

TECHNOVATE

ISSUE 4

TECHNOLOGY UPGRADATION AND SKILL DEVELOPMENT COMPANY - TUSDEC
Newsletter



Inside

- The Climatic Dividend of Industrial Growth
- TUSDEC Takes Green Energy Initiatives
- Prospects of Reliance on Biogas
- Success Stories of NIDA Peshawar
- Probing KP and FATA for a TVET Reform



The Climatic Dividend!

Pragmatically Pakistan is comprehended as an agrarian economy, where industrialization has been enslaved for its granary to a clique out of the enormous masses of the country. For the masses are residing in rural settings, still preserve agriculture as their only means of income generation imputing it to contribute 22% to the national income. Industry contributes 25.4% to the country's GDP, where the venturesome industrial revolt has been void of the subtlety for environmental conservation since its very onset. Industrialization while yielding staggeringly to the national economy has been plowing quite a trumped up field for the imminence of agriculture and overall eco-system through the heinous practice of releasing dross and toxic emissions directly to the adjacent soils, rivers and sea. According to a report, industrial pollution poses 20% of the entire ailment burden for the country while causing other tribulations to the atmosphere at large. In Pakistan, the irrigated share of crop land (80%) is almost twice the regional average affiancing 54% of the national labor force, but nearly half of this area has become water-logged saline due to the persistent amalgamation of waste water, noxious organic and inorganic pollutants.¹

As the industries have started numerating; the factories, tanneries and mills have started skewering out bulks of their effluents into the air and water. Besides, Pakistan is turning out to be largely arid and disadvantaged due to its dependence on Indus River, for the surface water. The country is therefore more vulnerable to the consequences of basin degradation and water pollution than any of its neighboring countries.

The most elusive demand has been the installation of appropriately equipped and seamlessly functional effluent treatment plants in the premises of Industrial Estates and within the boundaries of few predominant industrial units. The diffident outlook towards environmental protection has led various urban and rural terrains of the country to a breakneck level of pollution.

According to a report by FAO, the total wastewater discharged to the major rivers is 392,511 million gallons (1.782 x 10⁹ m³/yr and 1/3rd of all wastewater), which includes 316,740 million gallons (1.438 x 10⁹ m³/yr) of municipal and 75,771 million gallons (0.344 x 10⁹ m³/yr) of industrial effluents.³ The largest metropolis and industrial hubs of the country have received the severest gust of air and water contamination, Lahore once quoted as the 'city of gardens' now hosts one of the most begrimed rivers in the world. Ravi posing a menace for the city dwellers receives a load of 728.75 tons of waste water per day. About 1810 cusecs municipals sewage and industrial ooze is being dumped into the river by ten sewage and pumping stations.²

Karachi is ranked eighth among the most polluted cities of Asia where the tons of industrial discharge from Korangi, Landhi and Karachi Export Processing Zone has envenomed the sea water, 60% garbage (industrial and domestic) is being abandoned at dumping sites while 40% is being dumped in storm-water drains or towards the harbor.³ Faisalabad is enduring the same affliction; an abode to country's textile industry, the city is deprived of adequate and properly operational waste treatment plants, which makes the industrial and municipal garbage flow into open and low laying lands.

The ever mounting environmental degradation is costing Pakistan 6% of its annual GDP.¹ In vigilance of controlling the serious decay, the Government of Pakistan has implemented the National Conservation Strategy in 1992.

The strategy has been fostered through further institutional establishments and legislative enactments for environmental conservation but it could merely substantiate its objectives. The perturbation of instilling sustainability criteria in the policy and implementation to combat the environmental challenges threatens the country's long term economic growth. Up till now the focus on industrialization is myopic of its ecological dividend; our natural reservoirs and the climate at large are receiving. There is a dire need of taking an integrative and a 'Greener' approach towards industrial development in the country. Both the public and private sectors should collaboratively harness their efforts and resources to launch comprehensible reforms to protect and conserve the ecosystem. Aside to the

policy definitions, stringent monitoring mechanisms should be exercised to curtail many reckless business practices attributed for immoderate and ever hiking environmental debasement. TUSDEC is also serving the cause of environmental conservation through setting up National Cleaner Production Centre, a common facility centre to channelize the entire spectrum of technological support to promote environmentally sustainable production processes for various key industrial clusters of Pakistan. The centre will provide technical assistance to the industry in identifying the lacunae in their production operations which has led to pollution and exaggerated consumption of natural resources over the years. The company is also implementing trainings in industrial waste water treatment

through NIDA Centres. It is high time that pragmatic policy interventions should be inscribed and implemented effectively to stop over the smokestacks that are encroaching the pastel extremities of our environment and vacating the natural supplies.

1. Pakistan Strategic Country Environmental Assessment, South Asia Environment and Social Development Unit, October, 2006, Document of the World Bank.

2. River Ravi Potential Pollution and Solutions: An Overview by Yasir Yasir A., Fawad A., Fateha A., Amna I. and Zainab R. Sustainable Development Study Centre GC University Lahore, June 2010

3. Individual's capacity development on the safe use of wastewater in agriculture in Pakistan, Ghulam Murtaza and Munir Hussain Zia Institute of Soil and Environmental Sciences, University of Agriculture, Faisalabad-38040, Pakistan



01 Message from the CEO

02 TUSDEC News & Updates

06 Honoring the Cooperation
Joining Hands with GRFC, Diakob Enterprises and APHMA

07 Power it the Sunway
Skill Development in Solar Technologies

09 Biotic Potentials for Energy
Energy Production through Biomass

11 Probing the TVET Ground
Snippets from TUSDEC/EU Baseline Assessment in KP & FATA

13 Notes of Testimony
Success Stories from NIDA Peshawar

contents

Message from the CEO...



“Contribution towards national prosperity is binding all of our endeavors as more than a declaration of intent.”

Existence of a stable and economically viable society is inextricably linked to a persistent approach towards industrial and social development. Essentially TUSDEC is a company established to facilitate the industry in the transfer of modern technology and relevant skill development. In very few years, with our outspread strategic commitments, we have implemented numerous projects of technology support for the industry and with the same objective we have now joined hands with Asian Development Bank to setup Engineering Support Centres in three provincial territories. Our scopious experience over the years has rendered us with the requisite manpower, material and a broad-based model of project management. Hence to cogently deploy the available resources, we have adapted our work and strategy towards social sector development through the capacity building of marginalized fragments of society. I feel honored to announce that TUSDEC is working closely with notable international donor agencies; the Delegation of European Union to Pakistan, GIZ, ACTED and Asian Development Bank to implement various initiatives of social development.

