



Guidelines to Develop TDF Proposals

1. Background

The Pakistan Higher Education Commission (HEC) medium-term development plan explicitly puts ideals of knowledge economy at the centre of development for this 5-year period: to unlock and exchange the knowledge and expertise held by the universities for the benefit of communities and economies.

As per the vision 2025 of the Planning Commission, in a resource constrained economy, education and technology inputs especially those available at our universities should act as engine of growth. The proposed project will create employment opportunities for our educated and technical manpower and help develop indigenous enterprises to create appropriate jobs and stop the brain drain.

The Proposed project will enhance University-Industry interaction for problem solving and for development.

2. Guidance Notes

Proposals will be considered for partnership joint academia-industry project with clearly defined objectives and outcomes. Proposals should also demonstrate how the partnership will be further developed and sustained following the initial project with lab-scale or prototype.

In view of various priorities of participating institutions/universities, following are the key focus areas.

KEY AREAS

1. Climate Change and its impact on socioeconomics of Pakistan (Agriculture, Food Security, Urban development, Pollution, Floods, Biodiversity Conservation, any other)
2. Information and Technology/Computers (applications in Govt. services, health, textile, agriculture, dairy etc.) and Telecommunication
3. Engineering Sciences, Micro Electronics, Water, Power Energy and Fleet Management
4. Biotechnology and Allied fields (in health, agriculture, textile, leather, dairy etc.)
5. Material Sciences/Man Made Material (Nanotechnology)
6. Robotics, Defense and Military needs
7. Any other applied discipline which is inductive or conducive to success of products developed or upscale the process of Industrial level manufacturing, commercialization, and business development

A detailed list of potential areas of interest for TDF and other HEC research proposals is enclosed at annex "A" which are the asks in multiple roundtable meetings with Chambers of Commerce and Industry.

3. Possible Partners

The proposals need to be academia-industry joint projects leading to products or services which solve a current problem or identify a new opportunity; are marketable, leading to positive cash-flows. In another way the local Industrial R&D can join nearby academic research experts of the university to solve their problem, upscale the process or prototype their innovative idea to a successful business.

This grant can be used by the applicant to develop partnerships of their universities with business community (Industry, Chambers and associations). All proposals will be expected to have identified how their collaboration will develop partnerships outside the university with active industrial sector.

4. Business Model

Executive Summary

This executive summary will follow the title page. The summary should tell the reader what you want.

Business Description

The business description usually begins with a short description of the industry. When describing the industry, discuss the present outlook as well as future possibilities. You should also provide information on all the various markets within the industry, including any new products or developments that will benefit or adversely affect your business.

Define Product

Business plan will describe the product and its level of development and relevant field, industry, and its potential. Either it is an R&D product or low cost or reverse engineering with add on.

Identify Customer and User

Depends on products customers and user will be different. i.e., in case of digital seed meter customer will be car manufacturing companies but user will be the driver and normal public. The identification customer and consumer or user brings clarity to academic and industry partner of the projects for their roles.

Market Strategies

Market strategies are the result of a meticulous market analysis. A market analysis forces the entrepreneur to become familiar with all aspects of the market so that the target market can be defined and the company can be positioned in order to garner its share of sales.

Competitive Analysis

This is to determine the competitors' strengths and weaknesses within your market, strategies that will provide you with a distinct advantage, the blockades that can be developed in order to prevent competition from entering your market, and any weaknesses that can be exploited within the product development cycle.

Design & Development Plan

This is to provide investors with a description of the product's design, chart its development within the context of production, marketing and the company itself, and create a development budget that will enable the company or product to reach its goals.

Operations & Management Plan

The operations and management plan is designed to describe just how the business functions on a continuing basis. The operations plan will highlight the logistics of the organization such as the various responsibilities of the management team, the tasks assigned to each division within the company, and capital and expense requirements related to the operations of the business.

In case of introducing new product in existing industry or industry problem solution the operations plan will highlight the logistics of the existing industry/organization such as the various responsibilities of the management team, the tasks assigned to each division within the company in regard to this product or process induction in industry, and capital and expense requirements related to this intervention.

Financial Factors

Every successful business plan depends on financial data at its back, but that doesn't mean it's any less important than up-front material such as the business concept and the management team.

