

**Confederation of Indian Industries**

**IIT Bombay**

**2<sup>nd</sup> Symposium of University – Industry Council**

**9 – 10 May 2008; P C Saxena Auditorium ; IIT  
Bombay**

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**Plenary III : Case Studies in Industry-Academia  
Collaboration-Engineering**

## **Education as engine of caring and sharing growth and development in the North East:**

### **A new model of social contract for university-industry interaction.**

#### **Prof K Kannan, Vice Chancellor, Nagaland University**

The history of modernization and development is also the history of science and technology. The negative environmental, social, economic and political consequences of modernization now prompt us to think about and plan for Eco-restructuring based approach to sustainable development. Luckily majority of states of North East (NE) region (Assam, Nagaland, Meghalaya, Sikkim, Arunachal Pradesh, Mizoram, Manipur, Tripura) have remained largely closer to nature than any other state in India. Appendix -1 highlights some important facts about NE region. Appendix 2 show cases some of the infrastructure initiatives by successive Central Governments for capacity building.

Can we at least attempt a new form of development? Our vision for sustainable development is often rendered opaque by multitude of actors, interests, linkages, and scenarios. If there is one feature that stands out in these varying definitions and approaches to sustainable development, it is the role of science and the technologies it generates. Can we create a developed society avoiding the negative impact of development as has happened in cities like New York or Singapore in this region? Can we think of a holistic development of the region rather than on economic terms? Is Eco-restructuring an alternate approach to development in the mountain farming system? NE regions are experiencing rapid economic growth which raises the fundamental issue of the difficulty of balancing population, growth, economic development, and the environment. Eco-restructuring method (ERM) being a holistic approach, includes agro-ecosystems, people, resource, technology and environment.

NE region is a Genetic treasure house of plant, animal and microbial resources. SWOT analysis of impact of organic farming vs. Green revolution can also give insight into the future direction of economic growth by agricultural/ horticultural development through ERM. The region is one of the 12 mega-diversity rich zones of the world and forms a distinctive part of the

Indo-Burma Hotspot that ranks eighth among the 25 biodiversity Hotspots of the world.

Rich natural resources with fertile land, rich forests and substantive mineral and hydrocarbon deposits and has a high literacy rate. This region receives 20 % of the total rainfall of the country and hence great opportunity for hydroelectric power. The region being mountainous, adventure tourism can be a big industry. Lack of industry and tertiary sector as well as reduced employment opportunities in the Government sector, the problem of educated unemployment is very acute.

### **Case Study of Nagaland**

The warrior spirits of the Nagas are shown in Appendix 3. The fact sheet of Nagaland shown in Appendix 4.

#### Initiatives at Nagaland

His Excellency, former President of India Dr A. P. J. Abdul Kalam and Visitor of Nagaland University in his convocation address on 15<sup>th</sup> March 2007: Vision for Nagaland and the Mission for University "Capacity building among students the mission of University"

"The dream of the youth has to be the dream of Nagaland. Nagaland is the land of the young. At least 50% of the people are below 25 years. It is a beautiful state with unique tradition of tribal structure, community organization and strong bonds that connect people to people. I visualize Nagaland to be an economically developed state well before 2020 with its natural environment well maintained. What are the tools for economic development?" Most importantly six areas which can promote economic progress of the state are:

1. Specialised Tourism development including hotel industry, training of the people by expanding the infrastructure
2. Promotion of handicraft products with value addition obtained through technology infusion.
3. Agriculture with herbal, aromatic plants, horticulture and floriculture.
4. Industrial growth with processing of select high value agric products.
5. Bamboo and value added products.
6. The Knowledge products utilising core competence in English and special nature of environment.

Nagaland University has conducted a seminar on Green Technology in collaboration with Government of Nagaland and Federation of Indian Exporters Organisation in May 2007. Major outcome has been carpet weaving by villagers in collaboration with Nagaland University, Entrepreneurs Associates (EA) and Jaipur Rugs. The EA is led by a social entrepreneur who is one among the two in Nagaland who is a recipient of the prestigious Asoka Innovation Foundation Award. University is planning to set up SPV to promote industrial training and incubator facilities including research, development, demonstration and dissemination. The Centre for Women Studies is coming out with plans to inculcate entrepreneurship among youth from April 2008. Department of Biotechnology has supported a program to provide select farmers in several villages to grow disease free tissue cultured plants in collaboration with the Department of Biotechnology, Nagaland University since January 2008. In the first phase large cardamom will be provided through Tata Energy Research Institute (TERI). Department also supported Bioinformatics centre to provide quality education in modern biology. DST has agreed to improve infrastructure in three affiliated science colleges by providing Rs 50 lakhs for each college.