To attain sustainable economic growth, it is imperative to capitalize on the emerging facets of human resource development. Without having qualified and well-skilled manpower, it is impossible to compete in the fast growing global economy. On the face of prevalent economic situation in the country, a sound strategy for skill development could positively yield in terms of community based and participatory rural and urban development. Trained and competent workforce is also a credential for the optimum utilization of high-tech equipment and machinery. In order to effectively

lend in to the national skill base, TUSDEC has organized multiple programmes of vocational and technical skill development while also facilitating the industry with the supply of trained workforce in the most precise areas of digital product design and engineering.

As global economy is no more fractioned with the geographical barriers, which has intensified the competition within the international markets, hence the enhancement of productivity and competitiveness through technological precision is the way Pakistan can connect to the global value chain. Likewise all the organizations working under the canopy of PIDC (Pakistan Industrial Development Corporation) we are in a phase of formulating a comprehensive plan of action which would be directing our short-term and long-term strategies. These strategies will pave way for our imminent initiatives of technology support and skill development to substantiate the potentials of exports enhancement and import substitution through transforming targeted industrial clusters towards value addition and productivity enhancement.

Here, I would take the opportunity to vouch on my organization's commitment of delivering excellence in service standards while practicing highest organizational integrity and ethics to establish a prosperous, just and equitable Pakistan.

Basit Maqsood Abbasi
CEO, TUSDEC

News & Updates

A ROUND TABLE WITH CANADIAN INTERNATIONAL DEVELOPMENT AGENCY

Emissaries from CIDA (Canadian International Development Agency) visited TUSDEC to share a vivid idea about the operational ambit of both organizations while identifying the contingent action spheres for cooperation. The delegation comprised of Jacob Thoppil, Director Pakistan Programme, Camille R. Baudot, First Secretary Development and Noreen Hassan, Education Advisor at CIDA.

To start over the discussion, guests were conferred with a brief presentation on TUSDEC's accomplishments in the areas of technology upgradation and relevant skill development. The delegates appreciated company's pursuance for women socioeconomic

empowerment through vocational skill enhancement. The team from CIDA shared their plan of action to foster various development avenues in Pakistan, where the potential areas of confabulation between two organizations were also discussed over in detail. The delegates emphasized on the implementation of vocational trainings for women in various innovative trades to enhance their employability while reducing the labor force redundancy in local markets. Round table was also attended by guests from Central and North Punjab Women Chamber of Commerce and Industry and Lahore Waste Management Company.



Delegates from CIDA in conference with senior officials from TUSDEC.

TIDYING HER UP TO PATTERN THE TRENDS

In the month of March, 2013 TUSDEC organized a two weeks workshop of Fashion Design at its NIDA Karachi and Lahore Centres in collaboration with FWBL (First Women Bank Limited). The workshop arranged as an implementation of USAID Gender Equity Programme in Pakistan. 40 women belonging to the lower income backgrounds were equipped with the art and sense of dress designing. Proficient trainers were engaged to impart the students with a crisp and bracing outlook of fashion arena, its trends and forecasts. Most of the trainees had come to follow their long-held fancy of becoming a fashion designer and spirited entrepreneurs. With the provision of free of cost training, course material, tool kits and transportation

facility, the girls were enabled to attain their career aspirations. The workshop aimed at the capacity building of vulnerable women through vocational skill development so that they can earn an independent living for themselves. The course culminated with an adorned display of candidates assignments which they accomplished during their training. This was subsequently the second batch of trainees as TUSDEC has already implemented four vocational courses of fashion design and domestic tailoring in collaboration with FWBL (First Women Bank Limited). The tracer studies for the previous courses unveiled that many women are now practicing their skills as a formal line of work which has rendered them with their socioeconomic independence.



Trainees course work display at NIDA Lahore.

INSTITUTIONAL CAPACITY BUILDING

Under a contract with PSSB (Punjab Social Services Board), Department of Social Welfare and Bait-u-Maal, Government of Punjab, TUSDEC organized a Training of Trainers Programme in Lahore for the capacity building of local NGOs based in Punjab. 120 candidates from various organizations were trained so that they could further impart the acquired skills to their next tier employees; thus infiltrating the processes and framework of improved organizational management among their respective NGOs. Two days workshop was arranged on Governance and Office Administration while ten days training session was administered on Strategic Planning, Programme Management, Fund-Raising and Publicity, Human Resource Policy and Financial Policy.

The trainings were held at Social Welfare Training Institute, Township Lahore. TUSDEC affianced three specialized trainers to disseminate the multifarious courses and also extended the services of module development. Senior officials from Department of Social Welfare and Bait-ul-Maal, Pehchan, Face Foundation, Roshni Welfare Organization, Help Foundation, Liberal Forum and Itahad Foundation attended the workshops. The training was aimed to commission the human resource of local NGOs with the requisite skills set to operate more effectively. Proliferation of NGOs on the basal levels of society is itself anticipative of the preferential socio-cultural shift we are heading towards where the only void is to inculcate pragmatic organizational behavior, more analytical incisive and adaptive

capacities among these non-profit organizations so that they would continue striving for the required social amelioration with a more structural overture.

HAILING HIGH IN THE JOB TURF

TUSDEC attributes its talent pool for all of the company's accomplishments since its inception. As the assets need to be taken care of in terms of maintaining and replenishing them, TUSDEC has adopted a similar gambit to retain its human resources so that the organization would never be impeded on its pulse of operations and achievements. In the same quest the company took part in a Job Fair held on May 28, 2013 at Dean's Trade Center Peshawar Cantt. The one day event was organized by Rozee.pk one of the notable head hunting firms in Pakistan in collaboration with Government of Khyber Pakhtunkhwa. The job fair was first of its kinds to be held in the provincial premises of KP. Despite the turbulent situation of the region, the fair was thronged with numerous students, graduates and professionals. The event was huddled with numerous

stalls of big-league corporations, non-profit organizations and SMEs from all around the country. With its country-wide operations and projects under implementation, TUSDEC relishes the deference as an employer in KP. The fact was further endorsed when the company was ranked among the top five employers at the job fair. A huge assemblage of students and graduates from various far-famed universities stopped over the company's stall to drop their resumes. Due to its employee oriented working environment and meticulous policy measures, TUSDEC has always been marked as a front-runner among the employers.

We extend our compliments to Rozee.pk for holding such an extraordinary event to render the youth of KP with the requisite exposure of corporate arena. We acknowledge their

courtesy for inviting our participation and would like to accompany them in similar interventions so that the right resources could be harnessed in most righteous directions to build a prosperous nation.



A view of TUSDEC's stall at the job fair held in Peshawar.

SEMINAR ON INDUSTRIAL AUTOMATION



Audience attending the seminar at NIDA Peshawar.