5. Eligibility

Faculty members of Public & Private Sector Higher Education Institutions with relevant commercialization partner from Industry/ investor/ private/ public sector R&D institutes/ Spin-offs / Startups at leading Incubation Centers or Accelerators.

The proposals need to be academia-industry joint multi-disciplinary and multi-institutional leading to products or services which solve a current problem of industry/ society or identify a new opportunity of business which leads to positive cash-flows.

6. Duration and value of award

- Duration of each research project will be two years.
- **Total grant for each proposal: Maximum up to PKRs. 14.00 Million**
- Proposals with partner industry contribution (in cash) will be preferred, however in case of in kind its value must be calculated and incorporated in respective column of budget and incorporated in the industry interaction plan at section 4C.

7. Application Process

Proposals for funding should be submitted on the standard Application Form available on the HEC Research Grants Management System and further guidelines can be downloaded from the following link <http://hec.gov.pk/site/TDF>

Completed applications must be submitted online after the endorsement of University ORIC or where the applicant team is located dually endorsed by head of University and Partner Industry. Proposals will be received till December 20, 2022 and evaluated on first come first serve bases.

8. Evaluation Process

There will be a 3-stage approach to evaluating proposals:

- a. Initial Screening: This is designed to eliminate technically ineligible proposals. It will be undertaken by the Evaluation Panel. A prioritised list of projects for further evaluation will be drawn up.
- b. External Assessment and Evaluation Panel: All projects on the priority list will go for external peer review. Two experts, one of the subject fields and the other of representative of respective business/industry field.
- c. Evaluation Panel: The recommended proposals will be defended by the Principal Investigators of the project in an open seminar organized by HEC. The seminar/ defense will be attended by Academia and industry representatives.
- d. Approval of Project Committees: The award of grant will be confirmed on the basis of this defence and approval of the research executive Committee as well as TDF steering committee. The project steering committee has the power to revise the above procedure if deem appropriate.

9. Monitoring

Each partnership may be monitored over the course of the project and can be called to pitch the progress or product display.

10. Reporting

Each partnership is required to submit to HEC a mid-term report six months after the start of the partnership, an end-of-year report and a final report on completion of the project. These will be both technical and financial; the

items to be covered will be specified at the time of finalising the contract. The detailed policy points regarding project execution and industry interaction given at Annex 'B'.

11. Data Protection Statement

All information on the application forms of proposals that are successful and funded by HEC will have details made public and it is a condition of application to the scheme that you agree to this.

Please confirm that you agree to the use of the data in the application in this way. Furthermore, IP related matters be dealt with the HEC IP framework (available at <https://bit.ly/3h0rR4d>) and the one (if) developed by university itself.

12. Signatures, Submission and Deadline

Please follow the advice set out in these guidelines carefully. Applications should be submitted on the application forms available on the website.

If necessary signed letters of support from Partner Industrial/R&D institutional heads or equivalent can be submitted separately.

13. Proposal Information sheet

Proposal information sheet in M.S. excel is given with dummy data entered for the basic information of the proposal must be filled by Principal Investigator and send with the soft copy in email.

14. Application Procedure

The deadline for submission of proposals is **20th December 2022**; however, applications will be processed on **first come first serve bases**.

The paragraph numbering below follows the section numbers on the Application Form

1. Project Title

Please choose a title that uniquely describes your project and clearly identifies the primary subject area for the activity.

2. Key Subject Words

Please provide up to 6 key words that most closely relate to the application area.

3. Project Objectives

Please summarise the main objectives of the proposed project in terms that might be understood by a non-specialist. Please provide in a maximum of 100 words.

4. Proposed Start and End Dates for your project

The project will commence once the contract has been signed and will run for no more than 24 months.

5. Information about applicants

The details of the Project Team Leaders in each institution and their contact details should be provided.

6. Overview of the Project

Please provide an overview of the proposed project in a language suitable for a general audience. Include the project objectives, proposed process and anticipated outputs and impact.

7. Proposed Goals / Objective:

Please clearly identify the output in the form of a product or process, need or relationship to non-university partner

8. Project Business Development Plan / Work plan for the Project

Please provide an overview of your business plan to include activities taking place. Please note that this Business plan will form the basis of your contract and progress will be measured against working towards its delivery.

