Chapter 6
GIS: A New Tool for Criminology and Victimology's Studies[1]

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EXECUTIVE SUMMARY

The advent of the GIS technology has revolutionized the traditional field of information and cartographic production. The GIS, indeed, enables the management of much more numerous and more complex data and it is able to overcome the static and the traditional two-dimensional cartography. The Geographic Information Systems (GIS), that is used in various fields and disciplines, represent, also, in the university research, a valuable tool for investigation. In criminology, in particular, it has facilitated, regarding the city of Bologna, on the one hand, a kind of crime mapping on the nature of the so called "petty crimes" within the jurisdiction of the criminal Justice of the Peace, and the creation of a city's map on which have been identified support centers for victims operating in them. The use of GIS software is the basis in order to realize and put into practice not only operational measures designed to combat and to prevent crime, but it is also of help to social control measures, to public policy and to security. To the end of ensuring public safety, nowadays, it is essential, to have a clear, spatial and graphics representation, of the high concentrations of crime areas and of the degraded ones, in which there is a greater likelihood that some type of crime is committed.

ORIGINS

The history of cartography has very ancient origins; the first evidences, even still elementary, in fact, date back to primitive civilizations: their tendency to nomadism seems to have refined the ability to draw maps on stone or wood.

The production of maps was already known among Egyptians and Babylonians (III millennium BC) who built rudimentary maps of property and territorial representations of the known world, with decorative or religious function.

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Between the VII and VIII BC among Persian, Phoenician and Chinese developed the use of trace land and sea routes as a guide for commercial routes.

In classical times were the Greeks to give a scientific basis to the cartography applying mathematical and geometric notions to the geographic representations.

The first map of the known world is to be traced back to the philosopher Anassimandro (VI century BC) and Eratosthenes of Cyrene (III century BC) calculated with great approximation the circumference of the globe and created maps marked by a perpendicular grid of lines to measure distances. In the second century AD Claudius Ptolemy brought changes to the cartographic system introducing a network of meridians and parallels.

The Roman cartography, instead, pursued administrative and military purposes (http://digilander.libero.it/diogenes99/Cartografia/Cartografia01.htm).

These first cartographic representations used methods based on perception and subjective reconstruction and the surveying of the earth could vary depending on the point of observation of the cartographer.

During modern times occurred the problem of representing the spherical Earth's surface on a flat surface that was resolved, initially, using geometric solutions and, subsequently, using analytical performances, which the principles of modern projections maps are based on. To represent a three-dimensional space on a two dimension's map, is necessary to recall the concept of map projection; it refers to a series of geometric, mathematical and empirical transformations of geographical points expressed in geographical and Cartesian coordinates. Through the projections or representations we can approximately represent the spherical surface of the Earth on a plane surface, managing to maintain some geometric properties such as isogony, equivalence and equidistance

(http://digilander.libero.it/diogenes99/Cartografia/Cartografia02.htm).

Over the last century the aerial photos, the ortho-photos (Image solution system) and satellite images later, made it possible to achieve real representation of the earth, before unknown.

Today the most widespread cartography is no longer representing only places, spaces and geographical distances, but, it is also representing data and information of all sorts, associated with many different disciplines.

Among the many uses of thematic maps we can include agriculture, services to citizens, environment, statistics, tourism, transport, cultural assets and university research.

THE USE OF GEOGRAPHICAL MAPPING IN CRIMINOLOGY

Within the criminological research, geographical mapping has ancient origins. Already Quételet and Guerry, after a careful consultation of official data, had prepared a "paper crime" and Guerry in particular, in 1833, created a "social cartography" of relative crime on analyzing the socio-structural data belonging to different French departments (Melossi, 2002). However it is with The Chicago School of Sociology, in the first half of 1900, that are carried out systematic studies on the city, as an organic whole, making use of maps.

One of the recurring themes of this School is that of development and change of human behavior induced by the physical and social environment. According to the thought of Matza, The Chicago School of Sociology thought to individuals as complex creatures, able to adapt very different lifestyles and it considered the community as the main element of influence on the individuals' behavior. The community was to be regarded as the natural human environment and it was the main factor of influence on the behavior of individuals. The natural human environment was to be consid-