and Simulation Lab:** To check the efficacy of design, it is first simulated in this lab using different engineering softwares.

## IV. Research Output Existing Project Development Wind Turbine

In 2012-2013, Team CRER, successfully installed the Wind Turbine Generator at the field i.e., the Jaffer Jokhio Goth in Gharo, Sindh.



The installation is followed by field testing. The process aided in assessing the robustness of the power generation system. The team continuously analyzed the field behavior of the generator and resolved interruptions to make it adaptive to practical conditions.



The generator's on-field performance was pretty consistent, resulted in smooth production of 6kVA electricity.



Furthermore, to celebrate the considerable accomplishment of the Team CRER, the Wind Turbine inauguration ceremony was organized at the Jaffer Jakhio Goth in Gharo, Sindh.



The Chief Guest of the ceremony was Prof. Brig © Dr. Naseem A Khan (Former Head of the Alternate Energy Development Board and Vice Chancellor Hamdard University, Karachi). Other personalities of the ceremony were Dr. Azra Fazal (Chancellor-SZABIST), Dr. Saqib Rizavi (President-SZABIST) and Dr. Amanat Ali Jalbani (Vice President-Academics SZABIST).



## V. Team-CRER

To explore indigenous techniques in the field of renewable energy, the following SZABIST members work dedicatedly at CRER:

**Dr. Imran Amin**, Head of CRER, earned his PhD in Mechatronics from Loughborough University, United Kingdom (UK) in 2007. He has extensive teaching and research experience. His research interests are: Mechatronic Systems, Artificial Intelligence, Renewable energy and Embedded Systems. He oversees and manages all CRER research projects, and administers publication of the Journal of Independent Studies and Research-Computing (JISR-C).



**Engr. Moezul Hassan**, Research Officer at CRER, completed course work of Master in Control Systems from National University of Science and Technology (NUST). He earned his B.E in Electronics from Nadirshaw Edulji Dinshaw (NED) University of Engineering and Technology in 2009. His areas of expertise are: Analog Circuit Designing, Instrumentation, Control Systems, Power Electronics, and Energy Conservation with practically implemented solutions. His work is focused on energy efficient system modeling with sensitivity and predictability analysis.



**Engr. Sarmad Hameed**, Research Officer at CRER. He is currently pursuing his Master in Industrial Controls & Automation Program from Usman Institute of Technology, Karachi. He has earned his Bachelor in Electronics from Sir Syed University of Engineering and Technology (SSUET) in 2010. His research interests are: Digital Circuit Designing, Programming, Troubleshooting, and Power Electronics. He is engaged in integration of renewable energy technologies into the electric power system.



# Stem Cell Research Center (SCRC)

## I. Introduction

Stem Cell Research Center (SCRC) is a podium where researchers and academicians from various biological fields are provided with an opportunity to perform basic and applied research related to biology and allied fields. The center is multidisciplinary in terms of research interests and has a dedicated qualified team of young professionals.

## II. Aim and Purpose of Research

The research and innovation activities of SCRC aims to:

- Promote methods and applications of biological sciences to enhance human wellbeing.
- Discover new avenues of biological sciences.
- Maintain excellence in interdisciplinary biological research by advocating independent and original work, and training future academic leaders through education and research.
- Encourage cross-disciplinary research initiatives focused on the unique plant and microbial species.

## III. Infrastructure and Lab Facilities

SCRC is fully equipped with the required essential instruments to perform the prescribed research. Also, Team SCRC has full access to the high quality chemicals, reagents, and/or kits required to implement researches. The center is in process of acquiring more equipment and chemicals related to freshly added research interests like: enzyme isolation, metabolite fingerprinting, bioactivity profiling and the like.

## IV. Research Output

### A. Existing Project Development

#### 1. Micropropagation of Ornamental Plants

Team SCRC, in order to optimize the micropropagation protocols for rare plant species fabricated a plant tissue culture laboratory. The lab facilitates large scale production of exotic ornamental plants, which are difficult to grow and multiply under natural conditions. During 2012-2013, the micropropagation technique for the mass production of Orchid<sup>2</sup> plant was successfully implemented at the lab. Thus, commenced the multiplication of orchid plantlets.

2. Orchids are considered as a valuable commercial commodity in the global floral market.



Soon the tissue cultured plantlets will be transferred to the SCRC-Green House for acclimatization. Also, considerable quantity of Lilies with standard flowering is efficiently produced at the Green House.



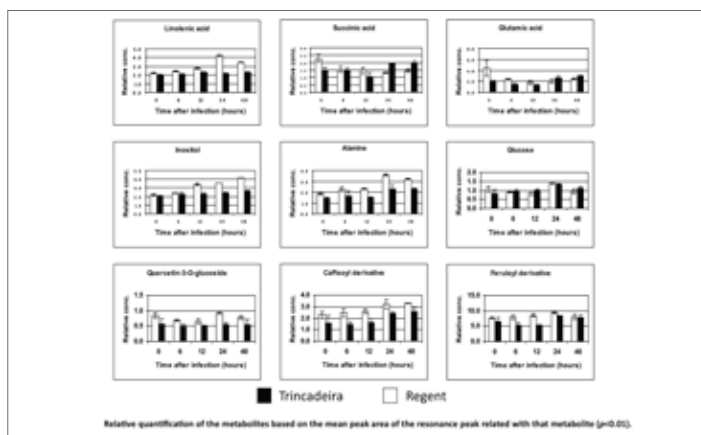
Currently, research is being conducted on *Ixora* and *Alternanthera*, and tissue culture protocol for their micropropagation has been successfully launched.





