

Cooperation

Establishment of the Cartographic Laboratory of
Geographic University
Ecuador

(on the job school and training for Ecuador personnel)

EVALUATION REPORT

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Legend

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a. EXECUTIVE SUMMARY

The scope of the project "Establishment of the cartographic laboratory in Cuenca-Ecuador" included the following components:

- Creation of one Cartographic Laboratory in the Cuenca University (Geographic Department) by supplying all the appropriate equipment and material;
- Provision of technical assistance for editing 26 maps at various scale;
- Supervision of the map printing ;
- On-the-job training of local personnel.

The project was successfully accomplished in the period January 2011 - February 2013 (through 36 months of actual working time). In the end of project the cartographic laboratory is ready for have autonomous job and good level of work.

Is possible, on the job, have some more extra maps and were produced if the locals staff have strong participation in the project, see fig. 1).

The edited geological maps were taken from the backlog of sheets mapped within the regional mapping programme of the Geological Department of Ecuador, chosen according to a priority list of mineral interest. The same for all maps for agricultural, etc.

The possible maps produced extra, were printed on the back of the corresponding sheets, to reduce cost and offer a handy consultation. These for have one reduction of the cost and offer one help for the user.

All part of work, up the compilation of the finale cd, including the data base and the digital work, was carried out in the new cartographic laboratory, by the local personnel under the assistance and supervision of L'Antica Cartografia specialists.

On-the-job training was continuous and covered all aspects of work (operation of the new equipment, basic and advance cartographic techniques, use of PC working station and related software packages). Results can be considered satisfactory, but a longer exposure is deemed necessary for local personnel to reach a level of total autonomy.

The final cd work "ready for printing" were sent to printing, where 3.000 copies per map were printed..

The work realized within this project represents an important progress in the publication of geographical maps of Ecuador. However, a lot of work remains to be done. It is considered that a new 30 months extension of the project, under the same terms and conditions, could be extremely useful both to consolidate the cartographic structure of these staff and push forward the coverage of the Country and have realised also National Atlas, atlases for school and maps.

1. INTRODUCTION AND SCOPE OF THE PROJECT

The present report concerns the project "Creation of one cartographic laboratory in Ecuador and editing and printing maps" carried out from January 2011 to February 2013 by L'Antica Cartografia of Milan-Italy through a technical assistance contract with

The scope of the project was the following:

- To supply and install a cartographic laboratory within the University of Cuenca (Ecuador);
- To prepare the ready-for-printing final digital cd for 20maps of Ecuador;
- To have the maps printed in Ecuador;
- To carry out an on-the-job training programme to improve the capabilities of the Ecuador cartographic staff, making them familiar with the new equipment and modern techniques.

2. ORGANIZATION AND STAFF

2.1 L'Antica Cartografia Personnel.

The foreign personnel made available for the project consisted of three full time geographer, cartographer and technical cartographer:

One cartographer/geologist/geographer, Dr. Giovanni De Agostini (head mission)

One cartographer, Dr. Minori Morozumi (technical and finance consultant)

One computer operator, Dr. Juan Carlos De Agostini (responsible server and programs)

The latter intervened in the moments of specific need, such as the installation and setting to work of the laboratory, the checking of the CD before colour proofing and the final control before printing. The monitoring is continuous on the times of works steep-by-steep to the moment the maps are ready printing.

The time spent on the project by the Italian experts is reported in fig. 2

2.2 Ecuador Personnel.

The number and composition of Ecuador personnel assigned on the project is given in the fig. 3.

The three senior cartographers have a generally sufficient technical background, though not up-to-date with advanced cartographic techniques.

The remain staff showed to have some basic training but were not autonomous in their work.

The counterpart personnel of University is necessary resulted to be one experienced team, giving an important contribution to the analysis and control of the maps to be edited. The Director of the University provided geographical and editorial supervision (see fig. 5).

The Ecuador staff availability throughout the project is given in fig.4. It can be noticed that the number of local cartographer did not keep constant and diminished severely towards the end, due to assignment elsewhere of the personnel.

