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Review Article

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The Vital Role of Voluntary Organizations in Earthquake Response and Recovery: Lessons Learned from Arkalochori, Crete

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Abstract

In the wake of earthquakes, communities often find themselves grappling with overwhelming challenges that strain local resources and capacities. Voluntary organizations emerge as indispensable allies in these times of crisis, providing crucial assistance and fostering resilience. This synopsis delves into the essential role played by voluntary organizations in earthquake response and recovery efforts, with a particular focus on the aftermath of the September 2021 earthquake in Arkalochori, Crete. The seismic event in Arkalochori, Crete, served as a stark reminder of the region's susceptibility to seismic hazards. In the aftermath of the earthquake, voluntary organizations swiftly mobilized to provide immediate humanitarian aid to affected communities. From distributing emergency supplies to offering medical care and psychosocial support, these organizations played a pivotal role in addressing the urgent needs of survivors. Beyond immediate relief efforts, voluntary organizations played a crucial role in facilitating communication and coordination among various stakeholders involved in the response and recovery process. By acting as intermediaries between affected communities, government agencies, and other relief organizations, these entities helped streamline assistance delivery and ensure a more effective response. Moreover, voluntary organizations played a vital role in supporting long-term recovery and rebuilding efforts in Arkalochori and surrounding areas. Through initiatives focused on infrastructure repair, livelihood restoration, and community development, these organizations contributed to the physical, social, and economic recovery of affected communities. The experience of Arkalochori underscores the indispensable contributions of voluntary organizations in earthquake-affected communities. By leveraging their local knowledge, flexibility, and networks, these organizations complement government-led initiatives and contribute to more resilient and inclusive disaster management strategies. As communities continue to grapple with the impacts of earthquakes worldwide, the lessons learned from Arkalochori underscore the enduring importance of voluntary organizations in earthquake response and recovery efforts. Through collaboration, capacity-building, and advocacy, these organizations play a vital role in building safer and more resilient communities in the face of seismic hazards.

Keywords: Earthquake, Arkalochori, Voluntary Organizations, Response and Recovery

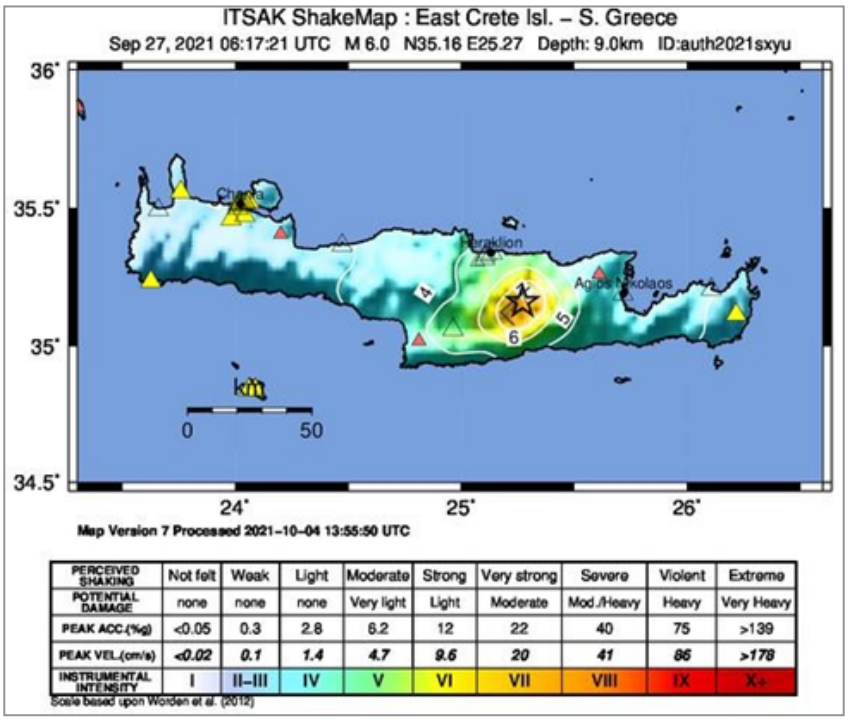
Introduction

Arkalochori Earthquake, Response and Recovery

In September 2021, the tranquil town of Arkalochori in Crete, Greece, was jolted awake by a seismic event that reverberated through the island and beyond. The earthquake, with a magnitude of 5.8, served as a stark reminder of the dynamic geological forces shaping the region's landscape. The earthquake claimed the life of one person and caused physical injuries to dozens of others, events that became known over the course of days, during which post-seismic activity was intense and material destruction was immense. Until October 7, 2021, autopsies had been carried out on 9,327 buildings, by engineers sent by

1. Ethnos 2021
2. (A Koutantou, G Georgiopoulos, 2021)

the Ministry of Infrastructure and Transport, where 4,122 were classified as habitable and the remaining 5,205 as uninhabitable[1] [1]. 61-year-old Iakovos Tsagarakis was killed instantly during work on the church of Prophet Ilias in Arkalochori, when the dome was hurled vertically by the earthquake and fell on him in a similar manner and force. The man was at the most inappropriate time in the most inappropriate place. And the impact was so strong, that for his release a whole operation was set up by EMAK men. As scientists and residents grappled with the aftermath of the tremor, it became clear that understanding the intricacies of this seismic event was essential for comprehending the broader seismic landscape of Crete. In 2020 there were only 73 earthquakes over 3.5 Richter, of which 21 were over 4 Richter and 3 over 5. For 2021, 140 earthquakes over 3.5 Richter were recorded on the island, out of which 34 were over 4 on the Richter scale and 3 over 5. In total, in Crete in 2021 2,493 earthquakes over 2 on the Richter scale took place (in the specific geographical designation)[2] [2].