## 2. Anti-Microbial Profiling of Different Plant Extracts

Under natural product chemistry, the research on anti-microbial effects of various plants extract on a range of microbial strains provided favorable results. It enabled Team-SCRC to publish the effective manuscripts in various National and International reputed journals.



## 3. Isolation, Purification, and Characterization of Enzymes from Microbial Source

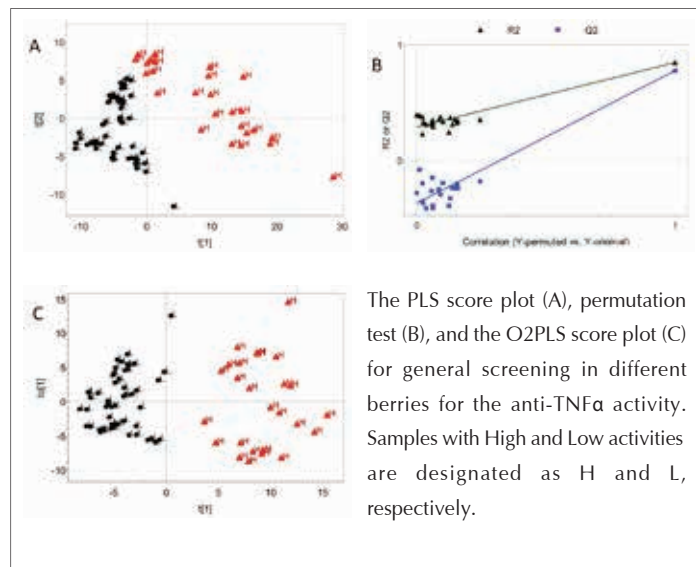
During 2012-2013, for isolation and characterization of industrially important enzymes, Team SCRC targeted enzymes, like Cellulase, Lipase, and Amylase purely because of their potential use in different industries. At present, emphasis is laid on isolation and purification; followed by a complete characterization of different enzymes from various microbial sources.



## B. New projects

### Metabolic and Bioactivity Profiling of Ornamental and Medicinal Plants: Metabolomics

Metabolomics, similar to its existence in natural product chemistry, is a new venture in SCRC research profile. In 2012-2013, Team SCRC successfully performed metabolic profiling of ten different varieties of Orchids. Also, efficiently executed the data correlation of bioactivity and metabolomics of Ocimum to identify the medicinally important metabolites.



The PLS score plot (A), permutation test (B), and the O2PLS score plot (C) for general screening in different berries for the anti-TNF $\alpha$  activity. Samples with High and Low activities are designated as H and L, respectively.

## V. Team-SCRC

**Dr. Kashif Ali**, Head of SCRC is PhD in System Biology and Pharmacognsy from Natural Product Laboratory, Leiden University, Netherlands, through an Overseas Scholarship offered by HEC-Pakistan. His work was on Nuclear Magnetic Resonance (NMR) spectroscopy-based metabolomics of grapes and derived products. After his PhD, he went to Qiagen (Germany) on Marie Curie Secondment (FP7 program) for his first Postdoctorate in Metabolism and Metabolomics, followed by a second Postdoctorate in Leiden University, Netherlands, on Marine Sponge Metabolomics. Before joining SCRC, he was doing his third Postdoctorate at the University of Florida, USA, on primary metabolism in Maize. Currently, he is doing bioactivity profiling and metabolic fingerprinting of various ornamental and medicinal plants.



**Dr. Sarosh Salman**, Research Associate at SCRC, has done MBBS and MBA from Dow University of Health Sciences (DUHS). Also, she has completed her MPH from Baqai Medical University (BMU). She is trained in Drug and Harm Reduction. She had been a Visiting faculty and Trainer for Drugs and other Medical fields at Sir Syed Medical College (SSMC), Dawood University of Engineering & Technology (DUET),



DUHS, and District Jail, Malir. Also, she has 14-year work experience in public service areas, such as: Women Prisoners, Commission on Status of Women (CSW), International Drug Traffickers, Flesh Trade Victims, Abused Children, and Injection Drug Users (IDUs). Her significant achievements include implementation of screening for HIV/AIDS and Hepatitis, as a mandatory feature at Karachi Women Prison. Her current research assignments are related to Bioethics.

**Mr. Shahab Mehmood**, Research Associate at SCRC, has an MPhil from Dr. Panjwani Center for Molecular Medicine and Drug Research. He has worked on HEC-funded projects dealing with the treatment of Parkinson's, Alzheimer's and immunological diseases. His expertise includes tissue preparation for various types of microscopy. He is also experienced in developing in-vivo degenerative disease models. His current assignment is to establish the protocol for the micropropagation of various ornamental plants.



