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TECHNOLOGIES, GOVERNMENT COMMUNICATION AND UNCERTAINTY MANAGEMENT IN NATURAL DISASTER SITUATIONS

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ABSTRACT

Natural disasters occur and management must adjust to the reality and needs that arise. The research analyzed Technologies, Government Communication and Uncertainty Management in Disaster Cases: The Case of Landslides and Floods, particularly the role played by government communication in the disaster that occurred in the municipality of San Gabriel in the state of Jalisco, on June 2, 2019. The methodology used was a case study and also of a descriptive nature, studying the case of landslides and floods generated by an avalanche of mud, water, stones and tree trunks that invaded a large part of the municipal seat of San Gabriel, located in the south of the state of Jalisco Mexico and caused the loss of five human lives.

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1. Introduction

Communication plays a very important role in times of disasters. Disasters can be of two types: natural disasters and disasters caused by human action or omission. During these disasters, moments of uncertainty are generated among the affected population and their families and friends, since disasters often cause human or material losses that affect society and nature.

For this reason, it is very important to manage communication during times of uncertainty generated by disasters, since both the absence of communication and inadequate communication can increase the levels of uncertainty and generate different protest and nonconformity movements on the part of the affected population and other social groups, which negatively affect the legitimacy of the governments in office. In this sense, it is of paramount importance to carry out research on the communication process and the management of uncertainty in the case of disasters, in order to try to determine the best courses of action, guidelines for action and strategies that can be recommended for application in other similar cases where disasters occur and a specific human community is affected.

This article reports on the governmental communication made in the case of the landslides and floods caused by an avalanche of water, mud, stones, debris and wood logs that occurred in the municipality of San Gabriel in the state of Jalisco, on June 2, 2019, which caused five deaths, one missing person and 3,000 victims, an incident for which there is still no response from the authorities.

This is a qualitative, descriptive and case study that analyzes the role played by governmental communication in this disaster to try to reduce the levels of uncertainty generated among the affected population and to be able to promote the actions of damage repair and reconstruction and return to "normality". The objective of this research was to investigate the role played by governmental communication in the management of uncertainty during this disaster in the south of the state of Jalisco, Mexico.

Natural phenomena such as earthquakes, avalanches, landslides and hurricanes have been present throughout the history of the globe, often causing real disasters that have affected different social groups in different ways. When a disaster occurs, people generally live under moments of tension, stress and uncertainty, generated by the damage and harm caused by these phenomena. This uncertainty increases when there are heavy human and material losses. In addition, uncertainty also increases among people in this crisis context when communication is absent, especially official communication dictated by any government institution or when there are deficiencies or failures in governmental communication.

In this sense, it is necessary to investigate the role played by communication, as well as its lack or deficiency in the management of uncertainty generated by a natural disaster. In this case, an analysis is made of the case of the landslides and floods that were generated on June 2, 2019 in the municipality of San Gabriel, state of Jalisco, caused by heavy rains, high deforestation and change of land use of the wooded areas surrounding the affected area.

This type of study is very important, since there is little research on the role played by governmental communication in the management of uncertainty during disasters, whether natural or caused by human action or omission. Historically, communication has played a very relevant role in human progress and the development of organizations, since it is necessary in all processes, whether economic, social or political (Álvarez, 2011).

In the case of disasters, such as floods, hurricanes, earthquakes or landslides, which generate uncertainty (mainly among the affected population and their loved ones), government communication becomes necessary (Colombo, 2004) to try to better manage uncertainty and generate confidence and tranquility among citizens. Hence the importance of studying the role played by government communication in the management of uncertainty during disasters, since, depending on the nature, coverage, type and timing of government communication, it will be the way in which the moments of tension and uncertainty generated among the population by this type of crisis can be overcome. In addition, government communication helps to provide guidelines on what to do, when to do it and how to do it (Molinari, 2008) to try to reduce the effects generated by disasters, as well as to reduce, compensate or overcome the damages caused to the population.

In this order of ideas, this research seeks to know the role played by government communication in a specific case of disaster generated by excessive rainfall, deforestation, land use change, forest fires and the accumulation of silt in a mountainous region in the municipality of San Gabriel on June 2, 2019 located in the south of the state of Jalisco.