A seminar was organized by NIDA Peshawar on industrial automation at CECOS University Hydayatabad Peshawar in the month of April, 2013. Mr. Fahim Khan a seasoned engineer, qualified from UET Peshawar and Lahore was the trainer at the workshop. He apprised the audience about the corporative utility of automation technologies to increase productivity and robustness of the industrial procedures. Dr. Riaz Ahmed Khattak Khan, Vice Chancellor CECOS University was the chief guest at the event, whereas other guest speakers were invited to share their expert outlook about the increasing partake and potential gains of industrial automation in Pakistan. They also expounded about various contours of automation programming such as PLC (Programmable Logical Controls), SCADA, HMI, their demand and dependability in the industry. The Programme Manager at NIDA Peshawar while addressing the ceremony said that through various trainings, TUSDEC-NIDA is striving to foster the sector of industrial automation in Pakistan with the supply of relevant skilled manpower. Pursuing the same verve, TUSDEC is establishing PIIA (Pakistan Institute of Industrial Automation). He said the more we will mount on mechanization technologies, it will render us with new inflection points for industrial growth and economic stabilization for our country.

WOMEN TRAINED ON CAD/CAM APPLICATIONS



Candidates paying heed to the trainer, imparting digital design skills.

Fostering the aim of transforming the industrial backdrop of Pakistan from analogue to digital, NIDA Karachi has joined hands with PNWA (Pakistan Naval Women Association) Institute of Art and Textile Design. In accordance to the terms of collaboration, both organizations will cooperate to promote and implement textile specific trainings utilizing CAD/CAM applications. Course of Computerized Design and Embroidery has been implemented at NIDA Karachi Centre where 45 women trainees have been recently imparted with the tools and techniques of modern textile design. The MoU between both organizations directs their further collaborations on the prospects of vocational trainings for women in various modern trades. The course of textile design will also be replicated for further batches.



Certificate distribution at CECOS University Peshawar.

TRAINING OF TRAINERS IN PESHAWAR



Snippets from the TOT sessions and exhibition held at NIDA Peshawar.

As a first phase of TVET Reform project that is being implemented by TUSDEC as a consortium partner with ACTED (Agency for Technical Cooperation and Development) and PMN (Pakistan Microfinance Network), a TOT (Training of Trainers) programme has been organized at NIDA Peshawar in the month of August 2013. Three years programme is aimed at improving the access, quality and service delivery of the TVET sector for rural, marginalized communities through the development of innovative curricula and training methods.

During the training session of 16 days, 12 TVET trainers from Swat, Upper Dir, Lower Dir and Muzaffarabad were imparted with the skills of Hand/Machine Embroidery and Dress Making on contemporary industrial machines. TUSDEC has engaged proficient curricula development experts to formulate innovative, progressive yet immensely adaptive course of study. The trainees have been stationed back to their TVET institutes in their respective districts where they would be training 2000 females from the local community in the areas of Dress Making and Hand/Machine Embroidery. As the first phase of TOT has been successfully completed, further sessions are going to be organized in three districts of Sindh: Sukkur, Kashmore and Shikarpur. TUSDEC TVET experts have selected various other market-oriented trades of Building Electrician, Refrigerating and Air Conditioning, Motorcycle Repair, Industrial Electrician, Solar Panel and Generator Technicians, in which 75 trainers in various TOT sessions will be trained. At the programme conclusion, 8000 men and women from rural, impoverished areas alongside the IDPs will be trained in multiple vocational and technical trades to enable them devise their livelihood ventures.

The project bears to enable the TVET trainees as well as the institutes to upgrade their curriculum and instruction facilities while enhancing the chances of quality technical and vocational education for the area inhabitants. The programme intends to contribute in rallying the participatory rural and community development approach which will render an improved socioeconomic situation in the target districts. National progress and integrity go hand in hand and can be triggered if whole of the potential manpower is equipped to work as an adept and productive human resource for the country.

The dissemination of advanced skills among the available workforce of the country would not only help in paving the sustenance opportunities but will induce work-orientation and national deference discouraging the prevalent malefic social behaviors.

TEVTA TRAINERS RECEIVE TRAININGS AT NIDA LAHORE



Trainees from TEVTA alongside the Instructor and Programme Manager at NIDA Lahore.

NIDA Lahore organized TOT (Training of Trainers) Programme training 81 TEVTA instructors from all over Punjab. The TOT sessions were commenced in the month of April and continued till July 2013. Trainings were imparted in the disciplines of Jigs and Fixtures Design for Manufacturing, Energy Efficiency and Management System, Computer Aided Analysis and Design of Civil Structures, 2D Drafting and 3D Modeling using Auto CAD, Heat Treatment and Quality Leadership, Micro-Controller Programming and Application, 5S Tools for Workplace Management and the Course of Advanced CAD/CAM Techniques. The training workshops were variably spanning over 3 days to 4 weeks pertinent to a particular course's requirement. NIDA Lahore engaged its most seasoned trainers to impart these trainings against nominal fee structures. Trainees and the authorities from TEVTA showed great satisfaction over the content, faculty and instruction facilities available at NIDA Lahore and affirmed it as one of the preferential technical training institutes of the country.



Certificate distribution to the TVET instructors trained during TOT in Peshawar.

Signing an MoU with APHMA & Diakob Enterprises

On July 5, 2013, at its head office in Lahore, TUSDEC inked an MOU with APHMA (Alternative Pharmaceuticals Manufacturers Association) and Diakob Enterprises to help uphold the unconventional medicine sector in Pakistan with various interventions of technological assistance and skill enhancement. The MoU binds the three parties to cooperate in the pursuance of bringing in manufacturing process improvements of herbal medicines through the induction of modern technology and techniques. Through the memorandum, the parties will also strive to cod

governmental support for the economic proliferation of this sector. TUSDEC aims to foster alternative medicine industry in Pakistan evaluating the immensity of its potentials. Thriving economies like China, USA and India have steered substantial investment for the research and growth of herbal medicine yielding positively to their national incomes. According to the MoU, Diakob Enterprises will cooperate with the provision of expertise in the fields of Herbal/Ayurvedic medicine and cosmetics production, development of GMP (Good Manufacturing Practices) flow and quality control management systems for alternative medicine manufacturers. APHMA will play a cardinal role in identifying and highlighting the impedances hindering the growth of this sector which would be addressed through various projects aiming to uplift the said industry. The MoU was signed at an affable gathering attended by the higher-ups from the three signatories of the memorandum. Mr. Basit Maqsood Abbasi, CEO TUSDEC, Mr. Abid Gillani, President APHMA and Mr. Khalid Mahmood CEO Diakob penned the MOU. It is the dire need of the hour to explore and establish innovative and forward-looking industrial clusters in Pakistan as this would evoke numerous employment opportunities while enticing the foreign and local investment.



MoU signing ceremony at TUSDEC head office in Lahore.