**Ms. Asma Bashir**, Senior Research Officer at SCRC, has Master in Microbiology from Department of Microbiology, University of Karachi. Her research interest is to create antibiotic resistant profiling of various antibiotics and medicinal antimicrobial plants. She has fruitfully completed various projects in the area of Immunology and Diagnostics of infectious diseases. Also, she has formulated entire spectrum of diagnostic procedures to perform screening of blood samples against infectious diseases, and marking samples as safe like HIV, Hepatitis, Syphilis, Malarial parasite etc. She has presented her research work at various International and National forums like United States of America (USA), United Kingdom (UK), Spain, Ireland and Pakistan. Currently, she is involved in the screening of extracts isolated from plants for their antimicrobial activity.



**Mr. Shahbaz Khan**, Research Officer at SCRC, has done his MS in Biotechnology from University of Essex, UK. To gain practical knowledge along with MS program, he had joined Research Groups working in collaboration with Leiden University, Netherland. As a researcher, he worked on Proteins produced by Streptomyces bacteria to identify specific protein involved in production of high levels of secondary metabolites, including antibiotics. Currently, he is working on research projects related to protein and enzyme purification, and characterization.



**Ms. Farah Ashraf**, Research Officer at SCRC, has MSc in Biotechnology from Department of Biotechnology, University of Karachi. Currently, she is engaged in propagating Banana Bunchy Top Virus (BBTV) free plantlets by using plant tissue culture technology and cultivates disease indexed plants, after which the plants are regularly analyzed against infection employing molecular techniques like Polymerase Chain Reaction (PCR), and Enzyme-Linked Immunosorbent Assay (ELISA). Also, she is working on isolation, characterization, and purification of various enzymes from microbial source.



**Ms. Nosheen Maqsood**, Lab Technician at SCRC, is currently enrolled in MS in Applied Mathematics program of NED University of Engineering and Technology. She has earned her BE in Biomedical Engineering from NED University of Engineering and Technology. Her current assignment entails propagation of Orchids and Lilies using plant tissue culture technology.



## VI. Future Plans

Team SCRC, plans to work on Bacillus species. The aim is to: perform the heterologous expression of the  $\alpha$ -amylase (Ethanol production) and pectinase (for Juice industry) enzymes, purify, and prepare structural analysis of the enzymes. Moreover, the same enzyme from different bacillus species will be overexpressed to identify specie which can steadily produce the overexpressed enzyme.



# Sustainable Development Research Center (SDRC)

## I. Introduction

Sustainable Development is commonly being defined as "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs".<sup>3</sup> Therefore, SZABIST-SDRC employs Renewable Energy, Environment, Sustainable Business, and Rural Development to offer progress that: protects the environment, attains economic advancement, and augments the quality of human life.

## II. Aim and Purpose of Research

SDRC aims to accomplish sustainable development by following four major identified domains:

1. **Research:** To enhance knowledge on the use of energy conservation for sustainable business development.
2. **Awareness:** To generate familiarity with the link between environmental protection through energy efficiency, energy conservation and sustainable development.
3. **Development:** To create Sustainable Rural Development models in the areas of sustainable energy, health, education, and entrepreneurship.
4. **Publications:** To write research papers and recommend policies on environment, energy and sustainable development for the well-being of the society.

## III. Research Output

### A. Existing Project Development

#### 1. Jaffer Jokhio village Project

The Jaffer Jokhio village project was undertaken with the intention of transforming the village into a sustainable model village. The project demands eradications of various deficiencies faced by villagers. Consequently, in 2012-2013, Team SDRC was able to overcome the following shortcomings:

#### a. Solar Solution

Being a developing country, providing electricity using regular resources, to the distant villages is not possible. Team SDRC, got over the prevailing issue by utilizing Solar Energy.



Presently, electricity is provided at the village through Solar Panels. The successful installation of the panels resulted from negotiation with Zindagi Services Ltd and funds raised by Community Services students of SZABIST-Social Sciences programs.



#### b. Need Assessment by Community Service Students

Having insight on the needs of the villagers is an integral part to enhance the standard of living. Head of SDRC along with Social Sciences Programs' Community Services students visited Jaffer Jokhio village to conduct need assessment exercise and undertake field work.



The visit aided villagers to: develop a true sense of community, improve coordination and overcome minor problems. Also, the visit helped identify dire need of the medical and hygiene facilities in the area.

3. The definition is taken from Our Common Future; Brundtland Report 1987.



### c. Medical Facilities at Jaffer Jokhio Goth in Gharo, Sindh

As per the earlier studies, unavailability of proper medical facilities was a big hurdle towards villagers' healthy life. Team SDRC, to mitigate the medical concerns of the people of Jaffer Jokhio Goth in Gharo, Sindh, organized a free medical camp at the village with the support of District Health Officer (DHO), Thatta, Medical Superintendent (MS), Gharo, Sindh, and People Medical Association.



At the camp, a team comprising of four doctors, paramedic staff, and volunteers<sup>4</sup> ministered 200 patients of the village and the surrounding areas.



4. The volunteers were SZABIST-Social Sciences Programs' Community Service students.

The patients were provided medicines, vaccines, medical test facility and refreshments.



### d. Hygiene Campaign

The revamping of Jaffer Jokhio Goth into sustainable model village entails healthy villagers. The thorough research and mapping of the village highlighted the absence of hygiene.



