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PHOTOGRAMMETRY AND REMOTE SENSING  
EDUCATION AND RESEARCH  
IN GREECE AND CYPRUS

Abstract

The state of the art, as well as problems and trends, in Photogrammetry and Remote Sensing Education and Research are analysed in Greece and Cyprus.

The author (regional delegate for Greece and Cyprus of the ISP WG VI - 1) presents all the information gathered for the Photogrammetry and R.S. Institutions and Organisations of these two countries.

Courses, enrollments, annual photogrammetry graduates, the duration of Ph. and R.S. study programs, teachers and equipment, as well as, research and development activities are reported. The problems of Education and Research in Photogrammetry and Remote Sensing are discussed and viewed as an inevitable consequence of the general social, economic and political conditions existing in Greece, which strongly affected Education and Research Laws as well as the structure and functions of Universities and other third level Education Institutions.

Some conclusions and recommendations concerning (a) a radical educational reform, urgently needed in Greece, which will positively influence both education and research in Photogrammetry and R.S, as well as, (b), the obvious need for the founding of the first University of Cyprus are presented.

1. UNIVERSITY EDUCATION IN GREECE

The basic law, which rules University Education in Greece, came into force at first in 1932. In 1975, the responsible organizations of the University Community and the Scientific Unions pressing for a democratic reform of Education, proposed a new draft-Law to the Government.

In 1978, a new law (815) for University Education came into force, which raised opposition from all students and teachers organizations, many University councils, as well as from all the scientific organizations, because the Government didn't take at all into consideration their positive proposals.

Greece is one of the few countries of the World, where the feudalistic University institution of the "Omnipotent Chair" still survives. That means that Department's democratic structure and functions have not yet been introduced to the University Education in Greece, which, maybe is also the only country in Europe, where Post-Graduate Studies and Research are not legislated. A number of Chairs forms a Faculty which grants its students M. Sc. degree after successful completion of five years courses.

Each Chair or Laboratory of a University (which is always connected to a Chair) organizes occasionally special courses leading to Ph.D. This depends of course in the one hand from a Dipl. Engineer's will to carry on his studies in a Research effort which leads to a Ph.D. and in the other hand, mainly

from Professor's time, capability and/or will, to let it be accomplished up to a certain degree.

So, the standards are different each time, since a good thesis is sealed: (a) by the "good" or "bad" scientific personality of the supervisor professor (b) by the student's ability and skill and (c) by a series of events and coincidences that favour or not the climate of cooperation between them and which does not reflect the more permanent characteristics of a systematic, programmed and coordinated educational and research effort.

Since there aren't practically any sum of money in the Budgets of Universities to support, post-graduate studies, one may easily come to the conclusion, that the success of a research effort in Greece for a Ph.D. often proves a candidate's scientific dedication, which costs him a lot of economical and other sacrifices.

It is very important also to mention that a 20% increase in the civil servants and university teachers salaries, was hardly recently (1978) recognised, for those who hold a Ph.D.

## 2. UNIVERSITY PHOTOGRAMMETRY AND REMOTE SENSING EDUCATION IN GREECE

The Courses in Photogrammetry and Remote Sensing at University level are offered in Greece:

21. At the National Technical University of Athens  
Faculty of Rural and Surveying Engineering and
22. At the Aristotelion University of Thessaloniki,  
Polytechnic Faculty, Section of  
Rural and Surveying Engineering.

Table 1 shows some basic characteristics of the structure of these courses and

Table 2 some basic figures about the Photogrammetry and Remote Sensing Equipment of these Institutions.