I am firmly of the opinion that Nagaland University belongs to the people of Nagaland. The University will commence steps and launch programs to see that every resident of Nagaland who desires to study and meets the prerequisites is provided an opportunity to study and necessary facilities for the same. To achieve this, the University will build an e-learning network that covers all the villages of Nagaland. Informatics is the dynamics of information generation, dissemination, exchange and effective actions resulting from the information at the receiving end. The University will further establish the Centre for Advanced Informatics and Society. This centre to act as the nodal centre that builds systems for Technology Enhanced Learning, Teaching and Evaluation (TELTE). The centre will support wide spectrum of education programs ranging from training teachers at the school levels, supporting web-resources and systems for the schools to advanced IT based systems and services for the higher education and the university's postgraduate programs in different fields. Further, to reinforces its social responsibility roles, the university will establish close linkages between its faculty members and scholars and the people of Nagaland at large to identify, study and come up with the diverse capacity building programs and empowerment of people in

Education, Agriculture, Health and Community Developments through ICT driven systems and processes. Our goal is to enable the villages and institutions of Nagaland through dynamic information generation and sharing systems of value to people, provide opportunities for Education to each, according to his/her level. Empower communities through ICT and Informatics to address their real world needs, generating new opportunities and harmoniously using the nature's gift to Nagaland with relevant socioeconomic activities and thereby nurturing the overall prosperity of the state. Our aim is to make this initiative serve as role model for similar initiatives across the country. It will set up the example of equitable opportunities to get educated and to serve the people of the state according to each one's ability and capacity to contribute to the overall progress.

The university is looking forward to a productive and meaningful collaboration with Industry and thereby commit to Green technologies only.

## **Appendix 1**

Some important facts about NE region:

- The states of Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland and Tripura are isolated and remote.
- With a landmass of 2, 62,500 sq. Km, the region has wide variations in physical features (plains, highly dissected mountains).
- With a population of 39.04 million (2001 census) [3.8% of country's population). Assam is the most populous (70%) in the region. The density of population varies from 13 /sq. km in Arunachal Pradesh, 120/ sq. Km in Nagaland to 340/ sq. Km in Assam.
- Connected to the rest of the country by a narrow corridor known as the "chicken's neck" (22 Km stretch), through which passes a cluster of railways and roads, as well as a pipeline for crude oil.
- British period saw the establishment of tea gardens, with migrant labour and creation of rail network to serve their commercial interest.
- Has international borders with China, Myanmar and Bangladesh. Due to complex relationships that Govt. of India maintains with these countries, very few border crossings are open to traffic of people and goods.

- During colonial rule, the British expanded into the Brahmaputra valley of Assam and thence into beyond eastern Himalayas, which were designated suitable for the cultivation of tea.
- An internal border (the 'inner line') was defined between the 'settled area' and the people who lived beyond it. The international border became known as the 'outer line'. One needs an inner line permit to visit Nagaland, Mizoram, and Arunachal Pradesh.

The people in these regions relate culturally and linguistically to both mainland South Asia and to the regions lying beyond the international border to the north and the east (contiguous regions of Bangladesh, Myanmar/Burma and southwest China.(98% of the international border). Topographically this area is beyond the eastern Himalayas, with mountainous terrain covered by tropical rainforests.

- Tibeto-Burman languages are largely spoken in this region
- Since the colonial times the hill societies are referred to as 'tribes'- a classification based on linguistic and cultural criteria. After 1947 the population in this region has been classified as Scheduled Tribe as per the constitution of India.
- Earliest British political agents and ethnographers compiled the first set of detailed Indian ethnographies of this region, mainly to facilitate colonial administration, enable tea plantation and the feasibility of opening a trade route with Myanmar (Burma).
- The ethnographers constituted an effort to write down for posterity the indigenous way of life which was seen as undergoing rapid change due to contact with the British administration and proselytisation by Christian missionaries.
- Agriculture is the mainstay of the economy in this region with more than 73 % of the state's population engaged in agriculture/ horticulture.
- Rice is the most important grain cultivated. It is said that there are more than 1000 varieties of rice available in this region. Jhum cultivation is still practised in some areas of North East.
- The people of this region have experienced considerable socio-cultural change over the last century and a half. Such as the introduction of new political and administrative systems, a cash economy, modern medicine, education and conversion to Christianity.