Abiding by its mission of technological upgradation and skill enhancement, TUSDEC has joined hands with GRFC (Global Research and Facilitation Council) on September 13, 2013 in Lahore. Both organizations have signed a Memorandum of Understanding to intensify collaboration specifically in the areas of research, development and manpower training to support the small and medium enterprises in the country. The MoU commits the two organizations to share knowledge, researches and publications to highlight the skill gaps prevalent in the various industrial sectors and to jointly hold various avenues of training and development in shape of workshops, seminars, certification and diploma courses in order to consummate those gaps.

TUSDEC Teams up with GRFC



From right, Mr. Basit Maqsood Abbasi, CEO TUSDEC signing MoU with Mr. Tauqeer Khan Lodhi President GRFC at the left.

sector. Mr. Basit Maqsood Abbasi, CEO TUSDEC and Mr. Tauqeer Khan Lodhi, President GRFC penned the MoU at a gathering organized at TUSDEC Head Office, Lahore.

TUSDEC is eagerly pursuing various projects of technological reform and skill development to perk up the productivity of many industrial clusters of the country, to induct further efficacy, the company deems to back each of its interventions with a concrete research milieu. Joint cooperation among the two entities would endow the facilitation of venturing more precisely into the perturbed areas of various industries based on the sector studies and involving other research contrivances. The MoU will also direct both parties to aid and expedite the linkages between private sector industry and academia in order to bring in the strategies for sustainable economic growth. Both organizations intend to utilize and leverage joint resources on research and knowledge dissemination about the latest technology implications for the industry, boost collaboration with other entities and mutually host training events to strengthen the already mounting SME

HONORING THE COOPERATION



POWER IT

the SUN WAY!

TUSDEC Imparts Skills in

Solar Technologies

Reclaimable utilization of resources inculcates the extraordinary solutions for the many surpassing perturbations. Pakistan is abundant in its exposure to the sun. The only void is to harness the nature's endowment appropriately for a sustainable emancipation from the bitter energy crisis. Besides, this comparatively 'Greener' source of power generation will not abduct the fragilities of our Eco-system leading us towards the privilege of becoming a Green Economy.

TUSDEC has been distinctively pursuing to propagate the sources and modes of renewable energy considering its substantiation for the time at hand. Hailing through the same docket, the company has recently instigated another action of skill development to assist the solar power sector of the country in collaboration with GIZ Pakistan. TUSDEC is implementing a one year programme of skill development in solar technologies.

The programme is co-funded by the European Union, the Embassy of the Kingdom of the Netherlands and the Federal Republic of Germany and implemented through Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH in collaboration with National Vocational and Technical Training Commission (NAVTTTC).

Under this programme 125 candidates will be trained in the areas of Photovoltaics and Solar Water Heating (SWH). TUSDEC has initiated the programme by launching three months courses of Photovoltaics (PV) and Solar Water Heating (SWH) recruiting 72 candidates from all over Pakistan. To emphasize the practical component of the trainings, a state-of-the-art solar lab has been setup at NIDA Lahore. TUSDEC has engaged immensely proficient trainers and consultants from the industry to devise operable and market-driven curricula for the courses. Placing an emphasize on pragmatic aspects of training, on-site demonstrations are being organized specifically in the disciplines of Water Pumping and Solar Dryer where master trainers deliver the lectures, employing the infrastructures originally deployed in Lahore and the suburban territories of Shiekhupura.

TUSDEC contemplated the programme by administering an acute baseline analysis comprising of rigorous focus groups with major Enterprises (Suppliers, Manufacturers and Assemblers) of solar power equipment and solar heating systems. Survey divulged huge dearth of local trained manpower in the industry which hampers major venturing in the solar energy sector inspite of its tremendous need and viability for the country. The curricula for the courses are also being formulated in perfect alignment with industry's demand. Programme beneficiaries have been enrolled from all over Pakistan. At the course culmination, the candidates will be able to work as Solar technicians in the market.

Development in the sphere of renewable energy is one of the priority areas that GIZ through its Technical and Vocational Education and Training (TVET) Reform Support Programme is focusing to propagate and develop in Pakistan through infrastructure improvement and skill dissemination. Government of Pakistan is also cognizant to the need of lending in a salubrious reform in the TVET system of Pakistan to ensure sustainable socioeconomic development and to reach parity with the global standards of growth and national prosperity. In order to harness the vital prospects of building a skillful nation, a National Skill Strategy

(NSS-2008-13) has also been devised by the Government of Pakistan. TVET Reform Support Programme is contributing to implement this strategy through FIT (Funds for Innovative Training) under Component III. TUSDEC is also implementing the above said programme of "Skill Development in Solar Technologies" under the initiative of FIT (Funds for Innovative Trainings). FIT has been setup as funding facility to assist the TVET reform in Pakistan through stimulating and supporting innovative approaches to skill development.

Pakistan is experiencing a rough patch pertaining to the country's economic situation which can be attributed to the austere setback contented by the power and energy sector provoking the ire among the general public due to prolonged hours of load shedding while giving a worst blow to the industry.

On the face of it, the imperativeness is to explore and develop on the areas of renewable energy. Availability of the technically equipped manpower is obligatory for a successful intervention into any industrial sector. Contributing to build on the solar power industry of the country, TUSDEC is implementing many projects of skill development to facilitate sector with the provision of technically trained workforce. Multiple donor agencies are also participating with the government to help Pakistan attain sustainable solution to its energy perturbations. Copulative efforts from public, private and the non-profit sectors to work up the alternate energy sources will certainly help suffice the country's accelerating energy needs on sustainable basis.



Panels affixed at TUSDEC solar lab.



Class of Photovoltaics at NIDA Lahore.



Practical training session of Solar Geyser installation.



Practical training session of Photovoltaics.

The Biotic Potentials for Energy!

The ambit of energy touches on every action and the very sustenance of mankind today. Without a wide-cut power supply, development avenues cannot be reached except in a wishful miasma. The use of fossil fuels such as coal, oil and gas has been tramping to meet the prodigious energy demand ever since the wave of rapid industrialization. The natural reservoirs are resultantly depleting and bulging out in their prices with each day. Pakistan is confronted with a terrible energy crisis impinging stagnancy in the economic development of the country. Drawn-out load shedding getting worse in hottest summer days is a modus operandi which is attributed to lack of good governance, continuous hike in oil and gas prices, lack of contingency strategies and efforts to operationalize the alternatives.

There is fairly a broad-brimmed array to mention of all the renewable and green resources of energy production for which many developing countries can be taken as significant beneficiary cases. China is the world's crowning renewable market, followed closely by Germany and the US, with India and France rounding out the top five. In November 2012, India hosted the 6th Renewable Energy India Expo and has been ranked fourth in the world for its renewable energy capacity which has crossed 26,000 MW mainly because of the onshore wind and only 4 percent of it is from solar panels. Being a neighboring country with a kindred topography and geological conditions, Pakistan can also embark on the various sources of alternate energy to obviate the prevalent crisis.

