

**Technical Education Quality Improvement
Programme
(TEQIP) – Phase II**

**PRELIMINARY PROJECT REPORT
A Concept Paper**

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**DEPARTMENT OF HIGHER EDUCATION,
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EXECUTIVE SUMMARY

- **BACKGROUND**

Technical Education Quality Improvement Programme (TEQIP) was conceived and designed as a long term Project to be implemented in 10 to 12 years in 3 Phases to support excellence and transformation in Technical Education in the country. The Phase – I of the Project started in 2003. Each Phase of the Project was to be implemented on the basis of success achieved and lessons learned in the earlier Phase.

- **PROJECT GOALS**

The TEQIP Phase - II is aimed to upscale and support ongoing efforts of Government of India (GOI) in improving quality of technical education and enhance existing capabilities of the Institutions to become dynamic, demand-driven, quality conscious, efficient, forward looking and responsive to rapid economic and technological developments occurring both at national and international levels. It will have a clear focus on outcomes to improve the overall quality of existing engineering programmes.

Competitively selected Institutions will concentrate on:

- (a) production/preparation of sufficient number of high quality teachers in technical education at both UG and PG levels;
- (b) PG education in high technology areas;
- (c) creation of related interdisciplinary Research facilities and Research culture;
- (d) creation of R&D and Consultancy culture;
- (e) strengthening/establishment of Entrepreneurship Development Centers linked to curriculum and with strong linkage with industries; and
- (f) establishment of technology parks.

- **PROJECT COMPONENTS AND SUB-COMPONENTS**

- (i) Institutional Development through Competitive need based funding subject to an overall ceiling at the Institutional level.

Sub-components:

- (a) Promotion of Academic Excellence,
 - (b) Networking of Institutions,
 - (c) Enhancing Quality and Reach of Services to Community and
 - (d) Industry-Institute interface
- (ii) Systems Management Capacity Improvement

- **SALIENT FEATURES**

- a) **Coverage**

A total of 206 Institutions (60 Lead and 146 Network) will be selected competitively. The selection of the State engineering Institutions will be done by the concerned States as per objective criteria consistent with the framework of implementation of TEQIP-II. These Institutions could be grouped in the following four categories:

- (i) New eligible States and Institutions (that could not be included in TEQIP Phase - I).
- (ii) New Institutions from Existing States (that could not be included in TEQIP Phase - I).
- (iii) Well performing Central and State Institutions under TEQIP Phase-I (with higher level objectives to attain excellence).
- (iv) Eligible CFIs that could not be covered under TEQIP Phase- I.

Accountability of the Institutions would be enhanced through outcome based monitoring and Performance Based Financing (PBF). An incentive system will be built-in whereby some fraction of the project funds as 'untied grants' would be available to the better performing Institutions for utilization on their innovative activities.

b) Framework for implementation of TEQIP-II

- Framework for implementation of TEQIP-II including eligibility criteria for States and Institutions will be worked out in consultation with the States, Experts and Institutions for both existing and new States/Institutions.
- While selecting States/Institutions, care will be taken to ensure that all eligibility conditions are met before declaration of the effectiveness of the Project.
- TEQIP Phase - II will be "**Centrally Sponsored Scheme**" in which existing States, new States, existing Centrally Funded Institutions and new Centrally Funded Institutions will participate.
- For existing Institutions, the equipment for Quality Improvement shall be permitted for PG & Research Laboratories in identified and focused areas; for new Institutions, this will cover UG courses also.
- The prime focus of the TEQIP Phase – II will be on production and preparation of teachers, PG education and development of Research culture & Faculty Development to upgrade and enhance knowledge and teaching skills.
- No civil works will be permitted to the existing Institutions. However, for new States and Institutions, civil works upto 10% of the Institution's allocation (for the Research Infrastructure Facilities), will be allowed.
- Private Institutions may also participate in the Project.
- The Project will support teaching and research in engineering disciplines.

c) Flexibility

TEQIP –II will be flexible in design to accommodate State Governments objectives including actions to make engineering education more inclusive. There shall be greater involvement of the State Governments in preparation and implementation phases of the project.

d) Project on Log- Frame

TEQIP-II will be built upon the findings of impact assessment of Phase I, but will essentially be project-based planned by the Institutions (bottom-up approach)/States. The Project proposals shall be thoroughly assessed by an Appraisal Team to assess need and quality of each Institution's sub-project. The TEQIP II project in respect of each State will be on log- frame with clear goals, objectives, intermediary outputs and outcomes with likely risk factors. In order to avoid time and cost overruns the critical path will be set.

e) PAB for TEQIP - II

At the National level, there will be a Project Approval Board (PAB) for TEQIP - II under the chairmanship of Secretary, Department of Higher Education to select State/Institutions and to sanction project proposals, and also review implementation of the programme.

While selecting State/Institutions and for approving the projects, the Project Approval Board (PAB) will ensure that all eligibility criteria in respect of States/Institutions are met before declaration of effectiveness of the Project.

f) Reforms Agenda

The TEQIP –II Project will conform to the reforms agenda of the XI Plan including faculty development, examination reforms, curriculum revision, semester system, seminar tutorials, internal assessment, autonomy with accountability, fee revisions and strive for accreditation of programmes and departments, if not the whole Institution(s).

g) Strong M & E Component

The progress under TEQIP-II will be reviewed by Joint Review Missions bi-annually (JRM), which has been found to be very effective for course correction and process evaluation. Besides, JRM develops a comprehensive database and supports project implementation.

h) Project cost

The estimated cost of the Project is Rs. 2,430 crore, out of which Rs. 310 crore will be allocated for the Central Sector and the remaining Rs. 2,120 crore for the State Sector.

i) Duration

The Project is proposed to start by July 2009, and would close in June 2012.

Technical Education Quality Improvement Programme

I BACKGROUND

Present System of Technical Education

Since Independence in 1947, Technical Education System has grown into a fairly large-sized system, offering opportunities for education and training in a wide variety of trades and disciplines at certificate, diploma, degree, postgraduate degree and doctoral levels in institutions located throughout the country. In the year 1947-48, the country had 38 degree level institutions with intake capacity of 2,500 and 53 diploma level institutions with intake capacity of 3,670. The intake for postgraduates was 70. There was rapid expansion of the system in the next 20 years. By 1967-68, the number of degree level institutions had increased to 137 with intake capacity of 25,000; and for diploma to 284 institutions with intake capacity of 47,000. In the next 10 years (in 1977), the system capacity increased only marginally to admit 30,000 students for degree courses, 60,000 for diploma courses and 6,000 for postgraduate courses. The system capacity increased very rapidly in the next 20 years, with the major role being played by the private sector. By 1997, the system had 547 degree level institutions with admission capacity of about 131,000 and 1,100 diploma institutions with admission capacity of about 184,000. Admission capacity for postgraduate courses had increased to 16,900. Out turn of PhDs were about 370 annually.

In the year 2006, the total number of engineering institutions, not including the IITs, NITs and university colleges rose to 1518 with admission capacity of 5,69,283 students; and 1250 engineering diploma institutions with admission capacity of 2,77,576. Approximately, two-thirds of these institutions were in the private sector.

Institutions of Importance

The Central Government, States and Union Territories have played an important role in the development of Technical Education System by establishing a large number of fully funded and aided technical institutions, and by providing adequate policy support.

At the apex of the Technical Education System in India are the seven Indian Institutes of Technology (IITs) located at Mumbai, Delhi, Kanpur, Kharagpur, Chennai, Guwahati and Roorkee, established with the objective of imparting world-class education. The IISc Bangalore was established to offer postgraduate education and to conduct research in various areas of basic sciences, engineering and technology. The MHRD has also established Indian Institute of Science Education & Research at Kolkata and Pune.

