

GOLDEN JUBILEE CELEBRATION



1955 - 2005

'FIFTY YEARS OF AEC: AN INTROSPECTION FOR GROWTH ORIENTATION'

SEPTEMBER 16, 2005

**ASSAM ENGINEERING COLLEGE
GUWAHATI-13**

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OBJECTIVES OF THE MEET

By

Dr Atul Bora

Organising Secretary

AEC Golden Jubilee Committee

2005 is the Golden Jubilee Year of AEC. We are celebrating our Golden Jubilee for the achievements of this premier institution over the last five decades. As a part of Golden Jubilee Celebration, we have dedicated this day for looking back to our past, for taking accounts of our failures, along with our achievements so as to draw a strategy towards sustenance the glory of the college, and for our resolve and commitment to the institution.

The first session is dedicated to discuss about the higher education scenario of the state, as health of AEC represents higher educational health of the state and the future growth of AEC is linked to our higher education policy as a whole. AEC is a Government Institute and Government is the principal stakeholder for AEC's future. We are pleased that our Hon'ble Minister for Higher Education Minister Dr Barman is with us along with the higher education commissioner to enlighten this distinguished gathering the relevant issues. Collaboration and partnership among the higher educational institutes are vital to meet the overall needs of the state, region and country. It is our pleasure that Director of IIT Guwahati Prof. Gautam Barua, VC of Tezpur University Prof. P.C. Deka, VC of Gauhati University Prof. G.N.Talukdar are with us as a sign of collaboration among the higher educational institutes and also to enlighten us on different aspects of on higher education. Dr Hiren Gohain, a distinguished critique is joining us to enlighten us on the social obligations of Higher Education.

As we can see that share in all India services of Assam and NE region is negligible. To create a competitive environment among the students and also to motivate the students for organized study, we are going to inaugurate a centre for Indian Engineering Sservices. Sri Satya Narayan, GM, IT & Marketing of BSNL and Sri Shantikam Hazarika, Director Assam Institute of Management will enlighten our students in this direction.

The 2nd session of the symposium is dedicated for discussion exclusively on Assam Engineering College and we are pleased that Prof. PK Sikdar of IIT Bombay and Prof Nayan Sarma of IIT Rookee [both are ex-students AEC] and many the present and Ex-teachers of the college will deliberate on the achievements and future orientation of this college.

I express my deep sense of gratitude to all of you for joining us today to address some vital aspects educational issues. With thanks with these words I conclude.

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MESSAGE

I am happy to learn that Assam Engineering College is celebrating its Golden Jubilee under a central theme of institutional sustainability.

I appreciate the sincere endeavour of the AEC Golden Jubilee Committee and extend my best wishes for the success of all events, Golden Jubilee Celebration of Assam Engineering College in general and the symposium on '**FIFTY YEARS OF AEC : AN INTROSPECTION FOR GROWTH ORIENTATION**' scheduled on September 16, 2005 in particular.

(BHUMIDHAR BARMAN)



INAUGURAL SPEECH

Dr Bhumidhar Barman

The Hon'ble Minister for Higher and Technical Education
Govt. of Assam

I am delighted to be here today to inaugurate the symposium on Introspection and Growth orientation of Assam Engineering College, organized as a part of Golden Jubilee Celebrations of this premier institution. I am also impressed to note that the college is celebrating its Golden Jubilee with a theme of institutional sustainability.

As the pioneer in technical education of the North Eastern Region, AEC reflects the higher education scenario of the state. With such a perspective, the occasion of Golden Jubilee Celebration of AEC is also an occasion for introspection and growth orientation of our entire higher education sector. I do sincerely believe and hope that this initiative will stimulate a constructive debate on the future directions, focus and orientation of not only for AEC but also for our entire education system.

Pandit Jawaharlal Nehru, the First Prime Minister of India after independence saw technical education as the key to India's growth. It was due to Nehru's vision that large sums were invested in building institutions like Indian Institutes of Technology (IIT's), Regional Engg. Colleges (REC's) etc. I salute the vision of this great leader of India, the late Prime Minister Nehru, who happened to be the formal inaugurator of Assam Engineering college on 16th Jan 1958.

The journey of Assam Engineering College began in 1955 as the Assam Civil Engineering College from the Assam Engineering Institute's campus of Chandmari, Guwahati. Today, in the Golden Jubilee year, the college is producing engineering graduates as many as in eight disciplines in addition to the three post graduate courses. Also the college has undertaken R&D work leading to award of several PhDs. The number of students rose from 72 to more than 1200. Over the last five decades, AEC has grown and done reasonably well in serving the cause for which it was created. It is to be noted that engineering colleges, under the private sector, which accounted for just 15 percent of the



seats in 1960, now accounts for more than 80% of the seats of the country. However, admission into these engineering colleges is not affordable by the poor and weaker sections of the society. Fortunately, this trend has not started in Assam and we have to ensure the due attention to the engineering colleges run by public funds. This also justifies the need to raise quality of engineering education in our country by reducing the gap between the IITs and state run engineering colleges. Our government will move to the central government to this end and demand a special package for the AEC and JEC. I am sure the 'Golden Jubilee Projects' and the deliberations of this meet would be useful for preparing a comprehensive package for pursuance to the Centre. Process for filling up the vacant posts of teachers are already on with the advertisement by Public Service Commission and appropriate steps would be taken to meet specific the need. Encroachment of College land also will be firmly dealt with.

From infancy, Assam Engineering College has entered to a phase of maturity, with more responsibility on its shoulders. Engineering is the application of science for practical purposes; the purposes are for wellbeing of society and people of the state and the country. Apart from class room teachings, the college has to play a vital role for productive use of local natural capital or for management of natural hazards endowed to the state.

Based on a firm foundation, I hope AEC will be able to face of the winds of change and competition. Significant changes in engineering education will be required if we are to meet the needs of our graduates in preparing them for the challenges of the coming century marked by globalization and changing world economy. The technical environment into which engineers will emerge in the next few years will be characterized by knowledge-based industries and knowledge-based economies, which are directly based on the production, distribution and use of knowledge and information. Information and knowledge are replacing capital and energy as the primary wealth-creating assets. The institutes of higher education, carries out key functions in the knowledge-based economy, including knowledge production, transmission and transfer. You may be aware that our Hon'ble Prime Minister Dr Manmohan Singh has constituted a 'Knowledge Commission' to advise the prime minister on how India can promote excellence in the education system to meet challenges of the 21st century. The 'Knowledge Commission' will cover five areas, which include increasing access to knowledge for public benefit, developing new concepts of higher education, and rejuvenating science and technology. Education being in the concurrent list, we have to work in the similar line in the context and interest of the state.

The kind of education which universities can provide will definitely affect the development of economy and the development of the state and the nation as a whole.



Thus our development should start from the preparation of human capital through education. The higher education fraternity, government and intelligentsia will have to initiate concerted effort without further delay for formulating appropriate policy measures for linking the state's higher educational institutions cum scientific establishment with the state's agenda for sustainable development. This is crucial for sustainable management of unemployment in one hand and for productive utilisation of the employed manpower on the other hand. I believe such an effort will help to attack the root causes because of which many of our premier educational institutions are crying for survival not to speak about the intellectual leadership they are supposed to provide.

Achieving a sustainable future will not happen unless our educational system graduates citizens and specialists who understand the interconnections among the environmental, economic, and social disciplines. We have to ensure that the interconnections between the environment, economy, and social structures become an integral part of formal education. We have to design and support opportunities for integrating the concepts and principles of education for sustainability into formal educational programs from early grade school through the university level. How we meet the future is in our hands. Education for sustainability provides an opportunity to craft the future we want for a sustainable Assam and India. I intend to formulate a policy for incorporating sustainability into our educational institute. Educational change cannot follow purely from governmental mandate. It is the responsibility of all teachers to increase the awareness, values, skills, and understanding needed to create a just and sustainable future. Let us resolve it on this historic occasion of Assam Engineering College.

With these words I inaugurate this symposium and I wish your endeavour all success.

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ASSAM ENGINEERING COLLEGE – A VISION FOR DEVELOPMENT

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Background

Assam Engineering College (AEC) is the first technological institution in the entire north-east, established in 1955, for imparting the degree level education in engineering. Later in 1980s it had started post-graduate programmes also in a few specialization. Through the deliberate policy of the State Govt. and the nation building objectives of all such institutions in formative years of independent India, the college had served the entire north-east as well as other states through their quota for admission. Until beginning of 1980s it was doing quite well, but later faded and lost its glory for various reasons. No doubt, Jorhat Engineering College (JEC) and Regional Engineering College (REC) Silchar, now NIT (National Institute of Technology) had their bit of pull, and therefore, had to share in the overall demand of the region in degree level technical education. During this time the demand for additional capacity in technical education grew tremendously along with newer disciplines like computer science, electronics, information technology, instrumentation etc. Most of the Indian states expanded their capacity and modernized the system while the north-east missed this vision, and some of the southern states today have about 300 colleges for engineering education with modern disciplines. Actually, the political instability in the state, insurgency and bankruptcy during this demand surge, all of which had severe blow in the state's education system in general, and particularly on a college of professional education, which created a big vacuum. Even today AEC enjoys a special status in the state as well as in all the north-eastern region in all sense because of its pioneering role in technical education in the entire region. In view of its attractive location in Guwahati, the gateway to the north-east, it could easily be another NIT if it would have been a vibrant Institute. Alternatively, the state could propose it as a Deemed University under the scheme of University Grants Commission (UGC). But due to the continued lack of vision and objectivity, it suffered repeated setbacks during last two decades or so. The infrastructure, faculty excellence, academic vibrancy, etc do not show it as a five-decade old institution. The following sections outline a set of prescriptions to revitalize AEC as a premier technical institution in the north-east region of the country.



Autonomy in Working

Academic institutions around the world, wherever it is, if under strict control of the government, have never performed well. Therefore, the first and foremost requirement is to release it from the shackles of the government bondage in stricter sense. Full autonomy with government rules made applicable, as in case of IITs, Central Universities, etc. is the only way to make a change in the working environment. Autonomy should be provided in all aspects of running the college in terms of admissions, recruitments of faculty and staff, development policy, etc making it fully responsible for its expenditures and accounts. However, the overseeing by the government shall be there always as it is there in case of IITs and Central Universities also. The present arrangement does not allow even the sincerest and the most honest ones to work at the competitive pace of present day requirements. Moreover, totally regulated environment does not have room for rewarding innovations. The state government channels for processing anything is tortuous, hierarchical and very clumsy, and it takes so much time that nothing is possible to be done in competitive time frame. Due to this, even a dedicated worker is also demoralized in no time to make him a dead wood in the long run. Of course, under such situation, normally the smarter ones will migrate to better and liberal environments. Governments generally have an unfounded inhibition that without the full control the college will not be possible to be run or will be mismanaged. In that case, there should not have been IITs, IIMs or any private Institution existing. Today, in India, some of the best institutions of technology, science and arts are flourishing under private management.

