

9. THE PHYSICAL FACILITIES I: STATUS AND MAINTENANCE

Introduction

Tribhuvan University (TU) has a total of 65 university campuses and some 133 private campuses located in the various regions of the country. The majority of these campuses offer Certificate level and Bachelor level programmes. The primary centre for postgraduate programmes in non-graduate programmes in non-technical areas is the Kirtipur Campus in Kathmandu, with some postgraduate programmes being offered at other campuses such as Prithvi Narayan Campus in the Western Region and the Postgraduate Campus in Biratnagar in the Eastern Region.

During the course of the IDA-financed Project Preparation and Pre-Appraisal Missions, visits were conducted 1992-93 to investigate the facilities at a total of seven major T.U. campuses in the Central, Western and Eastern regions. More detailed surveys of building conditions and measured drawings were prepared for three of the campuses (Kirtipur, Amrit, Trichandra) by the T.U. Project Preparation team. The following is a summary of general comments on the condition of physical facilities at the seven campuses obtained from these visits and detailed surveys.

The buildings at all campuses are for the most part in a comparable state of very bad repair. The reason for the consistent poor condition of the building is a result of a combination of factors: the advanced age of many of the buildings; virtually no new capital works in the past ten years; a serious lack of maintenance for many years; and, in the case of some of the more recent buildings, poor construction and workmanship. Site services are also a problem on many of the campuses due to ad hoc expansion of the system over time and the lack of proper maintenance and repair.

Despite their poor physical condition, with the exception of portions of a few buildings at the Kirtipur campus, the buildings are structurally sound and worthy of rehabilitation. Problems common to the majority of the buildings are: water damage from roof leakage; outdated and/or badly deteriorated electrical systems; damaged toilet facilities (mostly due to inadequate water supply); and, missing and broken windows.

The majority of the furniture in all departments in all campuses visited is old and much of it is in poor condition. The inadequacy of the furniture would appear to be most problematic in the science laboratories where the poor condition of the furniture must be hampering laboratory activities.

In addition, the instructional facilities, especially the laboratory areas in the science programmes, suffers from a severe shortage of equipment and supplies. The limited equipment they do have is for the most part outdated and much of it is in need of repair. The lack of available local services for even basic repair of scientific

equipment is a reoccurring and serious problem at all campuses. Even fairly recent equipment is often not being used because of the lack of any basic repair capabilities. In those instances where skilled technicians have been found by individually faculties, they are unable to keep these personnel due to the limited promotional opportunities for these job categories.

Existing facilities maintenance activities are extremely limited and of only the most basic nature. The current maintenance operations suffer from inadequate funding, absence of preventive maintenance programmes, poor staff training, and lack of tools and supplies. These serious problems with the maintenance and repairs are further compounded by poor control of new building design and construction which has resulted in additional maintenance problems and expenses due to poor design and construction. The lack of appropriate maintenance is contributing to an increased rate of deterioration of physical facilities and is limiting the effectiveness of even the modest recurrent investments that are being made.

All of the campuses face a problem of overcrowding, as enrolments greatly exceed the capacity of facilities. Campuses are operating two, and in some cases three shifts to cope with this situation. The heavy utilization combined with poor maintenance is adding to the deterioration of facilities.

On those campuses where both Certificate and Degree programmes are offered the enrolment/capacity problems appear to be the greatest for the Certificate level students and special procedures to cope with the demands of large numbers of young students dominate the campus operations.

Vandalism of facilities and property is a major problem at Kirtipur campus. The main source of the vandalism appears to be people from outside the campus who have free access to the campus for all forms of activities, including farming, grazing of livestock, cutting of vegetation for firewood, vandalization of facilities for materials use as well as just destruction. Further investments in rehabilitation of facilities on the campus will be short lived until open public access to the campus from the surrounding community can be controlled.

Objectives

The Preappraisal Project Preparation documents prepared by Tribhuvan University reaffirmed the following specific objectives aimed at addressing the above Issues regarding improvements to physical facilities :

- i. provide visible physical improvements to support accompanying institutional reforms.
- ii. ensure continued operations of existing facilities by rectifying critical health and safety problems.
- iii. improve the quality of existing programmes by upgrading buildings and equipment in key programme areas.
- iv. ensure consideration for efficiency and future flexibility in the planning and design of any new facilities.
- v. reduce enrolments to match capacity of facilities.