The Indian Institutes of Management (IIMs) located in six cities (Ahmedabad, Bangalore, Calicut, Kolkata, Indore and Lucknow) are institutions of excellence established with the objective of imparting high quality management education and training, conducting research and providing consultancy services in the field of management to various sectors of the Indian economy.

In the second tier, there were 17 Regional Engineering Colleges (RECs). These were established, one each in the major States, to meet the growing requirement of trained technical manpower for various developmental projects. On the basis of the recommendations of a High Powered Review Committee, GOI has renamed all RECs as National Institutes of Technology (NIT) and declared them as deemed universities for ensuring high standards of education and research on the pattern of IITs. At present there are 20 NITs in the country. Some of the existing engineering colleges of important States/newly created States have been upgraded as NITs. The NITs are being managed by governing bodies, enjoying complete academic autonomy and interacting closely with the industry in all academic ventures and are performing various activities aiming towards establishment of Centres of Excellence.

Over the years, several other institutes have been established for imparting quality education and conducting research in specialized areas. These include the Indian Institute of Information Technology (IIIT) at Allahabad; Indian Institute of Information Technology & Management (IIITM) at Gwalior; National Institute for Training in Industrial Engineering (NITIE) at Mumbai; National Institute of Foundry & Forge Technology (NIFFT) at Ranchi; Indian School of Mines at Dhanbad; Sant Longowal Institute of Engineering & Technology (SLIET) at Longowal; North-Eastern Regional Institute of Science & Technology (NERIST) at Itanagar; School of Planning & Architecture (SPA) at New Delhi; and 4 Technical Teachers' Training Institutes (TTTIs) at Kolkata, Chennai, Bhopal and Chandigarh which have been renamed as National Institute of Technical Teachers' Training and Research (NITTTR).

In addition to the above, there are a number of institutes & universities and deemed universities that have earned a name for themselves. These include Anna University in Chennai; Jadavpur University in Kolkata; Bengal Engineering & Science University at Shibpur; Birla Institute of Technology & Science at Pilani; Birla Institute of Technology at Ranchi; Thapar Institute of Engineering & Technology, Patiala; Institute of Technology of BHU at Varanasi; Punjab Engineering College at Chandigarh; and College of Engineering at Pune, VJTI and UICT at Mumbai.

Past GOI Initiatives and Investment in Technical Education with Funding by World Bank

The quality of education and training being imparted in the technical education institutions varies from excellent to poor, with some institutions comparing favourably with the best in the world and many others suffer from different degrees of handicap such as faculty shortages, infrastructure deficiencies, curricula obsolescence, lack of autonomy in academic, financial, administrative, and managerial matters; poor involvement in knowledge creation and dissemination, and poor interaction with community and economy.

Recognizing that skilled manpower of high quality can play a major role in economic development and in export of technology and services, and observing the growing demand for Indian technical professionals in all fields including software engineering in all parts of the globe, the GOI has decided to give very high priority to human resource development in engineering and technology.

During 1980s, Government of India (GOI) and the State Governments had felt an urgent need for revamping the Technician Education System in the country to make it demand-driven with relevant courses in new and emerging technologies, with adequate infrastructure resources, competent faculty and effective teaching-learning processes. The GOI supported the State Governments through three Technician Education Projects funded by World Bank, which helped to upgrade the system and benefited 552 polytechnics in 25 States and the UT of Pondicherry and Andaman & Nicobar Islands. The success of these Projects encouraged the GOI and the State Governments to seek more funding from the World Bank for systemic transformation of the Technical Education System as a whole with primary focus on degree level engineering education.

II TECHNICAL EDUCATION QUALITY IMPROVEMENT PROGRAMME (TEQIP)

The Ministry of Human Resource Development (MHRD), Government of India in the year 2002 decided to implement a long term Programme to support the technical institutions with primary objective to enhance their quality.

III TEQIP – PHASE I

Goal of Ongoing Programme

The Programme has been conceived in pursuance of the National Policy on Education – 1986 (as revised in 1992). The Programme aimed to upscale and support ongoing efforts of Government of India (GOI) in improving quality of technical education and enhancing existing capacities of the Institutions to become dynamic, demand-driven, quality conscious, efficient and forward looking, responsive to rapid economic and technological developments occurring both at national and international levels.

Project Design

The Project focused on holistic development of already well-performing institutions creating an enabling environment to become world-class institutions. Essentially the Project focused on: (i) improving academic capabilities of institutions to produce high quality technical professionals at all levels; (ii) establishing active networks of institutions so that faculty and students could benefit from each other's expertise, teaching and research facilities and learn to join hands in academic activities; and (iii) activating institutions, faculty and students to get involved in providing technical services to: (a) the community in the vicinity of the institutions; (b) the unorganized labor force in the vicinity of institutions, and (c) technical assistance and guidance to industry. The main emphasis of the project design was on implementation of academic and non-academic reforms.

The above design was evolved based on the findings of various published documents and extensive discussions with State Governments, Institutions and other Stakeholders. At the time of formulation of TEQIP Phase I, the technical education was facing the following major problems : (i) over-centralization and lack of autonomy; (ii) resource constraint in publicly funded

and aided institutions; (iii) absence of incentives to institutions and faculty; (iv) poor quality of education in most institutions combined with outdated curricula/programmes; (v) faculty shortages in most disciplines and acute in the emerging areas; (vi) shortage of quality faculty; and (vii) poor infrastructure with significant obsolescence in teaching and research facilities. The project design has attempted to address to overcome the above hurdles.

Project Approach

The project design allowed institutions the freedom to determine their own vision, mission, goals and activities for achieving excellence and the path for reaching the same within the broad framework of project objectives. The vision, mission and goals were determined through SWOT analysis of each institution. To ensure that the Project objectives are achieved, institutions were expected to carry out a set of institutional reforms as agreed with institutions and the participating Governments. Both the Central and the State Governments were required to fulfill certain pre-determined eligibility criteria to create the ambience in which the institutions could function with autonomy and accountability.

TEQIP Phase I was started in March 2003 and to be completed in March 2009.

Project Components and Sub-Components

1. Institutional Development through Competitive Funding

- (a) Promotion of Academic Excellence – Improving Academic capabilities of institutions to produce high quality technical professionals at all levels.
- (b) Networking of Institutions for quality enhancement and resource sharing – Setting up active clusters of Lead and Network institutions to share expertise, teaching and research facilities and to improve teaching learning processes.
- (c) Enhancing quality and reach of services to community and economy – Involving faculty and students of institutions in providing services to (i) community in the vicinity of the institutions, (ii) unorganized sector and (iii) collaborative activities with industry.

2. Systems Management Capacity Improvement

Building capacity of the institutional managers/management to adopt modern management practices, establishing structures to facilitate, guide and monitor project implementation units at Central, State and Institutional levels.

Project Objectives

The broad objectives of the Programme given below were derived from the National Policy on Education (NPE-1986 as revised in 1992):

- a) To create an environment in which engineering institutions selected under the Programme can achieve their own set targets for attaining excellence and sustain the same with autonomy and accountability.
- b) To support development plans including synergistic Networking and Services to Community and Economy of competitively selected institutions for achieving higher standards.

- c) To improve efficiency and effectiveness of the technical education management system in the States and Institutions selected under the Programme.

Institutional Reforms Envisaged

Since TEQIP Phase I supports quality improvement, a large number of reforms to be implemented by each institution have been envisaged in the Programme. Some of major reforms are: Granting autonomy to institutions; Introduction of structural and academic flexibility in programmes offered; Reforms in teaching learning processes; Establishment of governance system with participation of stake holders; Establishment of corpus, Staff Development; Maintenance and Depreciation funds; Changing pattern of funding to institutions from non-plan funding to Block Grant; Instituting measures for increasing recovery of cost of education, etc.

