

ROLE OF UNIVERSITY IN INFRASTRUCTURE DEVELOPMENT UNDER NEW ODA SCHEME

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ABSTRACT: Least developed countries are dependent on the developed world for human resources and technology. Existing Official Development Assistance (ODA) system has been concentrated in hard infrastructure development without improving human resources and technology development system in recipient countries. Poor performance of the universities in Cambodia and Nepal was investigated. Universities in these countries are limited in delivering theoretical textbook oriented knowledge due to lack of competent faculties and appropriate facilities. In this paper, role of university in capacity enhancement, technology absorption, development and mediation, and involvement in development works under the new ODA scheme are discussed.

KEYWORDS: Theoretical education, university education, ODA, human resources, technology

1. INTRODUCTION:

The least developed developing countries are still striving for basic infrastructure like road, water, power, communication, and are dependent to the developed world for human resources, technology and capital for their socio-economic development. For instance, more than 50 % of the whole development expenditure in Nepal and 75% of capital investment for infrastructure in Cambodia had been covered through foreign assistances. Developed countries have been supporting developing countries through official development assistance (ODA). However, the major portion of ODA in least developed countries including Cambodia and Nepal has been utilized in the hard infrastructure and putting a little or no attention in appropriate human resources and technology development in recipient countries.

Although the tertiary education is the source of the skilled manpower, the least developed countries like Cambodia and Nepal have not yet provided the graduates enough opportunities to acquire enough practical skills from the university education, and could not produce required quality of technical manpower. Moreover, the least developed countries could not invest sufficiently on education as seen from figure 1. Universities lack competent faculties and appropriate facilities and are unable to deliver practical and research oriented education. Theoretical textbook oriented education with mechanical testing is the domain of the university education in these countries. Industry professionals often complain the quality of new engineers for not acquiring the practical skills required for the industry. In addition, official development assistance (ODA) in developing countries has not been significantly utilized to improve the quality of higher education and technology development in recipient countries. As a result, the civil engineering universities from the least developed developing countries could not

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fulfill the demands for human resources and technology for infrastructure development and could not make the construction industry healthy. The objective of this paper is to define the role of universities in new ODA scheme developed at Kochi University of Technology, Japan in order to enable them able to develop required human resources and technology for infrastructure development.

2. CIVIL ENGINEERING EDUCATION IN NEPAL AND CAMBODIA

Although engineering education in Nepal was started since 1942, civil engineers were started to produce only from 1984. There are 13 institutions/colleges currently involved in producing civil engineers. The annual enrolment capacity of the institutions/college for the civil engineers is about 800. Similarly, technical education in Cambodia can be traced since 1963 and civil engineers from 1985. At present 6 institutions/colleges in Cambodia are involved in civil engineering education with capacity of producing about 300 civil engineers in a year. Although the civil engineering education more than any other has great influence in socio-economic development of developing countries, the strength of faculties and facilities in the civil engineering education in least developed developing countries are in very dismal situation. Lack of appropriate teaching and learning materials and qualified teachers are the major problems in all level of education in Nepal and Cambodia. For instance, a typical college/institute from Nepal and Cambodia as of 2003 had more than 50% of the faculties with one-degree-graduate (undergraduate degree). Moreover, about 90% of the practicing civil engineers were undergraduates.