Shakemaps service 2021

The Arkalochori earthquake, located near the southern coast of Crete, occurred within the complex tectonic framework of the region. Crete sits at the convergence of the African and Eurasian tectonic plates, where the ongoing collision and subduction processes give rise to a myriad of seismic activities. The release of accumulated stress along fault lines, such as the Hellenic Arc thrust fault system, is a common occurrence in this seismically active zone. The seismic crisis in the wider area of Arkalochori commenced with an earthquake swarm in early June 2021, marking the beginning of heightened seismic activity in the region. However, the situation took a dramatic turn following the occurrence of the main event on September 27, 2021, with a magnitude of Mw= 6.0. The earthquake swarm, characterized by a series of smaller seismic events clustered in close proximity, served as a precursor to the main event. While earthquake swarms are not uncommon in seismically active regions, they often raise concerns about the potential for larger, more destructive earthquakes to follow.

The main event on September 27, 2021, marked a significant escalation in the seismic crisis, with its magnitude of Mw= 6.0 sending shockwaves through the region. The occurrence of a single, large-magnitude earthquake shifted the focus from the ongoing swarm to the immediate impacts and aftermath of the main event. “It was lightning in the air" - Seismologists expected tremors, but the magnitude of the earthquake changes the data - Since the beginning of summer, scientists have been calling on citizens to be careful[3] [3]. The particular fault in the Heraklion basin, which certainly produced earthquakes hundreds of years ago, was not known or mapped and had not been studied. However, there are many unknown faults in Greece that produce earthquakes that surprise us since they are poorly studied[4] [4].

The causes of the Arkalochori earthquake are rooted in the tectonic interactions that have shaped the region over millions of years. The sudden movement along a fault line, likely triggered by the gradual accumulation of stress, unleashed powerful seismic waves that propagated through the Earth's crust. The epicenter of the earthquake, located beneath the sea floor, underscores the dynamic nature of the geological processes at play. The impacts of the Arkalochori earthquake were felt far and wide, both geophysically and socioeconomically. While the immediate damage to infrastructure and property was relatively limited, the psychological toll on residents was significant. The tremor served as a stark reminder of the region's vulnerability to seismic hazards, prompting calls for improved preparedness and resilience measures.

3. Lekkas 2021
4. Papazachos, 2021
5. Rizou et al., 2022

In the aftermath of the earthquake in Arkalochori, Crete, voluntary organizations emerged as frontline responders, mobilizing quickly to provide critical support to affected communities. These organizations, ranging from local grassroots initiatives to national and international NGOs, contributed diverse resources and expertise to the response efforts. In the following days, the procedures for hosting the earthquake victims in hotels, in the Klisto of Arkalochori (which had been properly configured and was only for vaccinated people) and in houses that are in the "ESTIA" program and intended for refugees, began. Then the first huts began to arrive and the work on their installation began, as well as the applications of the earthquake victims for their much-desired safe temporary residence. When the cottages started hosting people, the tents that had been set up at the Exhibition Center of Arkalochori also came out. The next goal was the opening of the schools; however, several school complexes were completely destroyed, among them the elementary schools of Arkalochori and Thrapsanos.

A titanic effort began to reach bathing rooms. Within a month, the primary education schools began to operate (in some cases on a rotating basis), while later the secondary education schools also began to operate. As a Municipal Authority in collaboration with the State, the Region of Crete, the Church, the entire Local Government and together with ordinary citizens and volunteers, they supported, materially, financially and morally, from the first moment of the earthquake, with quick reflexes, immediately and in the first year the immediate needs of the affected in food and shelter were met while the operation of all critical networks (road accesses, water supply, etc.) was ensured. However, the processes of building camps with huts to accommodate the earthquake victims also began immediately, while at the same time the repair of schools and buildings began [5].

One of the key contributions of voluntary organizations was the provision of immediate humanitarian assistance to those affected by the earthquake. From distributing emergency supplies such as food, water, and shelter materials to offering medical care and psychosocial support, these organizations played a vital role in meeting the urgent needs of survivors [6].

Moreover, voluntary organizations played a crucial role in facilitating communication and coordination among various stakeholders involved in the response and recovery efforts. By serving as intermediaries between affected communities, government agencies, and other relief organizations, these entities helped streamline the delivery of assistance and ensure a more effective response [7].

Furthermore, voluntary organizations played a pivotal role in supporting long-term recovery and rebuilding efforts in Arkalochori and surrounding areas. Through initiatives focused on infrastructure repair, livelihood restoration, and community development, these organizations helped communities recover from the physical, social, and economic impacts of the earthquake5 [8].

The experience of Arkalochori underscores the importance of recognizing and supporting the invaluable contributions of voluntary organizations in earthquake response and recovery efforts. By leveraging their local knowledge, flexibility, and networks, these organizations complement government-led initiatives and contribute to more resilient and inclusive disaster management strategies.

As we reflect on the lessons learned from Arkalochori, it is clear that voluntary organizations will continue to play a vital role in earthquake response and recovery efforts worldwide. By fostering partnerships, building capacity, and advocating for inclusive and community- centered approaches, we can harness the full potential of voluntary organizations in building safer and more resilient communities in the face of seismic hazards.

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