Programme Management

As per the Programme design, participatory approach in project management has been adopted to include all levels. At the national level, a National Project Directorate headed by Joint Secretary (Technical), MHRD as National Project Director, to provide overall control of the Programme supported by National Project Implementation Unit (NPIU) for facilitation, implementation and monitoring of the Programme with National Steering Committee (NSC) to provide guidance and directions, and suggest strategies for maximizing achievement of goals have been created.

At the State level, State Programme Facilitation Units (SPFUs) for facilitation, implementation and monitoring of Programme with State Level Steering Committee to provide guidance and directions, and suggest strategies for maximizing achievement of goals have been setup. At the institution level there are Board of Governors (BOGs) and Institutional Project Management Units (IPMU).

Selection of States and Institutions

The Programme is centrally coordinated, central and state-sector project in which 13 States i.e. Andhra Pradesh (12)*, Gujarat (6), Haryana (5), Himachal Pradesh (3), Jharkhand (4), Karnataka (14), Kerala (5), Madhya Pradesh (7), Maharashtra (17), Tamil Nadu (11), Uttarakhand (4), Uttar Pradesh (10), and West Bengal (11) are participating. The total number of institutions covered under the Project are 127, out of which 18 are Centrally Funded Institutions, 58 Government Funded Colleges, 10 Government Aided Colleges, 22 Self Financing Colleges and 19 Government Funded Polytechnics.

For the First Cycle six States namely, Haryana, Himachal Pradesh, Kerala, Madhya Pradesh, Maharashtra and Uttar Pradesh and for the Second Cycle seven States namely Andhra Pradesh, Gujarat, Jharkhand, Karnataka, Tamil Nadu, Uttarakhand and West Bengal were selected to participate in the Programme based on their commitment and preparedness. Subsequently, the institutions from these States were also selected through a well defined competitive procedure.

* Figures in parenthesis indicate numbers of institutions

Initially, the total cost of the Project was Rs 1,550 crore, out of which the share of the World Bank is Rs 1,250 crore. Out of Rs 1,550 crore, the share of the Central Sector is Rs 350 crore and that of the 13 States is Rs 1,200 crore. The Project allocation was revised to Rs 1,378 crore due to diversion of Rs 172 crore to Tsunami. Further due to fluctuation in exchange rates; an amount of Rs 39.049 crore has been eroded from the Project. Now, the revised Project allocation is Rs 1339 crore.

The States and institutions were selected on competitive basis as per pre-determined eligibility criteria. During two cycles of selection, 127 well performing engineering institutions were developed as Centers of Excellence in clusters of Lead Institutions and Networked Institutions. Each Lead Institution had to network with minimum of 2 engineering institutions. Major benefits at individual level and target population includes:

- Higher earnings for graduates,
- Reduced duration of unemployment due to closer alignment of institutions with labour market needs,
- Superior skills and training of about 20,000 students graduating every year from participating institutions,
- Knowledge enhancement of over 5000 persons per year benefiting from continuing education and training programme,
- Professional development of about 2,000 teachers and educational administrators every year, and
- Technical help to about 18,500 persons per year exposed to community outreach programmes of the participating institutions.

Overall Major Achievements

- The Programme has acquired satisfactory rating and is fully back on track with expenditure of Rs. 1249.87 crore and disbursed amount of Rs. 1238.16 crore as on June 2008. The periodicity of release of funds, expenditure and disbursement has been well established. It is anticipated that the pace of the Programme implementation is moving towards meeting of Developmental Objectives before closure of the Programme.
- 80% of the participating institutions have implemented the agreed reforms. Most of the Lead Institutions have received significant autonomy with block grant funding.
- A large number of programmes have been introduced and 93% of the eligible programmes are either accredited or are under assessment for accreditation.
- Industry has also supported the Programme by establishing specialized laboratories and Centers of Excellence.
- There has been a noticeable increase in number of graduates in critical areas and there has been substantial progress in placement of students for employment.
- There has been considerable improvement in research, PG and PhD programmes and faculty is encouraged to present papers at international conferences. The publications and patents have also increased. Data from Project Institutions indicate large number of registration for PhD programmes by faculty.
- There have been a large number of activities indicating good practices and innovations in TEQIP Institutions.
- There has been significant improvement in networking activities among institutions. 1,857 numbers of activities were conducted during the year 2007-08. The numbers of beneficiaries are 90,693.
- Under services to community and economy, expenditure continues to be low. However, the numbers of activities have increased significantly.

- Mentoring of institutions followed by Performance Audit by eminent technical educationists has significantly helped the institutions to achieve their pre-determined objectives. Five rounds of Mentoring exercises for all institutions under the Programme by eminent technical educationists have been successfully completed and this exercise has substantially helped the institutions to accelerate the pace of implementation of the Programme as well as achievement of the institutional vision. Sixth round of mentoring is in progress.
- Quality Performance Audit of Institutions is conducted by mentors (not for the same institution) as Auditors to assess (i) degree of progress on a large number of activities envisaged under the Programme and (ii) improvements in shortcomings noticed by the Auditors during earlier audit. Following areas are covered:
 - 1) Programme Implementation
 - 2) Implementation of Institutional Reforms
 - 3) Administrative and Managerial Efficiency Improvement
 - 4) Quality of Education
 - 5) Training and Services

So far six such Audits have been conducted. The National Average Perceived Score (out of 10) for the Audit shows an improving trend as depicted below:

First Audit (September 2005)	:	5.9
Second Audit (April 2006)	:	6.4
Third Audit (September 2006)	:	6.7
Fourth Audit (March 2007)	:	7.3
Fifth Audit (September 2007)	:	7.9
Sixth Audit (March 2008)	:	8.3

- Out of 127, a total of 79 institutions are exercising full academic autonomy and 39 have been granted substantial academic autonomy. More than 80% institutions have full financial, administrative and managerial autonomies and remaining institutions are growing with substantial autonomies.
- Out of 93 eligible institutions, 49 institutions are receiving block grant.
- Out of 127, a total of 109 institutions are retaining and utilizing IRG (Internal Revenue Generated).
- Out of 127, a total of 125 institutions have created 'Four Funds' (Corpus, Staff Development, Maintenance & Depreciation). These will support the institutions to sustain beyond TEQIP period.
- During the Programme period the institutions have so far obtained/filed 155/275 patents respectively. The Research activities have increased substantially since programme commencement. The Research papers published in National/ International Journals have gone up to cumulative 33661 since TEQIP inception. Project institutions have increased their current Ph D registration dramatically with 1186 students registered for Ph D in State level institutions and 587 PhD students registered in Centrally Funded Institutions.

IV MAJOR LESSONS LEARNT FROM IMPLEMENTATION OF TEQIP PHASE - I

It is a unique, multidimensional and complex Programme to be implemented in overlapping phases and cycles over a period of 10 to 15 years. Therefore, it is crucial that the lessons learnt during implementation of each phase/cycle be studied thoroughly and taken care of while developing the proposals for the subsequent phases/cycles each building on the experience of the previous

one in order to achieve the high goals set by the programme. While implementing TEQIP Phase – I, following lessons were learnt and TEQIP Phase – II will ensure that same shortcomings are not repeated:

- Under TEQIP Phase – I, limited number of States, 17-20 Lead Institutions and 50- 60 Network Institutions were to be selected which would have provided adequate financial support to the Institutions. Due to enthusiastic response and opportunity made available, 127 Institutions (40 Lead and 87 Network) were finally selected. However on account of reduced funding, the Institutions are pursuing a limited number of activities towards their Mission and Vision.
- The participating States were unable to formulate the policies to support reforms and or translate the policies into action for reasons such as mindset and attitude of the officials, different varieties of institutions included in the programme i.e. university institutions, public funded institutions and private institutions creating problems of multiple controls and connected implications.
- Many Institutions were also not tuned to working under Project Mode with specific targets and time limits and were not tuned to follow World Bank norms and procedures to undertake Project activities.
- During initial period, the sponsoring agencies (Central and State Governments) found it difficult to abide by the pre-determined eligibility criteria and legal agreements. Major areas in which there were delays related to (i) grant of significant/substantial autonomies (academic, managerial, administrative and financial) to institutions, (ii) changing non-plan funding to Block Grant, (iii) filling existing faculty vacancies and creating the new positions required for new programmes started/proposed to be started under the Project, and (iv) allowing institutions to generate and retain revenues to enable them to attain higher degree of self-sustenance.
- Though the Central Government provided adequate funds in advance to the CFIs, regular fund flow mechanism could not be established by the State Institutions. The release of funds by the State Government is still a problem faced by the Institutions.
- The State Governments took a long time to stabilize funding mechanism to Private unaided Institutions; some Private Institutions were dropped at the end of the third year of Project implementation.
- Institutions were unable to carry out several reforms for want of support from the Governments. If the State Government was willing to facilitate reforms process, the Universities were not tuned to such reforms and the coordination in many cases was lacking between State Governments and the Universities. As a result a large number of existing vacancies were not filled, and creation and filling up of new faculty positions for starting new programmes was affected.
- Training programmes undertaken by faculty under TEQIP were not recognized by AICTE for the annual promotion of faculty and was not considered equivalent to Quality Improvement Programme (QIP) of AICTE. Further, the faculty involved in TEQIP execution activities were not able to publish papers etc. which hampered their personal growth and promotions.

- Networking amongst institutions has progressed but not to the expected extent, despite guidance provided by NPIU. Clustering of appropriate Institutions under Networking posed serious problems and mutual exchange/sharing of resources were limited. The networking arrangements between Centrally Funded Institutions and the State Institutions did not function smoothly due to different controlling authorities.
- Several institutions did not understand the concepts of services to community and economy, and networking despite guidance provided by NPIU. The concept of Tribal Development Plan (TDP) due to its nomenclature was misplaced.
- In the design and concept of the Project and due to limited financial resources made available, the Polytechnics could not take full advantage of the Project. Many of the components such as PG education and research do not fall under the purview of Polytechnics, and therefore, their participation was limited.
- The accreditation (by NBA/NAAC) process was not adhered to by the Institutions because of a number of deficiencies existing in the Institutions (including inadequate number of qualified faculty). This feature of the Project has affected the Institutions to attain higher degree of standardization. A number of Project institutions do not measure up to the well-performing institutions status as conceived under the Project.
- The delay in selection of Institutions for the Second Cycle (November 2004) restrained the Institutions to actively pursue their Project objectives for a much shorter period than the Institutions selected under first cycle.
- Institutions have been over-concerned with creating infrastructure and procuring equipment, resulting in reduced attention to several key quality aspects of the Project such as faculty development, implementation of reforms etc.
- Though all institutions are said to have carried out SWOT analysis with participation of faculty, staff and students, interactions with faculty and students show that these groups are not well aware of the Project, and hence the sense of ownership was found to be lacking amongst them. Faculty in several institutions show lack of interest in the Project as they consider Project work an extra burden resulting in no benefit to themselves.
- The facilitating agencies at the national level, state level and institution level suffered from too many procedural controls and regulations from authorities. State Project Facilitation Units (SPFUs) and Institutional Project Implementation Units (IPMUs) were functional after considerable delays and did not realize their facilitation role for want of adequate autonomy. The NPIU also functioned under the umbrella of Ed CIL as an organization with dual administrative controls of MHRD and Ed CIL and suffered due to limitations of staff and resources.
- The Project design required concerted efforts on few well performing departments instead of spreading the resources thinly to all departments based on SWOT analysis conducted by institutions and resultant vision and mission statements. However, this did not happen and therefore desired extent of impact is not visible in the Project institution.

V GENESIS OF TECHNICAL EDUCATION QUALITY IMPROVEMENT PROGRAMME (TEQIP) PHASE - II

Current Technical Education Scenario

The new millennium has witnessed unprecedented challenges and opportunities for higher education, arising from the effect of changing economic policy of liberalization and globalization. The economic policy has not only opened wider options for the investment for the Indian industry but has brought in the realization that only the best can survive in the world market and that only quality in products and manpower is the key to success.

Knowledge is increasingly recognized as the main force behind economic growth and development in the context of global economy, coupled with information and communication revolution, the emergence of world wide labor market leading to significant change in the global sociopolitical environment across the world. The Indian Economy is helped greatly with availability of strong talent in Information Technology. Since IT is pervasive in all fields of technologies and India being the hub in this sphere, the present situation has created much larger avenues of education and training. To meet the existing demand, a large number of private self financing institutions were established in the country in the last ten years, mostly catering to IT industry which has now reached a saturation point and creating the problem of sustenance of these institutions. The management of private institutions lacked vision and expertise to adjust their curriculum to suit the changing needs efficiently and effectively and hence are unable to maintain world standards in education.

The Government institutions on the other hand, have so far survived due to public support. The institutions can no longer survive with obsolete knowledge among teachers, old curricula, obsolescence in the laboratories and workshops and wide spread indifference to the need of the industry.

One of the other major off shoots of globalization is the rising prosperity and reach of world media even in middle class homes creating awareness and demand for the latest technology among the consumers in every field, and consequently forcing the industry to provide the latest. The need for skilled manpower to cater to the changing technological needs is attracting multinational companies to invest in the country. Along with sound technological skills, today's technocrats need sound management skills to survive. The ability to take tough decisions, be motivating team leader, understanding the market behavior and orienting it to his/her advantage, are some of the key attributes of successful managers.

The Government of India Vision

The Report of the Committee on India Vision 2020 rightly recognized that a large number of the country's engineering colleges need to be up-graded to quality standards close to those of the IITs, and given similar autonomy. Private sector initiatives and investment, Indian corporate or NRIs or reputed foreign universities, need to be fully encouraged to participate in upgrading technical education in the country. Close links need to be fostered between technical institutions and industry.

Besides NPE 1986, a number of policy initiatives have been taken by the Government, some of these are: (a) National Technology Policy Statement (1983), Technology Policy Vision for India 2020 (1996), National Policy Initiative for Technician Education (1998), Information Technology Policy (2000) and Indian as Knowledge Superpower, Strategy for Transformation (2001).

The GOI's vision is "*To develop and nurture a technical education system in the country which would produce skilled manpower of the highest quality, comparable to the very best in the World and in adequate numbers to meet the complex technological needs of the economy; and would provide the nation a comparative advantage in the creation and propagation of innovative technological solutions and in the development of a technological capacity of the highest order, both for its application in the economic development of the country and for becoming a major supplier of technology and technological services in the World.*"

The Vision Statement has the following six main components:

- (a) To produce skilled manpower in sufficient numbers to meet the needs of the economy
- (b) To ensure the highest quality of output from the technical education system comparable to the very best in the world
- (c) To develop a comparative advantage in the creation and propagation of innovative technological solutions,
- (d) To develop national technological capacity of the highest order,
- (e) To use innovative technological solutions and technological capacity for economic development, and
- (f) To become a major supplier of technology and technological services in the world

As per the India Vision 2020: "*The advent of computer and the internet-based educational methods offer an exciting new learning medium that can literally transform our concept of school and classroom from physical into virtual realities. As a result of digital revolution, the studies conducted in the USA project a radical reshaping of higher education over the next two decades resulting into many traditional colleges closing down as more course works are delivered at a distance through alternative channels. The traditional boundaries between education and other sectors will fade, as publishers, for profit and non-profit organization, offer accredited, multimedia-enhanced courses directly to students, by passing the university. The traditional classroom type of education, which is most useful for students that require personal attention and assistance and for subjects that involve hands-on experimentation, will no longer be the predominant model of educator. For all other purposes, it is very costly and not very efficient in the way it uses the time of both teachers and students.*"

Therefore, the entire higher education system is on the verge of change and the institutions that do not recognize the sign would tend to decline.