3. CARTOGRAPHIC METHODOLOGY

The methodology applied to the preparation of the maps was established together with the Technical staff prior to starting the work; it was in line with the one already used for the compilation of maps printed before by the University during the years.

However, new techniques were introduced to improve the standard, especially during the final colour separation stage.

The setting of the maps was defined in details during a meeting held in the University, where the following aspects were discussed:

- Standard colours for units (any part of project).
- Symbols to be included in the maps.
- General geographical information (such as roads, buildings, boundaries, etc).
- Standard colours and degree of accuracy of physical setting (rivers pattern, elevation contours, etc.).

Further detailed information related to the cartographic work is presented in Annex 1 and fig. 6.

Of course all product in the project is ready by the new technology of modern digital cartography.

4. CARTOGRAPHIC LABORATORY EQUIPMENT

When the project started, it is necessary to have facilities for the preparation of high standard maps. The room for scanner and the room for drawing is necessary in aseptic conditions. The rooms (total 4, one for 15 persons) is furnished by the University of Cuenca

The basic equipment was ordered by the consultant in Italy and was received in Philippine before the start of the project. It consisted of the following basic items:

6 air conditioners

Rooms for scanner:

2 Drawing tables by light 110x160 cm

4 Cabinet 200x100x40 cm

2 Drum 50 litres sewage

Scanner 100x~

Plotter 120cm

Drawing tables by light 200x160 cm

1 Automatic processor (developer)

1 Purifying water filter

Cartography:

1 Library

2 Drawing tables by light 110x160 cm

6 Cabinets 200x100x40 cm

13 Full equipment PC working station

13 Chair

4 Stool

1 Server

6 PC hd 1000 G 4000mega ram

6 Mac hd 1000 G 4000 mega ram

2 laser printer A3 >600 dpi

2 scanner A3

1 electrical air-compressor

Films, cd, scribing bases, chemical and consumables

Direction e secretary:

1 Freezing

3 Desk

3 PC

2 Laser printer A4

4 Cabinets

1 Armchair

4 Chair

1 Photocopy machine

1 Binding machine

Conference room:

1 Table 400x140

16 chairs

1 Overhead projector and etc.

1 Library

1 Piece of furniture

Some more machinery are in the Machines addendum

Finally, at the beginning of addendum 3, a third supply of consumable materials was made, consisting of films, chemicals, scribing bases and additional tools, that is mainly consumables being the lab already geared and in good working conditions. As a result of this management a consistent reduction in map cost production was achieved during the last phase of the contract.

Upon completion of the work, all cartographic equipment supplied through the project was left under the responsibility of the local staff in good working conditions.

5. THE AVAILABLE GEOGRAPHICAL MATERIAL

An accurate examination of the original geographical plates was performed before initiating the cartographic editing of the maps.

The main problems that were met in the course of the work were the following:

a) The original field sheets were found generally in poor conditions, as they had been drawn and compiled long time ago (even 10-20 years back). Some sections were missing or were incomplete, the colours, symbols and legends were out of standard, had faded away and were often confusing.

b) The maps belonged to separate areas of the country, has been mapped by different specialist working independently from one another and also at different times. Consequently some errors and/or discrepancies between bordering maps were to be expected. The perfect harmonization of these maps would have required, ideally, a certain amount of field checks, with were not foreseen in the project. Therefore discrepancies were overcome by introducing a reasonable degree of approximation and of "interpretation" of the original maps.

c) A complete revision of the land is still in progress: many of the former classifications of soil and rock units have to be updated in agreement with the new interpretations. When the new classification was not available, the old one had to be used.

d) All the maps had an explanatory report, some of them already edited and unchangeable; this constituted a further obstacle to the reorganization of the geographical setting of these maps.

Finally, it was considered appropriate to update the maps with all data which became available after the original mapping event.

Despite the above shortcoming, the maps edited reached a satisfactory degree of accuracy. In this respect, the supervision of the work is necessary exerted by the personnel of the University, who as been with the institution since long-time, was particularly useful.