TABLE 1

## UNIVERSITY LEVEL

## PHOTOGRAMMETRY AND REMOTE SENSING EDUCATION IN GREECE

	NATIONAL TECHNICAL UNIVERSITY OF ATHENS (1) FACULTY OF RURAL AND SURVEYING ENGINEERING (3) CHAIR/LAB.OF PHOTOGRAMMETRY	ARISTOTELION UNIVERSITY OF THESSALONIKI,POLYTECHNIC FACULTY (2) SECTION OF RURAL AND SURV. ENGINEERING (4) CHAIR/LAB.OF PHOTOGRAMMETRY
ENROLLMENT	(1) : 5.735	(2) : 3.354
DURATION OF STUDY PROGRAM	5 years	5 years
NAMES OF COURSES AND LABS/ ENROLLMENT	PHOTOGRAMMETRY I/ 132 PHOTOGRAMMETRY II/ 39 PHOTOGRAMMETRY III/16 " SPECIAL TOPICS/16 REMOTE SENSING I /109 REMOTE SENSING II/ 18 " APPLICATIONS/9 NATURAL RESOURCES/ 21 INVENTORIES AND INTEGRATED SURVEYS CADASTRAL SURVEYS/108	PHOTOGRAMMETRY I/ 40 PHOTOGRAMMETRY II/40 PHOTOGRAMMETRY III/40 REMOTE SENSING/ 40          CADASTRAL SURVEYS Courses are given by the Chair/Laboratory of Cadastral Surveys and Land Consolidation
TOTAL NUMBER OF HOURS PER COURSE AND LAB.	26/26	26/26
TYPE OF DIPLOMAS	M.Sc. (Dipl.Eng). in Rural and Surveying Engineering (with major in PH. or R.S. or etc.) Ph.D. (Dr. Eng.)	
AVERAGE NUMBER OF GRADUATES	(3) 90	(4) 40
BUDGET	(1) 30.000.000 \$ (PH) 110.000 \$ (R.S.) 50.000 \$	
SCIENTIFIC TEACHING STAFF	J.BADEKAS Ph.D. Professor DEM.ROKOS* Ph.D.S.Lecturer ST.GIOKAS M.Sc.Assistant, P. ZENTELIS M.Sc. " A. TSAGARI M.Sc. " E. STAMPOULOGLOU M.Sc.Assis. Θ. KARRAS M.Sc.Assistant K. PAGANIS Surveying Technol.	C. CLADAS Professor (retired) E.PATMIOS** Ph.D,S.Lecturer G.TSOHOS M.Sc.S.Lecturer (1977) M.TSAKIRI M.Sc. Assistant and 3 technicians

\* He was elected Professor (18.3.1980) in the Chair of Cadastral Surveys and Land Consolidation in the Polytechnic Faculty of the Aristotelion University of Thessaloniki

\*\* He was elected Professor in the Chair of Photogrammetry

TABLE 2

PHOTOGRAMMETRY AND REMOTE SENSING EQUIPMENT OF UNIVERSITY LEVEL  
EDUCATIONAL INSTITUTIONS IN GREECE

	NATIONAL TECHNICAL UNIVERSITY OF ATHENS	ARISTOTELION UNIVERSITY OF THESSALONIKI, POLYTECHNIC FACULTY
	LABORATORY OF PHOTOGRAMMETRY	LABORATORY OF PHOTOGRAMMETRY
PHOTOGRAMMETRY EQUIPMENT	1 Stereoplanigraphe C.8,	1 Wild A7
	1 Technocart, 1 Aviograph B8	1 Wild A9
	1 Kelsh Plotter, 2 Multiplex	1 Wild B9
	1 Nistri Orthophoto, 1 Nistri	1 Wild E4
	Photomapper, 1 Wild A6,8 third	1 Wild STKI
	order instruments, 1 SEG`V ,	1 Wild C120
	1 Wild C 120, 1 Wild P 31	1 Wild C40
1 Zeiss UMK e.t.c.	1 Wild P30	
	TOTAL VALUE*: 500.000\$	TOTAL VALUE*: 250.000\$
REMOTE SENSING EQUIPMENT	Mirror Stereoscopes (40)	Mirror Stereoscopes (20)
	Pocket Stereoscopes (200)	Pocket Stereoscopes (100)
	Interpretoscope (1)	
	Zoom Stereoscope (1)	
	Hasselblad Cameras (2)	
	TOTAL VALUE* : 60.000\$	TOTAL VALUE *:10.000\$

\*time of order (approximately)

3. OTHER THIRD LEVEL INSTITUTIONS FOR PHOTOGRAMMETRY EDUCATION IN GREECE

Courses in Photogrammetry are also offered, in the Department of Surveying Technologists of the Centres of Higher Technological and Professional Education in Athens, Technologist level Educational Institution with a total enrollment of 1.250 students.

These no University - level Educational Institutions were planned by Cal Poly, following an agreement signed between the dictatorial regime of Greece and the World Bank. Thus, these educational Institutions (absolutely similar to the ones established by Cal Poly a few years ago in a developing African Country), were transplanted in Greece, without any reliable analysis of the concrete conditions and needs of the Greek socioeconomic reality. On the other side, the dictatorial regime never permitted any change of the "imported" model, although opposition organizations (all the organizations of students, teachers and scientists) revealed all the disadvantages of this new educational Institution.

So, at this moment, six years after the fall of the dictatorship, the Centres for Higher Technological and Professional Education continue to imitate University level studies, instead of training the necessary technologists for their very important task (operators of photogrammetric and remote sensing systems e.t.c. in our example).

This distortion of our educational system is a result of its feudalistic nature, as well as, of the tremendous social "prestige" of University studies in Greece, independently of their actual value. For this reason the Centres of Higher Technological and Professional Education don't contribute at all

to the symmetrical Scientific Technical and Technological development in this field.