Specific Policy Actions agreed to relative to the above Objectives, are outlined below :

- i. upgrading of buildings and science laboratory equipment at Kirtipur Campus to be first priority. These are highly visible improvements that are urgently needed and can be quickly implemented.
- ii. rectify critical health and safety issues . At Kirtipur Campus this would include :
 - closing and demolishing the large lecture theater in the Botany Department building.
 - demolishing the east wing of the main Physics building.
 - providing proper ventilation equipment in the Chemistry building laboratories.
 - supplying basic first aid and fire safety equipment in all science laboratories.
- iii. strengthen existing programme quality by improving buildings and equipment in key areas in a way that is efficient and consistent with potential future programme changes, including :
 - increasing the use of common facilities (i.e. classrooms , computer labs, A/V equipment storage & repair, conference / meeting rooms).
 - increasing section sizes where feasible to economize on space, equipment, staff and operating costs.
 - priority be given to upgrading and equipping existing facilities, and minimizing the amount of new construction.
 - instructional programmes / curriculum should be reviewed to assess opportunities and impacts of technological improvements (e.g. computerization, research labs).
 - upgrading and expanding the library facilities to better serve as an effective resource centre for both students and faculty.
- iv. increase the sustainability of facilities by improving construction / maintenance operations & budgets.
- v. upgrade site services and site security provisions for Kirtipur campus.

The University has considered the IDA-financed Higher Education Project as a means of providing immediate intervention to assist in improving the quality of the educational programmes at Tribhuvan University. Their first priority is to upgrade existing facilities and for limited additional new facilities in targeted campuses offering postgraduate programmes in Science, Education, Management, and Humanities and Social Sciences. Within this priority area, the T.U. officials identified three campuses for inclusion in the project - Kirtipur Campus and two lead campuses in the Kingdom to be identified later. These three campuses, considered the premier campuses in their respective programme areas, are seen as potential centres of excellence with the best capability for assuming greater autonomy in administrative and academic matters and for enhanced cost recovery.

The Mission felt that the limited funds available in the project required a more limited focus for the physical facilities investments and that the project would better achieve its broader policy and institutional objectives if it provided a broader regional perspective to its initiatives and financing. To this end the Mission proposed the development of a regional cluster concept where a major campus in a region would serve as a focus for a number of smaller "satellite" campuses. Relatively modest amounts of funding would be provided as a part of a basic package to improve the service capabilities of a central campus in the Eastern and Western regions, specifically in the areas of library and EMIS improvements. Additional funding for improvement of physical facilities would be available for those regional lead campuses that indicate a willingness to physically separate their Degree and Certificate programmes. Funding for upgrading the Amrit Science and Trichandra Campuses in Kathmandu were not considered a priority, and no strong justification was made for their inclusion relative to one or more of the project's overall policy priorities.

Maintenance

Tribhuvan University campus facilities are without exception in poor to very poor physical condition resulting from the advanced age of many of the buildings, a serious lack of maintenance for many years, and in the case of some of the more recent buildings, poor construction and workmanship. Site services are also a problem on many of the sites due to ad hoc expansion of the system over time and the lack of proper maintenance and repair.

In addition, the instructional facilities, especially the laboratory areas in the science programmes, suffer from a severe shortage of equipment and supplies. The limited equipment they do have is for the most part outdated and much of it is in need of repair. The lack of available local services for even basic repair of scientific equipment is a reoccurring, serious problem.

Existing maintenance activities are extremely limited and of only the most basic nature. The current maintenance operations suffer from inadequate funding, absence of preventive maintenance programmes, poor staff training, and lack of tools and supplies. These serious problems with the maintenance and repairs are further compounded by poor control of new building design and construction which has resulted in additional maintenance problems and expenses due to poor design and construction. The lack of appropriate maintenance capabilities is contributing to an increased rate of deterioration of physical facilities and is limiting the effectiveness of even the modest recurrent investments that are being made.

Many of the campuses also face a problem of overcrowding, as enrolments greatly exceed the capacity of facilities. Campuses are operating two, and in some cases three shifts to cope with this situation. This heavy utilization combined with poor maintenance is adding to the rapid deterioration of facilities.