On this particular topic, as noted above, little academic research has been done to analyze the role played by government communication in the management of uncertainty generated by disasters. What role did government communication play in the management of uncertainty generated by the mudslides and floods on June 2, 2019 in the municipality of San Gabriel, Jalisco, Mexico? Government communication played a very important role in managing the uncertainty generated by mudslides and floods on June 2, 2019 in the municipality of San Gabriel, state of Jalisco, Mexico.

The objective of this research was to analyze the role played by government communication in managing the uncertainty generated by the mudslides and floods on June 2, 2019 in the municipality of San Gabriel, Jalisco state, Mexico. Disasters have affected human beings throughout their history (Ayala-Carcedo, 1993; Svense, 2010; Withington, 2009). Thus, over the years, landslides, floods, pests, hurricanes, tornadoes, earthquakes, frost, droughts and tsunamis, among others, have presented themselves as real calamities, causing severe damage to their economy and affecting their quality of life and standard of living.

In fact, it can be said that the history of mankind has been the history of the way in which man has faced these disasters (Ayala-Carcedo, 2002), creating and developing different mechanisms, strategies and technologies to cope with them in a better way, trying to reduce their negative effects.

Unfortunately, natural disasters will always be present and will generate a series of damages and consequences for humanity in the future (González, 2015). Today, for example, global warming is causing climate change and serious natural disasters, which have an impact not only on the economy of nations (Torres, 2004) and the people who inhabit them, but also on the systems of coexistence and social interrelation (Gascón, 2005). According to the United Nations Meteorological Organization, the world suffers four to five times more natural disasters that cause seven times more damage than in the 1970s. In fact, it is to be expected that future natural disasters will be of greater magnitude and intensity, causing greater damage to the economy of nations and people, which makes it necessary to study and analyze these phenomena from different disciplines in order to mitigate their negative consequences (Dupuy, 2011).

One of the processes that contribute as strategic means to better manage uncertainty in the context of a crisis generated by a disaster is communication, since, depending on the type, quality and timeliness of the communication, the damages and affectations generated by the disaster can be mitigated to a certain extent. In this sense, it can be said that adequate and timely communication contributes to improve the resilience of communities affected by disasters. The word disaster comes from the Latin dis (separation) and astro (star), referring to abnormal astrological phenomena that the ancient Romans took as a harbinger of the approach of great evils. In this sense, a natural disaster is an abnormal phenomenon of nature that generates certain damages and losses for human beings (Olcina, et al, 2002). Thus, natural disasters can be conceptualized as those natural phenomena that occur with a certain frequency on the face of the earth and generate various damages to mankind. This damage can range from simple road disturbances to the loss of lives and substantial material and economic assets (Arranz, et al, 2000).

Natural disasters can be classified into four different types, according to the nature of the disaster and the cause that generates them (Zamora, 2002). These are hydrological, meteorological, geophysical and biological disasters. Hydrological disasters are caused by water, generally by its excesses, such as floods, tsunamis, storm surges and phenomena known as "groundswells", among others.

Meteorological disasters are generally caused by climate disturbances such as cyclones, typhoons, cold or warm fronts (heat or cold waves), the so-called "El Niño" and "La Niña" phenomena, droughts, tornadoes, tropical storms, hurricanes, snowfall, hailstorms and floods due to excess rainfall, among others. Hydrological disasters are caused by excess water, whether evaporated, liquid or solid, and can occur where there are large deposits of this liquid, such as in lakes, lagoons, dams, rivers, seas and oceans. Geophysical disasters come from the earth or space, such as solar storms, earthquakes, avalanches, landslides, volcanic eruptions and land subsidence, among others. Finally, biological disasters are those generated by the actions of some living beings, with the exception of man, such as pests, infections and epidemics, as in the case of swine fever and avian flu, to name a few (Valdez, 2020).