- With the Look East Policy of Government of India, it is imperative that there will be a major impact in this region and one needs to anticipate corrective measures to maintain the cultural and social traditions which have evolved through centuries.
- New sources of wealth, including commercial forestry and government jobs, are furthering social stratification and the formation of a privileged elite group in societies that were relatively far removed from concepts of caste and class.
- The past resonates in the present through oral histories, kinship relations, rituals, indigenous cosmology and disease aetiology.
- Since independence in 1947, NE regions and the borderlands of Bangladesh and Myanmar (Burma) have become conflict zones.
- Since independence, the state of Assam has been gradually fragmented to form smaller states. Further these states fragmented into administrative districts on the line of politics of tribal homelands.
- The food habits are unique to this region as compared to other parts of the country.

## Appendix 2

### Human Resource Infrastructure in the NE Region

The density of central universities are maximum in the North East region with every state having a central university with the exception of Assam which has two. Assam, Meghalaya, Manipur has medical colleges. Every state has Engineering program with a minimum of at least two branches. The oldest central university is North Eastern Hill University (Est. 1973) and other central universities were established during the last decade. All the central universities except at Tezpur are affiliate universities. In Arunachal Pradesh, Manipur and Tripura state universities were converted into central universities during the last one year. IIT was established at Gauwhati and recently IIM at Shillong. Central Institute of Plastic Engineering and Technology (CIPET) at Gauwhati, North East Regional Institute of Science & Technology (formerly RRL), Central Muga Eri Research & Training Institute and Rain Forest Research Institute at Jorhat, Central Agricultural University at Imphal, Central Institute of Horticultural at Nagaland, Regional ICAR complex at Shillong, area specific ICAR institutes, TERI centre at Gauwhati, Mini Tool Room facilities, ITI are some of the major centres for Human Resource development.

## Appendix 3

### The Warrior spirit of Nagas

The first Treaty of Yandabo, in 1826 between British and India affected the people of the region. While demarcating the boundary between India and Burma, caused the vivisection of Naga inhabited region. Further division was caused by the boundary demarcation between the then Nowgong district of Assam and the kingdom of Manipur. The first direct encounter of the British with the Naga people was in 1832. British managed to trace a route from Imphal to Dimapur, but not without facing fierce Naga attacks throughout. Frequent raids by Nagas on settlements in Assam became an embarrassment to British rule in India between 1832 and 1880. Not to lose their face and whatever influence they had in the plains in Assam, British tried several attempts in the next 48 years to annexe Kohima. The British, under Brigadier General Napier succeeded only on 27<sup>th</sup> March 1880, took over Khonoma village in Kohima district after the severest fighting ever known in these hills. British were finally compelled to establish an administrative headquarters in Kohima, much against their own accepted wisdom. By and large most of the other Naga regions were left unadministered and these Nagas were usually referred as the "Free Nagas". Only during the First World War, about 5000 Nagas had their first western exposure. The British Act of 1935 did place the Nagas outside the Reformed Scheme, terming Naga territory as "Naga Hills Excluded Area". During the last part of Second World War, the Nagas too found themselves in the thick of war. They helped the allied forces with carrying loads, gathering intelligence, providing guides, and capturing enemy, even sacrificing their homes by burning them lest these became useful to the enemy. The Battle of Kohima demonstrates the fighting spirits of Nagas as a team players with the allied forces in destroying the retreating 31<sup>st</sup> battalion of Japanese army in 1945. The battle of Kohima has often been compared with Stalingrad in Europe and El Alamein in the desert because it was in Kohima that the Japanese advance was finally halted. Before leaving Kohima, the British erected a moving memorial in memory of their fallen comrades: 'When you go home, tell them of us, and say: 'For your tomorrow, we gave our today'. In 1946, Pandit Nehru tried to make the Nagas join the Indian Union through an official communication to secretary, Naga National Council. On December 1, 1963, Nagaland became the 16<sup>th</sup> state of India under Article 371 [A] after a 16 point Agreement in 1960 and comprised Naga Hills – Tuensang Area.