The proposed autonomy shall provide the fast decision making at all levels. Such examples are there all around us and it should be adopted by enactment in the State Legislature or by an ordinance. The most important of all is the financial autonomy. The Administrative Officer or Registrar shall be the DDO (Drawing and Disbursing Officer) and submit all accounts to audit and AG (Accountant General) as it is being done now. All policies and plans regarding recruitments, infrastructure developments, and other budgeted expenditures etc should be managed by the college only with financial allocations from the government. There is nothing new in it and such systems are operative in NITs also where the management body includes a member from the State Finance Ministry. This means empowering the college to manage itself; but does not mean that government's contribution in the budget and expenditure will reduce. The college may, of course, be allowed to earn through sponsored research and consultancy services, and such receipts may be maintained in a special fund for infrastructure development and maintenance, the expenditure from which will be authorized by an Empowered Committee only. This autonomy will facilitate for the college to regain its glory again and it is quite likely that it will fly on its own wings.



Development of Teaching and Research Laboratories

The laboratories are to be developed, modernised and upgraded continuously for imparting latest knowledge to the students. This is not easy and comfortable as the funds are not readily available. Even the best institutions like IITs starve of funds in this respect. However, there is no shortage of the sources of funds to accomplish this. The only requirement is to project the proposed development realistically and prepare the proposals for funding by various funding agencies. For colleges like AEC there can be funding of such proposals from AICTE, MHRD, DST, NEC and so many other ministries of state and center as well as industrial organizations. However, the funding agency will scrutinise the credibility of the proposer and the institution where the facilities are to be developed. Every year such proposals are funded in large numbers, and therefore, separate proposals can be submitted each year for different existing laboratories and new laboratories. North-Eastern states enjoy a special status in the central government's policies, and it is believed that AEC can be benefited much by pursuing an intense programme in this regard. Further many industrial houses would support teaching and research laboratories for a name to be attached to it. Of course, the state government has to allow this to happen by loosening its bond and control.

Maintaining High Academic Standards

It is neither simple nor easy. It is very easy to loose the academic environment by not adhering to the higher standards. Those who are to promote and guide the college in this regard are the faculty. Each of them has done good research and as a result of that only they are taken in to their position. But, for not pursuing the same in later years may lead to decay, and majority appears to suffer from it. The students are with full energy and enthusiasm; a small idea given to them will be brought to full bloom in no time. Of course, each good thing to happen requires some kind of sacrifice however small it may be from both faculty and student. Therefore, it is necessary that faculty maintains a very active profile invigorating the young minds with ideas and associated work assignments which ultimately creates the academic atmosphere in the institution. If delivering the lectures and engaging the practical classes are the only engagements of the teachers, that is not a professional college. Limiting one's involvement to classes only will not only damage the academic environment, but also one's (teacher's) potential to grow and excel. As far as possible, a professional college should be fully residential for both students and teachers for maximising their time to professional build-up, which in turn provides the academic environment for excellence and high standards.



The fully residential status of the college was lost due to poor and insufficient infrastructure facilities, and both students and faculty opted out of campus status. A complete refurbishment as well as upgradation and expansion of the capacity in hostels and faculty accommodation in the campus is required to attract them back to campus. Also, the campus must have all the basic amenities of life such as sports facilities, entertainment and shopping facilities. Further, the Guwahati city being not so large and Maligaon/Pandu located in such proximity, the distance is not at all a deterrent to live in the campus. It is the deteriorated condition of all infrastructure without any attention for their upkeep for a long time which has been the main reason for the actual stakeholders' dissociation from the campus. It is not the academic curriculum alone which makes the students good engineers, a majority of the things required for successful professional career is learnt by living in the campus. This point need not be over emphasized, as IITs, IIMs and other similar Institutes in the country are the real examples of it.

Human Resources Development

No matter how well the laboratories are equipped and how often the infrastructure upgradation is done, nothing can be achieved without dedicated people in the faculty and staff of the college. Like all others, human resources also must be continuously modernised and refurbished. This means training and retraining of faculty and staff about the latest tools and techniques are required. More importantly, they are to be exposed to other similar and better institutions from time to time for sharing the ideas as well as to develop collaborations. The money and time spent on this are never a waste. During the early years of the college dynamic HRD policy was pursued through deliberate government policy on training, but in recent decades this was neglected on the pretext of shortage of funds. At present, the facilities available within India or even within Assam are tremendous, and upgradation of human resources is easy. Mobility of faculty and students for academic and co-curricular activities are of great importance for overall professionalism. It is believed that with the proposed autonomy the faculty must be able to sharpen their knowledge and skill by venturing into the new areas and new techniques through wider participation in activities outside campus. However, it must be clear that human resource alone of an institution cannot be developed or upgraded in isolation without associated developments in all other fronts..

Infrastructure Development and Computerization

The infrastructure of the college has grown old over the years and marginal enhancement and very little maintenance have been possible. Just like the saying, "... a healthy mind lives in a healthy body", infrastructure happens to be the most basic requirement for a healthy institution. However, lavish infrastructure certainly does not guarantee vibrancy



of the institution. It is the quality and upkeep of infrastructure and quality of human resource, which is supposed to put the facilities to use, characterize the institution. It is not that huge fund is required to maintain infrastructure, upkeep and maintenance are simply the reflection of organizational culture and attitude. No doubt, there is shortage of funds that can be provided for this by the state, but there are other avenues to generate resources for this as well.

Modernization of other infrastructures like computerization, LAN/WAN with internet facilities, advance softwares, etc are equally important. For example, the library and computing facilities are key infrastructures for a modern and vibrant academic institution, and there is no compromise possible. In the matters of library there can be collaborative efforts and programmes with other institutions in the city as well as in the region through established library networking methods. Even for these developments there are funds available with various central agencies which are to be tapped. Even multi-lateral agencies like the World Bank or Asian Development Bank and other international agencies also can be sourced for quantum jump in the provision of such infrastructures. A large scale computerisation is likely to change the overall working culture in the college. Of course, there has to be simultaneous capacity building to sustain such change within a specified short duration. However, it must be remembered that such developments are to be backed by a policy of open mind and equity for all classes of users across the board to have the best results.

Academic and Research Programmes

An academic institution is known for its academic and R & D programmes. These are to be refurbished from time to time depending on the requirements of the profession. To carry out such changes in the curriculum and also in the R & D activities of the college, the autonomy in this regard will be required. While the university has delegated a lot of its responsibilities to the college, the true academic reforms may take very long to come by through the existing procedures. These reforms only keep the students and teachers motivated to innovate in their spheres. A deemed university status may provide a lot of academic freedom to the college, but there must be systems put in place which will safeguard against dilution. It is always advantageous to hand-hold with reputed national or international institutions to remain in the currency of the latest developments in the professional fields. Thus, AEC can easily network with IIT Guwahati and other national level institutions in the eastern part of the country.

The college should formulate a set of guidelines to carry out consultancy works for the practical problems of the Government organisations and private industries. Experience of faculty and laboratory staff provide very important input to the teaching done by the faculty and laboratory staff. This also indirectly maintains the tempo and interest in the



new knowledge. Academic and R&D freedom along with the flexibility of operation sharpens the faculty skills in the business development and entrepreneurship. Participatory R&D with linkages to industry also can provide lot of incentives to faculty and students, and simultaneously change the future of an academic institution like AEC.

Conclusions

The absence of a regular (appointed) principal for quite sometime had its impact on the steady development and sustenance of the college. Also, the low faculty strength for many years due to recruitment policy of the state government had serious adverse implications on the academic programmes delivered under stress. Resource crunch of the government had many other restrictions even on the normal activities for very long period which led to degeneration. To position AEC as a premier technological institution of north-east, taking up the journey from the present condition, there has to be a grand vision of refurbishing almost everything. In this century, the economics has been redefined as that of knowledge and intellectual capital. Therefore, high level of intellectualism and competitiveness is required to make any meaningful existence, even for a college like AEC. And for that, sharp decisions and timely actions are the only "mantra" for survival. It is not the shortage of money or resources which hold us back, but the lack of initiative and clear vision. Let the successful industrialist and wealthy alumni of AEC flourishing in their respective fields in India and abroad contribute generously to a corpus to realize the collective grand vision of Assam Engineering College.



REVAMPING MY ALMA MATER AEC- FOR THE TWENTY FIRST CENTURY

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Since its inception, my alma mater the Assam Engineering College (AEC) made signal contribution in producing top-grade technologists in different disciplines of engineering, who did serve creditably not only Assam and India, but also the most developed nations of the world as well. However, the time has come now to overhaul and revamp the old set-up to meet the growing demand of the Twenty-First Century.

Unlike the students of national level technical institutions such as the IIT and the NIT, the AEC products not only belong to Assam but also to a large measure serve their home state whenever an opportunity comes their way. At this juncture, AEC has to play a pivotal role in spearheading a long-awaited economic break-through by producing bands



of highly - skilled as well as deeply motivated technologists in service of lowly - developed Assam and the North East Region of India.

In the above context, AEC urgently requires all-round radical transformation in the spheres of administrative set-up, academic orientation, infrastructural facility, service conditions and faculty strength, research initiatives, institute - industry synergy etc. As briefly indicated earlier, AEC has to primarily focus on imparting advanced knowledge-based education for solving on the ground the emerging as well as the chronic issues and problems having direct bearing on development of Assam. Some of these prime issues are-

1. Water resources development of the Brahmaputra basin which will include river management for stream bank erosion and flood control / flood - plain management, water - budgeting for long term perspectives, storage creation etc.
2. Development of modern irrigation infrastructure to cater for desirable intensive agriculture with high cropping intensity & high crop productivity for ushering in Green Revolution in agriculture.
3. Development of an extensive network of river navigation and inland water transport in the Brahmaputra and its numerous tributaries for facilitating highly cheaper bulk carriage of goods to nooks and corner of NE Region.
4. Earthquake hazard reduction through in-depth scientific analyses on seismology, structural dynamics and liquefaction potential zones in NER.
5. Cost-effective highway development & maintenance technology suitable for high precipitation zones in hills & plains and periodic flood submergence scenario in Assam.
6. Wetland development & management for conservation of biodiversity, off-channel flood storage capacity, ecological balance and for enhanced production of fish & other aquatic resources for livelihood & for meeting indigenous requirements.
7. Research & Development on cost-effective small hydro technology from hilly streams and possibly velocity - head turbine power from the main stream Brahmaputra & the major tributaries.

Complete revamping and overhauling and augmentation of the current AEC frame - work is a must for reconditioning it to fulfil its desired role as one of the prime - movers for regeneration of Assam's stagnant economy. Obviously, such an ambitious objective will call for a well - thought - out comprehensive blue- print, evolved through brainstorming by all concerned so as not to overlook even any small important grass-root detail. However, some general suggestions are presented below to initiate the matter.

- a. To revamp and augment the curricula and the syllabi of the undergraduate and postgraduate programmes to required depths with an emphasis on requirements for Assam which may also be in conformity with that of the country.
- b. To put in place compatible state-of-the-art infrastructure to back-up the new curricula appropriately.



- c. To attract and retain required faculty through vastly improved work environment and service conditions.
- d. To promote consultancy services by the faculty and generate resources for development by retaining a portion of the consultancy charges for the institution.
- e. To promote vigorous R&D activities by the faculty especially on the specific problems of Assam, in collaboration with other institutions of the country/abroad if required.
- f. To induct experienced technologists as Visiting Professor, Emeritus Professor, Adjunct Professor, Honorary Professor for enrichment of the curricula and the faculty strength.
- g. To associate the students appropriately in the consultancy and the research project activities in the form of Ph. D. / M. Tech. theses, term paper, project paper etc. or even as student – assistantship in whatever manner becomes feasible.
- h. To explore and promote faculty and student exchange programmes with premier institutions of the country and also from abroad.
- i. To convert AEC into a fully autonomous technical institution with requisite administrative, financial and academic powers for realization of it's newly – chartered course without any hindrance.