Therefore, to create awareness about basic hygiene for the preservation of health a "Hygiene Campaign" was organized by the students of Community Services at the village. During the campaign, demo about simple hygiene activities was given to the villagers.

## B. New Project/Activities

### 1. Fundraising Activities

Availability of sufficient finances is a major ingredient for realizing dreams. Thus, Head of SDRC along with Community Services students of SZABIST-Social Sciences program arranged following events to increase financial support for various activities at Jaffer Jokhio Goth, Gharo, Sindh.



### a. Carnival

To generate funds for the Solar light project a “Carnival” was organized at Sindbad, Karachi. From the activities at the carnival, a sum of Rs. 75,000 was collected for the social cause.

### b. Qawali Night



A “Qawali Night” was arranged to multiply the finances for the Solar light project. The qawal of the event was the renowned Mr. Amjad Ali Sabri. The event was attended by more than a thousand guests and generated Rs. 80,000 for the cause.



### c. Bake Sales

Social Sciences Programs’ Community Service students organized “Bake Sales” at various SZABIST-events. As a result, a considerable amount was accumulated to support different activities of Jaffer Jokhio Project.



## 2. Guest Lecture Sessions

Taking inspiration from the aim, SDRC organized series of Guest Lecture sessions to create awareness on the importance of community involvement in the process of its development. During 2012-2013, the following prominent speakers were invited to various events to share their community service experience:

- a. Event:** Pakistani Women in a Changing Society  
**Speakers:** *Ms. Anis Haroon*, former Chairperson, National Commission on the Status of Women (NCSW), Pakistan,  
*Ms. Zubeida Mustafa*, freelance Journalist and former Assistant Editor, *DAWN*,  
*Prof. Dr. Bernadette Louise*, Dean Principal, St. Joseph’s College for Women and  
*Ms. Mehnaz Rehman*, Director, Aurat Foundation  
**Date:** April 2, 2013
- b. Event:** Community Service  
**Speakers:** *Mr. Zia Awan*, Advocate and Human Rights Activist,  
*Ms. Sabeen Fatima Haque*, Interim Country Head, Naya Jeevan, Karachi,  
*Mr. Shahid Zaki*, Chief Executive Officer, Aman Foundation, Karachi and  
*Mr. Mudassir Habib*, Regional Manager, Fundraising, Shaukat Khanum Memorial Trust, Karachi .  
**Date:** April 27, 2013

- c. Event:** Talk on Martyrs and Marigolds  
**Speakers:** Ms. Aquila Ismail, Activist, Teacher and Author, Karachi,  
 Ms. Zubeida Mustafa, freelance Journalist and former Assistant Editor, DAWN and Nilofer Farrukh, Art Critic, Karachi  
**Date:** June 6, 2013



## IV. Team-SDRC

**Dr. Riaz Ahmed Shaikh**, Head of SDRC, earned PhD in Sociology from Hamdard University, Karachi in 2005 and Postdoctorate in Sociology from University of Ljubljana, Slovenia in 2010. He has served as Managing and Peer-reviewed editor of Asia Journal of Global Studies-AJGS, OSAKA, Japan, and Journal of Management & Social Sciences-JMSS, Karachi, Pakistan, respectively. He has authored six books and various publications of international repute addressing important societal issues. Also, has won an "Outstanding Author Contribution Award" at the Literati Network Awards for Excellence 2010 organized by the Emerald Publishers, UK for his research paper "Pakistani Military Role in Asian Context".



## V. Future Plans

Team SDRC in continuation of their current activities, plans to undertake new projects and activities for providing sustainable development.

### A. Continuing Activities

Team SDRC will continue vigorous efforts to gather substantial finance for Jaffer Jokhio Goth in Garo, Sindh through series of Fundraising Activities; negotiate with other Non-Governmental Organizations (NGOs) for provision of additional Solar Panels; and acquaint society with the concept of community service through renowned speakers like Mr. Adeeb Rizvi, Mr. Ramzan Chippa, Dr. Kaisar Bengali and Ms. Anis Haroon.

### B. New Initiatives

Team SDRC plans to commence the following projects in 2013-2014:

#### 1. Awareness Projects

Team SDRC plans to assign "Community Services Awareness Projects" to the SZABIST-Social Sciences Programs' Community Service students. This will significantly aid to motivate general public to contribute towards society welfare and development.

#### 2. Construction of Library

Team SDRC plans to construct a library in the school of Jaffer Jokhio Goth in Garo, Sindh. This will enable students to gain additional knowledge as well as have a secluded area to study the course books.



# Institutional Research/ Quality Enhancement Cell (IR/QEC)

## I. Introduction

The Institutional Research/Quality Enhancement Cell (IR/QEC) persistently ensures that SZABIST abides by its ideology of providing top-quality education and competitive advantage to the students. In order to sustain and nurture the high academic standards, During 2012-2013, the IR/QEC performed various reviews, analyses, and assessments.

The department's effectiveness and devotion is evident from the attainment of "W" category, the highest ranking category, in the bi-annual quantitative assessment of 2012-2013, conducted by the QAA-HEC.

## II. Quality Assurance Measures Taken at SZABIST

The IR/QEC department systematically works and divides the quality assurance assignments into: Academic Operations, Policies, and Outreach.