Natural disasters cause a series of consequences and damages to humanity, as well as a series of material and economic losses (Torres, 2004). Among the most important damages are the death of human beings, the mutilation of their bodies, the affectation of their mental health, famines, loss of

housing, destruction of public and private infrastructure, losses of crops, livestock and poultry (Capacci and Mangano, 2015) and, above all, the affectation of businesses and productive enterprises (Talavera, 2005). In this sense, natural disasters are unusual, surprising and unexpected disturbances, which, as a common feature, generate substantial human and material losses, as well as produce other types of consequences, such as political instability and inter-party alternation.

Communication is conceived as a bidirectional process in which information is exchanged between two or more individuals in a socially determined time and space (Palencia, 2011). This implies the existence of a sender, a message and a receiver. According to Frías (2000), "communication basically consists of the transmission of a message from one person or group to another, which requires the existence of a willingness to interact between both parties, that is, that a process of mutual and reciprocal influence is created, through the exchange of thoughts, feelings and reactions that are manifested through the feed-back that is established between the communicating parties".

Government communication is understood as the multidirectional process of production and dissemination of information from the different orders and levels of government with the aim of building social consensus and strengthening social legitimacy. It is also considered as a public policy and a management tool, aimed at trying to influence and shape public opinion to achieve the proposed institutional objectives and generate different benefits for citizens (Mares, 2011). For Mario Riorda (2016), government communication is "a method through which a democratic government tries to make its purposes or orientations explicit to public opinion in order to obtain support or consensus in the development of its public policies¨. In this sense, government communication plays a very important role in the management of crises and, in particular, in the management of the uncertainty generated as a result of a disaster, such as the one that occurred in the municipality of San Gabriel in the south of the state of Jalisco, in June 2019.

The term management implies the performance of a set of operations or steps aimed at directing and administering certain resources, trying to achieve some objective or to solve some issue or problem. The term uncertainty refers to the lack of certain knowledge. It implies ignorance of something derived from the absence of accurate and timely information. According to Fernández (2004), uncertainty is "the set of realities that tend to take us out of our comfort zone, because they do not respond to our organizational or personal routines. Uncertainty can produce bewilderment and discouragement." In the field of management systems, uncertainty refers to the risk that exists, real or perceived, about a certain complex, unstable and uncertain matter, present or future, and that generates lack of security or distrust among a significant part of the population (PAHO, 2009).

For the purposes of this research, uncertainty management is understood as the capacity of individuals or institutions to provide security and certainty to people in the presence of disruptive events, as well as to know how to deal with crisis situations that arise unexpectedly and generate damage to property or to people's health and integrity.

2. Methodology

In this research, we analyze the role played by government communication in the management of the uncertainty caused by the landslides and the overflowing of the Salsipuedes River in the municipality of San Gabriel, in the state of Jalisco, in June 2019.

The methodology used was the case study, analyzing, in particular, the case of the landslide and consequent flooding by mud, debris and logs of houses and streets in the municipality of San Gabriel, which resulted in five deaths, one missing person, hundreds of houses affected and more than 3,000 victims. The case study is defined by Niño (2011) as a research tool used in situations in which it is desired to study basic characteristics, the current situation and interactions with the environment of one or a few units such as individuals, groups, institutions or communities. This is also a descriptive and inductive study analyzing the role that government communication played in the management of uncertainty in this disaster. It is a descriptive study, because it describes what happened on June 2, 2019 in this southern municipality and the subsequent actions that were taken by the different governments to try to repair the damage and provide certainty to the population. At the same time, it is an inductive study, because it starts from the particular to the general, analyzing the case of the disaster in the municipality of San Gabriel and whose lessons learned in the management of uncertainty and government communication can be applied in other cases globally.

The objective of the research was to analyze the role played by government communication in managing the uncertainty generated by the mudslides and floods of June 2, 2019, in the municipality of San Gabriel, Jalisco state.

During the San Gabriel contingency, the different federal, state and municipal government agencies and officials were present on the scene from the very day of the disaster and were issuing different communiqués and messages of encouragement and attention to the population about the rescue and reconstruction work being carried out. In other words, government communication played a relevant role during this contingency to manage the uncertainty generated by the emergency.