The Twenty-first century is now all poised to bring about rapid technological revolution world-wide. Not to be left out from this fast emerging scenario, AEC genuinely beckons radical transformation as briefly spelt out above to play the role of a catalytic agent for development of Assam and NER. To move forward with the rapidly changing times, AEC needs to be completely unshackled from its antiquated set-up, and there-by trigger its fast racing ahead with a new incarnation for betterment of the underdeveloped Assam/NER, which is lying practically unattended in a far flung remote corner of our great Indian State.

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A ROAD MAP FOR DEVELOPMENT OF ASSAM ENGINEERING COLLEGE

Dr. P.K. Bora

Former Professor and Head
Civil Engineering Department
Assam Engineering College

My thoughts on the development of Assam Engineering College are presented here in response to a request from the organizing secretary of the Assam Engineering College Golden Jubilee Committee. These thoughts constitute an outline of the way the college may take in the pursuit of excellence.

1. The Assam Engineering College should excel in undergraduate and postgraduate studies and research activities to be able to get a 'deemed university' status with suitable autonomy. In doing so, the college should follow an already established institute of repute as a model.
2. To take care of the academic, financial and administrative aspects three bodies should be formed each having a tenure of 5 years. The committee looking after the academic aspect should review and renew the curricula every 5 years. The functioning of the bodies should be free from political interference.
3. The minimum tenure of a principal should be 5 years. Seniority should not be a criterion for selection of the principal.
4. Funding of the college may be from various sources e.g. state government, central government, project fund secured by teachers, consultancy fees, students' fees etc. Admission fees of students, monthly fees and examination fees should be enhanced to make these a significant source of income. The Tezpur University model may be adopted for this purpose.

The boundaries of the college land should be well fixed and secured. Parcels of land and water bodies which are not needed for use in near future may be rented or leased out. This would create another source of revenue.

5. Computers, LAN and the internet should be extensively used for routine activities of the college.
6. The number of employees should be minimized. The IIT model can be followed for this.
7. The AICTE (All India Council of Technical Education) norms or any other suitable norms may be followed for periodic self assessment of the college and its different departments. Provision should also be there for evaluation of teachers by students.
8. Admission of students should be limited to the physical infrastructure available.
9. For spelling out undergraduate and postgraduate curricula, committees which should function as 'vision committees' should be formed. The curricula so chalked out should be placed for consideration by the body looking after academic matters.



10. The undergraduate and postgraduate curricula should be rationally integrated.
11. The working period should be a minimum of 240 days per year. Additionally there should be at least three months of industry experience for every undergraduate student.
12. Teachers individually or as a group should take up R & D (Research & Development) activities.
13. A suitable person should be employed to act as officer-in-charge of students' placements. The person should also be a career adviser for the students and develop college-industry interaction.

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P.S. In preparation of the article help has been taken from various sources, a list of which has been omitted here for the sake of brevity.



A FRAMEWORK OF INTROSPECTION AND GROWTH ORIENTATION FOR AEC

Dr Atul Bora
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Assam Engineering College

Today, technology is changing in a fast pace and the world has become a global village. Under such a backdrop, whenever the question of AEC's achievements and failures over the last five decades arises, the following framework comes to my mind. AEC is basically an undergraduate college where teaching is predominantly text book specific. Many a times, teaching becomes lecture notes-specific, due to lack of proper library facilities. Yet, the overall training or the ABC of engineering imparted at AEC is still adequate for providing basic services such as safe drinking water, drainage and sanitation system and creating a sustainable infrastructure.

The post graduate level study at AEC started with introduction of ME course in Watershed Management and Food Control in 1977 followed by another ME course in Soil Mechanics & Foundation Engineering in 1988. History of PhD level research is only a few years old while the post graduate courses in the Department of Electrical and Mechanical Engineering have just begun. Thus evaluation R& D work at AEC with respect to the technological advancement in this era of globalization will not be fair. The works and the initiative taken by the then teachers of Civil Engineering Department for introduction of ME courses and PhD level research is really praiseworthy and commands respect from core of my heart. Also the courses chosen for post graduate studies are very relevant for our sustainable future.

The analytical framework of problem solving that an AECian finally takes after four years of stay here is the net asset for him. Such analytical framework is imparted in many apparent forms; starting from 'projection of straight lines' in a drawing class of first semester BE class.

As regards growth orientation, AEC will have to make a research agenda taking into considerations of hundreds of local and regional problems. A clear understanding and debate is needed about our overall institutional objectives, and how it is linked to our individual carrier along with the state's wellbeing. In other words, we have to come out with a vision and missions that are consistent with the state's vision and mission for sustainable development. Thus we have to incorporate sustainability principles and framework while designing course curricula and research objectives.



With an applied research orientation, project proposals have to be formulated to attack the problems. The intellectual inputs have to be taken from retired teachers and other experienced alumni working in corporate and other institutions. Collaboration with other institutions has to be made for cross disciplinary research. All these will also help to retain the teachers in the department and college beyond lecture periods. Everyone will enjoy applying theoretical knowledge into practical problems which will bring a sense of accomplishment and worthiness in the value system. Also, people engaged for production of engineers should at least be provided an independent cabin with minimum amenities to spend time beyond class lecture periods.

Reforms that can be done at the department and institutional level have to be done first rather than waiting at Governmental and university level. This does not mean that reforms are not needed in our overall educational policy. Competitive environment have to be created among the students, with an exposure of a broader dimensions of the subjects they study.

Over the last fifty year AEC has produced nearly seven thousand engineers. Although 7000 engineering brains are a huge force, it is a too small in terms of percentage of people involved either in the elementary or in the other non technical education system. An awareness of Government policy on higher education in general and technical education in particular is also important for our strategic growth orientation. Unless we take into account professionalism, it will be very difficult to face the winds of change towards private engineering education, having serious implications.

Professionalism has to be introduced in many areas. To cite an example, we do not even have a full fledged telephone and e-mail directory. As the organizing secretary of AEC Golden Jubilee Committee, I had to face lot of music also because of lack of a data bank of the greater AEC family. This reflects our weak linkages and interaction to the outside world as well. The college neither has a prospectus with a brief outline of the college history for newly admitted AECian, nor a full fledged web page for presentation to outside world. On the other hand we undertake debate in public forum about the birth date of the college after being indifferent in all forms, for long five decades!

The consultancy services have to be taken up in a professional manner with adequate exposure of our existing capacity to the prospective clients. Employment generating and need based short courses right from computer education to other entrepreneurial activities has to be started. We have to present our organizational and departmental strength by all possible means. Unless we take these steps, AEC will be an isolated system from the main stream which will be a state tragedy. The future is in our hands and we have to fight it under the theme of institutional sustainability.

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AEC: BUILDING INSTITUTIONAL IMAGE

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Introduction:

Assam Engineering College (AEC), the premier institute of Engineering and Technology has been the epitome of hope, aspiration, contribution and promise of the state and the whole north-east in the field of Engineering and Technology since the middle of fifties when the whole north-eastern zone was in desolation in technological education. Established in 1955, AEC has been marching ahead and its Golden Jubilee Celebration has been celebrating since January 25, 2005 with a year long programme. Since beginning, it has a sincere commitment and glorious traditions of contributing immensely to the development of the whole north-eastern region in particular and the nation and abroad in general. It has become now quite imperative for AEC to make continuous efforts to achieve excellence in its programmes imparting education, doing research and other activities and at the same time project its strengths and capabilities and thereby build image at the regional and national levels. All the concerned namely the persons that were/are associated with AEC i.e. the head of the Institution, faculties both retired and present, pass outs, students, other employees, alumni, the user agency, society, industry at large, appreciate and recognize the work being done by the institution which in turn will help the institute to get better inputs and improved facilities for better output. A good institutional image building is very essential to ensure good opportunities for its pass outs as well as promote Internal Revenue Generation (IRG) through consultancy, continuing education and other services.



Some essential points for building institutional image:

In this context, the following are some points to be kept in mind for projecting and building an institutional image for the institution like AEC.

The impressions projected outside about the achievement and capabilities of AEC by its faculties, ex-faculties, students and ex-students, alumni and their parents carry a lot of weight.

- Forums such as staff association, student association, alumni association, parent-teacher association, teacher-student association, college all-round development association etc. play an important role in projecting the image.
- Participation of the faculty, senior student in work-shops, seminars, conferences and some other programmes organised by professional bodies, societies, industry, government and some private agencies will help a lot to demonstrate the strengths of the institute and general goodwill.
- Use of the facilities of international and national journals to publish research papers by the faculties, use of the mass media like newspapers, radio, television etc to project the facilities, research, activities, innovations, achievements and future plans for the institute will focus in building the image of the institute.
- Emphasis on Technology Transfer (TT) which is distinct steps of invention, innovation and dissemination, should always be there in the institute.
- Technology Watch (TW) which is a mechanism to keep abreast of new technologies that are being developed continuously in different parts of the globe, is another important point of image building.
- A strong training and placement cell which should have well connection with different reputed firms and companies is necessary and pass outs should be groomed according to the need of user agency. This is an added image building of an institution.
- A course on Entrepreneurship Development Programmes (EDPs) is necessary. This may help in motivating few passout to become very successful entrepreneurs and eventually it builds the image of the institute.
- Quality, work culture, research and development, dedication of faculties of all IITs have built the highest institutional image building in national and international level. If AEC could follow their work-culture, dedication and R&D works, it will definitely build its required image as a state engineering college.
- A regular investigation of SWOT (i.e. Strength, Weakness, Opportunities and Threat) and its corresponding actions that are essential to be taken in time help to maintain the image of the institution.
- Internal Revenue Generation (IRG) by way of providing extension and support services like consultancy and testing, continuing education, open house programme, research and development support for the industry and community, training to the unemployed youth in computer and other vocational courses by



the experts of the institute etc can play an important role in building institutional image.

- It is essential to organise special functions to make the achievements of faculties and students. Institute must invite eminent persons to participate in specific programmes and activities. It is always advisable to encourage the faculties to get involved in research activities and publish research papers in reputed journals. It is also essential for faculties to get involved in various state and national level committees, in conducting open houses and exhibitions etc. All will bring pride to the institute.
- Total Quality Management (TQM) plays an another role in institutional image building. Institution must strive to become leader in importing top quality technical education and it must demonstrate its commitment through proper actions. Everyone in the institution must understand that TQM can make a difference, which can make an improvement in their lives and careers and as a whole image of the institute will surely improve.
- Another point to be noted is the management culture of the institute i.e. the ability of the head of the institute to motivate, co-ordinate, lead and make others work as a dedicated team will often determine the quality of performance of the institution. Good management can produce extra-ordinary results to build up institutional image.

Industry-Institute Interaction (III) or Academy-Industry-Partnership (AIP) is another real need for institutional image building. Technical Institutions are some system where the input students are converted to output after completion of study. Since the industries are direct customers of this output student must satisfy the needs of industry. Accordingly quality and quantity of this output should be produced keeping in view of the demand of industry. This arrangement of producing output as per need enhance the image of the institute and this is only possible through active AIP or III.

