

AN EXPERIENCE IN TEACHING PHOTOGRAMMETRY IN A DEVELOPING COUNTRY UNIVERSITY

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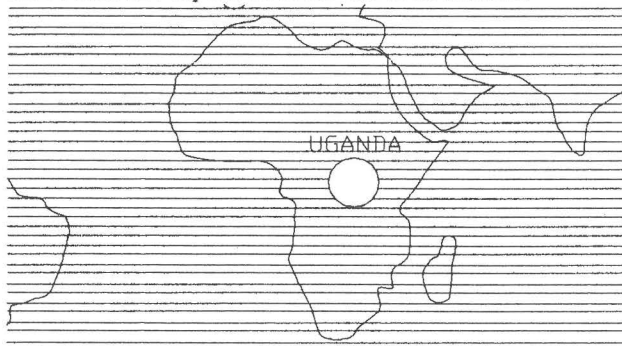
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ABSTRACT:

In a co-operation programme between Italian and Ugandan governments I had the chance to teach surveying, photogrammetry and remote sensing in Kampala University, Faculty of Technology. It has been a good occasion to meet colleagues, to compare the educational systems, to have an understanding of the local needs. Due to rapid changes in the environment it is of the most importance to deal with management systems, to swap from traditional geodesy and surveying to a more useful GIS taking advantage of new technology supplied by satellite imagery and remote sensing techniques. The utility of the co-operation is balanced with its limits, the main of it being the very short lasting in time.

1. INTRODUCTION

What kind of expectation had I when I was called by a colleague to go in Uganda for some courses in the local University? What was my feeling? How an experience in teaching in a developing country can be regarded? And how can I define this experience at the end of the mission?



- Striking ?
- Exciting?
- Hopeless?
- Boring?
- Good for making some money only?
- And how the experience can be generalised?
- And made useful for some other people also?
- What and where is the good ?
- Which was my contribution to the local university ?

The experience made in two different years in teaching photogrammetry and some other related subjects in the Uganda University, is described, adding some remarks. This University is the biggest in Uganda, the famous Makerere University, the first founded in Africa, in the years twenties. What I am going to refer is not a deep analysis of all the main problems of Africa, Uganda University and Italian Co-operation, it is just a short report of what was my impression, limited in the intention and extension. In spite of some difficulties, the collaboration with local staff has been very fruitful.

2. THE GENERAL ENVIRONMENT

This experience has to be described keeping in mind the conditions in which it has been developed. The University, after all, is one of the aspects of a society. The Ugandan society is composed by multiple ethnic groups, divided in many tribes, speaking different languages, with different religions, the only common link being the official language, English, and the same nation. Remind that Uganda nation was created "artificially" by UK putting together some very different populations and regions of the central Africa, around the Victoria lake.

2.1 Some Africa problems

Africa has very many big problems. Immense pressure have been placed on the Earth's natural system: the birth's rate is everywhere very high, thus doubling in few years the Uganda population. The economic growth cannot make agriculture and water resources to be subordinate to the industrialisation. The fundamental needs, such as food, shelter, health and protection are the bases for development. Underdevelopment results from poor resource allocation caused by incorrect pricing policies, derived from developed countries markets. The chronic lack of progress in human development for many countries, as Uganda, throughout the '80s and '90s has caused by many external factors, such as low prices for primary products, debts and lack of western investments. For example, Ugandan factories are given in the international market, one dollar and half per kilo for a very fine tee, one of the most important Ugandan product, while the final price to the customers is multiplied by hundred times more. The international market is ruled by western economies. I mention here the tee because for the its preparation tons and metric cubes of precious forest wood is fired every year, leading again to the destruction of the forest. Some scientists say that the ever increasing pressure on land (and other natural resources) occurs because the non-agricultural sector is not able to absorb increasing number of people (4). There is an urgent need for land monitoring and management (1). There is an ever-increasing demand for instrumentation and methodologies for monitoring the effects of various activities on the environment, including land degradation. setting up famine

early warning systems and the creation of suitable images (2). The scientific gap for Africa is ever increasing, giving the University the (hopeless ?) duty of reducing it or at least to keep it as it is now. In addition the health situation is expected to worsen in the future years because of Aids spread, and malaria.