### A. Academic Operations

In order to examine and enhance the quality of academic operations the IR/QEC undertook the following assignments:

#### 1. Strengthening the Institutional Research-Self Assessment Report (SAR)

The IR/QEC responsibilities entail organizing and managing the self assessment process of various academic programs. The process results in generating Self Assessment Report (SAR) of a program. The SAR is a combination of Program Team (PT) Report, Review by IR/QEC, and Assessment Team (AT) Report. The SAR evaluates the level of achievement of institute's educational objectives and outcomes by the academic programs, provides feedback for quality assurance of the program, improves academic standards, and enhances students' learning process.

During 2012-2013, the SAR of the 4 programs (Bachelors of Business Administration, Executive Masters of Business Administration, MS in Social Sciences, and MS in Management Sciences programs) have been completed and submitted to

QAA-HEC. In future, the department intends to produce SAR of BE-Mechatronics, BS-Media Sciences, BS-Computer Sciences, and BS-Social Sciences programs.



#### 2. Syllabus Correlation

The syllabus correlation exercise was performed to identify the degree of similarity and variation between course descriptions provided by the instructors and the course descriptions provided in the Course Catalogue. The analysis depicts that half (50%) of the course descriptions were "Dissimilar" whereas, the other half (50%) were either "Identical/Similar (30%)" or "Not Posted/Provided (20%)" by the faculty. Following the analysis, the Program Managers were informed about the need for uniformity in course description.

#### 3. Measuring Consistencies between Exam Papers and Course Outlines

IR/QEC evaluates SZABIST's academic standards by comparing exam papers and course outlines. The idea was to determine whether discrepancy between exams questions and the materials given in the course outline exist. The evaluation of the target sample indicated that 90% to 100% of the material is covered in exams. Thus, it can be safely inferred that SZABIST delivers the promised education.

#### 4. Preparing and Improving the Quality of Publications

Publications assist in apprising stakeholders and profiling progress. Hence, the IR/QEC staff members diligently work to enhance the quality of important SZABIST's publications. In 2012-2013, the team compiled, reviewed, and edited various publications such as: Student Handbook 2013, Course Catalogue 2013, SZABIST-Trust Annual Report 2011-2012, Research and Development Annual Report 2011-2012, and the 3<sup>rd</sup> and 4<sup>th</sup> edition of the newsletter "SZAB'nings".



## 5. Institutional Support to Dubai Campuses

The IR/QEC in order to standardize and improve Dubai campus's academic policies and operating procedures performed various tasks and provided required institutional support. Consequently, the goodwill of the campus was augmented.

### B. Policies

The IR/QEC implemented the following quality assurance measures to further reinforce SZABIST's policy framework.

#### 1. Surveys

In order to upgrade the academic standards and facilitate the attainment of education, the IR/QEC elicits feedback from various stakeholders (graduating students, alumni, full-time faculty, and employers) through surveys. The solicited responses were meticulously analyzed to assist Senior Management in overcoming policy and procedural limitations in SZABIST's academic and administrative operations.

#### 2. Admission Data Analysis

The IR/QEC staff members conducted a detailed analysis of admission data for 2009-2012. Consequently, the department helped in formulating guidance for future academic operations, ensuring competitiveness and determining promotion strategy.

#### 3. Institutional Research Studies

In addition to enhancing the department's portfolio, research studies facilitated Senior Management in developing competitive strategies, reviewing policies, and overcoming identified shortcomings. In 2012-2013, the IR/QEC staff members finalized the following research studies:

- Comparative Analysis of the Effective Cost of Education in Some of the Leading Business Institutes of Pakistan (LUMS, IBA, SZABIST, IoBM and Iqra).

- A Comprehensive Analysis of the BBA program at SZABIST.
- Quality Assurance at SZABIST: Measures, Challenges, and Impact.
- A Comparative Analysis-Karachi, Islamabad and Dubai Campuses of SZABIST.



## III. Outreach

### Relations with HEC and other Regulatory Bodies

The IR/QEC, along with undertaking assignments to augment SZABIST's education standard, maintains close working relations with HEC and other regulatory bodies. This includes responding to provision requests, and compilation and submission of documentation. During 2012-2013, the department performed the aforementioned activities for various regulatory bodies, including HEC-QAA, Government of Sindh's Chartered Inspection and Evaluation Committee (CIEC), Asia Pacific Quality Assurance Network (APQN), Knowledge and Human Development Authority (KHDA), Dubai (UAE), and Association of Quality Assurance Agency of Islamic World (AQAAIW).

## IV. Team-IR/QEC

Dr. Tayyaba Tamim<sup>5</sup>, Director Academics and Head of Institutional Research, has PhD in Education from the University of Cambridge, UK, as a fully funded Research Consortium for Educational Outcomes and Poverty (RECOUP) scholar. She has also earned MPhil in Research in Second language Education from University of Cambridge, UK, as a British Council fully funded Chevening



5. Dr. Tayyaba Tamim joined SZABIST in August 2014.

scholar. In addition, she has a Masters in English Language Teaching (ELT) from Kinnaird College for Women University, a Diploma in ELT, and a Masters in English Literature from the University of Punjab. Dr. Tamim has almost 18 years of experience in teaching, research, and administration at different levels in renowned universities such as Lahore School of Economics and Aga Khan University. Moreover, she has published her research and presented it, in National and International high impact journals and conferences. Her research work has involved an exploration of issues of social justice and equity in education, across gender, class and caste, teacher education, and the socio-politics of languages in education and language policy.