Conclusion on AEC:

Institutional image building is thus a responsibility of each and every person associated with the institute. The quality students and faculties and their teaching sincerity and dedication, courses offered and their curriculum and syllabi, performance of pass outs working both in state, national and international level, support of management, leadership of the institution, annual placement position, visit of reputed organisations and companies for campus interview, discipline and dedication of students, representation of faculties and students in different fields like research, innovation, recommendation of AICTE in national level etc are all needed in a large measure for enhancing the image of the institute.

Considering all the above points with reference to AEC for building institutional image it may be seen that the institution has offered 8 branches of engineering in



undergraduate level, 5 P.G. courses, 2 in Civil, 1 each in Electrical and Mechanical Engg. And 1 in M.C.A. Ph.D. research in 2 major fields in Civil Engineering started since 15 years back producing so far 10 Ph.Ds. Other branches like electrical, mechanical and chemical have also started guiding Ph.D. scholars now. Research papers that have been published in reputed international, nation journals, conferences etc will also be in hundreds. All the faculties are having their P.G. degree, many of them are doctorate. Thus academically AEC is quite sound. AECians in their professional and academic lives in state, national and international level have been doing quite commendable performance in the fields of teaching, research, administration and field works. Thus we all feel proud to be AECians. Placement cell in AEC has improved lot. Thus it has been observed that major points required to build institutional image have been fulfilled by AEC.

It is sincerely hoped that AEC will very soon come up with all the qualities in building its institutional image to stand on the fore front of Engineering Colleges of the nation.

Let AEC prosper to our expectation.

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DEVELOPMENT STRATEGY FOR THE FUTURE OF THE ASSAM ENGINEERING COLLEGE

By Prof. S.D.Phukan.

Retd Adviser NEC, Shillong

The Assam Engineering College, Jalukbari, is celebrating its golden jubilee this year. The college has ample reasons to be proud of her products who are governing the technical scenario of the whole of the North east. It is however surprising that such an institution is currently devoid of many facilities normally available to such institutions. This has retarded the development of the college in growth of infrastructure, creation of academic environment and provision of facilities for the staff and students. As a consequence, whatever growth has been achieved does not appear to be fully rational.

This article offers some suggestions for reshaping the development derived from experience in such situations elsewhere.

Any institution to develop, needs to follow certain policies of development. These policies enable the planners to fix their objectives. These objectives, in turn, help to generate a perspective blueprint for use. Without such blueprint, progress becomes non uniform and there is a tendency of the institution to move towards mediocrity.

In case such a strategy is not available for an institution as in the case of the Assam Engineering College there are still ways to reshape such institution and accommodate the up to date progress in the overall revised plan of development

Peter Drucker, the famous man on management once commented on Development thus I at least do not learn from mistakes. I have to learn from successes.

The obvious reason is the time required for locating and analyzing the mistake and the refitting exercise of the corrected component.. This also drags back the progress of any unit of development by several years and in the institution, it harms the students, the teachers and spoil the academic environment and therefore is not desirable. The concept of Peter Drucker is perhaps suitable in our situation as it saves time. When progress is galloping, we can not afford to merely stroll. This can be aptly used in formulating new strategy of development of the Assam Engineering College.

A second point which should be noted carefully is that Development can take place from *Whole to part or From part to whole*. A Part to whole development as it is taking place at the Assam Engineering College, Guwahati can never ensure rational progress. Such progress is invariably lop sided and individualistic. It is not desirable.

The present situation at the Assam Engineering College, Jalukbari, if viewed through the afore mentioned mirrors provide us with clues that will enable the college to develop properly.

If we consider the following issues



- (a) Infrastructural Development.
- (b) Shaping academic atmosphere.
- (c) Amenities for students and teachers

and try to analyse the case of the AEC we find that as one of the basic issues, it can be inferred from analysis that the infrastructural development of Buildings, Roads, water supply and Sanitation etc. of the AEC are totally ad-hoc. There was almost no interaction between Construction Engineers, owner and architect at the time of construction as well as planning of the AEC. This led to the absence of Boundary wall, absence of coordination of different buildings and Road construction. The omission of Architect's effective participation in the development process appears to be one of the main reasons of this. AICTE recommends minimum space requirements. Details of facilities to be provided are to be worked out. This was unfortunately not done.

Shaping the academic environment is one of the most important factors for proper all round development of an institution. As most of the persons in PWD Assam associated with the development of the college along with some staff members who were more familiar with the Bengal Engineering College, Sibpur it tended to shape as a role model of the AEC. The planners of academics had to confine themselves with all the restrictions faced in a state college. No room for development was left out. AEC acquired this disadvantage due to the above reasons. The I.I.T. at Kharagpur was developing almost at that time and taking the I.I.T. as a model in shaping the academics of the AEC would have improved the situation. People with independent academic mind would have done better. The confinement syndrome even forced many to oppose the continuous system of assessment of students before it was introduced. There are instances galore but we are not to discuss these today as they are not relevant.

Development of Workshop and laboratories along with the research faced the same plight. For several years, laboratories and workshops did not improve at all giving a terrible setback in the general progress of the college. Along with the development of major infrastructure for studies and research many associated facilities like copying, projection, electronic application etc did not take place as anticipated. It is for this reason that a well functioning Consultancy Cell is yet to function at the AEC.

Considering provision of amenities for staff and students at the AEC, the least said is better. In important institutions like the I.I.Ts the students too possess the experience of staying in tents at the start of the construction programmes but, in case of the AEC none of the hostels ever had the full facilities of Board and lodging in the hostels. The Constructions were invariably substandard. Surprisingly perhaps when money was fully blocked by the government some prime land needed for the development of the AEC was doled out to the Police Department. The Police department perhaps was blessed with more of government grant, they have utilized the land full, but the college has permanently suffered the constraint of future expansion. Nobody, having any idea of developing an institution would have done it.



The transportation of students in and outside the campus, communication facilities like telephones, absence of a planned market, a flimsy insider-outsider barrier have not allowed the campus to develop properly.

The next point which needs to be properly discussed is that the AEC developed from Part to whole whereas, good institutions normally develop from Whole to part. The aftermath is the absence of a master plan, a good Boundary wall, boundary encroachment, property grouped quarters and what not. The planning from whole to part which invariably leads to a better situation has enabled for example I.I.T.(G) to venture a centrally air conditioning project where as the AEC is yet to see a single such small unit operating in the campus. The Direct central assistance schemes which are only allowing development from part to whole are to some extent crippling the development of the college. AEC may boast of a few computers in a department but is devoid of a centrally operated computer centre. We shudder to think about the end objective of producing a student in an institution. Why then the facilities differ so much? A junior faculty member of the I.I.T. is entitled to two free telephones. We in the state colleges waited for long thirty years and did not possess even one. Those who are assessing the requirement must have gone wrong somewhere.

The Government of Assam who has established the AEC must in no case shrug all the responsibilities of rearing it. The fund must be arranged and planning must be revised. Sadly enough, the Government of Assam never tried to solve even a small local Engineering problem through the state Engineering colleges. A few case studies offered in slip-sod manner does not do any good to a college. Taking advantage of the existence of greener Pasture, many of the qualified staff members of the State Engineering colleges crossed over to the IITG only because facilities differed. The Government must take responsibility of such a situation. Why could not we think of developing a Corpus Fund to take care of the financial handicap?

There is still time to develop the Assam Engineering College to a specific elevated standard. The basic objectives of development need to be revised and refixed. The planners must fix up the trend even *ab initio* in some cases if necessary and act firmly.

Quoting from Kalidasa's *Meghdoot*, we must not allow Assam Engineering College to reach a stage *SAPE' NASTANG GAMITO MAHIMA*.

Revival has become necessary. All concerned- The students, teachers, staff and workers must spare a concerted effort. We will succeed.

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AEC BY 2025 - A NORTH EAST GIANT OR PYGMY?

By Dr U.K. Sarma,
Ex-AECIAN, & Teacher at AEC (1963 -1990)

Introduction:

The AEC was established 50 years back with its mission and vision statements. It is the premier technical college in the entire NE. AEC campus- its picturesque location with Deepar Bill in front and Jalukbari hills at its back and its majestic buildings, stand even today as very grand. Every one of the stakeholders witnessed the fulfillment of its visions (initial commitments); reverberations from every nook and corner of NE will speak the glory of AEC. Literates like Saurav Chaliha, Silabhadra, Deben Acharya, Phukan-couple are produced here. Its products are leading many big Indian industries of repute. It excelled in games and sports and cultural events. Few brilliant ex-students topped in academic achievements even in foreign universities (like Imperial College of Science and Technology, London). Entire NE feels proud of AEC's contribution to the society. The AEC was a giant in various fronts and had a glorious past.

But this "Ivory Tower of Excellence" is invisible not only from far off places of India but even from the peaks of entire North Eastern Hills. People say, " It seems the Giant AEC reduces to a pigmy". We the alumni are shocked to see this state of our alma mater, to whom we owe our bread and butter, a descent living and a position in the society. The



entire NE people cannot afford to see this giant as a pigmy. It is a matter to rejoice that AEC Alumni Association and the AEC staff are trying to lay a road map of our vision of AEC-2025 to revive it to grow to a giant. This 'road' is not an easy ride to paradise but treacherous; it demands a great futuristic view with dreams, reforms and management. Let us put all our heads and hearts together to make it a success. Human mind is like a parachute; it only works after it is open. The year 2025 is only 20 years from today; it is a very short time for an academic institution whose products (graduates) face a gradually reducing half-lives. Engineering profession is changing its hue and color from handbook engineering, to today's societal engineering through scientific engineering. This new society is a knowledge-based society where knowledge is power, the capital of 21-st century. Knowledge creation and knowledge deployment is the key for development. In this paper, missions and visions of AEC (as per the author's views) will be indicated and necessary steps to bring it to a giant in respect of reputation, excellence and brilliance.

Mission & Vision Statement of AEC:

The AEC must be guided by its **vision** (statements describing its future expectations; what it believes is possible to attain) to produce high quality engineering under- and post-graduates to contribute to the economic and social development of the region and; and specially to provide the human resource needs of industry, business and society. (The needs of society is changing with time and place and hence 'entrepreneurship development' is also presently included in the vision).

The Missions (expressing the purpose or functions it is attempting to fill in the society and they are the tools which help an organization to stay on track and progress towards its vision) of AEC are not different from those of an Ideal Engineering College as recommended by AICTE and published in the ISTE Newsletter (Vol. XII, No. - July 1992). These are not described in details here; only few main features are indicated-

- (a) Administration and Policy - autonomy, encourage entrepreneurship, administration by a governing body, managed effectively, fully staffed with training facility etc
- (b) Relationship and linkages - networking with institutions, industry, business, professional bodies; identify community needs.
- (c) Programs - need based curriculum, learner centered education, flexible teaching-learning modes etc
- (d) Students - suitable recruitments, involvements, educational needs (various skills)
- (e) Staff - motivated to teaching, commitment to life long learning, involvement in professional activities, attaining skills for various administrative and extra curriculum activities
- (f) Physical facilities and equipments - Environment (clean, healthy, aesthetic), teaching - learning resources, equipments, buildings etc

Our road map to AEC-2025 - to make it a "Giant and the Right Type of Giant"



(in the language of Clinton in the conclave with a theme- 'India 2003: Global Giant or Pygmy?'):

The year 2025 is only 20 years from today; a lot of change in technological world is expected. We must conjecture the requirements of skills, teaching- learning methods, evaluation techniques, transformation of society from industry-based (capital and labor) to knowledge-based [in the language of Dr APJ Abdul Kalam, the President of India, in "Vision for (for India) 2020", India Today, 17 March 2003] and many of our alumni may not be lucky to see the fruit of AEC-2025. It is a Govt. of Assam College; we need to co-operate with Govt. policy and we are to define our limits. So, we must have at least four Five-Year Plans and chalk out the activities in each plan, evaluate and modify the directions in the roadmap, if required, at the end of each plan. Our future actions are aimed at enhancing the image of the institution in all respects.