2.2 Some Uganda problems mainly from land management and mapping point of view.

Uganda gets out of the terrible experience of the civil war, lasted for many years with million people killed or dead, causing big troubles for the environment. Because of rapid changes in the landscapes, many of the existing maps are now out-of-date and urgently require revision (9,10). National mapping organisation is led by doctor Kajumbula which is at the same time my colleague at ITC in Netherlands (International Institute for Aerospace Survey and Earth Sciences) and part-time lecturer at the Makerere University (3). Most of the topographic mapping was carried out, over the years 1946-1985, mainly by UK. Since the withdrawal of the colonial powers and the achievement of independence there have been significant changes in the landscape. The impact of all these changes has been large shifts in population, resulting in a rapid and uncontrolled growth of the capital Kampala. In many rural areas, as well, while the basic land topography is apparently unchanged, the man made settlements, the communication networks, has altered dramatically the environment, in particular the forest and vegetation cover. The changes going on are often so quickly that the traditional map making procedure is hardly suitable to cope with them (6,7). The basic scale for maps is 1/50.000. The number of sheets at this scale is 310 (3). In Italy the corresponding amount is around 1000. The national agency is working under severe economical constraints, which limit its operational effectiveness and their possibility to invest in new technologies.

At the beginning of the century the Ugandan territory was almost covered by equatorial forest. Due to the human activities, now only twenty percent of the forest is remaining. Therefore an international project for mapping with Spot satellite images is starting now, although the suitability of such images for this task is still a question mark (3,6,7). There are present many pollution problems, in spite of poor industrialisation, such as the Nile river and Victoria lake pollution and the growth of the vegetation in the Victoria lake surface.

From this fact, it derives the need for environmental studies. Mineral exploration is a topic research in Uganda, for oil and minerals findings (5), by which the country is rich.

3. THE UGANDAN EDUCATIONAL SYSTEM .

The Ugandan Government gives a very strong effort in the education of its people, from the first degree of scholarship, to the University, relying on it for the solution of its problems. Since '86 the school fees were rather high, from '86 the compulsory frequency if free of charge.

3.1 UGANDA UNIVERSITY

Makerere University is one of the biggest university in Africa. It was the first University founded in Africa by

English people in the years twenties. All the faculties in Kampala are grouped in the Makerere campus, a magnificent wide area, where the housing for students, and many other facilities are present, including churches for every religion, swimming pool, foot-ball field, etc. . Many famous African people frequented this university, for instance among them, Nelson Mandela, the actual president of South Africa Republic.

There are some cottages and a guest hall for the local and foreign professors.

At the end of the war the structures of the nations were in terrible conditions, including the University. During the war the University was closed. It opened again in 1990, in spite of lack of lecturers. Now Uganda grows very quickly, because of the good political stability, led by president Museveni. In the 1996 Uganda had 8% growth rate, the largest for the African countries.

3.2 UGANDAN UNIVERSITY ORGANISATION

The university systems is based on the English system. The fundamental key points are:

- - National selection of the students
- - No scholastic fees
- - Limited and restricted number of students
- - Compulsory frequency of the courses
- - Examination (written) for all the courses at the end of Academic Year (compulsory).

The entry in the University is quite competitive and the student level is rather high.

The system is efficient: almost all the student become graduate in the scheduled time. The first real main problem is the lack of lecturers.

The salary for teachers is very low: around 300-500 Ugandan Shillings per month (300-500 U\$) and the cost of life is a bit lower but comparable of European standard. The inflation is very high.

3. 4 The Faculty of Technology

The Faculty of Technology is organised in Departments

- Mechanical Department
- Civil Department
- Electrical Department
- Mathematics Department
- Architecture Department
- Surveying Department

On top of the Faculty there are the Dean and Board of the Faculty.

In the whole Faculty there is one associated professor only, the Dean. The faculty building has been designed by an European architect who had in mind the Chandigar complex, by Le Corbusier. The result is not very functional, because the two situations are very different from each other. The room is not enough. Some laboratories such as the one devoted to surveying department, are absent.

4. THE SURVEY DEPARTMENT

The Department of Surveying was established in the Faculty of Technology in 1984: it is the smallest Department of the Faculty.