The duration of Study Program in the Dept. of Surveying Technologists is 3 years, the names of Courses are Photogrammetry I and II, (26 hours per course and 26 hours per Laboratory), and the enrollment reaches the number of 35 students per course.

The type of Diploma is: Dipl. Surveying Technologist and there are about 30 graduates each semester. The photogrammetric equipment of the Department of Surveying Technologists comprises one Wild A.10, one Wild B8 and one Wild A6 (Approximate Value : 120.000\$), as well as one Mirror Stereoscope and some pocket stereoscopes. (Approximate Value 1.000\$).

At this moment they are not other lower level Photogrammetry educational Institutions in Greece.

#### 4. PHOTOGRAMMETRY EDUCATION IN CYPRUS

In Cyprus there aren't either University or Higher Technical and Professional Centres where Photogrammetry and Photointerpretation are taught.

Cypriots, it is common to study either in Greece or in Great Britain.

Occasionally only, study Programs for Photogrammetry Technologists, lasting for 6 months (6 hours per day) are given by the Department of Land and Survey (Nicosia). There is an average enrollment of 4 students, Eight graduates per year, and the type of Diploma is a Departmental certificate.

Students are practicing in two Stereometrographs of Karl Zeiss Jena, (approximate value 250.000\$), which consist the Photogrammetric equipment of the Photogrammetric Section of the Dept. of Land and Survey in Nicosia.

Cyprus is planning now to establish a University in Nicosia where it is possible that courses in Photogrammetry and Remote Sensing will be included.

The Government of Cyprus is discussing now the matter with UNESCO and other International Organizations and its relative decisions are expected in the near future.

#### 5. PHOTOGRAMMETRY RESEARCH AND DEVELOPMENT IN GREECE

The parts D and E of the questionnaire on the status of World Photogrammetry Education and Research, were answered only\* by the Ministry of Agriculture and the Ministry of Coordination. The Ministry of Public Works (Directorate of Photogrammetry) reported no Research and Development activities.

Ministry of Agriculture Directorate General of Forests and Forest Environment Directorate A, Section 2 is a public organization. It has a total number of 23 employees and a total annual budget of 175.000\$. Directorate General of Forests reported a staff of 13 Research and Development scientists (Foresters) in the field of Photogrammetry (Orthophoto Unit). There are also 4 Operators, 2 Draftswomen, 1 photographer, 1 Cartographer, 1 Assistant Photographer and 1 Technical Assistant.

The annual expenditures for Photogrammetric Research and Development reaches the amount of 190.000\$ (plus a 10.000\$ for relative works).

This public organization has a specialization in the construction of Forest Orthophotomaps and operates:

-One Orthophotoscope T-64 (U.S. G.S.)	20.000 \$
-Two TOPOCARTS with ORTHOPHOT attachments (JENA)	105.000 \$
-One Hohlux Copy Camera (0,8 X 0,6m)	37.500 \$
-Miscellaneous accesories (contact printers, reduction printers e.t.c)	10.000 \$
-One Monocomparator	45.000 \$

\* Army Map Service reported unofficially that due to military restrictions they will send the answered questionnaire directly to the I.S.P.

According to UNESCO \*\*,in general, "Research and Development is defined as any creative systematic activity, undertaken in order to increase the stock of scientific and technical knowledge and to devise new applications".

Taking into consideration that the task of Ministry of Agriculture, Directorate General of Forests and Forest Environment Directorate A, Section 2, is the use of established processes, instruments and techniques in Photogrammetric production, one could entirely exclude its activities from Research and Development.

Ministry of Coordination reported as Organizations with Photogrammetry Research and Development activities:

1. National Council for Physical Planning and the Environment Secretariat  
1, Zalokosta Str. Athens - Greece and
2. Scientific Committee on Remote Sensing, Ministry of Coordination Scientific Research and Technology Agency  
48 Vas. Konstantinou str. Athens 501, Greece

In the first of these two public organizations, periodically, a number of individual scientists or "ad hoc" working groups are involved in various topics of land use and environmental Planning in general, and make use of aerial photographs as a secondary tool of information.

The second one is an advisory body to the Ministry of Coordination on issues related to the development of R-S in the country.

National Council of Physical Planning has a total annual budget of 550.000\$ and among its 43 employees there is only one scientist with a University Degree in Remote Sensing, (Dipl ITC Remote Sensing in Urban Planning and Ph.D. of the University of Aston in Remote Sensing applications in environmental planning).

Taking into consideration the strictly coordinating and/or advisory (at least, at this moment), role of the National Council for Physical Planning and the Environment, as well as, of the Scientific Committee on Remote Sensing (Ministry of Coordination), we can't consider these activities as Research and Development.