(a) A **SWOT Analysis** of AEC is the immediate necessity. Strength (arising from our internal resources), Weakness (internal drawbacks or weak spots), Opportunities (helps from outside possible to tap) and Threats (external hindrances) analysis of AEC will guide our movements/actions. The Alumni Association, in collaboration with AEC, is to entrust this to a committee with a date line to submit. Guidelines may be taken from ISTE. Then this report is to be discussed and the suggestions to be sent to Govt. and AEC for necessary action. In the mean time initiation on the long felt demands of AEC to be stated and necessary adjustments/modifications will follow.

(b) **Autonomy is a must** to AEC as one principal told about the process, which hinders and cause delayed decisions- Governing Body, Govt. of Assam, University, AICTE, MHRD, Govt. of India. The institute must discuss the issues arising out of autonomous status.

A **Technical University** may be planned in view of growth of various types of institutes dealing with technical education in the region either as a separate University or upgrading AEC to a Technical University preferably in the line of UNITECH of New Zealand affiliating all technical institutions in the region – all Engineering Colleges in the NE, all Polytechnics-, all ITIs, and all vocational institutes to come up in future like Bamboo craft, Wood and Furniture craft, Building Construction, Education Technology Management, Welding institutes, Quantity and Land Surveying institutes, Management Institutes, Pharmaceutical institutes, Office System Management Institutes, Plumbing and Gas fitting institutes, TV and Video Training Institutes, Internal Decorating institutes, Computer Aided Drafting Institutes, Environment Technology Institute, Automobile Institutes, Architecture Institutes, to name a few. (this action may be differed to second plan period as it needs more time).

(c) **Research and Development-**

Various types of R&D activities- functions of teaching is to transmit knowledge and skill; where as



research helps to discover knowledge i.e. generating knowledge. It stimulates creative thinking in teachers and keep him intellectually trim and increases his interest in teaching through the use of real than hypothetical problems. It will help him to remove intellectual obsolescence and create knowledge, patents, prestige and wealth.

(1) Sponsored research projects from Govt. organizations / Industry

(2) Collaborative Research Projects mainly from Industry or few Govt Organization- a faster moving field with good economic benefit to the institute as well as to the researcher.

(3) Ph D research work- purely academic may be on some real industrial problems. The present tempo to be intensified in more areas. More Ph D programs will enhance the institute's as well as the faculty's image.

AEC is to try to open M. Tech programs in more disciplines of relevance and this will automatically give incentive for Ph D research. Some collaboration with some industry / corporations to be sought as done by DU recently. In the mean time, industry to be approached for offering some sponsored or collaborative projects. Building space and senior faculty may be a problem. Help from some experts from industry, retired professors and even alumni may be requested.

(d) **Consultancy Services:** There are qualified faculty at AEC, which can be seen from the M Tech and Ph D programs conducted with so much of odds. It is also observed that qualified teachers when recruited by renown and reputed institutions/organizations, they become experts next day. This means image of the institute is very important in getting recognition. Consultancy works may demand some equipment of the state-of-the-art technology and industry to be offered testing facility (as exists on today). A consultancy cell to be opened at AEC with groups to handle different activities and norms to be framed so that teaching is not affected and income is generated. If necessary, experts from outside may be borrowed. (At a latter stage care is to be taken such that no consultancy is done in the name of research. Consultancy is considered as third grade technological exercise. Too much of consultancy will make the institute a commercial one and then teaching and research will be affected).

How R&D and consultancy can help the society? Examples are galore. Three examples are cited here.

Once, the then Chief Minister, Mr Sarat Ch Singha came to AEC just after forming his Govt. We offered him a red carpet welcome and during his address he asked us for two helps in the interest of the society. "One - we are aware that we have to live with floods; we have flood for three months but we can grow two crops within rest nine months. I shall give you fund, please provide water to the cultivators' land.



Second - lot of our resources are flowing out of the state without retaining any benefit to our unemployed youth. Our boys do not carry man pulled rickshaws but they ply auto rickshaws. They are reluctant to carry cement bags on their heads; can you devise some mechanism to help our unemployed youth and help the state economy as well?"

Alvin Toffler, a futurologist said, "India's Third Wave sector has been a success story but based on cheap labor, it is temporary and faces threats. Technological advances only make you a giant, not make life worse for the poor"; ... First Wave agriculture was pre-mechanized, minimally productive and gave a slight surplus; The Second Wave Agriculture is though partially mechanized, fails to make lot of surplus; though Third Wave agriculture does not exist, it promises a great economic benefit with the help of genetics, lasers, satellites and computers. This is the agricultural component of the knowledge economy. ["Tomorrow's Economy", India today, 17 March, 2003].

Once, South Korean shoe companies had been forced out of business by Chinese low-wage competition. But a firm called Digital Shoes introduced smart shoes (the customer taking part in production by ordering his choice and size in a computer monitor) to fight back.

Solutions of many of our society's problems need consultancy and R&D activity. Even the local entrepreneurs need various forms of consultancy activity in project formulation and execution. We must be able to help them. We must have a consultancy cell properly equipped with expert groups and office to collaborate with some consulting firms. Solutions of grass root level problems need high technology and; which is possible through a strong R&D activity only.

(e) Virtual Learning and Digital Library: Through the three C's (Communication, Computer and Community), even schools and colleges are imparting quality education in a cost effective manner. About 80,000 books, half of the IEEE & IEE journals are already digitized and can be accessed through digital library. Interconnection of libraries and Internet facilities to each student/faculty in their hostels/quarters will open opportunity of learning and of preparation of teaching materials. This will provide best learning materials at reduced expenses.

An e-library is the urgent necessity of AEC for the development of teaching-learning and research activity. A big fund is necessary. Alumni Association may approach Govt. for a collaborative action. From my frequent visits to AEC library, I suggest obsolescence books to be removed from the library and new books to be procured. Presently, the library is short of books (both title and copy wise) even as per AICTE norms. Alumni can request its members to donate their books (not old junks); but space and furniture needs



may be looked into. Library is to be kept open for a longer duration with facilities like air-conditioned reading rooms and photo-copy facilities. Library, the heart of the institute is to be maintained well.

(f) Opening of courses in the emerging areas: New technologies are coming up, new disciplines need to be introduced and outdated ones to be closed down; as many colleges has closed EE departments. Here comes the problem of removing obsolete equipments, designing and executing new curricula, fund and faculty. It involves financial risk; but it enhances the prestige of the institute. Mr Provakar Kore, Chairman, KLES who runs 110 academic institutions in South India, opined that higher education should be paid for by the students themselves through education loans etc as Govt. is reducing the subsidies in higher education. Govt. is spending Rs. 35 lakhs to Rs.40 lakhs of the tax-payers money on each IITian, (ob course a smaller amount for AECians) and a large majority of them go out to foreign countries and they fail to solve directly society's problems. But there is softer view - they may not be considered as brain drain as they contribute to the national wealth and image. Anyway, a large part of the expenditure for the introduction of new courses to be met from students fees and grants. Some tie up with some industry/corporations may be sought.

(g) A strong Industry Institute Interaction: For the success of the curriculum, it is AEC's interest to initiate a good rapport with industry. Teachers' industrial visits, industry people's involvement in curriculum framing, project evaluation and special lectures will help a strong relation. We should try to design training programs in some emerging area and sell them to industry also. If possible, we should open some MoU with some of them to get projects, equipments and sometime to share teaching load also. It will help to arrange practical training to the students and to sell our products to industry. Curriculum to be revised for executing students' project in industry itself.

(h) Strong Training and Placement cell: Industrial training help us many ways- the students are exposed to practical field of industry and they know industry's, requirement, which will help them in job search technique and ultimately recruitment. It is very good that such a cell is already very active at AEC. It should be given all facility- a senior level faculty as placement officer with telephone, fax, e-mail, office management support and even a fund to entertain the guests from industry. One major aim of all such exercise to sell the products. Students to be exposed to the requirements of different recruiting agencies and arrange pre-viva and tests. Some tutorials to be arranged to face interview and even how to write in these tests. To cite an example- at Patwa Toli, a remote and underdeveloped weavers' village in Bihar, one student of an IIT used to spend at least two hours a day to teach learning and writing skills to some aspirant young boys for preparation to entrance examinations. The amazing result - in 1997, 13



boys got into IITs and 53 into RECs from this village. An institute's prestige is measured by the name of the big industries coming for campus recruitment, the salaries its products are offered and the percentage of students in the batch selected.

(i) **Development of scientific models** for resource mobilization (income and expenditure), for excellence / quality assurance in engineering education [multi-attribute decision model, optimum admission in different branches, optimum number of faculty, how much to spend on training]. Excellence in education depends many factors like - quality of teachers, quality of students, up to date curriculum, suitable environment of study and class room, lab and project facilities, library facilities, industrial training schemes, placement facilities etc.

Qualified faculty is the back bone of the institute (as qualified students are back bone of our nation); action is to be taken for improving the faculty position. But shortage of qualified faculty is universal. Departments are to be managed with minimum number of staff and rest to be managed by experts from outside. [This proposal is discredited by the present MHRD (Assam Tribune 6.9.05), even though it is in line of working in all universities of advanced countries.] Services of retired teachers may be sought without violating Govt. rules and AICTE norms. Teacher training schemes is another way to get faculty qualified.

Quality products are the backbone of a nation and the pride of an institution. Teaching-learning methods are to be improved to supplement the chalk and black board. Learning to be student-centered by pushing the students to library (books and internet) and project room. Evaluation is an integral part of teaching; good evaluation (number of tests, question paper setting, marking, grading in theory, labs, sessionals, project etc) inspires students for hard work. Teachers are to be trained in this important activity also. The students are to be exposed to the set norms. This will help to keep a good relation between students and teachers. TQM is to be introduced to improve in various activities.

Selection / Entrance: Tests for proper aptitude and knowledge are important rather than for information. Some improvement is done through out the life of AEC keeping an eye on the Govt.'s policy but still needs more improvement in selection of students. [NERIST policy of three Modular structure is forced to a six-semester degree because of wrong student recruitments].

The half-life of engineers are becoming shorter and shorter- 2 ½ years in computer science engineering and about 10 years in civil engineering. Curriculum in technical education needs revision at frequent intervals. The present one needs immediate change. The curriculum is to include more time for student-centered activity. Project



work to be done in industry with monitoring facility by teachers; The help of alumni stationed at different locations may be sought for this purpose.

(i) **Globalization, Internationalization and Inter-connectivity:** The first two terms mean different things to many. But in India, by globalization, we mean liberalization and privatization. By internationalization, we mean- curriculum with international orientation designed for domestic and / or foreign students. It helps to attract NRI and foreign students for earning big resources and also help in opening double degree schemes in collaboration with foreign universities. This helps to get ISO 9001 certification. All these will enhance the image of AEC not only in India but outside also.