For example, on the same day of the disaster, the Civil Protection and Firefighters Unit of the State of Jalisco, as well as the Civil Protection Unit of the municipality of San Gabriel and neighboring municipalities, were present to help the affected residents. Personnel from the Secretariat of National Defense (SEDENA) and the National Water Commission (CONAGUA) also arrived at the scene to help those affected and to carry out an assessment of the damages caused by the disaster. In several cases, press releases were issued or press conferences were held to report on the damage caused and the actions taken, with the participation of representatives of the regional, state and national mass media.

Governmental communication was carried out mainly through social networks, which were replicated by the traditional media, such as television, newspapers and radio, since both the then delegate of the federal government in Jalisco, Carlos Lomelí, and the governor of the state of Jalisco, Enrique Alfaro Ramírez, and other state officials, issued different communiqués via Twitter about the events and the actions to be taken to attend to the victims of the disaster and compensate for the damages.

Thus, in order to reassure the victims and attend to the emergency, on the same day of the disaster, the state governor, Enrique Alfaro Ramirez, via twitter said: "after the overflowing of the Apango River in the municipality of #San Gabriel, personnel from neighboring municipalities, @PCJalisco and the federal government are on their way, they are not alone".

In this same sense, the governor announced on June 4, 2019, that the total investment would be 120 million pesos in reconstruction work, which will include the repair of infrastructure for water supply, the reconstruction of four bridges damaged by landslides and to carry out works of rectification of channels and containment on the banks of the Salsipuedes River.

For its part, on June 3, 2019, the municipal government issued the following notice.

"ATTENTION NOTICE:
In view of the emergency we are experiencing due to the overflowing of the river, the Municipal Government through the Municipal Unit of Civil Protection and Firefighters of San Gabriel, together with the surrounding municipalities and the State Government. We are attending to the disaster and are looking for shelters where the affected people can be sheltered. The neighboring municipalities have also given us their support to safeguard the lives of the people of San Gabriel in the face of this natural disaster. #SanGabrielLoConstruimosTodos".

In the same vein, the University of Guadalajara immediately expressed its solidarity with the victims of San Gabriel. The general rector himself, Ricardo Villanueva Lomelí, made a statement via twitter on the same evening of June 2, 2019, and stated the following.
"We have enabled the San Gabriel high school module as a temporary shelter to help the population after the overflowing of the Apango River. We remain in contact with state and municipal authorities to provide the necessary support."

Thus, during the contingency, different university brigades made up of civil protection personnel, academics and students from the Centro Universitario del Sur and the Centro Universitario de Ciencias de la Salud, formed Multidisciplinary Volunteer Support Brigades with doctors, nurses, psychologists, dentists and members of the civil protection teams, who remained for several weeks providing solidarity support to the people of San Gabriel.
In addition, on June 28, 2019, the governor of the state of Jalisco, Enrique Alfaro Ramírez, made an overflight to supervise the upstream works in the municipality of San Gabriel and announced, via social networks, that his government would invest an additional 25 and a half million pesos in three works to prevent future flooding.

In other words, as part of the assistance and support actions for the contingency, different agencies of the federal government (National Civil Protection Directorate, SEDENA, CONAGUA, Ministry of Environment and Territorial Development SEMADET, National Forestry Commission) and the state government (Civil Protection and Firefighters Unit of the Government of the State of Jalisco and the General Secretariat of Government, among others) were involved. In short, the collaborative work of different institutions, as well as the timely and true intervention and communication of the different governments regarding this disaster that affected the residents of the municipality of San Gabriel, made the recovery more bearable, helping to better manage the moments of uncertainty experienced by the residents of this municipality in the south of Jalisco. In this way, government communication became the means to manage the uncertainty generated by the disaster and to provide confidence and certainty to the inhabitants, making recovery possible in a better way.

During this disaster, government communication played a transcendental role in managing the uncertainty generated by the crisis, but what did the government communicate and how did it communicate it?

First, in the face of the uncertainty generated by the disaster, the government communicated confidence and certainty to the population that help would arrive in a timely manner and that support actions "were on the way" to attend to all those affected and to resume the services that were damaged, such as the drinking water network and the electricity suspended in some areas of the municipality.

