

Mathematics in Cambodia

Michel Jambu

Centre International de Mathématiques Pures et Appliquées

(April 2005)

The global challenge

A great challenge yet also a great opportunity for higher education in the ‘developed’ world is to contribute effectively to fundamental sciences in developing countries, where the need is large and increasing, but resources are lacking. Knowledge continues to replace physical capital as the source of national and regional wealth and this change is expected to accelerate in the future. As knowledge grows in importance, so does the need for higher education. Yet the gap between industrialized and developing countries continues to increase.

Mathematics, both school mathematics and university mathematics, forms the basis on which scientific and technological advancement are built. Among the international institutions currently working to advance mathematics and its teaching in the developing world are several European agencies which we propose as partners in the project outlined below:

- 1) ICTP (International Centre for Theoretical Physics), Italy,
 - 2) ISP (International Science Program), Sweden,
 - 3) CIMPA (Centre International de Mathématiques Pures et Appliquées), France,
- and well as the IMU (International Mathematical Union), ICMI (International Council of Mathematics Instruction), and EMS (European Mathematical Society).

The project discussed below focuses on Indo-China, and, within Indo-China, on Cambodia. It also proposes to incorporate relatively rich mathematical resources in Vietnam into a regional partnership.

Mathematics in Cambodia

A compelling reason to focus on Cambodia is the appalling destruction of the education system in that country, due mainly to the terrible civil war in 1970’s and 1980’s. In public secondary schools, there are more than 100 pupils in each classroom. The salaries of the professors are so low that they need to have at least one other job to survive, sometimes more. In those conditions, one cannot expect to attract young bright people into education. Moreover, many private institutions are appearing, especially in Phnom Penh, and these offer somewhat better conditions which further erodes the teacher pool in public education. Another factor is that many of the young people who do achieve an education are attracted into business where they expect far greater returns. Careers in mathematics and more generally fundamental sciences, even as a university professor, are not attractive. For example, the highest salary for a professor at the university is less than 300 USD per month although the minimum required to live in Phnom Penh is 600 USD. Almost all the professors at the university have only a Bsc. Between 1980 and 2000, only two Cambodian nationals were awarded a PhD degree in mathematics.

CIMPA as pioneer

The Cambodian mathematics and teaching communities asked CIMPA to help them develop a master degree in mathematics. CIMPA has just begun to develop a program to support mathematics with the help of AUF (Agence Universitaire pour la Francophonie) and IMU.

More than 40 participants attended the first courses, some of them students of RUPP (Royal University of Phnom Penh), of RAC (Royal Academy of Cambodia) and ITC (Institut de Technologie du Cambodge), others secondary professors. They attended the courses and pursue the degree at considerable personal sacrifice since they don't receive any financial support. In spite of this, more than 70 participants attended the second course. Even 4 or 5 USD per day during the period of the courses would have a strong positive impact for the secondary professors.

This program is the first step of a more ambitious one:

- A IBSP (International Basic Sciences Program) project proposal will be prepared in 2005 for the continuation of our project in mathematics in Cambodia in order to reinforce initial steps already undertaken.
- In 2006, a project of regional master of mathematics for Cambodia, Laos with the help of Vietnam and the participation of Thailand, will be prepared as ASIA-LINK European project.
- An annual regional 3-week institute, beginning in 2008 or 2009, which will provide intensive advanced courses for selected university students, and seminars and research talks for university personnel from the region, and mathematics-based professional development for secondary teachers. Accomplishing this in a single unified setting allows for efficient use of short-term visiting professors and for the exchange of resources and insights between practitioners in the entire region.

The overall goal is to have strong foundations in fundamental sciences in these countries with professional preparation adapted to the economies of the region. A vital short-term goal is to have at least 10 PhD returning in Cambodia and Laos in 6 or 7 years, a vital step on the long march toward mathematical autonomy.