Biomass currently accounts for 2/3 of renewable energy in Europe and bio-energy will play a key role in achieving the ambitious targets approved in the renewable energy directive of European Union. 20% of the final energy consumption has to be provided by renewable sources by 2020. According to a study of the European Environmental Agency¹, the potential from agriculture is still largely unexploited and this sector is expected to have the highest growth rates in the coming years. The shift towards renewable energy sources is critical for Pakistan in order to meet its surpassing energy demands while effectuating on the ventures of environmental preservation. Pakistan can venture in wind, solar and biomass energy to optimize the domain of energy production in the country.

Pakistan has low forest cover. About 4% of total area is covered by forest, in which only 5% area is protected. 90% of country's wood production is used as fuel and about 7000 hectares of land is deforested every year. To control deforestation, adoption of biogas is the best choice as it will not only be beneficial to the human health but will also have positive impact on the environment by creating a balance to atmospheric carbon dioxide levels through replacement of fossil fuels.

Biogas comes from animal manure, and is perhaps the ultimate win-win energy source, allowing people to produce their own electricity and reduce the water contamination, odor pollution, and global warming emissions caused by animal waste. The concept of biogas as a source of energy has been around since the early 17th century. Biogas originates from bacteria in the process of bio-degradation of organic matter under anaerobic conditions. In the absence of oxygen, anaerobic bacteria rots down into an organic matter and produce a gas mainly composed of methane and carbon dioxide, called biogas. Compared to other fossil fuels, methane produces less atmospheric pollutants and generates less carbon dioxide. Through the incessant technological advancements, the biogas generation plants have reached a parity of heat and electricity output (one kW electric for every kW thermal). The trend has raised the efficacy of biogas for industries and as domestic and transportation fuel.

Pakistan produces huge amount of municipal waste (Karachi 9,000 tons / day and other cities about 2,000 to 6,000 tonnes / day) and agriculture waste in the form of Bagasse, Cotton Sticks and Rice Husk. Converting this waste to energy can generate up to 3,000 MW of power. Pakistan offers lucrative opportunities in this sector in which a number of projects are already under preparation.

¹ EA 2006 "How much bioenergy can Europe produce without harming the environment?"

Analysis of biogas shows that it contains Methane 50-75%, Carbon dioxide 25-50%, Nitrogen 0-10%, Hydrogen 0-1%, Hydrogen Sulphide 0-3%, and Oxygen 0-2%, quite nearer to the natural gas, having good combustibility. Facing ferocious shortage of power and diesel availability, farmers are unable to benefit from water resources which are further demoting due to the climatic swings. Through biogas farmers can run their tube wells which are currently being operated using diesel oil. Keeping in view this technological advancement and attractive financial breakthroughs, it should be implemented in suitable villages to meet continuously increasing water requirements of agriculture.

The digested liquid manure coming out of the biogas plants would provide excellent organic manure in which all the useful nutrients remain preserved for promoting environmentally sound Eco-farming. Moreover, this biogas digested manure, improves water-holding capacity of the soil, and acts as soil-conditioner, improving its fertility and building-up micro-flora in the soil. Due to the residual effect of the biogas-digested manure on the soil, its positive impact could also be observed in the next 1-2 crops as well.

In rural settings the available outflow of animal dung, poultry wastes and agricultural residues can be utilized to produce biogas. In urban areas animal farms are nonexistent therefore the municipal waste can be deployed to produce biogas for its urban supply. Most of the developed countries have adopted these municipal waste materials as their main biogas production element. Two basic processes are being used to recover the energy from municipal solid waste. One is the thermo-chemical conversion which allows the waste get decomposed to produce heat or fuel gas and second is the bio-chemical conversion in which the waste becomes decomposed by the enzymatic action of some bacteria. For the

waste containing high percentage of non-biodegradable materials thermo-chemical conversion is more suitable. The main technologies involved in this process are Incineration and Gasification.

The process of organic material anaerobic digestion takes place in three main temperature ranges; 10-25°C, 30-37°C and 48-55°C. The ideal temperature is between 30 and 40 degrees Celsius (within the fermentation chamber) at which anaerobic bacteria are most active. If the temperature is too low, the process of fermentation will become slow, reducing the biogas production.

Punjab is the most populous region with 56% of total population. Moreover, the central Punjab including Faisalabad, Sargodha, Jhang, Toba Tek Singh, Sahiwal, Okara, Pakpattan, Sheikhupura, Hafizabad, Mandi Bhaudhin, Khushab, Mianwali and Bhakar are considered to be the most potential areas for installing biogas plants as they lie in the optimum temperature range as compared to the northern areas of the country which experience lowest temperatures around the year.

A study carried out by UNDP estimates that around 20 million households in the country are not connected to Piped Natural Gas and around 05 million of them have appropriate potential to benefit from Domestic Biogas Plants. Converting this waste into energy can generate up to 5,000MW of power. Also, both the production and consumption of chemical fertilizers have been steadily expanding over the past decades. According to an estimate it is predicted that the national consumption of mineral fertilizers could be reduced by 30% through the use of digested biogas sludge as fertilizer that improves soil fertility and increases crop yield by 10-20%. Biogas burning does not release any smoke or fumes so the residential premises remain clean and hygienic.

Pakistan is world's 5th largest sugarcane producer with an average annual production of 50 million tons cane and 10 million tons of bagasse. According to an estimate there are about 80 sugar mills having potential to generate almost 3000 MW energy through biogas generation but they are currently operating at 700 MW². Livestock sector is growing at the rate of 4% annually. There are almost 159 million animals and their manure can be used for generation of biogas in rural areas. Energy production by using animal feces is highly sustainable as it is economically viable, socially acceptable besides being environment friendly³.

There are almost 35.2 million cattle and buffalo (assuming that an average animal can produce 10 kg of manure daily) which

would account for almost 352 million kg of dung. If 50% of produced feces is collected and used for biogas production, it will be 176 million kg. According to an estimate, about 20 kg wet mass of manure can generate 1 cubic meter biogas, therefore producing almost 8.1 million m³ biogas daily⁴. Almost 112 million people in Pakistan are rural residents so biogas can prove to be most operable to meet their domestic energy needs. Citrus and paper pulp, dross from the slaughter houses and municipal waste can also be utilized to produce biogas.