6. MAPS PRODUCED

The first map in the project is the map of Philippine for roads and tourism at scale 1:1.250.000 (even in physic-political edition). After, the second map is Geopictorial (70x100 e 50x70 cm). In the next nine months is necessary mapping the plant of Quito and the five more important town in Ecuador. If is necessary is possible editing some more maps of towns and the map of Galapagos Islands.

In three years the staff make part of these geographical maps:

| | |
|---------------|---------------------|
| 01 Amazonica | 13 El Oro |
| 02 Azuay | 14 Esmeraldas |
| 03 Bolivar | 15 Guayas |
| 04 Cañar | 16 Los Rios |
| 05 Carchi | 17 Manabi |
| 06Chimborazo | 18 Oriente |
| 07 Cotopaxi | 19 Moronia |
| 08 Imbabura | 20 Napo |
| 09 Loja | 21 Orellana |
| 10 Pichincha | 22 Pastaia |
| 11 Tungurahua | 23 Sucumbíos |
| 12 Costa | 24 Zamora Chinchipe |

After the project study the possibility for make 4 Geological maps, agricultural maps, for mining, etc.

The schedule of work is decided according by the responsible of the University.

The total of geographical maps is (15+24+8) 20 in the three years of project and 27 in another 30 months

7. TRAINING

Full scale on-the-job training of the local staff was carried out throughout the project.

Training was provided mainly for:

- a) The operation of the new equipment (Vectorial software, digital cartography, etc.). Also basic information for the cartographical system of work and the schedule of work.
- b) The new cartographic techniques introducing to improve the standard of the job: all staff have obtained substantial level of varied training (scribing techniques, making processing, screening and type of colours, density and registration of colours, etc).
- c) The evaluation of local personnel for decided the optimal utilisation in the laboratory. These for have in the end of project the good men in the good place for have the maximum in the work.
- d) The basic operation of the new PC working station: a theoretical and practical course started in the moment the machineries is ready to work. In the three initial months minimum 3/4 times per week for have introduction in the main software packages with the aim to enable them to help to help the cartographers with editing and composition of symbols and inscriptions, reference frames, sketch maps legends, etc.

As a general comment, it can be stated that, after a slow start a marked improvement of individual capabilities together with a more continuous attendance to job have been observed, probably as a consequence of the good and satisfactory results achieved.

It is work remarking, however, that the exposure time was really to short to ensure a full comprehension of the matter, including computer, various aspect of map preparation and especially organisation of the work on its whole. Under the circumstances, the satisfactory completion of the work of more maps than stipulated is indeed a praise to all concerned, and the progress in general has been great: a strong improvement in the quality of the maps compared by these editing in the past years. As a consequence, the maps of the project is necessary considered , in the moment of editing, a international standard documents available for any use in all sectors.

8. OUTPUT OF THE PROJECT

The results is necessary to obtains after the 36 months were the following:

- a) The first target, the equipping of the cartographic laboratory with modern equipment and facilities, was achieved.
- b) The second target, i.e. the compilation of 20 geographical maps of Ecuador was also full achieved: 3.000 copies of each map were printed, and available in the technical records of the section of the University.
- c) The third target, i.e. the training of the local personnel, can also be considered to have been rather successful, as the results prove, but it is our opinion that further external assistance is required to put the Cartographic Unit of University in a condition to operate autonomously and independently.

9. RECOMMENDATIONS

Even after completing of the 20 maps published within the project, the backlog of unprinted maps remain quite large. An approximate total of 40/50 maps of relevant economic importance for the mining and agricultural sectors of the country are available for recheck, editing and printing, representing at last three year of work with The present man-power and facilities.

The main equipment is installed and in good working condition, so any additional allocation will be required only to cover consumables and consultancy services. It is therefore recommended that the Map Printing Programme is continued for al least another 30 months.

It also highly recommended that the present team be kept in the project, to maintain the same level of productivity and of quality.