Interconnectivity by computers using Internet, WWW (a repository of lot of information), video conferencing etc will help our students in many ways. There is an amazing success of Indian software in giving access to educational teaching materials prepared in top institutions of the world. To day, engineering community is a mobile and electronically connected one working at "homeless" workplace. Most laboratories (with state-of- the-art technology) need less- or no- space at all but some computers and soft wares. The student value in the industrial market will increase if they are exposed to handle these soft wares, which can be bought or may available free.

(j) **A huge corpus fund:** is essential for its future growth and activity. To day we have about 7000 alumni, 1200 students, 400 staff and a host of well wishers (OIL, BRPL, ONGC, NEPCO, Power Grid etc) and philanthropist industrialists (HPC, Bill Gates, Semiconductors Ltd, Mittal to name a few) and, annually we can collect easily about a crore of rupees and with a matching grant from the govt. we can expect to collect Rs two crores annually. I hope this could be achieved through the hard work of the Alumni Association if proper office facilities are provided.

Conclusion:

A dedicated Alumni Association with a well-managed office is the need. There must be some meetings at a central place preferably at Guwahati. All the mission activities are to be monitored at regular intervals. A model of strong cooperation between AEC, Alumni and the Govt. is to be framed. Qualified people must be engaged to frame the various models planned or the work must be entrusted to qualified consultants, if necessary outside agency also. If we wish we can do it. We all alumni must co-operate and proceed with a Visionary insight and a Missionary zeal. We all alumni and stake holders of AEC are taking a bold and gigantic step to raise status of our alma mater from the present



Pygmy to the Giant AEC-2025, a right type of giant in all respect of excellence, brilliance and reputation.

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AEC NEEDS ALL

Dr. Biswajit Banerjee
Ex-Professor of AEC

Assam Engineering College at Jalukbari, Guwahati, has been a pioneering technical institution of our country. A good lot of us cast our lots with this college and identify our existence with it. At this golden hour of joy and celebration, let our thoughts for diamond and platinum hours find expression.

A college of this stature, that has already celebrated its fiftieth birthday, could not have done so without delivering anything to the society. The college has produced engineers who are spread world over and have done the society proud. The glorious past demands an even brighter future. And things are changing fast, rather very fast. To cope up, a lot needs to be done; by you, me and everybody around.

The college urgently needs overhauling of its library, laboratories, workshop, teaching aids and staff management.

The library of an engineering college is an abode for both Saraswati and Viswakarma. It must not only have the latest books on engineering, but also the periodicals and journals. Books are storehouses of theories whereas quality journals are realities, though in print. Let our boys have access to the best of the engineering journals and get to know the gap between the cup and the lip, I mean, the gap between the theory and the practice.

The library should remain open on Sundays and holidays with revised working hours from 8 A.M. to 10 P.M.

It's sad but true that many of our laboratories are not in proper shape. They house outdated machineries. Having admitted the cream of the students, we must offer them the latest and the best. While visiting engineering colleges outside Assam as an AICTE expert and recommending their accreditation, I have seen very up-to-date laboratories in colleges, not so reputed. The same is true for workshops too.

Transparencies, slides, micro-films and facility for xeroxing should be made available to all teachers. An evaluation system for teachers may be introduced on trial basis.

We excel outside the state and earn a name for it. Have you thought of the reason? It's straightforward and simple. The infrastructure, the working conditions and the career prospects are better and also promising. Even with a doctorate degree in engineering, if one gets the first ever career lift after eighteen or nineteen years of continuous and dedicated service; imagine the despair and frustration upsetting the person. Why not introduce a time-bound promotion scheme, subject to fulfillment of desired conditions? A teacher has to be in the healthiest frame of mind in order to deliver the best. The lacuna has opened a gate of exodus. Many young brilliant teachers have left this college.



It is also an irony that a person, who is not qualified enough (as per AICTE norm) to be regularly appointed to an office, is allowed to hold charge of the same year after year. How is this? I

While we do talk a lot about restructuring the laboratories, workshop etc., we must also remember that ours is a government college and hence perennially fund-crunched. May I be permitted to say that the disease may be treated at home itself.

It might sound blunt, but would it be unfair if the college collects a mandatory contribution, distributed over four years, from each student, towards purchase of latest machineries and thereby imparts world-class knowledge? We can have a debate (discussion) on this issue. My point is straightforward. Many of our children migrate to institutions outside the state, being lured by their publicity cells and well fabricated network. These institutions are privately run and they charge heavily from our children. In return, what many of them offer is not all palatable. We tend to forget the proverbial saying that 'Pasture in the neighbour's field always looks greener'. So, big fund is churned out of Assam every year. My humble appeal is, 'Dear parents/guardians, please give us just one-half of what you have kept aside for your child's engineering education outside Assam, help us to be up-to-date and see, what we can do. Have faith on your own men. We are in no way inferior to the best in the country'.

Problems are aplenty. But solutions are not impossible, they just appear evasive. A dynamic, united and positive approach is, perhaps, the key.

May the Almighty continue to love and bless Assam Engineering College.



SOME THOUGHTS ON TECHNICAL EDUCATION WITH REFERENCE TO AEC

Dr. Raghavendra Choudhury
Former Prof. & H.O.D Chem. Engg Dept, AEC
and Member, A.P.S.C.

Technical education in the country over the last one and half decade showed remarkable growth particularly after the boom in IT industry. The intake capacity of students in various engineering colleges and institutes has increased many fold times. This has been largely possible because of huge private investments made in starting new colleges coupled with the fact that there is tremendous interest being generated amongst younger generation to go for job oriented technical education. IIT's, NIT's and state owned institutions with limited seats are therefore naturally unable to meet this demand. The position today is such that many are enrolling themselves right after school final exam to various corporate houses for coaching in addition to normal tuition. The only aim is to get a seat in a good institution like IIT's, NIT's and few state owned colleges. Those not getting seats in these institutions are rushing for admission in private institutions particularly in south. In this process lot of money is spent in terms of not only huge admission fees but almost sizable donations through agents. According to a rough estimate 25 crores of money are going out of state every year.

Almost every state of the country excepting states of NE region (Meghalaya has one private engineering college) and few small states has already established number of private colleges with the support of industrialists and politicians. There was no private technical institutes in West Bengal about 15 years back but with the continued effort of govt, more than 20 private engineering colleges are in existence today.

The state of Assam can roughly accommodate 900 students every year in Assam Engineering College (AEC), Jorhat Engineering College (JEC) and NIT's whereas in our country about 5 lakh students take admission in various technical colleges. AEC and JEC, the only two state degree colleges could not grow as per expectation because of several reasons, the most important being govt apathy. AEC being one of the oldest engg college of the country, celebrating the golden jubilee year, passing through some difficult times for last 15 years or so in spite of the fact that college has very good quality faculty members who were well trained both in and outside country. This resulted in not attracting good students as input. But fortunately college has started recovering recently and is likely to regain its old glory if proper support is given by all concerned.

In this golden jubilee year Govt should give serious thought how best college can be upgraded by giving various inputs in phased manner. To cope with the demand of students, immediate attention is necessary for increasing the intake capacity in all



branches but particularly in branches like Electronics and tele-communication engg, computer science engg, Instrumentation engg and lastly chemical engineering. The lone chemical engineering department in NE region which is in existence since 1965 with intake of only 30 can act as a nucleus in starting various professional courses like hypolymer technology, ceramic technology, petroleum and petrochemical technology and pollution control engineering. This will help in producing technical manpower needed for chemical and agro based industries of the region. But before increasing the intake capacity, govt should not only improve the present infrastructure of the college but also add to new facilities for such increased intake. Besides in order to arrest the outflow of students to southern and western states, all concerned about technical education should start thinking in terms of not only increasing the present intake capacity as mentioned above but also think how to attract private investments for establishing few engineering colleges in the state. This will go in a long way in helping our students in pursuing technical education in degree level. Here a special mention may be made about few deficiencies that need immediate attention for removal. They are strengthening of administrative wing of college, improvement of existing setup of training and placement, modernisation of workshop, upgradation of library facilities and creating a healthy academic environment for work-lastly facilities to be created in the campus so that all associated with the college find their stay attractive.



AN INSIGHT TO THE STRENGTH AND WEAKNESS OF AEC

Dr. Bibha Das Saikia
Civil Engineering Department
Assam Engineering College

In the question of strength and weakness of an academic institution, some of the qualities of the strength in the process of development are unity, knowledge, human values etc. whereas 'Ego' is one of the undesirable elements of weaknesses. It is one of the major problems of elite section of population, which causes a feeling of separateness among the people. Among the teaching fraternity of Assam Engineering College, if a single person having such quality may create weakness in the process of development of academic activity. Further, presence of a faculty member in the department for a very short time and keeping themselves busy in other non-academic matters outside the campus other than the class hours are also some of the weaknesses. A sense of belongingness towards the institution and a feeling of involvement in any development activities of the institution as a whole and individual department in particular will enhance fellow feeling among the academic community. An institution may not have modern laboratory and other facilities, but united efforts and devotion to work of the faculty will definitely strengthen the academic environment with minimum available resources.

Faculty and students of Assam Engineering College, Guwahati are the most vital human resource of Assam. There are tremendous latent possibilities in the young students brain. Our resourceful faculty members should guide them to utilize their innovative ideas. But in order to strengthen it further, the most wanted thing is to create a good work culture. By doing this, faculty members can involve themselves in different research activities. It will automatically attract students to work with the teachers. The progress of work at the initial stage may not be very satisfactory due to non-availability of suitable laboratory facilities, but it can be improved by applying laboratory development fund and research grants. The research activities should be directed towards development of technology for judicious utilization of natural resources in engineering activities of the region. Once such an environment is created in the college, its strength will take no time to grow Assam Engineering College to the level of NIT or IIT.

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ACADEMIC AUTONOMY: AN URGENT NEED FOR ACADEMIC DEVELOPMENT OF ASSAM ENGINEERING COLLEGE

Dr. Arup Kumar Sarma

Associate Professor, Civil Engineering Department
Indian Institute of Technology Guwahati

With my limited experience gathered through my association with various academic and other organizations, I feel that academic autonomy is one of the various important steps that we need to take up for academic development of Assam Engineering College. Not to talk about the private Engineering Colleges that have come up in the last two decades, strength of faculty members of Assam Engineering College in terms of Number, Academic Qualification and Talent, has always been superb if compared globally with any other institute providing engineering degree. Surprisingly, even the guardians of student residing in the Northeast India prefer to send their kids to a newly developed private engineering college than the Assam Engineering College. Blaming the guardian is not the solution; we will have to make a self criticism to realize the actual situation. We will have to analyze our draw back. If we analyze the situation, one point will be very clear that job opportunity is one of the major issues that are forcing the guardian to send their children to private engineering colleges by paying substantial amount of money. Arranging for campus interview is one way of improving the scenario and I think this aspect is improving significantly in the last few years. However, we must prepare our student to face competitive examination in national level. This will require lot of modification in the academic system in general and pattern of examination in particular. Academic autonomy can help a lot in this regards. I am just citing one example in the following paragraph to support my logic.