9. Proposed Project Outputs:

Please summarise briefly the intended outputs of the proposed co-operation – both qualitative and quantitative. Please try to fill all columns.

10. Other sources of funding

In this section, please include details of any funding which will be received by the project which is from a source outside of the participating institutions. Include details on the exact nature & amount of this funding, the donor organisation, and the anticipated time frame.

11. Proposed Team (Principal Investigator, Industrial Partner, and Co PI)

This section details about project team and their profile.

12. Financial Proposal

Please summarise the estimated costs (PKRs in Million) over the 2-year period of the project and present this information in prescribed **M.S excel spreadsheet** and same will be mentioned in the main application form.

You are also required to complete the shorter table in the application setting out your requests for funding. Please refer to the section in the Guidelines that set out what activities can be funded and what are ineligible. Note that funds cannot be employed to contribute towards the salaries of staff other than allowed nor for administration, estate costs or other institutional overheads.

Air fares should normally be the most reasonable economy class fare.

13. JUSTIFICATION

Please justify your requests for staff, Salaries Allowances, Expandable Supplies, and permanent equipment in background of the existing facilities available at the host Institute.

14. Referees/Reviewers

Enlist 3 academic and 2 Industrial Reviewers.

15. Checklist

Checklist is provided to have a holistic review of proposal developed whether it followed all guidelines which for sure made application pass successfully initial scrutiny phase.

16. Attachments

Make Sure CNIC, Photo, Industry Support letter, Key performance Indicators, CVs of PI, CO-PI, Industry Partner, and Quotations must be included in one M.S word application file and create PDF of the same. No loose above documents will be entertained.

Applications can only be submitted online <http://hec.gov.pk/site/TDF> and only one hard copy of the successful proposals will be required before release of funds with all original signatures (please keep hard copies of signed pages safe).

Technology Development Fund
Research & Development
Higher Education Commission
H-9 Islamabad
051-90401933

Once submitted, we cannot accept any changes to the application.

ANNEX A:

Areas of Research and Academic excellence identified during industry academia linkages roundtable with Chambers of Commerce and Industries across Pakistan

Engineering, Technology and Energy

- Engineering – Industrial Manufacturing, Energy production and conservation
- Trade in Raw material, its value addition and marketing
- Mining, mineral exploration and control on allied wastages (surveys, techniques, technologies), identification of issues, problems of the local mining industry and their scientific solution
- Studies of Technologies/techniques for reducing wastages from Mining Industry
- Mining and processing of precious stones and metals (identification of issues, problems of the local industry and their scientific solution)
- Minerals to Chemicals (Value addition and marketing)
- Gem's exploration and value addition and marketing
- Oil and Gas exploration (surveys, techniques, technologies), identification of issues, problems of the local industry and their scientific solution
- Petrochemicals and allied industries, identification of issues, problems of the local industry and their scientific solution
- Marble Industry and its waste control (surveys, techniques, technologies), identification of issues, problems of the local industry and their scientific solution
- Hydro power, Mini hydro power projects and their improvement through scientific research
- Hi-tech industry development, identification of issues, problems of the local industry and their scientific solution
- Reverse engineering as tool for import substitution through scientific R&D
- Modern Technologies (AI, Big Data, Cyber Security, Robotics and Automation) in IT and Engineering (GIS, Remote Sensing, metallurgy, Nanotechnology)
- Urban infrastructure and development, Energy and water efficient houses, adoption of green technologies
- Research on Polymers, plastics, and other materials to improve their use in construction and allied industries
- Chitral-Iron Ore, Oil & Gas (Nowshera, Karak, Kohat and other Districts), surveys, techniques, technologies, identification of issues, problems of the local industry and their scientific solution.
- Civil Engineering and Construction industry i.e., low-cost housing R&D
- Surgical, Cutlery, paper, Sports, Leather Goods manufacturing, innovation and identification of issues, problems of the local industry and their scientific solution.
- Innovative Uniform (military, forces and other)
- Improvement in Textile and associated sectors
- Electroplating and its innovative use in allied industry
- Vocational training centers strengthening and enhancement to provide trained/ skilled and employable human resource for all industrial sectors i.e., engineering, Surgical, Cutlery, paper, Sports, Leather etc.
- Industrial 4.0 and its mainstreaming in local industries and plants
- Joint Internship programs with Industry and Chambers
- Specialized Industrial Zones
- Indigenous textile industry (Baluchi Wool, Kashmiri, Khadi, Lacha etc.)
- Salt based industries and their value addition to enhance export revenue
- R&D to improve Communication and allied Infrastructure