In instances where campuses, and in some cases individual faculties, have found experienced and capable maintenance/repair staff. They have been unable to retain them for any length of time due to severe limitation in the TU job categories and salary scales for these types of positions. Also the lack of power at the campus level

to hire and fire even the lowest level service staff, appears to be another impediment to campuses being able to take action to increase the effectiveness of their current maintenance operations.

Objectives

- a. improve the sustainability of physical facilities through improved construction and maintenance procedure.
- b. increase the recurrent budget allocations for maintenance operations.

Specific Policy Actions identified relative to the above Objectives are :

- a. increase the sustainability of facilities by improving construction/maintenance operations & budgets, including :
 - revising the organizational structure to integrate new construction, maintenance & security operations.
 - separating the budget and administrative functions of academic operations from housing and student affairs functions.
 - improve maintenance capabilities and procedure by : introducing preventive maintenance procedure: training and equipping staff : developing equipment repair service : improving design and supervision practice.
- b. increasing the budget allocations for buildings & equipment maintenance (establish annual targets for increases and specifically designate funds captured through cost-recovery measures for reassignment to maintenance).

Organizational Change

There needs to be a much stronger commitment and recognition of the importance of proper maintenance and operations of facilities (both buildings and equipment) within the overall TU management. One of the starting points for such change should be to create a separate administrative department at each campus to be responsible for the operations and maintenance of site services, buildings and equipment (with an appropriate title such as Facilities Management Department). This Department should be given a suitable profile in terms of :

- a. its position within the campus organizational structure (reporting directly to the Campus Chief or to a Asst. Campus Chief specifically responsible for administration - and not to be just one of a multiple of administrative functions under an Administrative Office) :
- b. a suitably high job level and salary range for the Head of that department (this should be designed as a position for academic staff) :

- c. significantly increasing the budget allocation for this department.
- d. where relevant, the functions of maintenance of existing facilities and the planning and implementation of new capital projects should be integrated within this new department.
- e. TU regulations should be changed to decentralize authority for the hiring, firing, promotion and demotion of technical and support staff within the Facilities Management Department to the campus level.

Staffing

A number of options had already been tried and proven unsuccessful, and the best alternative now was to consider contracting out all of the maintenance and operation functions, rather than trying to hire, train and retain campus staff for these purposes. While it is recognized that it is probably more cost effective to rely on outside contractors to take care of specialized operations and maintenance activities, there is still a need to have, at the very least, a senior experienced person in charge of campus maintenance and operations activities. Even if the majority of the work is to be contracted out, there is still a critical need for an experienced in-house person to manage this area for the campus: preparing and administering budgets; establishing long-term plans and strategies for preventive maintenance and deferred maintenance activities; organizing and supervising work priorities relative to planned maintenance programmes, emergencies, and regular problem reports from campus personnel. There would also appear to be a solid justification for at least a small in-house maintenance and repair group which could do small routine non-technical work, take care of small emergency work where it is not reasonable to wait for the arrival of outside contractors, and in the case of larger emergencies, to help control situations until outside service personnel arrive.

Training and Technical Assistance

It was felt that there are two important training areas where technical assistance through the IDA-financed Higher Education Project could greatly improve the effectiveness of TU's facilities maintenance efforts. One is the provision of a specialized in-country training on preventive maintenance methods and procedures for experienced senior technical personnel who would assume the position of Department Head. The second is the provision of specialized training, through overseas fellowships, to a number of technical personnel who would staff a special Equipment Maintenance Unit to be established on a regional basis.

Facility Management Supervisor Training

It is proposed that under the IDA project funds be provided to assist in the establishment of a Facility Management Unit at Kirtipur and the two regional campuses. Project support will include: the construction of a Facility Management Office / shop building at each Centre; provision of basic equipment and resource materials for each centre; foreign and local consultants to design and deliver a special

in-country training programme on preventive maintenance methods and procedures; and, training allowance to personnel attending the training sessions.

Equipment Maintenance Specialist Training

It is proposed that under the IDA-financed Higher Education Project funds be provided to assist in the establishment of special Equipment Maintenance Units for each of the three regions. The best location of these Units within each of the regions needs to be further discussed and finalized. Project support will include : the construction of an office / shop building for the Unit in each region ; provision of basic equipment and resource materials for each Unit; and, fellowship training to selected technical staff.