We learn through our experience. An intelligent student may learn something quickly than a student inferior to him, but for learning anything every one must face that problem. Therefore, for improving the level of intelligence we must make the student to face most complicated question. In the present situation of absolute marking it is very difficult to set a critical question paper, as it may lead to failure of many. Moreover the questions are set by someone else than the person teaching the students. If extremely critical questions are asked the students may end up with a poor academic record, which will make them unfit even to apply for a good job. On the other hand if they do not get the opportunity of facing such questions during their academic course, they cannot compete with the students who are quite accustom to such complicated questions. A relative grading system can allow a teacher to set extremely tough question to judge his students. All these will be possible in Assam Engineering College if academic autonomy can be obtained.



There are several such positive points, which will help academic development of AEC through Academic Autonomy.



EXPLORING CONSULTANCY SERVICES AT AEC

Dr U.K. Sarma

Ex-AECIAN, & Teacher at AEC (1963 -1990)

Introduction:

The AEC was established 50 years back with some mission and vision. Every one of the stakeholders expects these visions to be fulfilled. The society and the community expects it to produce qualified engineering personals and to solve some the communities problems when needed. The AEC has produced more than 5000 highly qualified engineering graduates, which are well received not only in India but elsewhere. The society to day expects it to produce entrepreneur graduates. With the change in Govt.'s academic policy (20% resource cut), the institute is expected to earn while doing its other duties. Many institutions have come up and opened avenues for generating resources. Consultancy is one important area. Activities like III (industry institute interaction), R&D and consultancy are developing and merging at some point. Economic returns come from knowledge diffusion. Infrastructure like patenting is a profit business. To-day consultancy is very much image based where knowledge and skills also play a very competitive role. Innovative skills will pay. In this paper, some thoughts are put forward for the development of consultancy services at AEC to fulfill some of its requirements and some past experiences are presented to emphasize.

Types of Consultancy Services (as per norms to regulate faculty involvement considering other commitments (eg teaching):

- a) Institutional consultancy- by utilizing the professional knowledge and expertise of the faculty and institute facilities.
- b) Retainer Consultancy- faculty is retained by industry for a certain period (of sabbatical leave).
- c) Research based consultancy- it is sponsored research project of common interest and involvement and share know-how generated. It is different from collaborative research.
- d) Consultancies with adjunct professors- where industrial experts are borrowed by an insitution and utilize his service for various assignments including teaching, R&D and consultancy activities.



Benefits to All:

- a) To the institution: Earning revenue and prestige to create a good image and help to maintain the equipments, which are used for students' experimentation [in the past, Department of CE had earned a good amount from the concrete block testing and; even EE department earned a part of the amount given for repair of the HV Sphere gap assembly].
- b) To the faculty- unused knowledge and skill is waste and is depressing to them. It helps to widen their knowledge and help in teaching and getting satisfaction & confidence. They will earn much more than that from the exam related works. [From 1979 to 1983, author himself was maintaining an electronic thyristor panel at the Kamrup Paper Mills at Amingaon.]
- c) To the students- feel proud of their institute, they can participate in some activities of the consultancy activity and even earn something. This will change their mind-set from job-searching to entrepreneurship. [the author paid two students for repairing the digital gap setting device in the HV Sphere gap assembly for which the company paid a good amount to the EE department for necessary repair in the year 1982].
- d) To the society and community- local entrepreneurship will get the benefit. [in 1979, one local cable manufacturer came to us for getting a testing certificate. Even though this department is not authorized to certify, yet the local firm, floating the tender, agreed for at least AEC's certification. We failed to help the entrepreneur to provide the certification due to lack of proper testing equipments and, he had to lose the contract, as he has to go to Calcutta for the certification and at a great cost and time. But we could help the Kamrup Paper Mill at the need of its crisis when the system came to a stand still.]

Possible areas of Consultancy Services:

AEC has full fledged departments with qualified faculty to handle some projects; once some small projects are completed, industry's confidence and reliance about its capability will grow. Just to suggest a few-

- a) Consultancy on turnkey basis- it is normally difficult, ob course depends on the type of project.
- b) Preparation of Project Reports- outline, problem analysis, search of solutions, selection of best solution strategy, activities in implementation, project feasibility study, preparation of the report and presentation.



- c) Special studies- Fact - finding, Diagnostic, rehabilitation studies etc.
- d) Surveys- Industrial market potential-, Civil Engineering surveys in land, Geo-technical and soil Engineering.
- e) Management and Financial consultancy,
- f) Energy managements and energy audit in Hospitals, Hotels, Govt. Offices and industries like tea gardens etc.
- g) Design and Estimates on Electrical distribution systems, HV Transmission line, Civil Engineering bridge and building structures, Architectural Design; Design of lighting and sound system.
- h) Conducting Training Programs / Courses for industry on Industrial Safety, Entrepreneurship development, PLC, Computer Soft-ware training, Civil Engineering structural Design, Coaching courses to make the student salable like hot cake etc
- i) Offering testing facilities and expertise to different agencies. IC engine testing facility to garages. Offering laboratory experimentation facilities to sister institutions in the region
- j) Design of waste disposal systems for municipalities and other organizations
- k) Computer system configuration design, equipment procurement and installations, networking.
- l) Design of socio-economic models for solution of various societal problems (specially of rural life).

Present consultancy scenario in the NE region:

There were about 115 consulting farms working in this region in 1990s[1] and but many could not survive, as they could not compete with big national and international consultants. To day, consultancy farms need state-of-the-art equipment for taking up some jobs. As far my information goes- NEITCO, DICC, AIDC, SSI, AIM, Institute of Entrepreneurship and few local private farms are doing lot industrial consultancy. RRL, Jorhat and few R&D organizations are supporting a some consultancy activity mainly in collaborative research. The NERIST (Itanagar), IIT (G) and NIT (Silchar) are associated with many Govt. sponsored projects. Most of the consulting farms are from outside this reason. The universities of NE region, JEC and AEC are yet to bring consultancy activities in their academic program. But with the ongoing Ph D programs at AEC, it will definitely come in their road map of 2025.

Main difficulties faced by AEC to get consultancy:

- a) Lack of good image of the institute and lack of reputed teachers may be some of the causes; but it is observed that same teacher from AEC, after getting some assignments in some organization of repute (say IITs), becomes experts next day. This means most of



- the teachers at AEC are complacent with the present state and lack initiative to seek consultancy activity (most of them are workers not managers).
- b) Lack of facilities in the institute. Even lack of publicity about its capabilities.
 - c) Lack of consultancy rules and regulations to induce faculty. Lack of an environment for such activity. These rules will regulate how much consultancy and how much teaching. Also it will decide the boundary between research and consultancy.
 - d) Govt. and local industry does not prefer and rely on the capabilities of the institute.
 - e) Faculties involved in such activity are not credited in case of promotion etc.

What to do now? Obligations on the part of:

A) AEC authority:

- a) Build a good image of the institute (recruitment of qualified teachers, improving teaching, improving campus recruitments etc) and try to achieve ISO 9001:2000 certification.
- b) A consultancy cell to be open with liberalized norms to start with.
- c) Publish a pamphlet depicting its strength and capabilities (equipments and teachers)
- d) Initiation to approach agencies for consultancy work - build a good rapport with industries and few international consulting firms.
- e) Build a knowledge based education system with a large data base.
- f) Hire renown people from industry/consulting firms and utilize their service for teaching, consultancy etc.
- g) Improve R&D and III (industry institute interaction) activity as they help in consultancy.
- h) Networking with other institutions like IIT(G) and R&D organizations to share facilities

B) Government (concerned departments) and Industry:

- a) Experience is not born with but to be acquired. Govt. and local industries must lay a helping hand to facilitate the crawling child to walk. Sponsor projects to AEC to prove its capabilities.
- b) Industry should not have the prejudice always- " We make money and they (academic institutes) spend it". At the same time, the academicians are to avoid 'ivory tower' attitude- " Industry and Govt. would not make money, if they employ uneducated and unskilled people. They are getting the educated people free of charge".

Conclusion:

Academicians of AEC (and other institutes of this region also) should not keep them isolated from the needs of this region and their own institute. These institutions are to



grow and play a big role not only for the development of consultancy at a reasonable cost in this region but also for their own survival. There is always a lot of hard work and initiation behind earning name, fame and good reputation. To conclude in the language of Hendrik Casimir, a theoretical Scientist who work with Borh, Pauli and Ehrenfest and later became the brilliant Director of Philips Company of Copenhagen, " ... that the really fundamental notions required by industry are coming and should come from the Universities and not from Industrial Laboratories. But irony is that, the resulting wealth flows in the reverse direction." AEC should start consultancy activity and if necessary may requisite the consultancy expertise available elsewhere (including the alumni).

Reference: [1] "Consultancy Capabilities in the North Eastern Region", a draft prepared by department of Scientific and Industrial research, Ministry of Science & Technology (Government of India), New Delhi, March, 1993.

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A LETTER FROM AN EX-AECIAN

Dear Dr Bora

07.09.05

Kindly refer to the telephonic discussion we had on various issues pertaining to the improvement in financial health of a premier Institute like AEC, which is facing a serious financial crunch at present.

It is very strongly felt that an Institute like Assam Engineering College has plenty of human resources and a sizable infrastructure to support itself. The only area, which needs to be addressed immediately, is how to utilize these resources for the benefit of the organization and the student community as a whole. It is a fact that no Institute in today's competitive world can ever sustain on subsidies and donations. Keeping these factors in mind the following areas should be immediately looked into by the AEC authority, which will go a long way in helping the Institute to overcome the financial hardships. Proper implementation strategy can be worked out mutually through deliberations with the Govt of Assam where some of the key faculty members of the College as well as a few ex students should also be actively associated.

AEC authority can short list some of the identified projects as stated below and take it up with right earnest keeping the overall perspective of the students in mind.

1. Making proper use of the existing laboratories in Mechanical and Civil Eng Dept by taking up jobs in the following areas
 - Soil investigation for various projects under NHAI, National Airport Authority of India, Railways, and other Grass root projects in the Oil Sector
 - Survey work for all such projects
 - Destructive Test to determine Tensile strengths, Cube test for concreting jobs in buildings, pavements etc,
 - Non-destructive tests like Dye penetration test for mechanical jobs.
2. AEC students, under the able guidance of the faculty members can take up projects on some selective high-rise govt. buildings in the NE region to study the adequacy of seismic protection and disaster management plan in view of earthquake prone geological structure in this area.



3. Taking up projects on commercial basis in some identified places for solar lighting system in line with Umananda Temple, which was successfully implemented by the students of Assam Engg College. Such projects may even get sponsorships from some PSUs like ONGC, OIL etc.
4. To initiate discussions with the Tourism dept, Govt. of Assam to take up a project on conversion of a part of Deepar Beel into a WATER THEME PARK on a revenue sharing basis where the hydraulic design can be provided by AEC. This would be a viable project as Deepar Beel has started attracting lot of tourists due to the presence of migratory birds and it would give a good outing space for the Guwahati citizens. This would also indirectly help us in preserving this water body from pollution, encroachment etc apart from generating revenue for the Institute. AEC has the biggest advantage of its proximity to the BEEL.
5. The final year students should take up projects in specific fields in consultation with the industry instead of making it only academic in nature. The following areas can be thought of :
 - Development of software for local hospital management, hotels and other medium and small-scale industries by Computer science students.
 - Taking up projects on water logging in some specific areas in Guwahati and any other city, stabilization of riverbanks in some vulnerable stretches in Assam due to river erosion etc.
 - Design of multi storied buildings for some private builders, as there is a boom in the construction industry in the entire North Eastern region particularly in some major cities like Guwahati, Aizawl, Shillong etc.