Secondly, responsibility and unity were communicated by the different government agencies in attending to the victims, providing care to the injured, rescuing the bodies of the deceased, making damage inventories and, above all, supporting the reconstruction of housing and infrastructure works. Inter-institutional intervention and coordination was key to the proper management of this crisis.

Third, leadership and authority were communicated by the government to address the urgent needs imposed by the contingency, to do so promptly and expeditiously and, above all, to give the necessary guidelines to overcome the crisis, which was evidenced by the presence of high-level government officials in the municipality.

Fourth, control of the situation and security in the municipality was reported, since, with the presence of the army and national guard elements, fears of possible theft and looting of houses and belongings from the homes damaged and temporarily abandoned by their residents were dispelled. Control and security were also observed in the shelters set up to attend to the victims, who were provided with strong police security measures.

Fifthly, hope was communicated, since many of the messages that were conveyed to those affected by the disaster were that "what they were experiencing was temporary" and that "very soon things would return to normal", doing whatever was necessary to avoid future contingencies, such as the ones they were experiencing. In addition, the message of hope was felt by the broad solidarity received by the different fire and civil protection corps from other municipalities, by residents from neighboring municipalities and by educational institutions from Jalisco that were present to help the victims and attend to their needs.

Finally, it was communicated with concrete facts and tangible results, as well as with the presence of government institutions and officials at the site of the events, since the inhabitants observed the presence and the day-to-day progress in the reconstruction of the damages, received economic support to compensate for the damages and observed the reestablishment of water and electricity services, among others. The fact of telling things as they are, speaking the truth about the size of the damages and their causes, helped the government to generate trust among the population and obtain their cooperation to better face the reconstruction stage.

3. Conclusions

Technology and communication play a strategic role in managing uncertainty during disasters, since truthful and timely information becomes the most important input to generate trust, cooperation and certainty among those affected, as well as to avoid major conflicts that complicate rescue and damage repair efforts. In particular, government communication becomes the cornerstone during disasters, generating the necessary social trust to face the crisis and to be able to undertake, in a better way, the rescue work, attention to victims and damage repair.

In the case of the disaster that occurred in the municipality of San Gabriel on June 2, 2019, communication became a strategic means that contributed greatly to the government's ability to

address the contingency, rescue victims, generate community cooperation and, above all, promote the work of repairing damages and care for the victims. In this sense, government communication was successful in managing moments of uncertainty for the following reasons. First, the different government agencies worked in a collaborative manner seeking to generate certainty and confidence among the affected population, putting the general interest before the particular, since the governments come from different partisan signs. In other words, the government worked as a team, avoiding the political confrontations that sometimes occur.

Second, government communication was timely, since, from minutes after the disaster occurred until the damage reconstruction stage, different messages were issued, mainly through social networks, by the municipal, state and federal governments, which generated certainty and confidence among the population. Third, the information transmitted by the different government institutions and universities to society, through the media, was unified, focusing on informing about the diagnosis of damages and the actions to be taken to support the victims and the reconstruction of damages.

Fourth, the governmental information system that was put into action due to the disaster was adequate, reducing to a minimum the presentation of contradictory information that could confuse or misinform the population.

Fifth, the disaster relief and damage mitigation actions were timely, with the population receiving attention not only from different government agencies, but also from different educational institutions, such as the University of Guadalajara, and from the community as a whole. The response and support teams, especially the national army, also acted in a timely and appropriate manner. Sixth, the risk management and disaster management teams of the different governments acted in a coordinated manner, under a single command, which facilitated the work of monitoring damages, rescuing victims, supporting the victims and repairing the infrastructure affected by the disaster. In short, the timely intervention and adequate management of information by the different government agencies helped to better manage the uncertainty generated by the disaster, which contributed to generate confidence and certainty to successfully face the recovery stage. In other words, what was generated in San Gabriel, as a result of the atypical rainfall in the region that generated the mudslides and mudslides that flooded the city, were moments of uncertainty, which were, to a certain extent, mitigated by the timely intervention of the government and adequate communication with the affected community.

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