

CIVIC ENGAGEMENT PROGRAMMES
BY
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National University of Sciences and Technology (NUST) designs its programmes and courses primarily to address the national needs and social problems. This has been a driving force in a number of civic engagement initiatives undertaken by the Universities in recent days. Some of the programmes include:

a. **Education and Healthcare Support to the IDPs from Swat:** Pakistan witnesses the biggest population displacement in recent history in the wake of on-going operation against terrorists in Swat Valley during year 2009. NUST reached out to the Internally Displaced Persons (IDPs) lending financial help and organizing community support services in district Mardan. The University established its support centres at fourteen different locations providing education, healthcare, water and sanitation facilities to 1400 families, comprising about 10,000 members. NUST established schools for young children, engaging teachers from within the IDPs and provided free books, stationery, and recreational equipment. More than 500 students are enrolled in the school. A computer lab has been installed at Mardan to provide computer education and IT courses to grown-up students in the camps. Two medical camps have been established with doctors and free medicines. More than 200 patients visit each medical camp daily. NUST teams installed 6 x borewells, 8 fibre-glass water tanks and 16 electric water coolers for clean drinking water. They also repaired forty toilets for the use of IDPs.



b. **Provisioning of Basic Amenities of Light and Water in a Village of Baluchistan:** Baluchistan Province is the most under-developed and poorest area of Pakistan. There are thousands of villages that do not have access to the basic amenities of life such as running water and electricity. The province gets sun the year round, making solar energy an excellent resource to take advantage of. Solar PV panels can be used to generate electricity for home electrification as well as for powering water pumps. Patkin, a village in Kharan District of Baluchistan, was selected and funded by Win-Rock International, USA for implementation of the project. In this village, 36 houses were equipped with lighting facility by using solar power system. For water pumping, Lorentz PS600 HR-14 pump was chosen with two 175Watt PV panels. This particular pump has the capacity to pump 5,000 gallons per day. The project provided the inhabitants with the basic amenities of light and water. The project was carried out

by the resource persons from the NUST College of Electrical and Mechanical Engineering (E &ME) and NUST Consulting (NC).

c. **Clean Drinking Water to the Villagers of Remote Areas of FATA:** NC and NUST Institute of Environmental Science and Engineering (IESE) from Pakistan and Solar Energy International (SEI), representing USA were jointly awarded a MoST / HEC / USAID funded project, under Pakistan-US Science & Technology Cooperative Programme to provide Solar Pumping Systems for Drinking Water supply in 6 villages of the Federally Administered Tribal Areas (FATA) as a pilot project. The villages selected were Hasan Lagadai & Ali Masjid from Khyber Agency, Toda Cheena & Mirdu Tana in Kurram Agency, Kurchai in Bajaur and Shabana in Mohmand Agency. In these villages, water pumping systems of different configurations were installed either on spring water sources or on the dug wells. The water pumping systems were operated using solar power systems and the pumped water was stored in a cemented storage tank especially built for the purpose at a suitable location in each village. During the implementation phase--right from the designing, procurement, testing and installation stages--experts from IESE, College of E & ME and NC remained involved. NC managed the whole project well within the defined timeline. As an outcome, the villagers are extremely happy as they are getting water at their doorsteps.



d. **Heating of Water through Solar Energy for Industrial Usage:** In view of the fact that our industry is the major victim of energy crises faced by the country, a proposal was submitted to and approved by Higher Education Commission (HEC) for allocation of requisite funds to design and develop a Solar Hybrid Water Heating System for industrial application. The intent of this research project was to develop a process for pre-heating of industrial water that would be fed to a boiler run with natural gas for maintaining the temperature in all situations to sustain the industrial process. For this purpose, M/s Siddiq Leather Works (SLW), Lahore was selected. The daily hot water requirement of SLW was analyzed and a solar hybrid water heating system was designed. SLW has been using natural gas boiler to heat the water to be used for the processing of leather. The designed system was simulated using TSOL software. The solar evacuated tube collector system along with associated equipment was procured from China, whereas the rest of piping, insulation and other materials, etc, required for the system, were acquired locally. Complete system installation was completed at SLW in February 2008, and after insulating the piping and going through the process of leak test, the first system-run was given in March 2008. The system has been put into operation and is giving satisfactory performance since then. The principal investigator of the project is from NUST College of E&ME, while NC did the overall project management. Approximately 30 % saving in natural gas for industrial and other water heating requirements is anticipated. Presently, data for development of production specifications for domestic and industrial installation of this system is being gathered.



e. **Development of LED-Based Lighting System for Remote Rural Areas:** When compared to incandescent and phosphorescent light bulbs, Light Emitting Diodes (LEDs) based lights produce negligible heat, operate for a much longer life, are less prone to failure in high vibration environment and consume far less power. A team under the supervision of a faculty member from NUST College of E&ME has developed a complete household power generation and lighting system, especially for rural areas in remote locations. The battery of the LED lighting system, so developed, can primarily be charged through solar photovoltaic system and during consistent bad weather period the battery may be charged through a paddle generator as on a bicycle. The target utilization areas of this system could be remote places in the country where there is no electricity and poor households are in dire need of some alternate lighting arrangement. Solar Panel Based LED Lighting System was demonstrated to Pakistan Poverty Alleviation Fund who placed an order of 50 systems for a remote village Allah Bano near Kemari, Karachi, through one of their recipients, of the welfare funds "Indus Earth". After



development the units were successfully installed in June 2008, and they are giving satisfactory performance since then. Based on the success of this pilot project, much bigger projects are likely to be undertaken in the near future.