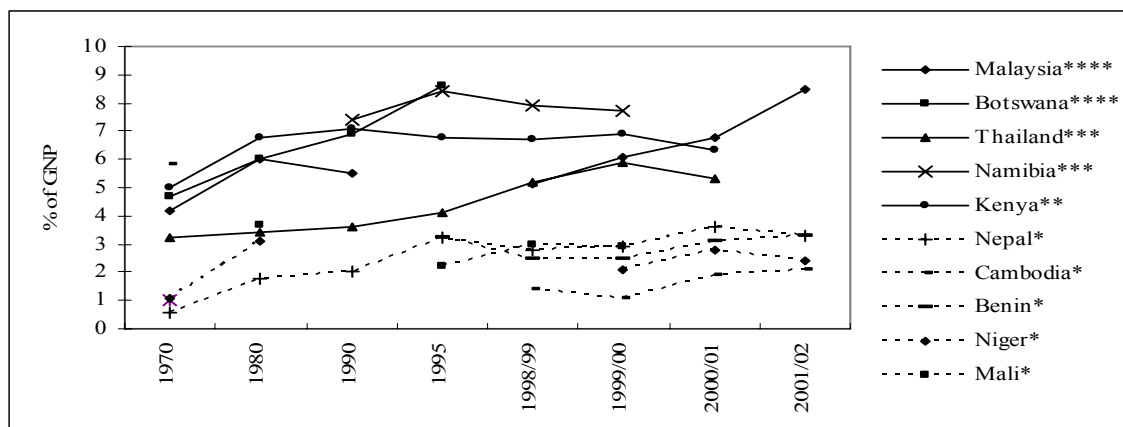


Fig 1: Governments' expenditures on Education in some developing countries, Source: UNESCO, *: Least developed countries, **: Low-income countries,*:Lower middle income countries, ****: Upper middle income countries (DAC classification)**

The “department store” type education offering similar disciplines with similar curriculum and contents can be seen in Nepal. The institutions have been following the other established institutions’ curriculum irrespective of the strength of faculties and demands for the local/regional development. The universities provide lecture rooms where faculties deliver lectures and simple laboratories where students fulfill the course requirements by testing the some of the fundamentals. However, not all the lecturers/professors do have their own space/rooms and research infrastructure in universities. They used to come for lectures only. No research laboratory has been established and no regular journals are available in the universities. It is far from expectation that students be provided extra space and facilities other than the classrooms and library. The students usually come to the universities to attend lectures only. The written examination of theoretical knowledge at the end of the academic semester/year is the only measure of competency of the students. The students are encouraged to remember the lecture notes and to read the textbooks referred by the teachers in order to prepare for the exams. Moreover, the civil engineering education, which is supposed to contribute in improving

quality of life, does not emphasize on the application of science and engineering knowledge for the societal problems, and could not make graduates creative and adequately prepared for the construction industry. The existing education system has made the students exam-oriented striving for academic certificates by passing the examinations instead of acquiring skills, searching and using the world's knowledge. However, Japan in her developing stage could deliver unique engineering education system, and the domestic skilled workforces were able to develop and industrialize the country without significant involvement of foreign human resources.

3. MODERN ENGINEERING EDUCATION IN JAPAN

The modern engineering education in Japan was started in late 19th century as the Meiji era began. The unique engineering education system including civil engineering, according to the 'Nature' [1] (May, 1877), Japanese government with the help of Mr. Henry Dyer, a British engineer, had developed a unique educational model in engineering education to provide students a highly scientific training, combined with actual practical experience in engineering workshops. The course of training was extended over six years. The first two years were spent entirely at college in studying general and scientific courses. During the next two years, six months of each year were spent at college to study technical courses and six months in the practice of that particular branch which the student may select. The last two years were spent entirely in practical work. The system of instruction in the college was partly professional and partly tutorial, consisting in the delivery of lectures and in assistance being given to the students in their work. Thus unlike the situation in the Europe, the modern engineering education in Japan offered engineering education as an applied science. As results of such education system the nationwide demand for human resources trained in applied science (engineering, medicine, agriculture, etc.) was fully satisfied. This had important consequences in the course of Japan's development and industrialization.

An interesting characteristic of the early expansion of educational institution in Japan is that the initiatives came not from the government or the ministry of education but rather from the institutions themselves and ordinary people. Many of the educational institutions established in the past were by well-educated local people of high social standing who had great interest in education and culture (ibid). The unified higher education was started after the Second World War. Master courses in engineering were developed from 1963 onward, and doctorate courses since the latter half of the 1970s.

4. EXISTING OFFICIAL DEVELOPMENT ASSISTANCE (ODA) SYSTEM

Official development assistance (ODA) are those official transactions which were made with the main objective of promoting the economic and social development of developing countries and the financial terms of which were intended to be concessional in character. As such, least developed developing countries do lack enough resources for social and economic development; they prefer any foreign assistance to be utilized for hard infrastructure development from which quick development could be observed. Therefore major portion of ODA in least developed developing countries have been utilized through the development organization like ministry of physical planning and works in Nepal, ministry of public works and transport in Cambodia. Very little attention has been paid to the higher education.