The program is designed with the aim of imparting some working knowledge in Surveying, Urban Planning, Land Management. There are 30 courses.

Therefore it could play an important role for the Nation.

The programme is a four year academic programme of the University. In theory a lot of emphasis should be put on practical, Lectures, and Tutorials. In practice, for survival reasons, every teacher gets some extra money making professional jobs, thus spending very little time for education and no time at all for research and updating. The Department Staff is composed by the Head of Department, which is Engineer N. Batungi, graduated in Lagos University and by some part-time lecturers, with different degree of involvement.

4.1 Some problems of the Department of Surveying

In practice it is a two rooms and two men department. The department problems are in practice the lack of suitable lecturers, no time for Students, the lack of books and generally of suitable literature, no availability of scientific magazines, no room for laboratories, leading to absence of research and updating for lecturers.

Most of the lecturers followed courses in ITC, International Institute for Aerospace and Earth Sciences, in Enschede, Holland, like me. There should be a tight link with the Survey Department (the national cartographic Agency situated in Entebbe, 40 km from Kampala). Nevertheless *Photogrammetry*, as matter of study, is almost unknown.

At the end of the four year courses the student becomes Bachelor of Science in Surveying. The quality of the thesis are very poor, because of the limited time spent for the preparation and lack of good literature.

5. THE ITALIAN CO-OPERATION PROGRAMME

The Italian project begun in 1992, ended in 96. It was based in the three following key points:

- - Supplying Italian Professors to the local University.
- - Research Funds Financing.
- - Supplying a number of Fellowships for students coming in Italian Universities. It is a good thing that local students can take advantage of such an opportunity thanks to the Italian aids.

The funds have been used to finance the Computer Centre also, which is the most crowded place in the Faculty. In few years Italy switched from the first to one of the last places, among the financing western countries, causing some difficulties to the co-operation programme.

This programme required a good effort on the part of the local and Italian government. If this relationship between Italy and Uganda is to be developed over time into lasting co-operation, great care should be taken to match supply to demand in almost real time. From this point of view more flexibility should be required, compared with the past programme. I would synthesize this statement in less money for Italian professors, and more lower level Italian teachers, to make the help continuous in time.

The new future Italian co-operation programme going to start is based on:

Preparation on the future staff members with Master courses and PhD diplomas. As far as I know, this programme is not yet started.

6. MY PERSONAL EXPERIENCE

I taught in two Academic Years 95 and 96

- Photogrammetry I(Principles of Photogrammetry)
- Surveying I
- Surveying II
- Remote Sensing.

The student level is good, their number is low (10-20 per course). Maybe it has been a good occasion to teach properly. I made the students to practice on computer computations and adjustment. Since Aerial Triangulation is not taught in a regular course, I made some seminars in Aerial Triangulation.

I translated in English my book in Photogrammetry, giving the photocopies to the students.

I organised some technical visits to the Forestry Department in Kampala and to the Survey Department in Entebbe taking advantage of the personal friendship with their staff. In the Forest Department some GIS projects are carried out, one called Biodiversity, and another one Biomass both of them sponsored by FAO. I could define my experience as really interesting, exciting, useful (at least for me), and finally, in a certain sense frustrating also. In spite of some difficulties, the collaboration with local staff has been very fruitful. My hope is to come again, to deep the started collaborations with the Faculty, the national mapping agency in Entebbe and the Forest Department.

7. CONCLUSIONS

In theory almost everything is properly settled, the good selection of the students, the organisation of the courses, the examinations. The final level of the graduated could be rather high. The staff should receive a good salary to spend full time in the University. The point is: the level of the local lecturers must be risen. HOW? The task is very delicate: how can be improved the quality of the local lectures? And: The Italian Co-operation Programme was really useful, or vice-versa, it was a drop in a sea, the sea of the Ugandan needs? These are still open questions. We tried our best. For me, it was exciting to meet local people, to co-operate with old friends, to challenge this task.

Organisations in the country demand fully professional staff at Msc and PhD levels properly equipped to deal with the technological developments.

Technological developments are always racing ahead and the knowledge gap can only go on being reduced if existing knowledge in the country is continuously updated. This is the tremendous assignment of the Uganda University.

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