

Cartography of Quick Answer after Natural Disasters - The Mexican Experience

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SUMMARY

The purpose of this paper is to show the Mexican experience in the generation of geographic information for the detection and evaluation of the degree of damages caused by natural disasters, to facilitate the right and opportune decision making.

The benefits of this project are: Considering that the time response has taken too long respecting to the nature of the disasters forces to remain in a process of continuous improvement; The information generated must be adapted to the necessities; The solution to these exigencies must tend to simplify the use and access to the information; The battle area of the immediate future of the INEGI will tend to an opening performance, therefore we must be prepared to new modalities on watch; and a greater commitment of the Government and Local areas.

RESUMEN

Este trabajo tiene como propósito mostrar la experiencia Mexicana en la generación de información geográfica para la detección y evaluación de daños causados por desastres naturales, para facilitar la correcta y oportuna toma de decisiones

Los beneficios de este proyecto son: El tiempo de respuesta se ha reducido, sin embargo se debe continuar en un proceso de mejora continua; La información generada se adapta mejor a las necesidades; La búsqueda de soluciones que tiendan a simplificar el uso y acceso de la información; fortalecimiento de alianzas entre autoridades de distinto niveles de gobierno.

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1. BACKGROUND

The Mexican Republic by its geographic location and characteristics is exposed to great variety of natural phenomena that could cause disasters, particularly the hydro-meteorological phenomena. Mexico is located in an inter-tropical region, which makes it vulnerable to the cyclone impact generated pretty much in the Pacific Ocean as well as the Atlantic Ocean, an average of 25 events arrive annually to our coasts, four to five out of these cause severe damages like floods and transport of materials carrying danger to population and infrastructure.

By the occurrence of some disasters, the National Institute of Statistics, Geography and Informatics (INEGI) makes contacts with federal and local authorities, being among them the National Disasters Prevention Center (CENAPRED), the National Defense Ministry (SEDENA) and the Social Development Ministry (SEDESOL) to provide cartography and geographic information of the ill-fated areas, as well as collaboration in analysis, interpretation and consequences of the damages.



As an immediate answer, INEGI reunites the available data input of the ill-fated areas and makes the equipment, software and capacity technician personnel available, as well as the

data and information derived from aerial photography and satellite images in the amount, coverage, quality, and opportunity required. It could be emphasizes of this information the cartographic heap in analogical and digital format, as well as the economic and the socio-demographic information whereupon counts. All this data are considered to schedule or appoint the photogrammetrical flights necessary to assess the damage caused to the civil populace, in its person and its goods, as well as the best response, to the demands of interpretative analysis on the materials and information available.

With this, INEGI looks for generate Cartography of Quick Answer for the detection and evaluation of the degree of damages caused by natural disasters, facilitating the decision making in a scheme of inter-institutional collaboration, contributing to reduce the impact of these phenomena in the population and affected infrastructure.

Taking in account the fact that the INEGI's mission is "To generate, integrate and provide statistical and geographic information of national interest, as well as norm, coordinate and promote the development of the National Systems of Statistical and Geographic Information, to satisfy the requirements of information from the diverse sectors of the society", the Cartography of Quick Answer before natural disasters hits in the daily task in the following aspects:

- Generation of efficient, agile, and transparent schemes of information, in order to reduce times and costs for all the decisions takers.
- Standardize the data by means of the use of the technology of information, providing to the society information of national interest.
- Create solutions, through this type of cartography, that involve different Information Producing Units.
- Promote the development of the National Systems of Statistical and Geographic Information, and
- Encourage the construction of the Spatial Data Infrastructure of Mexico (IDEMex).

2. COVERAGE

The project of generation of *Cartography of Quick Answer* has a national reach, much of this by the contents cover, the magnitude and type of contingency, as well as the possibilities of hitting to the diverse sectors of the society; looking that the users must count opportunely with information that they require to support the decision making to Federal, regional, municipal and local level.

3. BENEFITS AND STRENGTHS

In addition to the social benefits derived from the opportune decision making that supposes to count with this information, INEGI has promoted the implementation of quality systems, having generated strengths when counting on the necessary elements to assure to the users the quality, opportunity and reduction of costs of the information.

Also the benefits are obtained in other cartographical processes, like the obtaining of digital images and its respective geo-reference, which originally was made manual way and at the present times the processes has been automated, reducing considerably the response time.

The previous benefits have been possible thanks to the reached maturity and professionalism within the formation of the work teams, constituting themselves in true homing groups during the march of the contingencies.

INEGI through its General Direction of Geography is the pioneer at national level in the generation of *Cartography of Quick Answer* that mainly assures the intelligent decisions taking hitting in the affected population. Until early October 2005, the images that were caught with analogical photogrammetrical cameras in special flights, rastering it exclusively in order to be able to count on a fast distribution of the photographic materials, leaving a side their possible incorporation and operation through Geographical Information System. At the present time, photographic images obtained with digital cameras count on their geo-referenciation and it has the possibility of adding themselves, like layers, in Information Systems through platform developed by INEGI or in commercial platforms. Basically, the geo-reference process leans in the existence of digital ortho-photos, which allows reaching acceptable levels of precision.

In relation to the production of *Cartography of Quick Answer* to take care of catastrophic situations, we can say that it has had impact in the traditional productive processes, capitalized the experiences in our normal processes, in the following ways:

- The massive handling of color photographs instead of black and white images, allowing to improve substantially the established develop and copied processes.
- The necessity of using of camcorders and digital (non-metric) cameras allow to making in minimum time (2 days) its installation in one photogrammetrical window of the airship, commonly used for the metric camera, until the learning and handling of the equipment by the aerial team.

Work in equipment	Tasks as the developed one, contributes in the consolidation of the work in equipment within the institution, since they fortify the bows of cooperation between the areas hitting in addition in the leadership.
Service to the client	The works made were done from the requirements created by the contingencies, identifying it different clients within the process, same who finally were reflected in the necessities of the population like final and main client.
Learning	The experience was capitalized contributing in the maturation of productive processes and labor relations.
Commitment	The nature of the project again to allow demonstrating the sensitivity of the personnel of the INEGI through the conviction of the importance of there task.
Responsibility	The results were obtained opportunely and with the best quality, thanks to the answer of the involved personnel.
Honesty	The generated information reflects the integrity in which the processes are made in the INEGI.

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