ADB CFC Programme

Peshawar Engineering Support Centre (PESC)

Technology Upgradation and Skill Development Company
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(A company setup under Section 42 of Companies Ordinance 1984 having capital share)

Introduction:

In NWFP, the industrial units which have a major engineering content are engaged mainly in the production or manufacture of: sugar, cement, steel, paper & board, tobacco, matches, metal-working, plastics, food & beverages, chemicals & pharmaceuticals, furniture & wood and marble processing & products. Most of these industries have low productivity and quality as they are generally using obsolete equipment, older technologies and untrained labour.

To be competitive at national & international levels, these industries wish to upgrade by investing in technology and hiring trained manpower, but face major problems in finding an institute able to assist them in overcoming the lack of contemporary know-how and be a source of skilled technicians and labour.

In and around the capital city Peshawar. Local industry still relies on dilapidated tools and techniques as well as suffering the dearth of skilled manpower. Their inadequate level of technology and virtually no understanding of quality requirements has resulted in low productivity due to inefficient resource utilization and in turn low wages for the work force.

Technical and vocational institutes in NWFP are not able to provide adequate technical consultancy services and training due to financial and management constraints, Further, there are no modern common facilities available to local factories capable of providing services as per today's industrial technology requirements.

TUSDEC carried out intensive Need Assessments to identify the demands of industry and has proposed the PESC (Peshawar Engineering Support Centre) to be a modern CFC (Common Facilitiy Centre) with a major emphasis on producing skilled manpower. The centre will also be a practical demonstration of modern technologies for adoption by the engineering industry in NWFP to modernise, improve quality and be competitive with other regions of Pakistan.

PESC will provide an opportunity to existing manufacturers to diversify their product offerings while encouraging entrepreneurs to enter into engineering. The CFC (Common Facility Centre) ies based on modern CNC machines, metrology and CAD/CAM techniques will allow local industry to solve their practical problems as they will have access to precision machinery. The workshops and factories will have an opportunity to become familiar with latest machinery, tools, techniques and processes and incorporate these in their own businesses. This centre will also be a source of trained manpower for local industry. Workers will acquire basic and advanced skills to work with conventional and non-conventional machines and processes, resulting in improved productivity, precision and quality.

Objective:

PESC is to provide the engineering industry of NWFP with modern design, training, technical assistance, consultancy and facilities in high-precision manufacturing. PESC will be equipped with advanced manufacturing common facilities for use by local industries. Adopting modern technology requires capital investment which may not be affordable for many. Metal manufacturing, light engineering sectors specially deal extensively with machining and relevant operations for which cutting edge technologies today are touching unprecedented heights. Even large scale process industry frequently comes across parts manufacturing, dies and mould-making for various sub-processes and overhauling/retrofitting operations. This work, if outsourced to SME level manufacturing units, provided they do have enough capabilities to meet the quality standards, can bring considerable gains for their businesses.

This centre will therefore, enhance skills of craftsmen in modern manufacturing techniques. It will facilitate the industry through provision of practical 'common facilities' to provide latest manufacturing techniques and will encourage adoption of international quality standards. This will motivate stakeholders to be self-sufficient in skills which will aid in upgrading the industry in this region.

It will provide need-based human resource development; demand-based technical assistance and support to the industry. This includes technical training with a focus on manufacturing and management training in various disciplines. The expertise and services made available by PESC will be equally shared.

Trained manpower and engineering services provided by PESC will enable industry to produce quality products, with the added advantage of reduced turnaround time and costs. The project also matches the “Engineering Vision” adopted by the Government of Pakistan. Furthermore, the centre will contribute towards poverty reduction as it will produce a skilled workforce so that they can move to good value employment.

Peshawar industry still relies on dilapidated tools and techniques. Engineering sector is suffering from scarcity of skilled manpower, inadequate level of technology and virtually no understanding of quality standards. This has resulted in low productivity due to inefficient resource utilization and in turn low wages for the work force. There is also lack of institutional support especially in terms of technical assistance and training. Due to these limitations, Pakistan has been unable to produce tools or products of international quality. To be competitive at national & international levels, these industries wish to upgrade by investing in technology and hiring trained manpower, but face major problems in finding an institute able to assist them in overcoming the lack of contemporary know-how and be a source of skilled technicians and labour.

