

MONITORING THE URBAN DEVELOPMENT AREAS BY USING PHOTOGRAMMETRIC TECHNIQUES

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Commission VII, WG VII/4

KEY WORDS: Urban, Digital, Photogrammetry, Method, Land Use

ABSTRACT:

The Urban areas have been growing up and developing like living creatures. Development can be regularly or spontaneously. In Turkey, municipalities responsible for planned development of urban as the most of countries are in the world. In urban, which will be categorized in the shape of old and development areas, development plans have been using to direct the development. Planning process, which is beginning with the determining of the area that can be settlement, has completed with development plan of the property texture and its transformation into appropriate structuring data. In order to the human being give preference to the development areas, these areas should be attraction center performing urban social-technique infrastructure linked the development programs or plans. However, in urban, which has rapidly been growing up than the development plans, the governments have some difficulties to make urban oriented. For this reason, municipalities have been obliged to observe the spontaneity urban developments and revise their plan with respect to this development. In case legal or illegal residence settlements can be temporarily observe with advanced technological methods, technique or financial methods that can early identify and urgent intervene the paradox problems will be improved by the governments. In this contribution, digital photogrammetric techniques have been introduced to inspect urban development and to take preventive measures for the problems, therefore in stage of development plan it is possible to follow and check the problems in time. In observing the urban development, traditional methods have been compared with contemporary methods (photogrammetric methods) in point of analysis of cost-benefit. An application have been performed based on proposed method and presented some suggestions.

1. INTRODUCTION

After the 1950'S the migration from rural area to urban area had been in turkey as it had been in the world. The ration of the rural population was 75% at the beginner of the republic. But now the ration of the urban population is 65%. In the 1950'S the population ration in urban area was 27%. The main causes of the migration were especially the industrial developing and the increasing of the road networks possibilities. The reflection of the migration action in the urban places has reached undesirable situations like, constructions, near the urban areas, without infrastructure and permission. The municipality had not obstructed this improper construction. Because of the classical comprehension of the municipalities, the planning of the urban politic, and the inspection its implements have not been possible in turkey. This understanding has still continued in the municipalities. But the demand to the cities is increasing gradually. This migration increase from rural area to urban area has reached quite big number of the migration rate of the population. If this migration action had not been controlled, it could cause very urgent social and economical problems. In this study we aimed the development of the cities' orienting and inspection by using the remote sensing techniques systems (Larsson, 1997).

1.1 The Urbanization Shape Of Turkey

The cities in turkey can be divided into two parts at the point of their improvement and settled areas. There are generally the legal constructions with infrastructure in the settled areas in cities. The improvement areas in the cities are focused in this paper. There is no infrastructure in these areas and also the agricultural use has been continued on these areas. At the same time, the improvement focus of the cities is not one way about location. There are a lot of directions and places for settlement in cities. The city improvement plan is prepared for determining the directions and places for settlement and controlling the development direction of the cities. But sometimes-undesirable development directions at different regions could be in the cities (Uzun, 1992). These main causes are given following;

The owner is the state in the settlement such as; forest areas, which their property rights are belongs to the state and the parcels, which their registrations have not done yet, etc.

The places, which their arrival cost, are very cheap and their reachable are maximum. The places, which have the public constructions such as university, hospital, the industrial center etc. close by.

The general scene of the Turkish cities is very bad condition because of the causes, stated above. The municipalities have not controlled the undesirable and without planning constructions near the development settlements in cities in turkey. The main cause of this is lack of the technological hardware and software in the municipalities. In addition to there is no skilled person to

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use these technology and manage and monitor these undesirable and without planning constructions near the urban areas (fig. 1).

