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ORIGINAL PAPER

# Responses to earthquakes and volcanic eruptions under authoritarian rule: a comparison between fascist Italy and Portugal during the *Estado Novo*

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**Abstract**
This paper seeks to examine how two authoritarian regimes in Europe handled earthquake and eruption disasters, and the extent to which deep-seated continuities in vulnerability and resilience are revealed which continue to affect responses regardless of the regime in power. In the middle decades of the twentieth century Italy and Portugal were both under the control of authoritarian regimes: Mussolini's Fascism in Italy (1922–1943) and the *Estado Novo* (i.e. New State) in Portugal (1932–1974). The *Estado Novo* also had a powerful leader, António de Oliveira Salazar (1889–1970), who dominated Portuguese politics until 1968, with the regime continuing to control the country after his death. Although both regimes enjoyed success in managing post-disaster responses and longer-term recovery; apart from their authoritarian character, reactive management style, effective news management and lack of any democratic accountability for their actions, the two regimes and the societies in which they operated were quite different. In the case of disaster management in Italy, style was as important as substance, the two coming together successfully in the post-1928 rebuilding of Mascali in Sicily. This mixture was less successful when disasters were larger-scale affairs, with costs that strained the regime's longer-term commitment to rebuilding. In Portugal and in common with Italy, peripheral areas were not central to the regime's concerns. Successful responses to the 1957/58 emergency on Faial and to the 1964 earthquake, both in the Azores, still depended critically on the effectiveness of local leaders who encouraged the central government to act effectively. It was only following the 1969 earthquake in the Algarve, when changes had already taken place in the personnel serving in the cabinet and their priorities, that the regime was able to mount an effective policy without any prompting by local leaders.

**Keywords** Fascist Italy · Estado Novo (Portugal) · Earthquakes · Volcanic eruption

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## 1 Introduction

Earthquakes and volcanic eruptions have been prominent themes in the histories of Italy and Portugal. The 1755 Lisbon earthquake (magnitude c.8.5), as well as killing around 12,000 people in Portugal[1] and costing between 32 and 48% of the country's *Gross Domestic Product* (Chester and Chester 2010), also unleashed an intellectual ferment as some of the leading savants of the age sought to explain its causes and significance, using both naturalistic and theological frames of reference (Chester et al. 2025). Lisbon and other parts of the country devastated by the earthquake were re-built under the authoritarian rule of Marquês de Pombal (1699–1782) who instituted a national recovery programme that included the reconstruction of the ruined quarters of Lisbon and introduced Portugal's first national earthquake-building code (França 1977). The Azores has also suffered the impact of many eruptions and earthquakes since the archipelago was first settled by the Portuguese in the fifteenth century CE. Sometimes styled the 'Land of Disasters' (Alexander 1987, p. 226), Italy has had an even more turbulent geological history with Etna in Sicily and Stromboli in the Aeolian Islands being continually active volcanoes. Historic activity has occurred at Vesuvius and Campi Flegrei on the mainland, and the islands of Ischia, Lipari and Vulcano (Guest et al. 2003—see Fig. 1). Few centuries have not seen the country convulsed by at least one devastating earthquake.

In the middle decades of the twentieth century Italy and Portugal were both under the control of authoritarian regimes: fascism in Italy and the *Estado Novo* (i.e. New State) in Portugal. Associated with its leader Benito Mussolini (1883–1945), the fascist regime ruled Italy from 1922 until it was deposed in July 1943 following the Allied invasion of the country.[2] The *Estado Novo* was in power from 1932 until 1974 and also had a powerful leader, António de Oliveira Salazar (1889–1970), who dominated Portuguese politics from 1928 until 1968, with the regime continuing to control the country after his death until it was eventually overthrown by the 'Carnation Revolution' of 1974 (Birmingham 1993). During their periods of office both regimes had to respond to earthquakes and eruptions on several occasions (Table 1) and, as we will argue, did so in ways that reflected: the similarities and differences between the regimes; the personalities of their leaders and the deep-seated characteristics of Italian and Portuguese society.

This paper has two objectives. First, both Italian fascism and Portugal under the rule of the *Estado Novo* generated a vast literature on the regimes' domestic and foreign policies, but with the exception of some publications by the authors on a number of individual disasters (e.g. Duncan et al. 1996; Coutinho et al. 2010; Branca et al. 2017; Chester et al. 2022), responses have neither been comprehensively reviewed nor compared. The principal research question of this paper is to remedy this deficiency. For instance, new construction in connection with disaster recovery has received far less academic and popular interest than the regimes' policies on urban renewal and infrastructure investment: new towns and land reform in Italy; and housing, schools and rural development including dam construction

[1] Estimates of mortality vary. Earlier claims of a total mortality of c.120,000 (e.g. Bolt 2004, p. 307) are now thought to be grossly exaggerated. Mendes-Victor et al. (2005) assume a death toll of c.12,000 in Portugal with c.10,000 in Lisbon, whilst a more comprehensive assessment by Pereira (2009) quotes figures of 20–30,000 in Lisbon and 35–40,000 deaths in Portugal, Spain and Morocco.

[2] Mussolini was deposed by the *Fascist Grand Council* but was later restored by the Germans to the largely symbolic leadership of the *Republic of Salo* in the north of Italy and was executed by communist partisans in 1945 (Chester et al. 1999).