So far Pakistan Council of Renewable Energy Technologies (PCRET) has installed 4015 biogas plants (with net generation capacity of 17980 M³/day) on cost sharing basis throughout the country. During the 2011-12, 234 biogas plants have been installed. PCRET has also installed 1000 biogas plants of 5 cubic meters each with annual production of 1.941 million cubic meter gas, 1.567 million kg of manure and 4.7 million kg of carbon dioxide abatement. In addition the Council has installed 30 commercial size biogas plants ranging from 50-250 M³ by extending technological support for irrigation and power generation. They have a target of installing 50,000 units producing 0.300 million M³ /day by 2015.⁵

A World Bank funded project for carrying out a detailed study for Biomass / Waste-to-Energy projects in 20 cities of Pakistan has been initiated. Another Waste to Energy Study, funded by U.S Trade and Development Agency (USTDA) is being carried out for Karachi to generate 5-10MW power. Alternative Energy Development Board has issued an LoI to set up a 12MW Biomass to Energy power project in Sindh, based exclusively on Biogas / Agricultural Waste. The project is jointly sponsored by investors from US and local entrepreneurs, the SSJD Bio Energy. Another LoI has been issued to M/s Lumen Energia Pvt Ltd. to set up a 12MW power plant at Jhang based on agricultural waste like cotton stalk, ice husk, sugarcane trash, wheat chaff and other crops as multi-fuel sources. AEDB has issued an LoI to M/s Pak Ethanol (Pvt) Ltd. to set up a 9 MW biogas power project at Pak Ethanol (Pvt) Ltd, Matli and Sindh.

Biogas is a cut-rate source of energy, it is clean and soot free so can be proved as the most viable and acquirable fuel specifically in the rural terrains. Agrarian communities can experience convenience and a healthy atmosphere with the introduction of biogas. Their standard of living can be improved which will cut back the rate of migration to urban areas while sustaining the ecological balance of the region.

A typical biogas plant consists of a digester where the anaerobic fermentation takes place, a gas holder for collecting biogas and input-output units for feeding the organic matter and storing the effluent respectively and gas distribution system.

2 PBIT. Power generation from sugarmills; 2010.

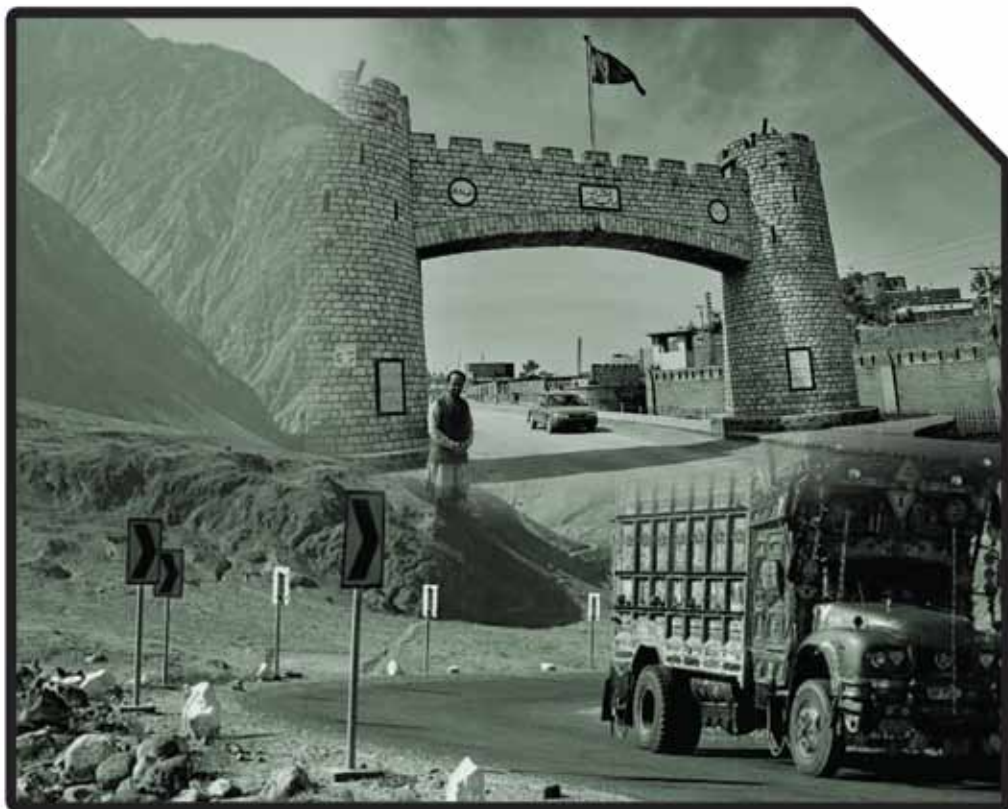
3 Beta Pak, Biogas Plants, equipments and services, <http://betapak.org/2010>

4 Sheikh MA, "Renewable Energy Resource Potential in Pakistan",

Renewable and Sustainable Energy Reviews 2009; 13; 2696-702

5 Pakistan Economic Survey, 2011-12

Probing the TVET Ground in KP and FATA



Snippets from the verification visits and interviews during baseline assessment.

Education is acknowledged as the primary area of improvement to ascertain sustainable economic development in a country. At times, it has proved to be the only catalyst for the economic and social overhaul for some of the most progressive nations in the world, where the people have been enabled to learn skills, knowledge and attitudes making them productive members of the respective societies. In developing countries like Pakistan, where the population or most appropriately manpower is outgrowing the available earning avenues; only the mainstream education system would not do the kindness resulting into unemployment, unequipped and incompetent workforce. Focus on technical and vocational education has aided in constituting momentous economies like Germany and Japan gaining headways in economic growth as well as social evolution.

In Pakistan, we have less than 5% enrollment in the TVET (Technical Vocational Education and Training) sector out of the overall education streams in the country which stirs up the

attention towards the lacunae impeding the promotion and conscription of the technical and vocational education.

In order to give in to its strategic commitment of skill development, TUSDEC has teamed up with the Delegation of European Union to Pakistan to implement a four years programme aiming at strengthening the TVET sector in KP (Khyber Pakhtunkhwa) and FATA (Federally Administered Tribal Areas) as an engine to connect the area inhabitants to the mainstream economy and social amelioration. Through this programme 12000 men and women will be trained belonging to the far flung areas of the rock-strewn provinces.

At its core, the programme intends to renovate the TVET sector in KP and FATA from a supply-driven to a demand-driven system through curricula up-gradation and standardization, improvement of training facilities and promotion of enhanced linkages between the employers and the local training institutes. Under the programme, technical

and vocational trainings will be imparted in various fields, hailing employment opportunities for the TVET graduates. The content and the curricula of the trainings will be modified to suit the industry's demand again to augment the marketability of the skills earned by a trainee.

Installing effectiveness necessitates delving and actual probing to further signify the assumptions driving the objectives of a large-scale programme. TUSDEC conducted a baseline study to assess the overall TVET (Technical Vocational Education and Training) system in KP and FATA. After a detailed review of information and a scrupulous secondary data analysis, the gaps identified were consummated with targeted small scale field surveys, focus groups and key informant interviews with local training institutes, employers and other notable TVET stakeholders such as TEVTA KP/DGTE & MT Government of KP, FDA (FATA Development Authority), Skill Development Council Peshawar (SDC), NAVTTC – Regional

Directorate KP/FATA, GIZ-TVET Programmes KP/FATA, KP Chamber of Commerce and Industry.