Increase of Operating Funds for Maintenance and Repairs

TU's own specialists suggest gradually increasing the annual maintenance budgets of building and equipment replacement cost. Though this figure was not specifically calculated it is clear that it would be substantial, and likely to be unrealistic. It was suggested a ratio of total annual Campus Operating budget may be a more practical basis to use for setting budget target figures. An appropriate and attainable maintenance budget needs to be determined. The possible of inclusion of some funding for Operating costs during the project (presumably on a declining basis) to assist in increasing the availability of appropriate funding during the course of the project, until such time as the university can implement its policy initiatives to increase cost recovery, should also be considered.

Kirtipur Campus: The State of the Facilities

Introduction

Situated in Kirtipur, Kirtipur Campus is the apex Campus of Tribhuvan University and major postgraduate facilities for postgraduate studies in Science of the Institute of Science and Technology with nine specialization departments, in Management of the Faculty of Management, in Humanities and Social Sciences of the Faculty of Humanities and Social Sciences with twelve central departments and graduate and postgraduate studies facilities under the Faculty of Education are located here. The site area approximates 3322 ropanis or 169 hectares. In addition to these teaching departments, the site also houses the Central Administrative Complex, the Tribhuvan Memorial Complex, the facilities for Curriculum Development Centre, the Research Centres (CEDA and RECAST) as well as student and faculty housing.

Services

Services and security aspects of Kirtipur site are very poor. The site boundaries are not secured and as a result the facilities are subject of much external vandalism. The road that provided access to the site cuts through this to the Kirtipur Village and is thus a public thoroughfare. The site does not have a unified water supply or electrical supply system. Each of the complex units is individually serviced

from city lines. The sewage treatment for individual units use septic tanks with absorption pits. There is no drainage system to talk of.

The Central Departments of the Institute of Science and Technology

Postgraduate courses in science at Tribhuvan University, Kirtipur Campus has had massive increases in student population over recent years. The facilities developed in the sixties had been designed for intakes ranging from 15-30 students in various areas of specialization such as Physics, Chemistry, Botany, Zoology, and Mathematics. In recent years new disciplines such as Geology, Microbiology, Meteorology have been added with stop-gap building additions of minimal nature. There has been hardly any renovation or refurbishing of these facilities since their construction. Admissions have reached blow up proportions due to inability of TU to resist student pressures on admissions. Generally, intake was doubled in 1988 and in 1990 these admission figures have again been doubled. The following table shows the designed capacity as against the annual intake as 1990 :

Subject	Designed Capacity	Last Annual Intake	Current Annual Intake
Physics	30	60	120
Chemistry	30	90	180
Zoology	30	45	90
Botany	30	70	120
Microbiology	-	30	30
Geology	-	20	60
Meteorology	-	20	20

These intake figures are not only significantly high but they also appear unrelated to the national manpower needs. Except for the Central Department of Mathematics and the Central Department of Statistics, which are housed in a newly constructed building, all other departments are housed in either aged and unmaintained premises or in buildings designed for other purposes. The Physics Building is a single-storied load bearing building, one wing of which is settled and is unsuitable for continued use and the basement floor is a potential health hazard. The Electronics wing, which is a recent addition, has unsuitable upper floor used for lecture room. The Chemistry Block is in good shape structurally but lack of maintenance has led to complete failure of plumbing services. The lack of fume exhausts or their non-function is a potential health hazard. The whole building is very dimly lit due to blocking of windows in subsequent renovations. The Botany Building, which is sited too close to the contour drops, shows many cracks. Particularly the lecture theatre has slid downwards and shows gaping cracks and the seminar wing shows signs of being pulled along with the lecture theatre. The poor selection of roof form and lack of leak-proofing has possibly led to corrosion of reinforcement in structural beams and slabs of the laboratory wing. Here too the electrical and plumbing services are in a poor state of repair and are a potential safety hazard. The Zoology Building, built about seven years ago, is not suitable for laboratory or sample museum function. The other three Central Departments, Microbiology, Geology and Meteorology, are housed in buildings unsuited for their purpose.