These are some of the identified project specific to North East which can be easily taken up by the students. However a focused group has to be identified in the form of a Task force initially for giving shape to these ideas. These kinds of strategies are adopted all over the world by most of the Private Institutes apart from some renowned Govt colleges and IITs in India for the purpose of revenue generation as well as giving practical exposure to the students.

I am sure the distinguished AEC fraternity would give a serious thought in this direction, which would help the Institute to overcome the serious crisis presently being faced.

I would like to have valuable comments from other members of AEC family in respect of my views as stated above.



Thanks and regards

(J.M.BARUA)
Indian Oiltanking Ltd
128, Maniram Dewan Road
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Guwahati 781003

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A E C
R.M. Dutta Choudhury

Till the Assam Engineering College was established in Guwahati in 1955 there was not much opportunity even for a willing and meritorious student of Assam to be an engineering graduate. Before independence there were only a couple of seats in Sibpur Engineering College (Civil Engineering) and a couple of seats in Benaras Hindu University (Combined Mechanical and Electrical Engineering) for students of Assam. That, too, when the geographical area of the State of Assam was much bigger, including Surama Valley which is now a part of Bangla Desh (formerly East Pakistan) and also other regions which have now become separate states.

After independence there was a dearth of technically qualified persons to execute successfully the various ambitious projects which were launched for the rapid development of an under-developed country like India. With a view to removing the lacuna the Assam Engineering College (referred to as AEC subsequently) was established in Guwahati in 1955 in a rather modest way. The college started functioning in the premises of the Assam Engineering Institute in Chanmari and was later shifted to its permanent site in Jalukbari, next Gauhati University. The classes were held in the main building when it was still under-construction. The building was formally declared open by Jawaharlal Nehru, the first Prime Minister of independent India, in January 1958. This, too, was something that AEC can be proud of, because according to the definition used by Nehru, AEC, too, may be defined as a temple of progress.

Incidentally I may say that Sri N. Das Gupta was the Principal of AEC at that time. I also remember that he vacated the Principal's bungalow to accommodate



Nehru in it and shifted himself and the members of his family to the college guest house. I also remember that Krisha Menon was also with Nehru. I also declare with justifiable pride that I, too, had the rare opportunity to shake hand with the architect of modern India when the teachers of AEC, standing in a row, were introduced to him by the principal.

I have already said that AEC started functioning rather modestly. In 1957 graduate courses in Electrical and Mechanical Engineering were introduced. The degree course in Chemical Engineering was also introduced in 1963. The postgraduate classes in Civil Engineering were started while I was still a teacher of the college, that is, before 1982 because the post graduate students had a paper in higher mathematics.

I learn that graduate courses in many other disciplines of Engineering have been introduced in AEC to be in rhythm with the requirements of modern age when there has been a virtual explosion of knowledge in the field of science and technology.

I am glad that the quality of Engineering education imparted by AEC has been rather appreciated in India and abroad. Many of our graduates hold senior positions in public and private corporations, railways and Army. I remember with pleasure that some 16 years ago while I was in the railway platform in Amritsar, a high ranking army officer suddenly bent down and touched my feet. He was Sm. Choudhury, one of my students from AEC. Many of our students are working as successful teachers of IITs of India, too.

The Institute of Higher Education of Shanghai, Lio Tung University in China recently conducted a survey to objectively rank the world's universities. This was done by Prof. Nian Cai Liu and his colleagues.

"Out of about 2000 universities from all over the world for which the Shanghai group collected data only three Indian Institutions make it into the top 500. The Indian Institute of Science, Bangalore is in the 250-300 slot and the Indian Institute of Technology of Delhi and Kharagpur are at 451-500 slot. Not a single Indian university in the conventional sense of the term is in the ranking."

(The Hindu, 8.7.2004)

So we can be proud of our students who can be successful teachers of IITs.

Prof. Dinesh Mohan of IIT, Delhi, recently said in an article (The Hindu, 27.8.2005) that it is the stress on post-graduate education that has helped the IITs develop their reputation and expertise.

I think that we should take effective steps to improve the quality of education imported to the students of AEC. It should not be a knee-jerk action. It is a continuing and sustaining process. Also we should see that the plans prepared by us today do not become obsolete within a few decades.



IN RETROSPECT

Prof. P.K. Mahanta
Retd. Principal
&
Retd. D.T.E. , Assam

Looking back at my professional career of more than 36 years as a teacher of engineering colleges I have no hesitation to say that it has been a fascinating, exciting and stimulating carrier. Based on my experience, I shall try to touch upon a few points here.

Each technical institution has its own programme consistent with the national perspective of development and to create an environment to generate new knowledge, to take participation in the national effort, to improve economy as well as to strive for excellence. An environment must exist which is conducive to achieve the above. And to create this environment the teachers and the management must bear the major responsibility. The management must provide to the necessary facilities and infrastructure to the faculty and the students.

The role of a teacher is crucial. He has to acquire the status of a custodian of his students. He should not be concerned with the coverage of the prescribed course only; also he has a role to play as a character and personality builder. The teacher is the inspirational guide for developing a balanced personality of his pupils. The responsibility of the teacher is manifold - class room/ laboratory teaching, student assessment/ evaluation, curriculum design and development, supervising students' project and to provide leadership, research, counseling / guidance and many more. He must involve himself whole heartedly in these activities to achieve the goals of the institution. For this the teacher must be confident, open minded, dynamic with positive thinking. He must present himself as a role model. However the role of the student community is also very important. They must be regular and punctual in attendance and timely completion of all assignments. Under guidance of their teachers, the students must devote for development of qualities like leadership, communication skill, time management, academic excellence etc. The management, teachers and students must join hands to put up best efforts for achieving the vision of the institute.

Many challenges are encountered by a technical teacher in his profession. Perhaps the most important of them is the realisation that there is a substantial difference in the personality and mental approach of each student and they must not be treated in the same manner. Each student must be studied as an individual with sympathy and great care to accomplish the objective of a course. The teacher has to be creative to handle each



student in a way to mould him without destroying his self- confidence and personality. Assignments have to be designed and developed such that the student must exert himself mentally to understand and complete them; but at the same time it must not be beyond the comprehension of his intellect. The close and sympathetic study of a student as an individual, I believe, is the biggest challenge for any dedicated teacher.

The advantage of being a teacher is many. Year after year he interacts with young people and is exposed to their refreshing and new viewpoints and ideas all the time. This induces vital enthusiasm stimulating him for betterment of the student community, institution and society as a whole. Also the working schedule of a teacher is not very rigid. There is enough flexibility and time to pursue one own's intellectual bent and other interests. Such flexibility is rare in other professions. Scope for research, consultancy and persual of one's own hobby is very great. The environment of the institution - academic, cultural, social etc- is very much inspirational for living and raising a family.

A great reward for a teacher is to observe the growth of students' ability, personality and intellect gradually under his careful guidance and encouragement. The motivation induced in the minds of the pupils to achieve the cherished goal in life and helping and counseling them towards this goal is highly fascinating. There cannot be a greater pleasure for a teacher than to se that his student has reached the pinnacle of glory in his profession and when he acknowledges that his teacher and educational institution are greatly responsible for this achievement.

The great Saint Kabir one said:

"God & Teacher standing before me whom should I pay obeisance, I bow before my teacher for he led me to God"

However in this modern era, life values have gone a sea change and the centuries old perception of teacher student relation has also changed. I believe a teacher must not demand respect from his pupils (as in old days); rather he should earn it. This he can achieve by making himself a role model with objective assessment about his qualities and talents as a man and teacher.

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ASSAM ENGINEERING COLLEGE CELEBRATING GOLDEN HISTORY

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Introduction :

It has been a tremendous achievement for premiere engineering college of Assam is celebrating its golden history by completing half a decade. AEC has grown tremendously during these years in spite of facing many hurdles in front of it. This article would like to highlight some of the prospects, which may be undertaken for further growth of this prestigious institute.

Quality Education :

An educational institute has foremost job is to provide good and quality education to its students. Quality education in engineering should be provided in such a way that once a student pass out he or she should have enough knowledge needed to interviews for job or to start own entrepreneur. Emphasis should be given to

- Follow a strict calendar for whole year.
- Theoretical knowledge: there should be minimum number of classes allotted for each subject (e.g. 35/45 classes per subject/semester) below which the examination cannot be conducted.
- More laboratory classes should be introduced to give practical engineering knowledge.
- More tutorial classes should be arranged.
- Industrial training in reputed industries should be made compulsory for all disciplines.
- Course curriculum should be constantly modified at par with the national institutes and local need.
- For each discipline, higher degree courses like M.Tech, Ph.d should be introduced in each disciplines. Even in non-technical branches like Mathematics, Physics, Chemistry and Humanities, B.Sc, M.Sc and PhD s can be introduced. This will help in the growth of level of education in this prestigious college.



Infrastructure Development :

To sustain the global competition of new private and foreign technical institutions that are setting up every other day Assam Engineering College has facing a challenge to retain its glory. Although the College has admirably fulfilled its mandate of producing the technical graduates, the number should exceed approximately seven thousand during last fifty years of its inception, but the basic infrastructure still need a great upliftment to maintain its dignity for next fifty years. Some steps can be summerised as:

- First and foremost things to be done is to have a boundary demarcation wall, lack of which giving rise to unabated and un authorized human encroachments.
- Self-Sufficient Electricity Generating system.
- A full-fledged library building with electronic system, which should be open for 24 hours.
- Modernising the existing laboratories.
- Rather than private buses, own transport system for students and AEC families.
- Adequate basic facilities like more canteen, drinking water and toilets for students and faculty.
- Central Computer Central which should be open for 24 hours.

Administrative Reforms :

One of the factors that contributed to the state engineering college losing their sheen an obsolete administrative set up. This needs to be restructured in the light of modern educational management system. As the College is under the administration of State Government for any scheme of improvements needs permission from the Government and which is generally lengthy and time consuming and many times frustrating for the College administration. There may be few suggestions that can improved the condition of the college.

- Giving full autonomy to the college in the decision process for the improvement of education.
- Giving autonomy in examination process up to declaration of results.
- Faculties should be provided with incentives if they can bring finance through project and consultancy to the college.



Training and Placement facility :

With the changing pattern of job market, an institute is also ranked according to its training and placement facilities. Although we are now in a right direction in this regard, yet miles to achieve. The training and placement facilities should be made similar to some of the national level institutes like IIT's and NIT's.

Interdisciplinary Research Centre:

Every technical institute of which have name in technical education have a research center incorporating all the disciplines. This will enhance the research activity in the institute.

Last words

Many of the above goals do not need funds at all but a desire to do. Our system of education or the course curriculum or the individual quality of teaching is at par with some of the best institutes of the world. What we are lacking is the work culture. We are not focused to our duties and responsibilities. Buildings and infrastructure alone do not make an institution, but the people working inside it do. This is just not our job but our life too. We should think what we have contributed to the college and not what the college has given us. Let us maintain and spread the past glory and dignity of this college worldwide.

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