Under a more methodical approach towards research and programme implementation, the overall targeted geographical areas of KP and FATA are segregated among five zones of central KP, southern KP, northern KP, Hazara and FATA with its 7 agencies and 6 frontier regions as the fifth zone.

Through the thematic analysis of existing TVET infrastructure and facilities, the accessibility of quality technical and vocational education for the potential target communities has been evaluated. There are more than 500 private training institutes that are imparting technical and vocational education in Khyber Pakhtunkhwa province. In KP central, there is reasonable number of training institutes, while northern and southern KP also retains good TVET coverage as compared to the Hazara zone. The situation is terribly unsatisfactory in FATA region where only 16 technical education facilities are available for the inhabitants of 7 tribal agencies and 6 frontier regions. Due to the meager law and order situation and incessant socio-political unrest, most of the training institutes are operating quite below the par.

A comprehensive course of information assessment, interviews, field surveys and focus groups with the local industrialists, trade associations, principals and teachers of training institutes and other prominent TVET stakeholders, has divulged a set of 9 industrial sectors, signifying enormous potential for the workforce skilled according to the job market requirements. Industrial clusters such as construction, light engineering, automobile, mining, gems and jewelry, paramedics, food and agriculture are projected to be expanding in coming years to fulfill the increasing demand of their product and services. The owners of many industrial units when interviewed, affirmed to absorb the trained graduates from various TVET institutes, where the only requisite is that the trainings should be imparted following the particular industry's demand for the skills and expertise.

Encapsulating the findings from the study, 18 training areas have been initially identified to launch the pilot phase of the four years programme. 2 to 3 months trainings will be imparted in the trades of Land Surveyor, Quantity Surveyor, Domestic Electrician, Plumber/Pipe Fitter, Welding, Solar Paneling, UPS Assembling, Auto CAD, HV&AC, Leather Work, Gems Faceting, Wood Work, Mason, Steel Fixer and Steel Fabrication. Vocational trainings for women will be arranged in the areas of Beautician, Advanced Tailoring, Hand/Machine Embroidery and Gems Faceting during the pilot phase.

Target Geographical Zones	Districts	TVET Coverage
Central KP	Peshawar, Mardan, Nowshera, Charsadda, Swabi	45%
Southern KP	Kohat, Karak, Hangu, Bannu, Laki Marwat, Tank, DI Khan	22%
Northern KP	Swat, Buner, Upper Dir, Lower Dir, Shangla, Chitral	13%
Hazara	Haripur, Abbottabad, Mansehra, Kala Dhaka, Battagram, Kohistan	17%
FATA	7 tribal agencies and 6 frontier regions	3%

** zone wise geographic segregation of KP & FATA*

As the baseline study suggests that 500 technical and vocational training institutes are affiliated with TTB (Trade Testing Board) of KP. During focus group discussions with the local TVET stakeholders, 131 institutes were underscored for further inspection on the basis of an institute's legal capacity, training facilities, affiliation, curricula, number of batches trained, courses offered and focus on employability. At the culmination of painstaking institute inspection, 30 training institutes have been chosen in Khyber Pakhtunkhwa to run the pilot phase of the programme. The selected institutes are affiliated with BTE (Board of Technical Education) and TTB (Trade Testing Board) of KP.

Another considerable postulation that has been endorsed by the baseline study is the enormous disconnection and lack of cohesion among the entire assemblage of TVET stakeholders in the area that is comprised of training institutes, employers, trade associations and overseas employment agents.

Generally, most of the TVET institutes operating in the target areas do not keep sturdy liaison with the industry, consequently the content of the trainings imparted does not justify the actual call of the job market for skills and expertise. This aggravates the situation when the trainees passed out from these institutes are not welcomed for OJTs/Apprenticeships or placement in various business units.

Successful accomplishment of baseline study has set forth the basis for an absolute implementation of the four years programme precisely delivering to its objectives. At the programme conclusion 12000 men and women from KP and FATA will be equipped with employable skills. The programme will also aid in projecting the overall representation of technical and vocational education as an equally sought-after path towards a reputable career.

There is a mismatch between training given by TVET institutes and trainings required by us. That is why 6 months training in institute and 6 months training on Job/Internship should be there. Focus on youth trainings should be made to increase employment and remittance and to escape from religious extremism in which majority of youth from this area is involved.

Riaz Arshad
CO Libra Pharmaceuticals

The study has divulged that in both formal and informal work settings, half of the units desire to hire competent trainees of technical institutes pertaining to the relevance of their training with their industry's demand. Respondents from majority of the vocational training centres (public & private) reported that they have insufficient resources like premises, training area, labs with old tools & equipment, outdated training manuals, obsolete pedagogy approach, lack of expert input in training, weak linkages / liaison with employers / industries. It has also been accounted that the improvement of linkages between the industry and TVET institutes is indispensable to the overall reform and propagation of TVET sector in KP and FATA. Establishment of linkages with the employers can be enhanced through initiatives like lectures and demonstrations by the industrial experts for the trainees, internship programmes and regular students' tours to the industry.

Notes of Testimony



Mohammad Raffique

In the area of Sheikhabad Gulbahar Peshawar, Mohammad Raffique is running a shop of UPS Assembling and Repair earning a reasonable living for his family. Two years back, it was being difficult for him to meet the both ends as the sole bread winner of the

family with no certified skill at hand. Raffique had always been looking for an affordable avenue, where he can attain some kind of employable skills or would be able to hone his informal acquisition of electrical services within few weeks.

"Few of my friends mentioned NIDA Peshawar in context of their short technical courses in various fields. I was already working as an electrician in an electrical service shop but could never spare time to attend any formal training as my family was entirely dependent on my daily wages. But at the same time I knew a certified training course was the only way I could lift up my income stream".

Raffique came across a poster announcing the course of UPS Assembling and Troubleshooting in NIDA Peshawar. Ready to grease his elbows in order to up-throw his living standards, Raffique got enrolled into the three months course and kept on working on part time basis.

"It was impossible for me to leave my work for three months so I continued working. It is a very extensive field and initially I had doubts how would I be able to learn everything in such a narrowed time-line as I wanted to acquire maximum skills so that I could work independently after the course".

Mohammad Raffique completed the technical training course from NIDA Peshawar and started off his own business. He opened up his own electrical services shop which later turned out to be quite a rendering income stream for him.

"The instructors at NIDA Peshawar trained us comprehensively; we studied theoretical fundamentals with extensive practical lab sessions. I still have my first UPS unit saved with me that I assembled as my course final assignment. It is such a vast field that you cannot learn everything in such a limited span of time yet our trainers imparted every necessary skill and technical knowledge that we needed in order to start working on our own. We cannot find such a compact training package in informal 'Ustad Shahgird' system. There it takes over much time to enable someone start working on his own. Besides a lot of exploitation is involved at the hands of Ustaads training young lads in terms of devalued wage rates and physical abuse".