Peshawar has the potential to become an established industrial cluster (SMEs), if provided with the latest design, technical assistance & consultancy and training services in the field of precision manufacturing & business management and marketing of their products. Efforts are needed to introduce latest design techniques and digital manufacturing technology in the local manufacturing industry.

PESC will provide an opportunity to existing manufacturers to diversify their products and become familiar with latest machinery, tools, techniques and processes. It will help manufacturers incorporate latest tools and techniques in their businesses while being a source of trained manpower. Workers will acquire basic and advanced skills to work with conventional and non-conventional machines and processes, resulting in improved quality.

This objective was compiled after the need was assessed and is in accordance with the efforts in government quarters to strengthen the role of manufacturing sector especially value added manufacturing for the country's future economic development.

Outputs:

PESC will provide modern training, consultancy, design & manufacturing services apart from modern common facilities. PESC is designed for providing manufacturing facilities of key components of engineering products and technical services to the industry for upgradation. In parallel to being a CFC, the PESC will also provide training to approximately 355 students per year in various technical and management fields.

In three years of operation, PESC shall provide training to approximately 1065 students. The Centre's common facilities in precision manufacturing will be used by industry and it will offer consultancy services to industry for upgrading their facilities & troubleshooting technical problems. PESC will also guide investing in manufacturing businesses.

Resource & time utilization of PESC will be as follows:

Training	20%
Common Facilities	50%
Consultancy	30%

Support & Services:

- Design, development and manufacture of tools, piece parts & products
- Technical Services in conventional and CNC Machining, CAD/CAM and CAE solutions, Precision Grinding, Inspection and Metrology
- Technical literature, books, journals and engineering software

Training Courses:

- Basic Engineering Drawing
- Conventional Machining
- CNC Machining Operator
- Inspection and Measuring Techniques
- Quality Control & Quality Assurance
- Business Management & Communications
- Marketing & Export

No. of Training Courses: 12
No. of Students per Class: 5-15
Fee: Pk Rs 1,000 to 3,000 (depending on course)
Duration of course: 2-12 Weeks

Technical Assistance/Consultancy:
Advisory services for improvement of products, processes, quality and productivity will be provided through experts hired by PESC

Employment generation (direct and indirect):
PESC will provide direct employment to 24 people. The centre will enhance skills of existing industrial workers as well as train new manpower. This would help build a high-value and skilled workforce. In addition, indirect employment will be generated in other sectors like, raw material supplies, transportation & logistics and associated vendor industry.

Supply – Demand Gap:

Following table shows the sectors in the province of NWFP that will be the potential beneficiaries of the proposed project either directly or indirectly.

Sector	No. of Units	Investment Rs Millions	Employment
Metal and metal products, electric/electronics goods	219	6107.64	6605
Beverages/Mineral water	16	560.91	722
Cigarettes Industry	30	1256.65	2990
Rubber and Plastic goods	141	3161	2032
Melamine Industry	9	61.28	7
Miscellaneous metal based manufacturers	18	28.98	74
Motor Car Battery	2	174.05	270
TOTAL	**435**	**11350.51**	**12700**

[Source: Directory of Industrial Establishment - 2002]

Engineering industry is shifting from conventional to digital manufacturing globally. This shift has placed Pakistan far behind the developed countries. Engineering industry of Pakistan, especially in NWFP region, is striving to move from conventional tools, techniques and processes but faces acute shortage of trained & skilled manpower and consultants for proper guidance for selection of technologies and investments.

Reports from NWFP Government, media & other organisations clearly reveals a strong demand for establishing a support centre for the local engineering industry in order to fill the supply gap of trained manpower and modern technologies.

Table . NWFP Sectoral Origin of Gross Domestic Product					
	1998/99	**1999/00**	**2000/01**	**2001/02**	**2002/03**
Industry	16.9	16.3	15.9	16.3	16.1
Mining and quarrying	0.7	0.7	0.7	0.7	0.8
Manufacturing	7.2	7.0	7.5	7.6	7.8
Large Scale	3.9	3.7	4.0	4.1	4.2
Small Scale	3.3	3.3	3.5	3.5	3.6
Construction	3.9	3.9	3.8	3.9	3.8
Utilities	5.1	4.7	3.8	4.0	3.7

Source: NWFP Economic Report FY05

The most rapidly growing sectors in recent years have been livestock, forestry, mining, manufacturing, wholesale and retail trade. The largest contributions to overall provincial GDP growth came from trade, agriculture, manufacturing and transport.