Unlike others, Japan's ODA has human resources development component under technical cooperation. It consists of i) dispatch of experts, ii) acceptance of trainees, iii) provision of equipment and materials, iv) project-type technical cooperation incorporating all the above three (i-iii) components, and v) dispatch of Japan overseas cooperation volunteers. Trainees from developing countries are given opportunities to be trained in Japan or other third country. Since Japan follows the equitable distribution of the resources, she invites trainees from different countries. The training provided under Japan's ODA were not tailor made for a particular country, and is generic in nature. In addition, there would no opportunities for a country to be continuously participate in a similar training.

Further, the training cost was very high, only few people had opportunities to go for training. Typically, it was found that the Japan International Cooperation Agency (JICA) training cost per trainee in infra sector was about 180 times expensive than the government's expenditure per student in higher education in Nepal in 2002. In the period of 9 years (1994-2002), only 70 people from Cambodia and 119 people from Nepal had received training in infrastructure sector under Japan's ODA [2] where as Cambodia and Nepal produce about 300 and 800 respectively the civil engineers every year. Thus training for few people keeping the domestic education system unimproved does not significantly affect the skill level of the skilled workforce where large numbers of untrained manpower enter the industry every year. In order to improve the situation of least developed countries, new ODA scheme developed at Kochi university of Technology, Japan has incorporated the capacity enhancement of local university and strengthening human resources and technology development system in recipient countries. Since the details of new ODA scheme is out of scope of this paper the activities and role of university in the new scheme is discussed below.

5. ROLE OF UNIVERSITY IN NEW ODA SCHEME

A new ODA scheme developed at Kochi University of Technology, Japan has integrated human resources and technology development together with hard infrastructure development in recipient countries. Unlike the traditional function—theoretical knowledge imparting, of the university new scheme integrates the following functions of the university.

- i. Technology absorption and capacity enhancement,
- ii. Human resource development,
- iii. Technology/product development and mediation, and
- iv. Involvement in development works

The above four functions of the university envisaged in the new scheme have been designed to perform through universities collaboration and the center of excellence for education and research (COE&R) established at the university in developing country.

5.1 UNIVERSITIES COLLABORATION

As such universities in least developed countries are in very dismal situation, the new system has universities collaboration activity at the first step in order to enhance the capacity of least developed countries' universities. University from developed country collaborates with university from least developed country, and faculties from least developed countries are provided opportunities to be trained in developed countries in the fields which are necessary for the domestic infrastructure development. Technologies which could be applicable and beneficial for the domestic infrastructure development in recipient country are investigated. The seed technologies are then transferred to least developed country's university through joint researches. In this way, faculties from a recipient country can enhance their capacity and able to absorb technologies required for their domestic development.

Kochi University of Technology (KUT), Japan has been collaborating with Institute of Technology of Cambodia (ITC), Cambodia in order to provide ITC faculties opportunities to acquire advanced education/degree and to develop appropriate technology for infrastructure rehabilitation in Cambodia. KUT-ITC collaboration is presently working in training the ITC faculties on concrete technology and management and in transferring seed technology for producing high strength pre-stressed pre-cast concrete girder/beam using self-compacting concrete to ITC. The prevailing collaboration will enable ITC to deliver advanced training on concrete technology and management and to introduce a new product for Cambodian infrastructure rehabilitation. The KUT-ITC collaboration is diagrammatically shown in figure 1. Thus the proposed universities collaboration system will enable universities from developing countries to enhance their faculties' capacity and to absorb technology in order to develop appropriate human resources and technology domestically.

In contrast to the existing ODA system where trainees were usually selected from governmental (clients) organizations for generic training abroad, the new system through universities collaboration provides university faculties opportunities to acquire advance degree and knowledge who will then continuously involve in education/training, research and development. The new scheme assumes that if faculties had enough capacity and universities had appropriate research facilities, the quality of education and consequently competency of the new graduates would be improved. Thus small number of trained faculties can produce large number of skilled workforce every year. Organizational benefits from the training for a faculty will be higher than that of an employee from clients' organization. The new approach will give the multiplier effects on skill manpower development. In addition, the new scheme would enable universities to introduce new technology in the local industry.