**Ms. Faryal Shahabuddin**, Manager QEC, earned MBA from University of Karachi. She is a member of IR/QEC since April 2010. Her work entails preparing, coordinating, evaluating, and submitting various reports, such as, SARs of academic programs; conducting and reporting various analyses, editing of SZABIST Publications, and being an integral part of maintaining close relations with the higher education regulatory bodies. Currently, she is working on varied assignments such as: SZABIST-Trust Annual Report 2012-2013, Research and Development Annual Report 2012-2013, data compilation for Fact Book, analysis of various surveys, and Voices of SZABISTians-II.



**Ms. Hira Anwar**, Assistant Manager IR/QEC, earned MBA from SZABIST and joined IR/QEC in June 2010. Since the beginning of her association with IR/QEC, she has been involved in initiating various assignments for improving quality of various SZABIST's policies and procedures. For example, SZABIST Trust Annual Report and Admission Analysis. Also, she has edited various SZABIST publications, and prepared SARs of various programs. Her current work assignments include Admission Analysis 2013, and Analysis of Graduating Students Survey 2012-2013.



**Ms. Mahwash Imran**, Institutional Research Officer, earned MBA from SZABIST and joined IR/QEC in February 2011. She has been involved in assignments such as: identifying syllabus correlation, measuring consistency between exam papers and course outlines, analyzing surveys, and reviewing and editing publications. She is currently working on the SARs of various programs, SZABIST-Trust Annual Report 2012-2013, Gender-based Differences in Academic performance: A study of SZABIST students, "SZAB'nings" edition 5<sup>th</sup> and 6<sup>th</sup>, and Full-time Faculty Survey 2012-2013.



**Ms. Fatemah Mohsin<sup>6</sup>**, Institutional Research Officer, earned MBA from SZABIST. She was involved in conducting analysis, reviewing documentation, and editing and designing of publications. She is currently working on Alumni Survey 2012-2013, Voices of SZABISTians-II and Admission Analysis 2013.



## V. Future Plans

The IR/QEC plans to continue its regular assignments and take new initiatives for further strengthening the quality of education at SZABIST.

Some of the regular activities include: initiation of the SARs of the BE Mechatronics, BS Media Sciences, BS Computer Sciences and BS Social Sciences programs, conducting the next round of survey, reviewing, editing, and publishing Research and Development Annual Report, SZABIST Trust Annual Report, and "SZAB'nings".

New initiatives will include conducting the Admission Analysis 2013 for other Campuses, Analysis of the MBA Program, Comparative Analysis of Faculty and Alumni surveys; initiating University Portfolio Report (UPR) requirements of the HEC, and publishing the Fact Book.

6. Ms. Fatemah Mohsin was associated with SZABIST till May 2014.



## Senior Faculty & Program Managers

**Dr. Amanat Ali Jalbani**<sup>7</sup>  
Vice President (Academics)  
Dean  
Management Sciences Department



**Dr. Tayyaba Tamim**<sup>8</sup>  
Director Academics and  
Head  
Institutional Research



**Dr. Nadeem A. Syed**<sup>9</sup>  
Head  
Management Sciences Department  
Program Manager  
MS Management Sciences and  
PhD Management Sciences



**Mr. Masood Ahmed**<sup>10</sup>  
Program Manager  
Master of Business Administration  
(Day)



**Mr. Kumail Hemani**<sup>11</sup>  
Program Manager  
Master of Business Administration  
(Evening)



**Mr. Jamil Ahmed**<sup>12</sup>  
Program Manager  
Master in Project Management,  
Master of Business Administration  
(Banking and Finance), and  
Executive Master of Business  
Administration<sup>13</sup>



**Ms. Wajeeha Fatima Javed**<sup>14</sup>  
Head  
Student Support Services  
Program Manager  
Bachelor of Business Administration  
(Yr 3 and 4)



**Mr. Fahad Zuberi**  
Program Manager  
Bachelor of Business Administration  
(Yr 1 and 2)



**Ms. Shehla Najib Sidiki**  
Program Manager  
BA in Business Studies



7. Dr. Amanat Ali Jalbani was associated with SZABIST till March 2014.

8. Dr. Tayyaba Tamim joined SZABIST in August 2014.

9. Dr. Nadeem A. Syed appointed as the Head of Management Sciences in March 2014.

10. Mr. Masood Ahmed became Program Manager for Master of Business Administration-Day by replacing Ms. Hina Mubeen in December 2013.

11. Mr. Kumail Hemani became Program Manager for Master of Business Administration-Evening by replacing Mr. Masood Ahmed in December 2013.

12. Mr. Jamil Ahmed appointed as Program Manager for Master in Project management and Master of Business Administration-Banking and Finance in June 2014.

13. Mr. Jamil Ahmed became Program Manager for Executive Master of Business Administration by replacing Ms. Subeika Rizvi in June 2014.