- SDGs
- Risk Mapping of floods, earthquake and other nature calamities

IT/CS

- IT and Telecom and their applications in other sectors
- Improvement of Services sector by investing in research through advance IT and CS technologies to facilitate industrial zone at (Hub, Gwadar, Lasbela etc.,)
- Industrial 4.0 and its mainstreaming in local industries and plants
- IT Skill based Associate Degrees and Diplomas
- Industry supervised FYPs
- Modern Technologies (AI, Big Data, Cyber Security, Robotics and Automation) in IT and Engineering (GIS, Remote Sensing, metallurgy, Nanotechnology)
- Gaming, Augmented and virtual reality, Software development
- Hoteling as industry

Biological Sciences, Health, Pharma

- Nutraceuticals/ eastern medicine standardization and improvement
- Health (Pharma, Drug Discovery, vaccine production and instruments)
- Use of Biotechnology and research for Pharma, Chemicals, etc. for the benefit of society and economy
- Bioinformatics, Proteomics, Genomics
- Research on modern trends of biological sciences
- Biodiversity, forest, and Wildlife
- Biological and genetic Resource mapping and its valuation
- Sustainable Development Goals

Commerce, Finance, accounting

- Focused Research to establish SMEs culture (development, their financing, and operations related interventions)
- R&D inputs to improve Supply chain management, accounting, and finance
- Corporate Law and Contract negotiation
- Curriculum development for Entrepreneurial footprint in the country
- Blue Economy (Marine Aquaculture), Ports and Shipping
- Improvement in Services sector for efficient businesses and operations
- Intellectual Property and its transactions
- Corporate financing

Social and business Sciences

- Peace and Conflict Management
- Education
- Livelihood improvement, poverty alleviation
- Sustainable Development Goals
- Area Studies, Geopolitics
- Meritocracy
- Employment generation, Job Security, Brain Drain reduction
- Population Explosion and its impact on economy and ways to convert mega population as resource
- Entrepreneurship and relevant ecosystem strengthening through research-based interventions
- Regional Harmony, Peace, and Conflict studies

- Epistemology, Paradigmology, Strategic Policy Advocacy, Prolific Profiling
- Traditional business and knowledge accumulation, conservation, and promotion through innovation

Climate Change, Agriculture, Water, Forests, Livestock and, Ecotourism Climate Change

- Climate Change and its impact on agriculture, food security and livelihood, Biodiversity, Forests, Rivers and their dynamics, flood
- Climate resistant crop varieties, hybrid seeds for vegetables, fruits and crops Agriculture, Fruits, and Livestock (hybrid vegetables seed production Technology)
- Biological control of pests and insects
- Precision farming, agriculture and crop production
- Meat and meat processing and its value chain
- Water harvesting and conservation systems, techniques, and Technologies
- Hotel, tourism, and hospitality Industry (Mainstreaming local communities and resource sharing mechanism), identification of issues, problems of the local tourism industry and their scientific solution
- Agriculture and Agricultural Waste, its processing as products to ensure its societal impact-import substitution and exports enhancement through value addition
- Organic food/ fruit processing
- Livestock and Fisheries (breeding, genetics, genomics for variety improvement and propagation, aquaculture practices i.e., cage farming)
- Handicrafts, Non-Timber Forest Products, Medicinal and Aromatic Plants
- Environment (waste management, Pollution, and recycling)
- Waste Management (Industry, Domestic and Services Sector)
- Organic food colors/ dyes their preparation from sugar beet or other sources