5.2 CENTER OF EXCELLENCE FOR EDUCATION AND RESEARCH (COE&R)

It is an entity established at the university from least developed countries where the faculties with advanced degree/knowledge and experience join in order to deliver the functions listed in ii, iii and iv above. The activities of the universities through the COE&R are shown in figure 2. The center will bridge the industry and university to feed the industrial needs in the university education. In addition to the regular education COE&R will provide internship for graduates and training for industry practitioners under human resources development function. The seed technology transferred from the developed countries will be materialized at the center in the forms of new technology and products. The development of new products will be done with the close cooperation with local as well as donors' industry. The center will be continuously engage in research and development works in order to

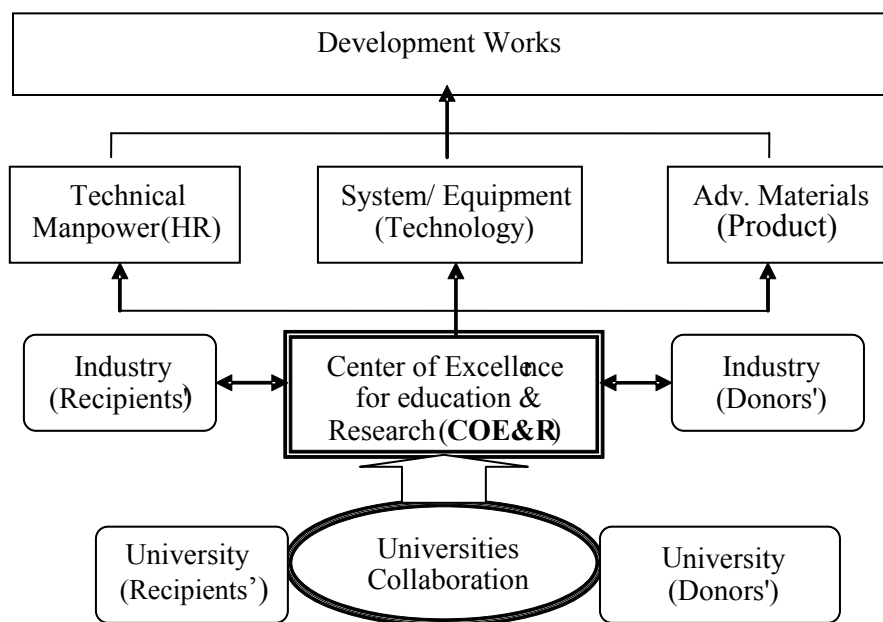


Figure 2: Universities' Activities in New ODA Scheme

develop appropriate human resources and technologies required for the domestic infrastructure development. The support to the center through universities collaboration will be provided till faculties are able to perform all the functions of COE&R themselves. The human resources of the center and technology/product developed at the center will be deployed in the development works through the cooperation from clients and the industry. The benefits received from the delivery of the services/technology/product will be utilized for further research and to improve quality of education. Thus the center will help university be self financed and contribute the industry meaningfully.

KUT-ITC collaboration has already enable ITC to absorb seed technology for high strength concrete using self-compacting concrete. The extended collaboration between KUT and ITC will enable the center of excellence able to introduce the new product—pre-stressed high strength concrete girder/beam using self-compacting concrete in the Cambodian construction industry. The standardization of the new product has been in progress with the cooperation of implementing agencies in Cambodia. Thus there will be parallel growth of human resources and technologies in a least developed developing county which will enable local industry able to develop domestic infrastructure themselves, increase the competitiveness of the local industry and help reduce the dependency to the developed countries.

6. CONCLUSIONS

Universities in least developed countries including Nepal and Cambodia are limited in delivering theoretical textbook oriented education due to lack of competent faculties, enough financial resources and appropriate facilities for research and development. The lack of appropriate human resources and technology development system in least developed developing countries is the major reason for low capacity of the local industry. The existing ODA system could not significantly improve the quality of human resources and performance of the local industry. Developing countries would be able to produce appropriate human resources and technology domestically if the new scheme were effectively implemented.

7. REFERENCES

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