Globalization of Higher and Technical Education

Indian Higher Education system has matured and is gradually acquiring international standards. The IT revolution and the Indian contribution in it have brought the Indian higher education system to the forefront of the world market. The emerging comparative picture has put the IITs among the 10 best institutions in the world.

Although India is today recognized as the Technical manpower hub by World Economic Forum, Switzerland as per the Global Competitiveness Report 2005-06 declaring India at number one position in terms of availability of ICT manpower, the realization is dawning on the Indian education planners that there is vast gap between the educational standards of IITs and other technical institutions and that the handful of few IITs can not change the fate of the whole country nor improve the entire educational system. If concerted efforts are able to bridge this gap between IITs and other institutions, the manpower thus produced will be ready for global absorption.

As an off shoot of the above, the current educational scenario in India is also witnessing the advent of foreign colleges and universities either in the form of offering collaborative degree programmes or seeking Indian students to study at their campuses. It is crucial for Indian institutions to compete in order to survive in the world education market emerging within and outside the country today.

Current Problems in Technical Education

A number of problems/issues were identified that were hampering Technical Education in the country. The design of TEQIP Phase I, made serious efforts to resolve these shortcomings. However, due to limited funds and small number of institutions covered under TEQIP Phase I, the impact of these interventions was limited. Therefore, in large number of institutions the problems identified still persist. Some of such problems revealed by a GOI-World Bank study on "*Scientific and Technical Manpower Development in India (August 2000)*" are listed below:

- Multiple control mechanisms and controlling regulations have stifled innovative initiatives in recruitment of faculty, admission of students, curricula revision and up gradation, and financial management in most institutions.
- Resource constraints, low efficiency of utilization of existing resources and lack of mechanism for sharing physical and human resources of sister institutions have led to large scale obsolescence of physical resources, deterioration of quality of teaching/learning processes and lowering of competence of teachers.
- Low internal efficiency of most institutions due to large drop-outs and failure rates.
- Rapid obsolescence of curricula and course contents due to infrequent revision and much delayed response to technological advances and consequent market demands.
- Failure to attract and retain high quality faculty due to archaic recruitment and promotion procedures, absence of incentives for quality performance, and non-existent staff development policies in most institutions.
- Inadequate tapping of talent pools of women, minorities and persons with disabilities who still remain under-represented in technical profession and developing the critical mass of research and innovation capacity that can propel them into the knowledge economy.
- The economic growth of 10% Gross Domestic Product (GDP) is expected to be maintained which requires highly competent, skilled and trained manpower. It is estimated that an increase in the degree level engineering intake @ 15% would be required to cater to the requirements of industry and other sectors.

Apart from these major problems, other problems have cropped up due to unprecedented expansion of Technical Education System in the country as identified in various documents published by MHRD, AICTE and other committees constituted from time to time. The problems have also been summarized in the World Bank document titled "India and the Knowledge Economy – Leveraging Strengths and Opportunities" published in 2005. A summary of such problems is given below:

- a) **Teacher Shortage and Faculty Development:** Teacher shortage is endemic, both in numbers and in quality. As per the Report of High Power Committee for Faculty Development in Technical Institution, AICTE, 2006, the number of teachers required is as large as 118608 in about 1475 institutions with an enrollment capacity of about 5 lacs in 2005-2006. This figure would have further increased in 2006-07. At any given point of time, 30% of vacancy persists in technical institutions. The practice of adhoc or daily-wage teachers is hampering quality of education badly. Such adhoc arrangements need to be addressed and completely banned.

Earlier the attraction for technical graduates was to join the industry at a premium salary but now due to voluminous growth of Institutions in private sector, the private sector itself is attracting teachers on lucrative salaries.

Availability of teachers with doctoral qualifications is low. There are very few institutions offering PG programmes, out of which 90% of the institutions do not have any worthwhile programmes leading to Doctoral qualifications, resulting in reduced number of students enrolled in different branches. This necessitates the need for more qualified teachers. Some of the important disciplines such as IT and its related areas, availability of teachers is dismal.

The salaries offered to teachers are as per AICTE norms and attracting teachers on higher salary is difficult in public financed institutions.

There are no regular training arrangements for the technical education teachers. The teachers are straight away recruited even without assessing their ability to teach. The teachers badly lack communication and pedagogical skills. The systematic approach to faculty development in most of the Institutions is non-existent. The institutions do not pay adequate attention to faculty development. The shortage and lack of training and attention to overall growth of teachers is exerting enormous pressure on the educational delivery system to meet quality benchmarks, largely because the majority of teachers themselves are not familiar with the latest. This factor is adversely affecting knowledge and skill acquisition by students thereby lowering their employability (only 25% at present). The performance and accountability of teachers should be enforced.

Undergraduate teaching-learning processes are dismal in most institutions. The learning is focused towards mere passing examinations. Significant efforts are not made to develop, either self-learning skills or industry needed "soft skills". With a good undergraduate education only, one can conceive the production of high quality postgraduates and researchers.

In spite of above factors technical education system in the country is growing and many new teachers are joining the system. Efforts are required to be made to attract better quality of teachers to the system and retain them by providing motivational inputs such as better working conditions, growth opportunities, acquiring higher qualifications, cultivation of research culture and linking them with industries. A scenario is to be created such that the institutional faculty own technology development not merely remain as teachers of borrowed technology.

- b) **Attracting Students to become Teachers:** Due to the existing plight of teachers in technical and other institutions, there is no motivation for the

students to opt for this profession. The institutions take pride in placement of students in the industry but none of the institutions make any attempt to place the student in their own campus. The placement is normally taking place in the 5th/7th semester of the engineering course. During such a placement exercise, students may be given an option to become teachers and they may be attracted to undertake PG and Ph D. This will help in increasing the number of teachers to a large extent.

- c) **Attracting Students for PG Education:** Attracting students (other than serving teachers) to post-graduate work would remain elusive unless there is a large-scale demand for them in areas other than education and institutional R&D with visible premium on their emoluments as compared to Bachelor degree holders. Through intensive interaction with industry, the need for employment of PG pass outs may be insisted. This will require a cultural shift for employment of PG pass outs in all sectors of economy. The latest trends to Knowledge Process Outsourcing (KPO) sector and high tech manufacturing may be promoted by the GOI to increase the demand of PG pass outs of engineering.
- d) **Innovation, Intellectual Competition, and Entrepreneurship:** Innovation, intellectual competition, and entrepreneurship are almost totally absent even in many good institutions, as these are not considered integral part of the curriculum and training of young graduates and post-graduates. Innovation demands intellectual challenge that is rarely put before the students. Even conversion of a research result to a useful product needs specialized skills that require not only nurturing and fostering but also training and repeated exposures to “learning from failures”. While the graduates and postgraduate students are transient and disappear from the scene after receiving their respective degrees, there is no institutional mechanism to convert innovative ideas generated by outgoing students into useful products.
- e) **Creation of Research Culture:** Most of the Research efforts in the country are discipline oriented and there are hardly any interdisciplinary groups even in the top ranking institutions. If the country has to survive in the global competitive market, it is important that in every technology institution the Research culture be promoted.
- f) **Lack of Attention to Private and Unaided Institutions:** There is large variation in the quality of degree level institutions. Upgrading a few institutions may not result in a system wise quality improvement. A minimum of 50% coverage over time alone will make any visible impact. The private sector in this regard has been neglected since their attitude is not focused on institutional development or technology advancement. Their primary objective is profit making and exploiting desire of students and parents to get engineering education for better livelihood. Large number of institutions (85%) exist in the Private Sector and certain policy level changes are needed to bring them under the umbrella of quality conscious institutions.

Under TEQIP Phase II, it is proposed that attempts will be made to hold discussions on the problems faced by the Central and State Governments. In this context, experts will also be consulted to overcome these problems and further sharpen the focus of TEQIP Phase II.

