

# **Report on the Establishment of the Faculty of Engineering in the University of Jaffna by the Senate Sub-Committee (March 2011)**

## **Preamble**

Due to the warlike situation that prevailed in the northern region of Sri Lanka for more than three decades no major development projects were undertaken at the University of Jaffna. Primarily a more desired project, the establishment of the Faculty of Engineering, could not be materialised during the conflict period.

Aftermath of the war, in the context of development of the region, the Senate and the Council of the University of Jaffna, the UGC, the Ministry of Higher Education, the General public and professionals wanted to initiate actions to establish the faculty of Engineering at the University of Jaffna.

In this regards, the Senate of the University of Jaffna at its 353<sup>rd</sup> meeting held on 29<sup>th</sup> October 2010 appointed a sub-committee with the following members to study and report to the Senate on the establishment of the Engineering Faculty:

<b>Prof. K. Kandasamy (Chairman)</b>	Dean, Faculty of Science
<b>Dr. S. Srisatkunarajah</b>	Head, Department of Mathematics & Statistics
<b>Prof. P. Ravirajan</b>	Head, Department of Physics
<b>Dr. E. Y. A. Charles</b>	Head, Department of Computer Science

In section 1, the committee reports a brief history of the project, starting from 1979, to establish an Engineering Faculty at the University of Jaffna. In section 2, the committee's refreshed view is furnished on the establishment of the Engineering Faculty, considering the reports of the previous sub-committees, present trends of the Engineering Education and the Government's commitment on restoration of normalcy and development of the region.

## **1 Brief history of the project to establish Engineering Faculty at the University of Jaffna:**

### **1.1 The Report of the Committee appointed by the University in 1979:**

The Senate and the Council of the University of Jaffna decided in 1979 that a Faculty of Engineering should be established in the University of Jaffna as soon as possible and appointed a Committee of com-

petent professionals to study the matter and submit a report.

The Committee consisted of the following professionals:

**Late Prof. T. Sivaprakasapillai** - Formerly of the Faculty of Engineering, University of Peradeniya.

**Late Prof. A. Thurairajah** - Formerly the Dean, Faculty of Engineering, University of Peradeniya and the Open University of Sri Lanka and later Vice-Chancellor of the University of Jaffna.

**Mr. A. Rangunathan** - Dockyards Ltd. Colombo.

**Dr. P. Sivaprakasapillai** - Formerly of the University of Moratuwa.

**Dr. A. K. David** - Formerly of the University of Peradeniya.

The committee submitted a comprehensive report in 1980. The report was adopted by the Senate and the Council of the University of Jaffna and was submitted to the UGC for its approval.

Some of the recommendations made by the Committee are:

- i. A Faculty of Engineering be set up and be attached to the University of Jaffna
- ii. The Faculty be located in Kilinochchi.

## **1.2 The Report of the Committee appointed by the UGC in 1987 and the follow-up actions taken by the UGC:**

After a considerable delay, the UGC, in October 1987, appointed its own Committee to consider the request made by the University of Jaffna. The UGC Committee comprised of the following academics:

**Dr. S. M. A. Perera (Chairman)**

**Prof. C. Dahanayake**

**Prof. Willie Mendis**

**Prof. Milton Amaratunga**

**The Vice-Chancellor/University of Jaffna** or his nominee.

The Committee appointed by the UGC, comprising the above with Professor K Kunaratnam, *in-lieu* of the vice-chancellor, had a number of sittings and submitted a report in November 1988 and recommended the following:

- i. A Faculty of Engineering be set up and be attached to the University of Jaffna
- ii. The Faculty be located in Kilinochchi.
- iii. The initial intake be 50 students for the academic year 1991/92.
- iv. Additional provision be made in the University Grants Commission estimates for 1990 prepared in 1989, for capital expenditure in 1990 for the new Faculty.
- v. A Professor of Civil Engineering and two technicians be appointed in 1989 to prepare plans for the commencement of building works in 1990.