Finally, we could conclude, that only the Laboratory of Photogrammetry of the National Technical University of Athens, and Scientists and Engineers as research units or groups\*\*\* cover the Research and Development activities in Greece in the field of Photogrammetry and Remote Sensing,\*\*\*\*

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\*\* UNESCO Statistical Yearbook 1975

\*\*\* And only in the case, the Service of Scientific Research and Technology would approve their research programs, according to the arrangements of the Law "for Scientific Research and Technology", which came into force in 1977.

\*\*\*\* We have also to mention here, the military applications oriented National Space Research Center, a public organization of the Ministry of National Defense, specialized in Remote sensing. N.S.R.C operates one Analog Image Analysis system (approximate value 30.000\$) and one Color Additive Viewer (20.000\$).

## 6. PHOTOGRAMMETRY RESEARCH AND DEVELOPMENT IN CYPRUS

None Photogrammetry Research and Development activity is reported for Cyprus.

## 7. SOME CONCLUSIONS

In consequence of the above, it is obvious that it is now an imperative requisite for Greece, the establishing of Post-graduate University Studies by a legislative act. Further to this, Universities in Greece, must (a) maintain strong ties with the concrete problems and needs of the community and (b) mutually and systematically influence and be influenced by the scientific and technological evolution.

Most of all, an essential and radical change in the whole institution of the University Education should be immediately pursued in Greece. The realization of this need will be of course the sound foundation on which the progress of Education, Research and Development in the fields of Photogrammetry and Remote Sensing in Greece, will be based too.

Research and Development have to be legislated as a main University function connected with Post Graduate University Studies.

To promote Remote Sensing Applications in Greece, a National Center for Remote Sensing must be included in the frame of the National Organization for Mapping and Cadastral Surveys, which the Technical Chamber of Greece and the Association of Rural and Surveying Engineers of Greece have already proposed to the Government.

## 8. RECOMMENDATIONS

### 8.1. GREECE

Last year more than 70.000 Greek highschool graduates didn't manage to find a place in some Greek University.

On the other side, at this moment, more than 36.000 Greek Students are studying in foreign Universities. As a result of this, there is a tremendous foreign exchange outflow from Greece every year.

Taking into consideration that all Development Infrastructure studies in Greece, (Mapping of Greece at scales 1:20.000, 1:5.000 and larger, Cadastral Surveys, Natural Resources Inventories e.t.c.), haven't yet been started and/or accomplished, it becomes obvious that Photogrammetry and Remote Sensing Education, Research and Development is a very important problem for Greece, for which special care should be given in the near future.

So, Photogrammetry and Remote Sensing Methodologies and Applications Courses must be included and developed in the new Polytechnic Faculties and Universities which must be established in Greece. We have to note, that Photogrammetry and Remote Sensing must be taught in the old and new Universities not only as separate specialized scientific field, but also, in some appropriate way, as a basic multidisciplinary scientific tool for all scientists and Engineers dealing with Development planning and Design projects both in Greece and abroad, (for example in Third World Countries where many Greek Engineers are working during the last years).

All these, of course, presuppose the radical change in the structure and function of Greek University Education System and this is the first and main goal for students and teachers organizations.

### 8.2 CYPRUS

The establishment of a National University in Cyprus which would include courses in Photogrammetry and Remote Sensing, as well as, teaching of Photo-

grammetry and Remote Sensing topics and training of Technologists, in the existing Technological Institute in Cyprus, seems to be a basic recommendation for Cyprus.

There is a need, however, for a broader consideration of the multidimensional problems (societal, economical, educational, e.t.c.) which Cyprus is confronting under the present so difficult conditions, which its people is passing by.

Government of Cyprus political will for the establishment of a University in Cyprus seems to form a positive base, not only for the future prospects of Photogrammetry and Remote Sensing Education, Research and Development in Cyprus, but also for the decisive contribution of this University to the protection of National Independence, and the National Sovereignty of the Democracy of Cyprus.

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#### 10. REFERENCES

1. Dem. Rokos : "Integrated" Photogrammetric Contribution to Development. Educational and Administrative Aspects. PRESENTED PAPER 13<sup>th</sup> Congress of the International Society for Photogrammetry. Commission VI. Helsinki July 1976 (International Archives of Photogrammetry 1976).
2. Dem. Rokos : Fundamental Presuppositions for a rationalistic National Development. PRESENTED PAPER 11<sup>th</sup> Congress of the International Society for Photogrammetry. Lausanne 1968.
3. Dem. Rokos : Some Thoughts on educational reform as fundamental presupposition for Development. PRESENTED PAPER 1969 United Nations International Program Geneva.
4. Dem. Rokos : The role of the Surveying Engineer in Planning, His Social Responsibility . INVITED PAPER. XV International Congress of F.I.G. Proceeding Stockholm 1978.