## Appendix 4

### Facts about Nagaland

- The word 'Naga' is a Tibeto-Chinese word.
- The population of Nagaland has increased from 12.2 lakhs (1991) to 19.9 lakhs (2001).
- Decadal growth rate is the highest in the country (64.4%). The fertility rate of Nagaland was reported to be 3.74 in 2006 as compared to the national average of 2.68.
- High population growth rate along with high fertility present a formidable challenge for the state. Though in absolute terms it is very small but as a state it can take positive advantage of the situation by capacity building of human resources for making the state a developed state well before 2020.
- Out of 1225 villages, 1092 have been connected with roads in Nagaland. Only 616 villages are connected with fairweather roads but 98% of the villages have electricity.
- Most of the cultivable land belongs to the Village community, khel and clans and a few to individuals. In Dimapur area it belongs to individuals and in Kohima and other districts, it belongs to community.
- The society is patriarchal when it comes to ancestral property.
- Plots are given to the landless individual for cultivation on tenancy basis. Complete dependence on rainfall during summer, which facilitates only one crop. By traditional technology, the farming continues to be organic.
- Agricultural growth has been highest in Nagaland (10%) during 2006-2007 which is much higher than the national average of 2. Tremendous potential for agric/ horticultural based food processing industry.
- Though every village has a dispensary, public health centre or sub centre, many areas are deficient in basic and vital infrastructure of health.
- Every village has a primary school and a cluster of four to five villages has a middle school within 5 to 7 Km.
- Two land mark achievements are creation of Village Development Board (VDB) through the Nagaland Village and Area Councils Act, 1978(Powers of administration of justice according to Customary Law to the Village Councils) and Communitisation Program of Public

Institutions and Service Act, 2002 (Education, Health and Power) by the Government of Nagaland through legislation.

- There are nearly 5 lakh children in primary education which falls to 33,554 in high school and 18746 in higher secondary. There are about 16000 students at graduate level {arts, science commerce and Agriculture} and 1100 children at PG level {Social Sciences, Sciences, Humanities and Education, Agriculture and Rural Development}.
- There are currently about 25,000 (estimate) students studying outside Nagaland! If infrastructure for capacity building is available within the state, we should be able to attract back these students to build a modern state of Nagaland.
- The Government of Nagaland has announced 2008-2009 as the "Year of capacity building". The society being egalitarian, it should be possible to make the state a developed state before 2020.
- Nagaland University has three permanent campus at Lumami (Headquarters.) {801 acres}, Meriema [Kohima district] (Interim Headquarters. 240 acres) and Medziphama (Agriculture campus 150 acres) and temporary campus at Dimapur for Engineering and Management. (Residential campus).
- The professional education was started from 2007 in engineering (IT, CSE, ECE, Biotechnology and Agricultural Engineering and Technology) with an intake capacity of 60/ branch.
- Management program commences from July 2008 with an intake capacity of 60.
- Plans are on to start professional courses like medical, nursing, veterinary, tourism, hotel management etc. in the XI th five year plan.
- The engineering program is supported by Technology Enhanced Learning, Teaching and Evaluation (TELTE) and faculty are being trained to teach in the new mode.
- Aim is to set an Education Grid and ultimately deliver quality education to every village through TELTE, thereby make education totally inclusive.
- The school of Engineering and Technology has more than 120 computers already in place and has collaboration with faculties from IITM (Kerala), IIT (Gauhati, Mumbai and Madras) and IISc Bangalore as part of National Program of Technology Enhanced Learning (NPTEL) of MHRD.

- The School of Management is guided by faculty from IIM (Ahmadabad and Bangalore) and IRMA (Anand).
- Under the National Innovation Foundation, University is trying to document indigenous knowledge and conserve biodiversity.
- The efforts of Govt of Nagaland can be seen at [www.industrynaga.org.in](http://www.industrynaga.org.in) .The Govt has set up a Mini Tool Room facility at Dimapur. Plans are in progress to set up SEZ at Ganesh nagar at Dimapur.

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