In accordance with the Committee's recommendations, the UGC in November 1989 approved 01 Post of Professor and 02 Posts of Technician Grade II Segment B for the Faculty of Engineering in the 1989 cadre of the University of Jaffna. This was confirmed by the Chairman, UGC by his letter to the Vice Chancellor, University of Jaffna in February 1990. In the meantime, the University took action to procure lands for the Engineering Faculty in the Kilinochchi area close to the Faculty of Agriculture which was formally established in 1989 following UGC approval in October 1988. The Land Commissioner approved the alienation of 100 acres of land along the Murugandy Akarayankulam Road about 1 mile from the main Kandy Road (A-9) for the Faculty of Engineering. The University of Jaffna was also informed later that if the above block of land was not suitable, alternate arrangements would be made for the alienation of land in the region.

In accordance with the decision of the UGC, the University appointed a Professor of Civil Engineering (Prof. V. Navaratnarajah) and two technicians in September 1990 for preparing plans for the commencement of building works and designing the curriculum for a degree programme.

Sketch plans for buildings were in fact prepared and request for approval of projects was sent to the relevant authority. The University requested the UGC to allocate funds for the appointment of Consultants and the preparation of building plans.

However, in view of the military conflict and the unsettled conditions that prevailed in the North after 1990, the UGC by its letter dated 10 February 1992, expressed the view that it was prepared to give top priority to the University of Jaffna for its development programmes after peace was restored in the region.

### **1.3 Initiatives taken by Sri Lankan expatriate in 2002:**

A Sri Lankan expatriate, Mr. Vinayak Bharathan, settled down in the UK had got a "proposal for the Jaffna peninsula undergraduates" prepared by two Professors from the University of Cambridge, UK - namely, Prof. Gehan A. J. Amaratunga and Prof. William I. Milne - and sent it to the Vice Chancellor, University of Jaffna through Positive Business Consultants (Pvt) Ltd., Nugegoda for his comments. The project proposal prepared by these Professors was for the **establishment of a Department of Electrical, Electronics and Information Engineering (EEIE) at the University of Jaffna, Sri Lanka**. This proposal had never been placed before the Senate and the Council of the University of Jaffna for its consideration and approval. Without the approval of the Senate and the Council, this proposal had been sent to the UGC by the then Vice Chancellor in June 2002.

It was envisaged in this proposal that this Department of Electrical, Electronics and Information Engineering will form the basis for the expansion of Engineering education in Jaffna to encompass the other major engineering disciplines in a unified Faculty of Engineering.

The UGC, after referring the Cambridge Proposal to the Standing Committee on Engineering & Architecture, reaffirmed its commitments and approved in principle the establishment of a Faculty of Engineering in the University of Jaffna at its meeting held on 10.07.2002 with the following three departments of study:

- i. Department of Electrical and Electronic Engineering.

- ii. Department of Information and Communication Technology.
- iii. Department of Inter-disciplinary studies.

The then Vice-Chancellor appears to have written another letter to the UGC on 26<sup>th</sup> July 2002 requesting a Department of Civil Engineering. The Vice-Chairman of the UGC by his letter dated 05<sup>th</sup> September 2002 had informed the then Vice-Chancellor that the request for a Department of Civil Engineering had also been agreed in principle by the UGC and requested the University of Jaffna to submit a new comprehensive report to take further action.

#### **1.4 The Report of the Committee appointed by the University Senate in 2002:**

The request of the UGC was reported to the Senate of the University of Jaffna on 24<sup>th</sup> September 2002. At this meeting the Senate of the University of Jaffna appointed a Sub-Committee with the following as its members to prepare a comprehensive report:

<b>Prof. R. Kumaravadivel (Chairman)</b>	- Dean, Faculty of Science
<b>Mr. S. Rajadurai</b>	- Dean, Faculty of Agriculture
<b>Prof. K. Kandasamy</b>	- Head, Department of Physics
<b>Dr. S. Mahesan</b>	- Head, Department of Computer Science
<b>Eng. R. Vijeyaratnam</b>	- Head, Department of Agricultural Engineering
<b>Prof. K. Kugabalan</b>	- Head, Department of Geography

Four members of this sub-committee visited the Faculties of Engineering at Ruhuna, Moratuwa and Peradeniya to obtain first hand information about engineering education in other Sri Lankan Universities. The sub-committee had prepared a comprehensive report after giving due consideration to the following:

- (a) The establishment of a Faculty of Engineering in the University of Jaffna will permit a substantial number of students to pursue an education in engineering nearer to their homes reducing the cost of education and allowing them to be integrated with the community and its development programmes.
- (b) The development of the Faculty of Engineering in the University of Jaffna will also release the pressure to a great extent on the existing Faculties of Engineering and assist in national and regional development. It would also make a significant contribution to the rehabilitation of the region. It is our considered view that the development of the Faculties of Engineering and Agriculture in the University of Jaffna should form an integral part of the overall development of the Northern region.
- (c) Although the fundamentals of engineering education remain largely unchanged, rapid changes in technology have taken place during the last two decades. The courses of study in the new faculty of engineering should incorporate the recent developments in computing, material science, electronics and management.
- (d) When establishing a new faculty of engineering in a war devastated area, many challenges will have to be met and the implementation of the programme will have to be planned according to the local available infrastructure facilities and carried out with foreign aid.

The report submitted by this committee dealt with the following:

- i. The location.

- ii. The Courses of Study.
- iii. Building and other infrastructure requirements.
- iv. Staff requirements.
- v. Cost estimates.
- vi. Stages of implementation.

**Highlights of the above items given in this report as follows:**

- (a) **Location:** The Faculty of Engineering should be established in Kilinochchi in close proximity to the Faculty of Agriculture and within a radius of 8 km from the Kilinochchi town and within 2 km from the A9 road.
- (b) **Courses of study:** Initially the Faculty shall have the following four departments of study:
  - i. Department of Civil Engineering.
  - ii. Department of Electrical and Electronic Engineering.
  - iii. Department of Information and Communication Technology.
  - iv. Department of Inter-disciplinary studies.

The courses shall be such as to provide management skills and competency in English and computer applications in addition to specialised knowledge in selected major fields. The structure of the course shall be designed by competent engineering academics.

For the courses in Electrical and Electronic Engineering and Information Technology, the course structures proposed by Professors Gehan A. J. Amaratunga and William I. Milne of the University of Cambridge shall be adopted.

- (c) **Building Requirements:** The buildings would fall into three major categories:
  - i. Academic buildings
  - ii. Residential buildings consisting of residences for academic and non-academic staff and hostels for students.
  - iii. Common utilities buildings including a Guest House with all facilities.

(d) **The total capital costs and annual recurrent expenses:**

The total estimated capital cost is approximately Rupees 1190 million, made up of the following components:

Buildings and infrastructure	- Rs. 800 million
Equipment and Books	- Rs. 360 million
Furniture	- Rs. 30 million

The annual budget for recurrent expenses when the Faculty is fully established would be approximately Rupees 62 million.

(e) **Stages of implementation and the phased out capital costs:**

A schedule to complete the project in four stages was presented.

Stage I of the programme consisted of surveying and fencing the land, establishing water resources, constructing roads, a water tank and a guest house with all facilities and preparation of drawings and BOQ for the buildings. This will require approximately 70 million Rupees and the envisaged implementation period is ten months. The recurrent expenditure during the first eighteen months of the programme is approximately four million Rupees.

Stage II of the programme will involve construction of buildings, provision of other infrastructure facilities and procuring of equipment and books that are needed to commence the first year of studies.

Stage III of the programme will fulfil the minimum requirements for the second and third years of studies.

Stage IV will fulfil the basic minimum requirements of the faculty.

Stages II, III and IV could be carried out in parallel or in stages.

**The Capital and Recurrent Costs of the Four Stages are given below:**

**Summary of Phased out Capital Costs (in million rupees):**

**Duration: 4 years (Jan. 2003 - Dec. 2006)**

Stage	Year	Infrastructure	Equipment & Books	Furniture	Total
I	2003	65.0	4.5	0.5	70.0
II	2004	400.0	133.0	20.5	553.5
III	2005	250.0	190.0	6.5	446.5
IV	2006	85.0	32.5	2.5	120.0
<b>Total</b>		800.0	360.0	30.0	1190.0

**Summary of Estimated Recurrent Costs(in million rupees):**

Stage	Year	Personal Emoluments	Traveling	Supplies Maintenance & Repair	Contractual Services & Others	Total
I	2003	2.0	1.0	0.2	0.8	4.0
II	2004	9.0	2.0	1.8	2.2	15.0
III	2005	22.0	2.0	10.0	3.0	37.0
IV	2006	34.0	2.0	10.0	4.0	50.0
-	2007 & thereafter	46.0	2.0	10.0	4.0	62.0

- (f) **Intake of students:** Students shall be admitted only when Stages I and II of this programme are completed. If these two stages are completed according to the programme outlined in this report, then the first batch of fifty students could be admitted in October 2004.