VI SUGGESTIONS FROM STATES AND CFIs FOR TEQIP PHASE-II

During the 7th Joint Review Mission (June 2007), 8th Joint Review Mission (Jan/Feb 2008) and 9th Joint Review Mission (June/July 2008), some of the key suggestions/observations made by the State Secretaries and Directors of CFIs are:

- The institutional reforms, initiated by the Project, have just begun to take root and show some positive impact and it will take at least another five years to build on this initiative to sustain and improve the gains – without this, the institutions may slip back.
- The institutions are reasonably equipped to handle UG programs. The focus of TEQIP II should be on promoting PG and PhD education, faculty quality and faculty research culture. Teachers need to be given flexibility to apportion their time between teaching and research.
- Technical Universities could be made the focal points (lead institutions) in TEQIP-II.
- The project may cover pharmacy and architecture also in addition to engineering departments.
- Some Centers of Excellence in areas like Nano-technology, Biotechnology, and incubation centers could be supported.
- There is a need for increased exposure to best practices abroad. Foreign experts in critical areas could be invited to provide the benefit of their expertise to a large number of institutions.
- The Project should encourage and promote public- private partnership in technical education, with significant involvement of industry/ service sector.
- All Universities and colleges should have a common benchmark of quality to be achieved – in terms of quality of students. NBA primarily looks at inputs – there is a need to focus on outputs and outcomes. The process must be shortened.
- New Institutions could be allowed to compete.
- TEQIP Phase I elements of Networking amongst institutions, services to community & economy, and conduct of performance audits needs to be continued.
- States/ CFIs desired to actively and continuously participate in potential project preparations.
- States/CFIs agreed to prepare a strategic plan to ensure further growth, relevance and competitiveness of programs offered to attract good students, faculty and funding, greater self reliance and leadership role and become key partners in national economic growth.

VII CONCEPT AND DESIGN OF TEQIP PHASE-II

As per the concept and design, TEQIP is to be implemented as a long term Programme of 10-12 years duration, each building on the basis of lessons learnt from implementation of each prior phase of the Programme with World Bank assistance. All the more, for bringing excellence and a massive transformation in technical education, a short period of five years is inadequate.

As TEQIP Phase - I is reaching its last year of implementation with visible success, it is time to take detailed stock of lessons learnt from implementation so that Phase II could be built on sound grounds of success.

Implementation of TEQIP Phase I in 127 institutions is only a small beginning. There are more than 1500 engineering institutions in the country that require similar interventions to show visible impact.

The State Governments and MHRD still find the objectives of the TEQIP Phase - I relevant for adaptation with significant shift in emphasis in TEQIP Phase - II. Since the problems of technical education continue to persist, TEQIP Phase - II may be designed with the view that selected Governments (Central and States) and institutions work towards providing solution to the problems and are willing to work under **Mission Mode**. Following are proposed:

Project Goal

TEQIP Phase I was conceived in pursuance of NPE–1986 (as revised in 1992). Therefore no change in the Project Goal is proposed. However the major changes in the capability and output/outcome of the institutions are proposed. The Project Goal of TEQIP II may be considered as:

“The TEQIP Phase II is aimed to upscale and support ongoing efforts of Government of India (GOI) on improving quality of technical education and enhancing existing capabilities of the Institutions to become dynamic, demand-driven, quality conscious, efficient and forward looking, responsive to rapid economic and technological developments occurring both at national and international levels. Competitively selected institutions, apart from the above, may concentrate on (a) production/preparation of sufficient number of high quality teachers in technical education at both UG and PG levels; (b) PG education in high technology areas; (c) creation of related interdisciplinary research facilities and research culture; (d) creation of R&D and consultancy culture; (e) Strengthening/ establishment of Entrepreneurship Development Centers linked to curriculum and with strong linkage with industries; and (f) Establishment of Technology Parks focusing on public-private consortia related to institutional strength.”

Project Objectives

- a) Selected engineering institutions act as catalyst to produce and prepare effective teachers for technical education system in focus areas with best of their capability in qualification, core knowledge, good understanding of pedagogy and raising higher standard of teachers etc. The institutions should become capable of undertaking PG education and research in high-tech areas. The institutions also serve as agents for creation of knowledge based society. The Institutions will perform a catalytic role in use of education technologies, content generation, distance education, internet based education methods to reach large number of teachers to improve their basic skills, concepts and advances in engineering.
- b) Create an environment in which engineering institutions can identify focus areas and achieve their own set targets for excellence and sustain the same with autonomy and accountability.
- c) Support institutional development projects of competitively selected institutions to achieve higher levels of measurable academic performance and make concerted efforts through well planned and designed synergetic, result oriented networking among predetermined cluster of institutions for resource sharing and providing services to community.

- d) Create state of the art laboratories (with latest hardware, software, instrumentation and CAD tools) in focus areas with high degree of utilization to promote R&D, very intense interface with industry, strengthening/ establishment of Entrepreneurship Development Centers linked to curriculum and Technology Parks with committed public-private partnership. The Institutions will be encouraged to set up Centers of Excellence in identified areas where expertise already exist to some level.
- e) Improve efficiency and effectiveness of the technical education management system through training of technical education policy planners, managers and administrators. The systems at State and National levels will also be improved to undertake policy reforms and research studies.

Apart from creating ambience to attract the best and motivated persons to the teaching profession, faculty development and PG and research education is central objective of TEQIP Phase – II.

Project Components and Sub-Components

Looking at various comments and suggestions received from States, Institutions and Experts, no major change in the components of the project is proposed. However, there are improvements proposed in the sub-components which need re-emphasis and sharp focus on some of them.

(i) Institutional Development through Competitive Funding

- (a) Promotion of Academic Excellence: In TEQIP Phase II the emphasis will be laid on the following activities:
 - Improving Academic capabilities of institutions to produce high quality technical professionals at all levels.
 - Develop/Improve/Upgrade curriculum (UG & PG) for all disciplines in accordance with latest trends in the world market.
 - Create facilities for production and preparation of effective and capable teachers
 - Start PG education in priority high-tech areas such as Nano technology, Bio-technology, Energy, Disaster Management, Manufacturing etc.
 - Create resource base for research (i.e. PhD, Projects, Consultancy, R&D, Patents, etc.). It is envisaged that approximately 9 Senior Research Fellowships & 55 Junior Research Fellowships for each lead institutions and 7 Senior Research Fellowships & 35 Junior Research Fellowships for each network institutions shall be offered as per the Institutions requirement.
 - Establishment of State of the art labs, technology innovation center and centers of excellence in selected high-tech areas
 - Establishment and Strengthening of Entrepreneurship Development Centers – providing support to students (more so for PG level)
 - Development of Technology Parks
 - Explore innovative options such as virtual classrooms/institutions, offering partnership programmes.
 - Management Capacity Development at the institution level.

(b) Networking of Institutions :

Networking of Institutions for quality enhancement and resource sharing – Setting up active clusters of Lead and Network institutions to share expertise, teaching and research facilities and to improve teaching learning processes. Networking will be electronic with pre-determined activities and achievable goals. Formal networking between lead and networking institutions with mission mode working on faculty development and develop high quality, high standard teachers. The lead institutions will be encouraged to have **“upstream networking”** with 7 IITs and IISc who have credible PG and research Programmes. Expertise of the faculty of these institutions will be effectively used, through a formal institutional arrangement, to guide and mentor the lead institutions on curriculum planning, laboratory development, continuing education programmes, joint research, industry/international linkages, student guidance, etc. Upstream networking with International Institutions will also be encouraged to achieve global quality. The IITs in different zones will cater to the Institutions selected under the Project.

(c) Enhancing Quality and Reach of Services to Community

Identifying priority areas of Services to Community and involving faculty and students of institutions in providing services to (i) community in the vicinity of the institutions (ii) Unorganized sector and weaker sections of society.