Raffique assembled few UPS units at his house and managed to sell them on good prices. He also started training his younger brother so that he can become self-sufficient while being a helping hand to his work.

"I assembled few UPS units and sold them in market, that is when I realized my grip and grasp over my work, I borrowed capital from one of my friends and took a shop on rent and since then I am working, assembling more and more orders each day. It has been almost two years since I am venturing into my own business and now I am earning handsome amount to support my family".

Never cubing his knowledge to himself, Raffique has started training two young boys at his own shop. They work as helpers, assist Raffique and his brother while making a monthly wage for them.

"NIDA Peshawar has endowed a brilliant platform for the people who want to earn integrally out of their meager circumstances or who want to step up the ladder of success with their only asset of effort and handwork. Such short and comprehensive technical trainings against nominal fee structure do not extend in the encumbrance of the trainees and their dependent families".

Raffique is living merrily with his family as he is able to provide them with better provisions of life. Besides he is planning to expand his business through opening up another service shop in Peshawar where he plans to offer the services of generator repair and for that he intends to attend the short course of Generator Technician at NIDA Peshawar centre.



Mohammad Alam

Alam was residing meagerly with his two kids, elderly parents and younger siblings in Hassan Garhi Peshawar, when he lost his only job which was sparingly providing him the very basic means of life.

He was dejected in the face of his pressing financial responsibilities which he owed to his family. He was working on day-to-day wages at a shop nearby his home, when a minuscule row with his employer cost him to let go of his job. Alam had passed the exam of intermediate privately but could not carry on his education due to insufficient financial provisions.

"I could not continue my education because I had to earn to support my family but the jobs were laborious and were not paying off to suffice the basic necessities of life. As I had no skill at hand, I mostly used to dust and clean the shop of my employer, managing his daily supplies where he never used to trust me to perform any technical task. He never used to impart the complete knowledge and it was very difficult to learn in such circumstances. When I lost my job, I was deeply dejected and had no clue as how to initiate barely an earning avenue".

Alam had few friends who had attended the technical training courses at NIDA Peshawar and were now working independently or are employed on appropriate monthly salaries. Struggling against the oppressions of life, Alam consulted his friends to suggest him a way out of this financial difficulties. His friends encouraged him to get enrolled for a short technical training course at NIDA where he would also be receiving a monthly stipend.

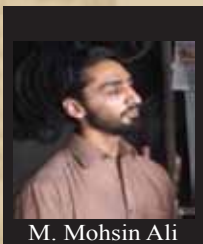
"I opted for the course of UPS Assembling and Troubleshooting perceiving the energy crisis in country to last longer than we expect. NIDA Peshawar has few remarkable instructors who primarily emphasized on our practical trainings. The trainers used to conduct many test sessions to induce hands-on experience of UPS assembling and repair among the trainees."

After the course completion, Alam started working in partnership with one of his friends and later was able to start his own business. He also took private orders for UPS assembling and gathered money to fuel capital into his business. The inaugural months of his business put him to struggle and strive but the endeavors paid him well

afterwards. Alam is now making adequate income to propel his household expense cycle. He has brought in two pupils as well who are aiding him in his work. Alam is determined to train these lads as comprehensively as he has been trained in NIDA Peshawar.

"I can say that my life has improved after my training at NIDA Peshawar. It has proved to be immensely beneficial for me in raising my income level. I would recommend others too to take up any technical training course which is particular of their interest at NIDA centres. I am also planning to get enrolled for the course of Solar Panel Installation. This will help me expand and augment the set of services I am offering at my shop".

Mohammad Alam still keeps a close contact with his instructors at NIDA Peshawar and calls on them in case of any difficulty he comes across while handling an order. Indeed he has been successful in lifting up his livelihood stream through the extensive technical training of three months.



M. Mohsin Ali

Dawn Electric Services is a retail shop owned by Mohammad Mohsin Ali in the area of Gulbahar Peshawar. Mohsin, 22 years of age, is the youngest among the family of four. Since his father passed away, the family was struck with the financial malaise which did not allow Mohsin to continue his studies after intermediate. He had to opt for a job of sales man at one of the locality's retail store. But Mohsin had always been aspiring for a little more to achieve in his life. He wanted to earn but not in petty chunks, so that he can ensure better provisions of life for his family. He had a dream of venturing into his own business. When he analyzed, he found a formal vocational training as the only means to his aspiration. Mohammad Mohsin Ali, who attended the short course of UPS Assembling and Trouble Shooting from NIDA Peshawar which finally enabled him start his own small scale business.

“I was the youngest of the family but I had to contribute to my household expenses so I started working on a shop on nominal wages. Even after investing day long effort and hard work I was never able to earn enough to arrange a decent sustenance for my family. I saw these many posters of NIDA Peshawar in Qissa Khwani Bazar and went to check the courses available as I was looking for a technical training programme limited to few weeks so would not be hampering my existing income stream and that was factually the last resort at hand”.

Mohsin registered himself in the course of UPS Assembling and Troubleshooting looking at the fair amount of stipend, the content and the appropriate duration of the course.

“I visited the centre and was provided with a well-rounded career consultation. The instructor elaborated me about the structure of the various programmes which were being offered at NIDA Peshawar. He told me that the centre is offering few short technical courses which are specifically designed to expedite the livelihood chances. I was already looking for a formal technical training avenue which would be offering short term

courses with practical implications. In our local electronics market we have so many people who are successfully running their businesses after receiving some kind of technical trainings. I found it a relatively popular institute and decided to take admission”.

Mohsin grabbed the bolts and nuts of UPS assembling and troubleshooting within few days and then he kept on practicing the acquired techniques. After the completion of his training, he started working on an electronics service shop to assemble and repair the UPS units but later he managed to open up his own. With very meager beginnings, he started taking orders and repair jobs at the same time. By the time his work load began to put up and he hired two boys for his assistance.

Mohsin has experienced a dire change in his income level. He is the youngest but now has become a potent contributor to his household expenses. He is also continuing his studies further ahead.

“Financial relief has geared my mind towards education once again and now I am preparing for my bachelors’ exam”.

Mohsin attained the technical training from NIDA Peshawar two years ago when the cumulative income of his family was PkR 15000 and now he is making PkR 40,000 on monthly basis out of his very own business. The family has experienced an avid privilege of not barely meeting the both ends but relishing an easy life.

“At NIDA the focus was on practical trainings and that has enabled me to start working independently. In such a short time period our instructors induced the dexterity in our hands. Now I am assembling 15 to 18 UPS per month while handling many repair orders”.



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