The annual intake could be increased to 100 when all the four stages of the project are completed.

- (g) **Recruitment of staff:** Appointment of a total of 50 academic staff, 76 academic support staff (called the Departmental staff), 55 academic service units staff and 42 common utility services personnel is recommended.

The first appointments to 02 academic, 01 non-academic and 05 supporting positions shall be made three months before the completion of the stage II of the building programme.

At the commencement of the implementation of the programme, it is recommended to appoint an engineering academic qualified in Civil Engineering on a permanent basis either as the Dean of the Faculty or as a Professor or as a Senior Lecturer Grade I to guide the Programme Consultants in drawing the plans, by providing information on the requirements of the internal design of the buildings. If it is not possible to recruit a suitable engineering academic on a permanent basis for this purpose, it is recommended to obtain the services of a civil engineering academic from other local or foreign faculties of engineering on an assignment basis (as consultant). It is also recommended to get the services of engineering academics of other disciplines (electrical, electronic, information and communication technology) on assignment basis (as consultants) to provide information on the requirements for the internal design of the laboratories in their respective disciplines.

The Comprehensive Report prepared by the above Senate sub-committee was approved by the Senate on 02.12.2002 and the Council on 18.12.2002 and sent to the UGC in December 2002. Because of the situation that prevailed in the region the UGC did not want to act on the establishment of the Engineering Faculty based on the report.

## **2 Refreshed View of the Present Sub-committee of the Senate:**

### **2.1 Courses of Study:**

Considering the recommendations made by previous committees and the UGC, current trends in engineering education and the job market, the committee recommends to establish the following departments in the Faculty of Engineering at the beginning:

- (a) **Civil Engineering**
- (b) **Electrical and Electronic Engineering**
- (c) **Computer Engineering**
- (d) **Inter-disciplinary studies.**

Considering the relevance and demands of the nation, the committee recommends the establishment of following departments in course of time:

- (a) Architecture
- (b) Mechanical Engineering
- (c) Quantity Surveying
- (d) Surveying

(e) Marine Engineering

The structure of the courses will have to be designed by competent engineering academics. Therefore the committee recommends the appointment of a team of senior lecturers (at-least one for each proposed department) to plan the course structure and laboratory programmes and to prepare syllabus. The committee also recommends the appointment of senior lecturers at least six months before the commencement of the teaching of the first year courses.

## 2.2 Infrastructure Requirements:

(a) **Land:**

As already committed by the university and approved by the UGC and recommended by the previous Senate sub-committees,

*this committee also with the opinion that the Faculty of Engineering shall be established along of the Faculty of Agriculture in the allocated land of 400 acres at Kilinochchi, which will allow to share common utilities and reduce both the capital and recurrent costs.*

Further, the availability of enough land in the site identified for the Kilinochchi Campus of the University of Jaffna gives room for future development of the Faculty and the Campus.

(b) **Buildings:**

The building requirements would fall into three major categories:

- i. Academic buildings consisting of laboratories, lecture halls, workshop, academic staffrooms, office of the Dean etc,
- ii. Residential buildings consisting of hostels for students as well as residences for academic and non academic staff, and
- iii. Common utilities buildings including computer units, library, health centre, water tanks and a guest house with all facilities.

**Academic buildings:** Based on the infrastructure facilities available in the other Engineering faculties it is identified that the faculty needs a minimum of  $20,000m^2$  floor area buildings for its academic programme. The estimated cost for the construction of floor area of  $18,000m^2$  is Rs. 810 million (Rs.  $45,000/m^2$ ). The construction may be phased out into three phases:

- **Phase-I** should include minimum infrastructure facilities to commence the first year courses. *Phase-I should be completed within a year from the commencement of construction programme.*
- **Phase-II** should include infrastructure facilities needed to conduct second and third year courses. *At least a part (60%) of this construction phase should be completed before the commencement of second year courses.*
- **Phase-III** should include the balance infrastructure facilities required. *Preferably, this phase should be completed before the first batch of students completes the degree.*