(d) Industry Institute Interface :

Setting specific targets and approaches to establish intense interface with industry for various kinds of collaborations in the field of training, faculty exchange, R&D, Projects, Consultancy etc.

(ii) Systems Management Capacity Improvement

Building capacity of the National/State management to:

- a) Adopt modern management practices,
- b) Modify current practices and policies,
- c) Conduct systemic research study at state and institutional levels,
- d) Monitor performance of the institution,
- e) Pursue Implementation of reforms,
- f) Undertake Quality and performance audits,
- g) Establish structures to facilitate guide and monitor Project implementation at Central, State and Institutional levels.

The implementation of reforms would remain the key emphasis of the Project. The reforms being implemented under TEQIP Phase I will continue. However, more emphasis on reforms considered necessary by an expert group in consultation with the sponsoring Governments will be taken into account.

Standardization of institutions according to international parameters will continue under TEQIP Phase II and greater emphasis will be laid on accreditation of courses.

One major lacuna in technical education system is monitoring of the activities of the institutions rather than controlling them. TEQIP Phase II will lay greater emphasis on self-evaluation and monitoring. The present system of mentoring and quality performance audits will continue which will involve larger number of mentors and auditors across the country.

Under TEQIP Phase I, Tribal Development Plan (TDP) was not clearly understood because of its nomenclature. Under TEQIP Phase II the document and the related activities under this sub-component will be placed properly as per recent policies of Governments. This sub-component would also include other disadvantaged sections of society.

Coverage

Under TEQIP Phase I opportunities were given to all States and Institutions through open invitation to join the Project but due to Project design covering limited number of institutions, it was not possible to accommodate some of the prominent States and Institutions. Therefore, in TEQIP Phase – II the opportunity to all States and Institutions including Centrally Funded Institutions will be provided considering equity factor and development of technical education in the entire country.

TEQIP - II will be open for competition and participation by all technical institutions across the country and is proposed to be implemented as “**Centrally Sponsored Scheme**” with contribution from State Government in the manner of matching shares. A total of 206 Institutions will be selected competitively. Out of these, 60 will be lead institutions and 146 network institutions. Lead institutions will be competitively selected to work under mission mode to become faculty production and preparation centers apart from becoming centers of excellence and would pursue the components and sub-components of the Programme. These institutions would also indicate their capability to undertake PG and research education. Under each lead institution, a cluster of network institutions (about 2-3 numbers) will be selected based on competition that will derive the benefit of teacher training, PG & research education from the lead institutions in a structured manner with specified outputs. The lead and network institutions would be networked electronically for maximizing the output.

The institutions that can participate under TEQIP Phase II fall under four categories as indicated below:

- (i) New eligible States and Institutions (that could not be included in TEQIP Phase – I)
- (ii) New Institutions from Existing States (that could not be included in TEQIP Phase – I)
- (iii) Well performing Central and State Institutions under TEQIP Phase – I (with higher level objectives to attain excellence)
- (iv) Eligible CFIs that could not be covered under TEQIP Phase – I.

Accountability of the Institutions will be enhanced through outcome based monitoring and performance based financing (PBF). An incentive system will be built-in whereby some fraction of the project funds as 'untied grants' would be available to the better performing Institutions for utilization on their innovative activities.

Since Private Self Financing Institutions have increased manifolds in the last ten years and have been established in the major States of the country, State Governments may be encouraged to support such Institutions that are performing well and are eligible to join the Project and are willing to contribute towards the vision of India to produce high quality technical manpower. Under TEQIP Phase I considerable time was wasted by the State Governments to arrive at a mechanism of funding the private self-financing institutions. In TEQIP Phase II, the States will be asked to be ready with a mechanism before declaring Project effectiveness.

Framework for Implementation of TEQIP - II

In order to bring in standardization in technical education institutions with already accredited programmes (to the extent of 50% of the courses) will be permitted to participate.

Selection criteria for both States and Institutions need to be more stringent, ensuring that all conditions essential for immediate start up and successful implementation of TEQIP-II are met before declaring effective date of the Project. The new criteria may be evolved based on the current status of Technical Education in the country, specific needs of Technical Manpower of the State and suggestions by probable Institutions to be included in TEQIP Phase – II. The criteria would be different for existing and new States/ Institutions. The eligibility criteria for States and institutions will be redefined in consultation with the State Governments and experts. In this context, it will also be ensured that only those who abide by the legal covenants of TEQIP Phase I are considered for TEQIP Phase II.

For existing Institutions the equipment for quality improvement shall be permitted for PG & Research Laboratories in identified and focused areas; for new Institutions, this will cover UG also.

Under TEQIP Phase II, no civil works would be permitted to the existing institutions. However, for new States and institutions, civil works upto 10% of the institution's allocation (for Research Infrastructure Facilities) will be allowed. Procurement of Equipment for quality improvement may be permitted to the institutions for largely PG and research education in identified focused areas.

Flexibility

TEQIP –II will be flexible in design to accommodate State Governments' objectives including actions to make engineering education more inclusive. There shall be greater involvement of the State Governments in preparation and implementation phases of the project.

Project on Log- Frame

TEQIP-II will be built upon the findings of impact assessment of phase I but will essentially be project-based planned by the institutions (bottom-up approach)/States. The Project proposals shall be thoroughly assessed by an Appraisal Team to ensure need and quality of each institution's sub-project. The TEQIP II project in respect of each state will be on log- frame with clear goals, objectives, intermediary outputs and outcomes with likely risk factors. In order to avoid time and cost overruns the critical path will be set.

PAB for TEQIP - II

At the National level there will be a Project Approval Board (PAB) for TEQIP - II under the chairmanship of Secretary, Department of Higher Education to select State/Institutions and also to sanction project proposals and also review implementation of the programme.

While selecting State/Institutions and for approving the projects, the Project Approval Board (PAB) will ensure that all eligibility conditions in respect of States/Institutions are met before declaration of the effectiveness of the Project.

Preparedness of States and Institutions

a) For New States and Institutions:

- MHRD shall organize extensive training on concept, design of the Project and the World Bank norms and procedures to be adopted right from the beginning and ensure that all pre-requisite conditions of the Project such as eligibility of the States, mechanism of participation by private institutions, readiness to release funds, constitution of various committees at state and institution levels, establishment of SPFUs, IPMUs, BOGs etc. are in place.
- The selected States would submit a Detailed Programme Report (DPR) containing all documentary evidences to reflect the above and give concrete evidence for granting autonomy to the selected institutions which is one of the most important pre-requisite.
- The States to be included only after adhering to specific eligibility criteria – without entertaining any relaxation or compromises.
- The State Institutions to be included only after adhering to specific eligibility criteria and initiation of implementation of reforms – without entertaining any relaxation or compromises.
- States to promote participation of well performing Private unaided Institutions and should be well prepared for mechanism of funding before inclusion in the Project.

The eligibility criteria for New States and Institutions will be worked out in consultation with the States.

b) For the Existing States and Institutions:

- Existing institutions (State or Central), if selected, shall participate in the programme, and willing to initiate teacher education, PG and research education apart from other components.
- The existing institutions should be willing to associate themselves with network institutions, competitively selected from nearby area and provide them the benefit of teacher education and research.
- Increasing enrolment of full and part-time students into Masters and Doctoral programs, especially in the emerging technology areas, for increasing the supply of professionals for both teaching and research in educational institutions, and for the labor market.
- Facilitating and enhancing enrolment of teachers and working professionals in doctoral programs on part-time basis.
- Promoting non formal networking between academic institutions, and employers, industries and R&D organizations.
- Promoting innovations and patenting.