14. Ms. Wajeeha Fatima Javed was appointed as Head of Student Support Services SZABIST in August 2014.



## Senior Faculty & Program Managers

**Dr. Mohammad Altaf Mukati<sup>15</sup>**  
Dean  
Computer & Engineering Sciences



**Dr. Imran Amin**  
Head  
Computer Science Department



**Dr. Husnain Mansoor**  
Program Manager  
MS Computer Science and  
PhD Computer Science



**Mr. Asim Riaz**  
Program Manager  
BS Computer Science



**Dr. Faraz Junejo**  
Head  
Mechatronics Engineering Department



**Dr. Riaz Shiekh**  
Head  
Social Sciences Department  
Program Manager  
MS Social Sciences and  
PhD Social Sciences



**Dr. Farheen Nasir**  
Program Manager  
BS Social Sciences



**Mr. Shehram Mokhtar**  
Head  
Media Sciences Department  
Program Manager  
BS Media Sciences and  
MS Media Studies



**Mr. Salman Abedin**  
Program Manager  
Master of Advertising and  
Master of Television Production



**Dr. Kashif Ali**  
Program Manager  
BS Biosciences



**Ms. Shaaista Sarki**  
Head  
Law Department



**Dr. Ghazala Rahman Rafiq**  
Director  
Sindh Abhyas Academy



15. Dr. Mohammad Altaf Mukati joined SZABIST in September 2013.

## Senior Faculty & Program Managers

**Dr. Mustaghis-ur-Rahman<sup>16</sup>**  
Faculty Management Sciences



**Dr. Manzoor Ali Isran**  
Faculty Management Sciences



**Dr. Syed Saif-ur-Rahman**  
Faculty Computer Science



**Dr. Ummad Mazhar<sup>17</sup>**  
Faculty Social Sciences



**Dr. Sidra Afzal<sup>18</sup>**  
Faculty Mechatronics



**Dr. Tahir Abdul Hussain<sup>19</sup>**  
Faculty Mechatronics



**Dr. Sarosh Salman<sup>20</sup>**  
Faculty Bioscience



16. Dr. Mustaghis-ur-Rahman was associated with SZABIST till May 2014.

17. Dr. Ummad Mazhar was associated with SZABIST till March 2014.

18. Dr. Sidra Afzal was associated with SZABIST till May 2014.

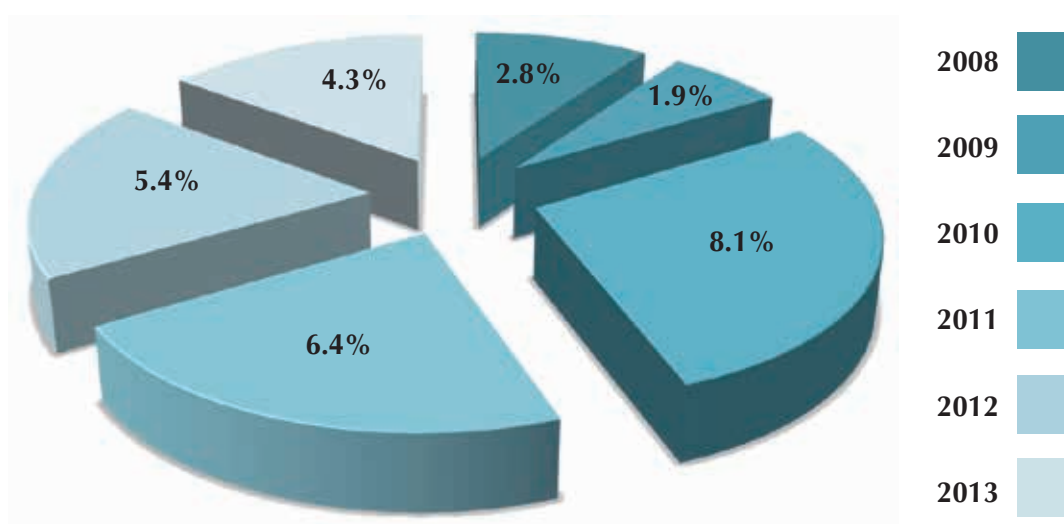
19. Dr. Tahir A. Hussain joined SZABIST in January 2014.

20. Dr. Sarosh Salman joined SZABIST in January 2014.

# Budget Allocations for Research

(Research Budget as Percentage of SZABIST Budget)

SZABIST- Budgetary Allocations			
(Rs. Millions)			
Year	Research	SZABIST	Percent <small>*Research Budget as Percentage of SZABIST Budget</small>
2008	4.95	175	2.8
2009	3.65	193	1.9
2010	23.5	289	8.1
2011	29.8	468	6.4
2012	22	406	5.4
2013	19.8	463	4.3



# Publications, Conferences, Workshops, Video Conferences and Visits

## Publications

### Center for Renewable Energy Research

#### i. Publication in Conferences

Saquist, S. M. T., Hameed, S., Ali, S. M. U., Jafri, R., & Amin, I. (2013). Wireless Control of Miniaturized Mobile Vehicle for Indoor Surveillance. Presented at the First International Conference on Sensing For Industry, Control, Communications, & Security Technologies (ICSICCST), Institute of Physics (IOP) Conference Series: Materials Science and Engineering, IOP Publishing.