**Residential buildings:** Considering the present condition of Kilinochchi it is important to provide residential facilities for students and staff. Like the academic building programme, the construction

of residential buildings can also be phased out into three phases in parallel to the three phases of the academic building programme:

- **Phase-I** should include two student hostels and a guest house. Of the two hostels one should be for male students with accommodation for 100 students and the other for female students with accommodation for 50 students. The Guest House should have private rooms with sufficient infrastructure facilities to accommodate at least ten senior academic staff.
- **Phase-II** should include two more hostels and a chummary for Junior and Temporary staff. Of the two hostels, one hostel is to accommodate 200 male students and the other to accommodate 50 female students,
- **Phase-III** should include staff quarters for at least 25 senior staff or financial assistance to be given for the staff to construct their own residences close to the campus premises.

***The estimated cost for the construction of students hostels and residential buildings for staff (approximate total floor area of 5000m<sup>2</sup>) in Phase-I and Phase-II is Rs. 225 million.***

**Common utilities buildings:** In this category **water tank should be constructed before commencing the first year academic programme.** Other buildings like library and computer unit are common for Faculty of Agriculture and Faculty of Engineering. The construction of buildings for library and computer unit (total floor area of 4,000m<sup>2</sup>) should be commenced during Phase-II of the academic building programme. During the first half of Phase-II, action should be taken to establish network facilities. **Estimated cost is about Rs. 215 million.**

Based on the building construction plan, we estimate the financial support needed to be Rs. 225 million for Phase-I, Rs. 725 million for Phase-II and Rs. 300 million for Phase-III.

***The committee recommends the appointment of a consultant to advise the building programme and a civil engineering staff to plan out and oversee the building programmes as soon as the establishment of the Faculty of Engineering is approved by the UGC and the Cabinet.***

### **2.3 Furniture, Books and Equipment:**

After the commencement of the construction works of the buildings, action should be taken to procure furniture needed for the faculty. The estimated cost is about Rs. 70 million.

Immediately after the appointment of senior academics to each department, action should be taken to purchase books and equipment needed for the faculty on priority basis. The estimated cost is about Rs. 775 million.

### **2.4 Other Capital Expenditures:**

Leisure facilities, roads, path ways and parking facilities should also be established. The estimated cost for these expenditures is about Rs. 10 million.

### **Summary of Phased out Capital Costs (in Million Rupees):**

**Duration: 4 years (July 2011 - June 2015)**

Phase	Year	Infrastructure &Other Capital Expenditures	Equipment & Books	Furniture	Total
I	2011-2012	225.0	23.0	2.0	250.0
II	2012-2013	375.0	200.0	35.0	610.0
	2013-2014	360.0	400.0	20.0	780.0
III	2014-2015	300.0	152.0	13.0	465.0
<b>Total</b>	-	<b>1260.0</b>	<b>775.0</b>	<b>70.0</b>	<b>2105.0</b>

## 2.5 Recruitment of Staff and Commencement of Academic Programme:

The faculty needs approximately services of 75 academic staff (50 permanent staff and 25 temporary staff), 02 administrative staff, 30 academic support staff, 35 academic service units staff and 30 common utility services personnel for its four year academic programme.

*Appointment of 04 senior academic staff, and 01 administrative staff shall be made six months before the completion of Phase-I of the building programme is recommended.*

Appointment of another 10 academic staff (04 permanent staff and 06 temporary staff), 01 administrative staff, 10 academic support staff, 10 academic service unit staff and 10 common utility services personnel shall be made just a month before the commencement of the academic programme is also recommended.

## 2.6 Recurrent Costs:

### Summary of Estimated Costs (in Millions Rupees)

Year	Personal Emoluments	Travelling	Suppliers, Maintenance & Repair	Contractual Services & others	Total
2011	20.0	1.0	0.5	0.5	22.0
2012	35.0	2.0	2.0	2.0	41.0
2013	45.0	2.0	10.0	3.0	60.0
2014	55.0	2.5	12.5	4.0	74.0
2015 & thereafter	60.0	2.5	12.5	5.0	75.0

*The committee recommends that the Senate and the Council should take swift action to obtain the necessary approval, secure funding, develop infrastructure facilities, procure equipment and books etc. in order that the first batch of students be admitted in September 2012.*