- Substantially increasing faculty research, preferably in collaboration with industry, to offer solutions to industry problems and also to develop solutions to support development of sustainable and affordable technologies to meet the emerging challenges in such generic areas as energy production and management, improved housing and management of rapid urbanization, urban waste management, improving delivery of health services, improving quality of life, environment protection, transportation, electronic communication, etc. The outcomes of such research support will be quantifiable in terms of masters and doctoral research work, publication of papers, technological reports, sponsored projects, consultancy, patents, technology transfer, teaching/learning aids, monographs etc.
- Improving teaching and research competencies of faculty.

The eligibility criteria for existing States and Institutions will also be evolved after due consultation with the Governments and existing institutions (both Central and State).

The eligibility criteria for new States are required to be made more stringent and adherence to the eligibility criteria should become stricter to avoid any time lag in immediate implementation of the Project.

Under TEQIP Phase II, since the emphasis will be more on development of research culture, it is imperative that only engineering institutions will be considered for participation. However, at a later stage participation of Polytechnics under TEQIP Phase II may be considered.

All care will be taken while re-designing TEQIP Phase II to ensure that the mistake made or aspects overlooked are not repeated and that there is concept clarity among all institutions.

The management structures at National / State and Institutional level will be redefined and made more efficient and will be provided adequate funds for facilitation of Project activities.

The documents pertaining to guiding the States and institutions to participate in TEQIP Phase II will be revised and circulated. This exercise will be achieved with the help of a specialized team. The formulation of the strategy including a series of discussions across the country as well as with international bodies will be attempted separately.

Reforms Agenda

The TEQIP –II project will conform to the reforms agenda of the XI Plan including faculty development, examination reforms, curriculum revision, semester system, seminar tutorials, internal assessment, autonomy with accountability, fee revisions and strive for accreditation of programmes and departments, if not the whole institution(s).

Strong Measures and Evaluation Component

The progress under TEQIP-II will be reviewed by Joint Review Missions bi-annually which has been found to be very effective for course correction and process evaluation. Besides, JRM develops a comprehensive database and support project implementation.

VIII FINANCIAL IMPLICATIONS

It is envisaged that the TEQIP Phase II will be implemented as “**Centrally Sponsored Scheme**” with contribution from State Government in the manner of matching shares for a period of 3 years starting from July 2009 and will close in June 2012. It is envisaged that about 60 lead institutions would be selected on competitive basis from existing States and Centrally Funded Institutions and new States and new Centrally Funded Institutions. For each lead institution a provision of Rs. 15.00 crore is proposed. Each lead institution will network with 2-3 institutions located in closer proximity. 146 network institutions shall be selected competitively with a provision of Rs. 10.00 crore each.

Cost per Institution - Lead Institutions

		(Rs in Crore)
a)	Capacity Building (Management Training for Head of the Institutions/Deans/HOD @ Rs. 15 lakhs per annum, 3 to 4 persons per year, 9 to 12 persons for 3 years).	0.450 (3%)
b)	Faculty and Staff Training, Pedagogical Training, Deputation to Conferences, Seminars, Presentation of Papers in National and International Forum, Visit and Training etc. About 30 faculty per year and 90 faculty in 3 years.	2.250 (15%)
c)*	Research Scholarship/Fellowship approximately for 9 Scholars (Senior Research Fellow) and 55 Scholarships/Fellowships (Junior Research Fellow) per year @ Rs. 15,000 per Scholar per month and Rs. 10,000 per Scholar per month respectively. In-addition contingencies of Rs. 15,000 per annum per scholar for SRF and Rs. 10,000 per annum per scholar for JRF (as per the AICTE/MHRD provisions).	2.700 (18%)
d)	Networking of Institutions	0.600 (4%)
e)	Services to Community & Economy	0.300 (2%)
f)	Student Centric Activities	0.150 (1%)
g)	Industry Institute Interaction	0.300 (2%)
h)	Research Infrastructure facilities including equipments, civil works, etc. (Civil Works not exceeding 10% of total allocation for Research Infrastructure facilities)	6.750 (45%)
i)	Salary for specialized faculty/staff	0.900 (6%)
j)	Incremental Operating Cost	0.600 (4%)
	Total	15.000

Note: Fellowship Details

*For Lead Institute

M.Tech (JRF) - [55*10000*12*3] + [55*10000*1*3] = 1,98,00,000 + 1,65,00,000
= 2,14,50,000

Ph.D (SRF) - [9*15000*12*3] + [9*15000*1*3] = 48,60,000 + 4,05,000
= 52,65,000

Total = 2,67,15,000

Approximately, Rs. 2.7 Crore

Cost per Institution - Network Institutions

(Rs in Crore)

a)	Capacity Building (Management Training for Head of the Institutions/Deans/HOD @ Rs. 10 lakhs per annum, 2 to 3 persons per year, 6 to 10 persons for 3 years).	0.300 (3%)
b)	Faculty and Staff Training, Pedagogical Training, Deputation to Conferences, Seminars, Presentation of Papers in National and International Forum, Visit, and Training etc. About 20 faculty per year and 60 faculty in 3 years.	1.500 (15%)
c)**	Research Scholarship/Fellowship approximately for 7 Scholars (Senior Research Fellow) and 35 Scholarships/Fellowships (Junior Research Fellow) per year @ Rs. 15,000 per Scholar per month and Rs. 10,000 per Scholar per month respectively. In-addition of Rs. 15,000 per annum per scholar for SRF and Rs. 10,000 per annum per scholar for JRF (as per the AICTE/MHRD provisions).	1.800 (18%)
d)	Networking of Institutions	0.400 (4%)
e)	Services to Community & Economy	0.200 (2%)
f)	Student Centric Activities	0.100 (1%)
g)	Industry Institute Interaction	0.200 (2%)
h)	Research Infrastructure facilities including equipments, civil works, etc. (Civil Works not exceeding 10% of total allocation for Research Infrastructure facilities)	4.500 (45%)
i)	Salary for and specialized faculty/staff	0.600 (6%)
j)	Incremental Operating Cost	0.400 (4%)
	Total	10.000

The Project Management Structures at State and National level will also be funded. 20 State Management Structures are proposed with a cost of Rs 3.00 crore each. The National Management Structure will be provided a total amount of Rs. 10.00 crore for the Project duration. The distribution of the cost for lead, network institutions and Management Structures is given in table below.

The funding mechanism is categorized as follows:

The Project cost will be borne by the GOI & the States in the ratio of

- (a) 90:10 for the North - Eastern States & Sikkim
- (b) 75:25 for the remaining States

**For Network Institute

M.Tech (JRF) - [35*10000*12*3] + [35*10000*1*3] = 1,26,00,000 + 10,50,000
= 1,36,50,000
Ph.D (SRF) - [7*15000*12*3] + [7*15000*1*3] = 37,80,000 + 3,15,000
= 40,95,000
Total = 1,77,45,000
Approximately, Rs. 1.8 Crore

(Rs. in crore)

S. No	States/Institutions	Numbers	Cost per Institution	Total Allocation
1	Lead Institutions from New and Existing States and CFIs	60	15	60X 15 = 900
2	Network Institutions from Existing/ New States	146	10	146 X 10 = 1460
3	Project Management structures at State level	20	3	20 x 3 = 60
4	Project Management structure at National level	1	10	1 x 10 = 10
	Total			2430

Central Sector Allocation	
Centrally Funded Institutions	20*15 = 300
Project Management Structure at National Level	10
State Sector Allocation	
State Funded Institutions	40*15 + 146*10 = 2060
Project Management Structures at State Level	20*3 = 60
Total Central and State Sector Allocation	= 2430

EXPENDITURE PLAN FOR 3 YEARS: 2009-2012

(Rs. in Crore)

2009-10	2010-11	2011-12	Total
585.00	860.00	985.00	2430.00

FUNDING PATTERN

The funding pattern will be as follows :

IDA/World Bank	-	1400 Crore
Central contribution (11 th Plan)	-	500 Crore
States contribution	-	530 Crore
Total		<u>2430 Crore</u>