#### ii. Publication in Journal

Hassan, M. U., Kadri, M. B., & Amin, I. (2013). Proficiency of Fuzzy Logic Controller for Stabilization of Rotary Inverted Pendulum based on LQR Mapping. *Fuzzy Logic and Applications, Lecture Notes in Computer Science*, Francesco Masulli; Gabriella Pasi & Ronald R. Yager, WILF, Springer, 8256, 201-211. ISSN: 0302-9743 (Print) 1611-3349 (Online)

### Stem Cell Research Center

#### Publication in Journal

Sherwani, S. K., Bashir, A., Haider, S. S., Shah, M. A., & Kazmi, S. U. (2013). Thrombolytic potential of aqueous and methanolic crude extracts of *Camellia Sinensis* (Green tea): In vitro study. *Journal of Pharmacognosy and Phytochemistry*, 2 (1).

Ali, K., Iqbal, M., Fortes, A. M., Pais, M. S., Korthout, H.A. A. J., Verpoorte, R., & Choi, Y. H. (2013). Red wines attenuate TNF  $\alpha$  production in human histiocytic lymphoma cell line: An NMR spectroscopy and chemometrics based study. *Food Chemistry*, 141 (3), 3124-3130.

Haider, S. S., Sherwani, S. K., Kazmi, S. U., Bashir, A., & Shah, M. A. (2013). Blastocystis-Hominis-Potential Diaphorreal Agent: A Review. *International Research Journal of Pharmacy*, 4 (1).

Ashraf, F., Bashir, A., Mohammed, S., & Noman, B. (2013). New horizon in therapeutics: Antimicrobial action of *Dendrobium nobile* and phalaenopsis against pyogenic skin infection isolates. *Indian Journal of Health and Well Being*, 2 (7), 1452-1457.



## Sustainable Development Research Center

### i. Books

Shaikh, R. A. (2012). *Back from the Brink: India-Pakistan Ties Revisited*. Karachi: Ushba Books Publication.

Shaikh, R. A. (2012). *Takhleeq-e-Pakistan: Hamza Alavi's Article's Translation*. Lahore: Fiction House.

Shaikh, R. A. (2013). *Strangling the Liberty: Press in Distress in Pakistan*. London: Frontage Page Publications.

### ii. Articles

Shaikh, R. A. (2013, March 13). Greater Connectivity for Regional Prosperity. *The News*.

Shaikh, R. A. (2013, April 1). India, Pakistan: Let academics meet. *The News*.

## Institutional Research/Quality Enhancement Cell

### Articles

Khan, H. A. (2013, July). Quality Assurance at SZABIST: Measures, Challenges, and Impact. *Research Global*. The Association of Commonwealth Universities Research Management Network.

## Conferences

### Stem Cell Research Center

SCRC participated in the:

- Conference on "Botanical Gardens in Biodiversity Conservation and Sustainable Management", on 14 - 16 June, 2013, at Baragali Summer Campus–University of Peshwar, Abbottabad NathiaGali.
- Ninth International Biennial Conference of Pakistan Society of Microbiology on "Microbiological Analysis and Isolation of Antibiotic Resistant Bacteria from GharaWater Samples (Karachi-Pakistan)" on 28 – 31 January, 2013, at International Center for Chemical and Biological Sciences (ICCBS), Hussain Ebrahim Jamal (H.E.J) Research Institute of Chemistry, University of Karachi (UoK), Karachi.
- Conference on "Phytochemical, Phytotoxicity activity and Antifungal screening of Carica papaya L. leaf extracts against pathogenic fungi: A Search for new therapeutics" on 2 February, 2013, at Advance Educational Institute & Research Center (AEIRC), Sheikh Zaid Islamic University, University of Karachi (UoK), Karachi.

## Workshops

### Stem Cell Research Center

- SCRC participated in the: "Biosafety Training Workshop" on 10 December, 2012, at Federal Urdu University of Arts, Sciences & Technology (FUUSA), Karachi. At the workshop, Ms. Asma Bashir, as Biosafety trainer, trained 35 students of BS, M.Sc. , and MS level programs

## Institutional Research Department/Quality Enhancement Cell

The IR/QEC staff attended the following workshops arranged by QAA-HEC, in 2012-2013, to further acquaint with quality assurance criteria and standards set by the HEC.

- External Evaluation of Academic Institutions and Programs held on October 9 2012, at Iqra University, Karachi.
- Case Study of Selected Universities' QEC held on June 7, 2012, at HEC, Lahore.

## Video Conferences

### Institutional Research Department/Quality Enhancement Cell

The IR/QEC participated in the below-mentioned video conferences to get insight on diverse quality assurance methodologies. The video conferences are conducted by members of QECs e-group:

- Baldrige Performance Excellence Program held on February 8, 2013
- How to write Self Assessment Report (SAR) held on February 14, 2013

## Visits

### Sustainable Development Research Center

- Dr. Riaz Shaikh, Head of SDRC visited "Aga Khan University Hospital (AKUH), Department of Community Health Sciences (CHS)" in Karachi on August 29, 2013, to collaborate on combine community welfare activities.
- Team SDRC visited below mentioned development projects in Karachi to gain knowledge about various developmental activities and to create liaison:
  - Orangi Pilot Project on February 25, 2013 and
  - Khuda ki Basti on March 8, 2013



***SZABIST***

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