Machining on a tractor crankshaft in a medium size set-up in Peshawar

Compared to the rest of Pakistan, NWFP has a higher share of employment in agriculture, electricity, gas and water (reflecting large hydro-electricity generation facilities in NWFP), construction, transportation and services sectors. Its share in employment (and in the provincial GDP) is relatively lower in manufacturing, trade, and financial sectors. Now, considering the country's strategic vision, it is highly important to take steps that can encourage sectoral growth which are not conventional in the province. Therefore, by promoting and supporting the manufacturing sector, even though its share in current economic contributions is not substantial compared to other sectors, will help in opening new socio-economic development in NWFP.

Some plastic products currently being manufactured in NWFP

The limited manufacturing sector in the province, as per TUSDEC's need assessment survey, clearly shows that the sector does have growth potential in NWFP if properly supported and strategically lead. However, currently most of the SMEs in machining sector are relying on automotive parts retrofitting and similar work. Non-availability of high precision machines and training hampers the scattered conventional machining sector from obtaining orders from large scale manufacturers for dies and moulds.

Vacuum Forming at a relatively advanced manufacturing concern

Dilapidated training facilities at one of the training institutions in Peshawar

Facilities:

TUSDEC proposes that PESC be housed in an of 20,000 Sq Ft with 15,000 Sq Ft covered. The CFC would be equipped with modern equipment and machines to help local industries adopt modern manufacturing techniques as well as have access to trained workers and technicians or have their workforce trained accordingly. Conventional machines will also be provided for lower-end working. The technical description of the major machines to be procured is shown in the List of Machinery and Equipment below. As already mentioned, the centre's major focus will be on metal machining and relevant areas. Primary outputs will be precision machining, dies, moulds and metrology facilities made available for the sector.

Machinery and Equipment:

In order to meet the perceived technological levels for PESC, following generic machines and equipment have been identified: Vertical machining centre - for most of the milling and relevant operations, EDM , Wire Cut machines and Turning Centres are major other machines that are commonly used in die and mould making as well as most machining operations. In order to ensure high precision manufacturing, advanced metrology and inspection facilities would also be provided in PESC such as a Coordinate Measuring Machine (CMM).

A modern Vertical Machining Centre (VMC)

A typical EDM system

A typical Wire Cut system

The list of major machinery and facilities is as under:

Description	Specifications
Precision Machining Section	
CNC Vertical Machining Centre (VMC)	3 Axis Machining Centre (850mm x 520mm x 540mm)
CNC Turning Centre	2 Axis Turning Centre (320mm x 600mm)
EDM Machine (CNC)	75 Amps, 400 x 300mm
Wire Cut Machine	30 Amps, 400 x 280mm
Tool & Cutter Grinder	3" OD Milling cutter, 3/4" shank end mill
Conventional Machining Section	
Universal Milling Machine	Turret
Lathe Machine	Centre Lathe
Shaper Machine	Size 12"
Radial Drilling Machine	
Drilling Machine	Benchtop
Surface Grinder	12” Working Length
Cylindrical Grinder	Max Dia 3” & Length 24”
Benchworking Section	
Vises	Bench Vises with benchworking tables
Hand Tools	Miscellaneous tools
Surface Treatment	
Electroplating equipment	For Photostatting, bluing etc
Heat Treatment	
Salt bath furnace	
Muffle furnace	
Inspection & Measuring Section	
Coordinate Measuring Machine	Gantry/Bridge type vertical CMM
Measuring Tools	Vernier Calipers, Micrometers, Height Guages, etc.
Marking Tools	Height Guages, Calipers, Punches & Scribers, etc.

Management:

TUSDEC would form an executive committee to look after the operations of PESC composed of members from both public and private sector. The Project Monitoring Unit already established in TUSDEC as part of the ADB CFC Programme's recently approved Ceramic Development and Training Centre will supervise the project.