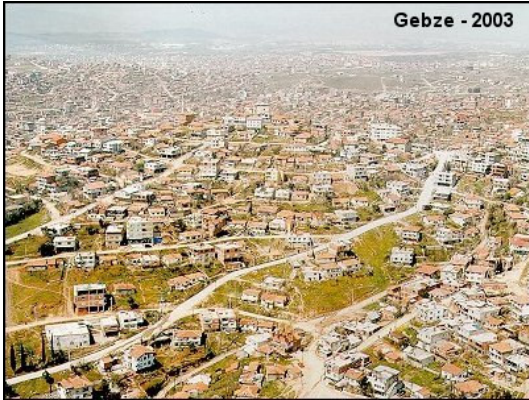


Figure 1. The illegal settlements on Forestry area (OGM, 2004)

Because of these irregular settlements many issues arise in turkey. The main ones of these issues are summarized below.

These city districts deprive of many technical and social infrastructures (e.g. Water, sewerage, road, green area, education area, health area) required for life quality.

Having dramatic difficulties concerning financial resources, local authorities have difficulties in construction of these basic infrastructures as well as realizing their main duties with respect to technical and financial matters in such areas. But, as a result of necessity to provide these investments with respect to political and humane, there will also be an enterprise for legalization of these areas (Dale and McLaughlin, 1999).

Natural resources (e.g. Water protection catchments, forests, historical areas) required for sustainable development are destroyed with unplanned residences.

Because environments of such areas have visual pollution, weather pollution and social insecurity, these areas affect environmental quality negatively. Failing to prevent such unplanned developments, the administrations prefer preparing of revision development plan to legalize unplanned developments with desperation. These legalizations are supported by the central administration via laws put into practice in election periods.

92% of turkey is in earthquake belt. So, unqualified buildings led to life and asset lost on a large scale especially in natural disasters.

2. PLANNING AND MONITORING OF URBANIZATION IN DEVELOPING AREAS

In planning of such areas, planners mainly use three types of data. These are, in turn, topographical map (current map), geological map and property map, if exists. With constructed relationships among these three maps and with taking into consideration of other exterior data (expected urban development directions are acquired from construction permits and from foundation investments of other administrations), developing regions are planned to design future structuring. However, because planning regions are too big to understand

for planners, they have been in error in many times. Because of the analog structure of used three maps, 3D cannot be understood and so, spatial analysis errors led to deficiencies in planning. Because planners use analog topographical maps, they cannot realize some spatial analysis like slope, aspect and visibility. As a result of this, the urbanization model realized with planning in developing regions is in an inharmonious structure. Generally, a need to revise the plan arises for eliminating of this inharmonious structure. This situation lead to deviations from targeted planning aims.

An alternative approach is seen inevitable for eliminating errors stated above. Having the top technological level, remote sensing systems arise an alternative way for solving these issues. The alternative method stated above can be applied with remote sensing systems via mainly two different data and tools. These are aerial photos evaluated with photogrammetric techniques and satellite images evaluated by remote sensing techniques. It will be evaluated in the next part of this paper that in which stage these tools and techniques will be used for the solution of urbanization issues in urban development areas respect to time, cost, accuracy, hardware and technical personnel employment.

3. USING THE REMOTE SENSING SYSTEMS FOR PLANNING THE URBAN AREAS

When discussed the planning and monitoring the improvement urban areas, there are many advantages of the remote sensing system according to classical systems. The most important superiority is the photograph, which is used as a planning tool and representing the data relating to the areas. Thus, the city planners have a lot of possibilities to make more objective plans with seeing the view of the city using this data. This approach is presented new alternatives to the city planners to make objective city plans. For examples, the photos are presented a lot of data to the city planners to make plans without going to the areas. It can be done the places analyses (slopes, views, public or private properties, etc.) Which forming the main of the improvement plans, with these techniques. In addition to, this technique is give possibilities to do alternatives improvement plans and selected the optimum one to apply in the cities by municipalities. Besides, determining the land use change from the photographs and use this data to make an optimum plans such as where the settlements areas must be planed and so (Fig. 2 and 3) (Kraus, 1999).

