

A Radical Solution for the Cadastre Problem in Egypt Using Integrated GPS-GIS System

Dr. Ehab NABIL NASSIF, Egypt

Key words:

ABSTRACT

During the period 1897-1907 the cadastral surveying of Egypt was established. The increase in the total area of cultivated land and the rapid escalating need for planning of national projects, highways, canals as well as updating land information require non-traditional solution of such large-scale maps.

The Egyptian Survey Authority (ESA) started developing cadastre since 1988, using the total station technique. About 1.2 million feddans of total nine million feddans were covered by cadastre maps. The shortcoming digital maps with no attribute data have been produced.

A multi-purpose cadastre system for Egypt, which is feasible to solve the Egyptian conditions, has to be developed. Obviously, An extended know-how technique with regard to the existing procedure and regulations is utilized.

The use of digital equipment accelerates the production rates, yet many technical requirements are needed to overcome some major obstacles. Among these the huge number of traverse stations that must have intervisibility, and also the large number of traverse points required to cover a limited area (one point per fifty feddans), in addition to the destruction of about 50% of them by the people and farming machines. Also, we have no kind of quality checks and quality control, because we just measure a ray from the traverse point to the prism in its position. Again, in total station surveys it is essential to number all boundaries on survey sketches before surveying. One more team in the office has to edit and link the separate points to form the polygon then the resultant form is a closed line not identified area features. The output of all these production phases is a survey map but with nothing about the ownership and registration information. The collection of the attribute data is treated in many other long stages. Yet, we still have all the defects mentioned above.

An integrated RTK-GPS system and designed GIS modules for full data acquisition, as well as immediate quality control and quality assurance was proposed. This paper focuses on the proposed system, which automates the parcel transactions and preserves any update information in both spatial and attributes data.

Automating parcel transactions and developing fully attributed cadastral maps are the main objectives in the proposed cadastral system in Egypt. This proposed system preserves any update information in both spatial and attribute data. Also it helps to achieve the user requirements for the cadastral system quickly and efficiently.

JS2 GPS for Cadastral Applications

Ehab Nabil Nassif

A Radical Solution for the Cadastre Problem in Egypt Using Integrated GPS-GIS System

FIG XXII International Congress

Washington, D.C. USA, April 19-26 2002

An integrated GPS-GIS system allows the pre-designed features to be uploaded as a data dictionary file. The required features are categorized geometrically, (point, line, area) together with the related attributes for each feature.

The designed database is imported to the GIS System; the main obligation in this design is to be capable for extension and always ready for continuous feeding. The distribution of the picked features through the designed database is programmed using V.B.V.6. Additional codes are written for parcel transactions, (selling, splitting, aggregation), and design of instantaneous deed plan certificate are developed. The programs are fed into the GIS software and treated as a separate customized module.

- Using the RTK system for survey of boundary marks gave a high accuracy. At each mark the surveyor can check the accuracy before recording the position. Applying the standard specifications for RTK observations and set the tolerance in horizontal and vertical direction. Since the data are processed instantaneously using the phase and code data of the base receiver.
- As we survey the parcels as independent lots (not individual points), no errors in numbering or mistakes in attribute recording were occurred.
- The line features like canals, roads, railways and bridges since they were surveyed as line features with full identification in the field if they were arcs or straight and the capability to divide them in many segments in the field. This option reduces a tedious work in linking points to form the line features.
- The cartographic work was almost diminished in this system. Each feature class in the used data dictionary was distinguished. The features have definite layer, definite colors and definite symbols.
- For estimating the rate of work using the RTK system, an area of 350 fed. Was considered. The time required to produce a cadastral map for this area was found to be 3 days /crew. (Crew has two RTK surveyors for fieldwork and one technician for office work).
- Using the RTK system accompanied with GIS data-logger reduces the time and cost and cancels many stages in cadastre production.
- Finally the author out lined a two years plan to finish the cadastre mapping in Egypt. The plan considers the cost, time, equipment and manpower.

CONTACT

Dr. Ehab Nabil Nassif, Researcher
Survey Research Institute (SRI)
National Water Research Center (NWRC), Egypt.
308 Al-Haram St.
Talbía
12111, Giza
EGYPT
Tel. + 202 586 7174
Fax + 202 584 9283
E-mail: ehab_mina@hotmail.com

JS2 GPS for Cadastral Applications
Ehab Nabil Nassif
A Radical Solution for the Cadastre Problem in Egypt Using Integrated GPS-GIS System