ANNEX B

TECHNOLOGY DEVELOPMENT FUND

Policy points

1. TDF is a PSDP project, all of its objectives are linked to strict timelines, thus all stakeholders are expected to respect these timelines and achieve targets within given time frame which is otherwise considered as violation against contract agreement signed by all parties.
2. Read the contract agreement carefully, any violation to any clause of this agreement is not allowed unless approved by the competent authority (ED or Chairman HEC) through TDF team.
3. Any action which effects the scope of project is not allowed unless approved by the HEC TDF steering committee.
4. Any re-appropriation in approved budget across different heads is not allowed unless the competent authority approve that re-appropriation and communicated to team TDF in writing through ORIC, VC & Industry Partner (all signatory of contract agreement). Before sending re-appropriation request ORIC is advised to analyze and recommend if in house solution is possible to avoid wastage of time in approvals etc. Re-appropriation within a specific head i.e., equipment or extendable supplies must be requested through proper channel (ORIC) but within heads might not be possible or refused.
5. Project start date is calculated from the date HEC release funds to university, extension in these dates is not possible in any case. In case of unforeseen circumstances causing delay, inform TDF Team through ORIC well in time through proper request (letter) which is endorsed by VC & Director ORIC of concerned university keeping in loop Industry Partner.
6. Industrial partners of TDF projects are expected to commercialize the outcome of these projects. PIs must have to keep their industrial partner in loop during the execution of their projects. Also sign in 1st year before progress report the Non-Disclosure and Material Transfer Agreement and License Agreement with the final progress report. ORIC must divert financial and technical support in filling IP and agreement and product outreach and other negotiations.
7. There will be annual monitoring visit during execution of the project, this monitoring will be conducted at both university and Industry ends, PIs, ORICs & Industry Partners are requested to fully cooperate during these visits.
8. Due date of first year progress report is mentioned against each project (downloads of HEC-TDF webpage), there must be no delay in submission of these reports as TDF Team have to submit these reports to federal audit after expert evaluation. The due date is calculated from the date of issuance of 1st installment cheque to VC of the University of the Awardee.
9. For financial reporting in annual progress report, a format is available at TDF web page. All PIs are expected to report their expenditures on given format dully endorsed by internal auditors. Any yearly progress report without endorsement and on any other format will not be accepted.
10. Progress report without financial expenditure dually audited by university treasury/finance will not be accepted.
11. PIs are not allowed to avail ex-Pakistan leaves during project execution. In case the ex-Pakistan leaves (not more than 15 days) are essential so application endorsed by VC (concerned) must be sent for approval of Chairman HEC. PIs will nominate CO-PI as caretaker of his project and properly inform TDF Team through university ORIC / VC office.
12. In case any PI leave the project un-attendant, full recovery will be made from the PI as per contract agreement.
13. For any kind of communication regarding any matter related to TDF projects, PIs are advised to keep university ORIC and VC office in CC.
14. For any kind of technical or financial issue regarding re-appropriation, extension etc. request must have to come in written through university ORIC with supporting evidence. Any of request letter coming in emails will only be treated to save time but hard copy in original will be required to ensure the decision of authorities at HEC.
15. PI and team must cooperate with TDF Team for effective promotion of project objectives i.e., Introductory Video, Facebook page, press releases as success stories and any other.
16. PI, ORIC, University and industry partner must look into project objectives and must strive for successful commercialization of proposed product/prototype.

17. ORICs must facilitate patent filling, finalizing license agreement with current and future commercialization partners. On such communication HEC TDF Team will be kept on board.
18. Sign Non-Disclosure (NDA), Material Transfer Agreement (MTA) **(mandatory to submit with 1st progress report)**
19. Licensing Agreements (3-5 years) as per university policy with partner industries **(mandatory to submit with or before 2nd (final) progress report)**
20. Filling patent, copy rights, trademark etc. **(preferably in 1st year but mandatory in 2nd year of project & must be part of final (2nd year) progress report)**
21. Follow the deadlines of projects awarded i.e. **deadlines of submission of progress reports, funds details and progress status (satisfactory or not)**
22. Must read and understand well the contract agreement signed at the time of project award to stay bind with term & conditions.
23. ORIC and University authorities (if ORIC not notified) should help PI and team to mass scale their product and process and help in filling IP and its allocation as per HEC IP Framework (available at <https://bit.ly/3h0rR4d>) and university/ ORIC IP policy (if one exist).
24. For any query, please contact gsarwar@hec.gov.pk and huabbas@hec.gov.pk.

If there is any query or question, please contact team TDF contacts are available on www.hec.gov.pk/site/tdf