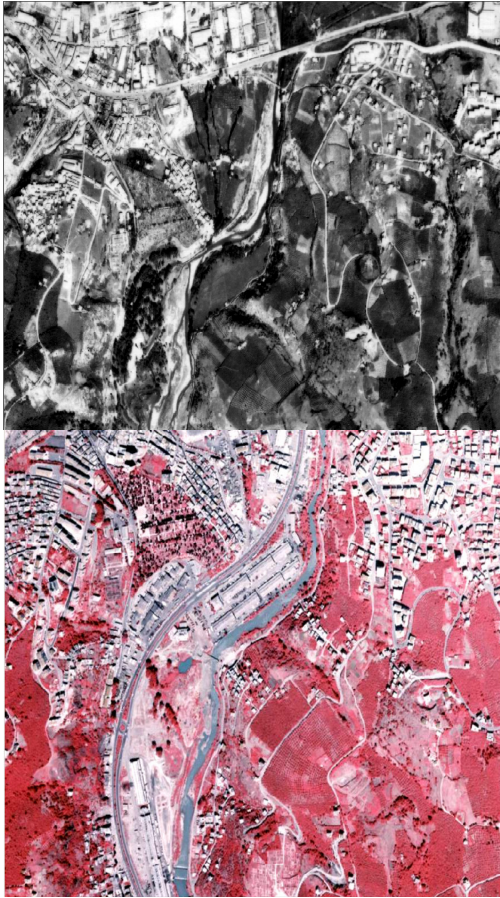


Figure 2. Land use change

3.1 Under Controlling and Monitoring the Urban Development Areas

Because of the continual growing of the constructions in the cities like a living organism, it is very difficult to under control of the developing areas in the cities with using the topographic maps, which are surveyed between the past and now, manually. In addition to, the topographic maps are not updated properly. Because of this, there is an urgent need to renew these maps for monitoring and under controlling the undesirable development areas in the cities. In order to work out this, the economic and politic supports are needed. The most disadvantages of the classic methods in the phase of the monitoring and controlling of the constructions are not to be flexible. In the process of time, it can be added one or more than one story to the current buildings or it can be built new constructions. That the determine those kind of buildings are very difficult with classical methods. But it is rather possible to determine these kinds of construction with suggested methods. With this methods the aerial photographs and satellite images are used. The municipalities using this method can obstruct the undesirable constructions in the developing areas. And than the cities are going to take the desirable urban construction and healthy views. So the controlling, monitoring and make a decision for developing the cities will be easy for municipalities.



Figure 3. Vector maps produced from aerial images

4. DISCUSSION AND CONCLUSIONS

To determine the necessary of using this suggested method these suggested criteria's must be taken into consideration. These criteria's are given follow.

- . The cities, which have the migration actions and undesirable constructions,
- . The cities, which have the industrial developments and tourist center,
- . The cities, which have the parcels of which owner is the state, etc.

It has been very important to determine the period of the span time of taking the photographs and satellite images for monitoring and planning the urban developing areas. For determining this span time periods, some essential criteria's are given follows. These criteria's are;

- . Before and after the election,
- . The periods for encouraging the people to do illegal constructions like making a law about these buildings in the public opinion,
- . Before and after the designing of the urban projects, which attract the people to settlements near this area,

Outside of these three criteria, stated above, the span time of taking the photographs must be determined as one time in a year. The cause of this is checking the implementations results

of the developing plans in cities. So the decision makers can develop the optimum strategies for cities in the short run. And this will obstruct the useless investments.

If these criteria's stated above are not taken into consideration by the authorities, the confidence of this suggested system will decrease at the point of the cost and benefit. The authorities have to decide that which data, photographs or satellite images, can be used in phase of the planning by the city planner. We can suggest that the satellite images can be used to prepare on a large-scale development plans and the photographs can also be used to prepare on a small- scale development plans such as forming the property valuation maps, geological risk maps and orthophoto maps etc..

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