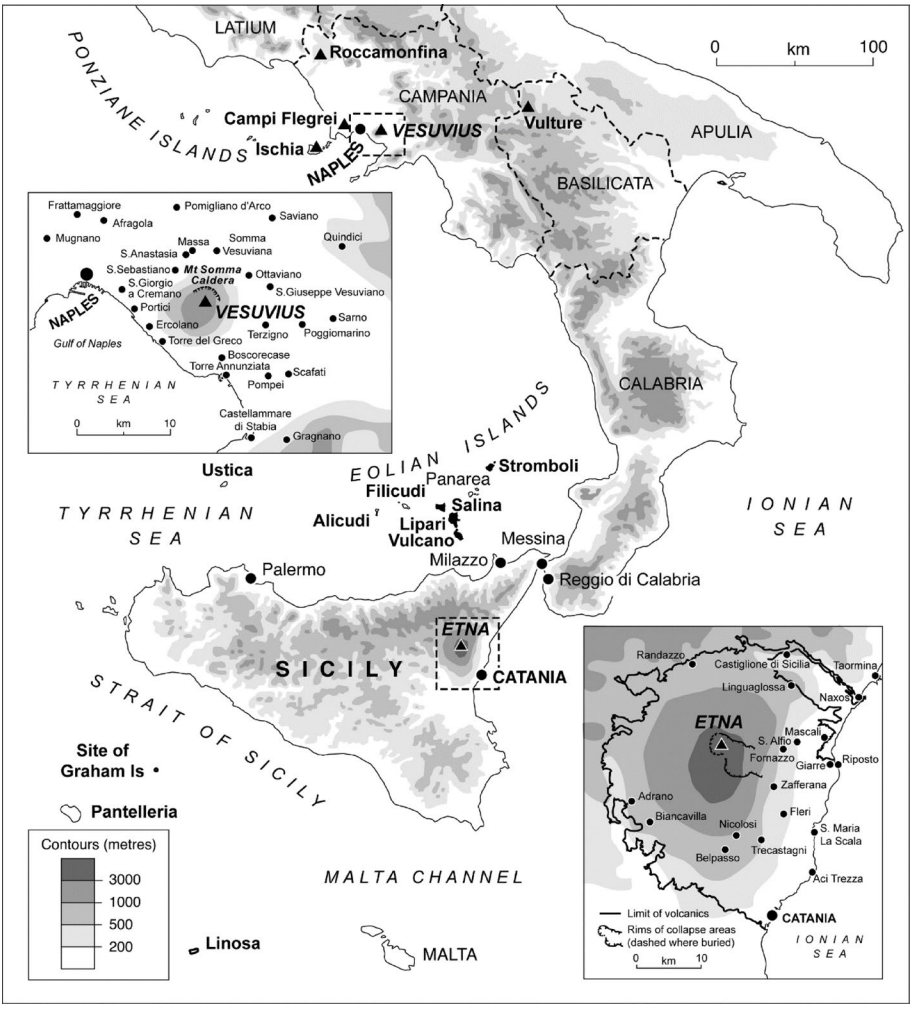


**Fig. 1** Maps showing the location of Etna, Vesuvius and other active and inactive volcanoes in Italy (Based on Chester et al. 2008. *Journal of Volcanology and Geothermal Research* 173, 216–238, with additions and amendment)

in Portugal.[3] Another objective is related to historical continuities. The disaster researcher David Alexander (2000, p. 106) and environmental historian Greg Bankoff (2012, pp. 39–40) both argue that historical studies of disaster are important for several reasons two of which are relevant to Italy and Portugal during their episodes of authoritarian rule. First, results may uncover aspects of vulnerability that continue regardless of the regime in power even when it is interventionist and, secondly, such studies may reveal deep-seated aspects of

[3] In both Italy and Portugal distinctive architectural styles developed under authoritarian rule. In Italy the regime projected power through scale and the use of Roman motifs (Ghirardo 1980), whilst in Portugal what became known as the 'soft' Portuguese style (*Português Suave*) developed. This combined strong nationalistic and traditional elements within contemporary buildings. Sometimes stone was used but more frequently concrete (Fernandes 2003).

**Table 1** Major earthquakes and volcanic eruptions in Italy (1922–1943) and Portugal (1933–1974)

| Location | Date and characteristics | Effects |
|---|---|---|
| *Italy: Eruptions* | | |
| 1923: Etna | 16th June to 18th July. Earthquakes were felt on the 16th June and on the 17th a fissure opened across the summit cone and vents opened down the NE rift at 2400 m, 2200 m and 1900–1800 m. From the lower vent the lava travelled 7 km in 10 h. A further earthquake occurred in Puntalazzo on 27th June. The eruption ended on 18th July | The railway station at Castiglione was destroyed on the June 19th. Crops, woodland and some houses were destroyed, and major damage occurred in the villages of Cerro. Catena, a suburb of Linguaglossa, was evacuated and a few houses were destroyed |
| 1928: Etna | On 2nd November a fissure opened on the NE flank of the summit crater giving rise to short lived flow. The eruptions was accompanied by an earthquake. In the early hours of the 3rd November, a 3.2 km long fissure opened with major effusions between 2300 and 2050 m. On the night of the 4/5th November another fissure opened at 1200 m producing a large lava flow. The eruption ended on 19th November | Roads were cut and on 6th November lava cut the Circum-Etnean railway and destroyed the town of Mascali by the 7th. The trunk railway from Messina to Catania was cut on 11th November and the station was destroyed |
| 1930: Stromboli (Aeolian Islands) | The volcano is continually active with eponymous strombolian activity and occasionally more violent activity. On 11th September and lasting for less than a day a major eruption occurred possibly the largest for 13 centuries, although violent episodes such as these are expected over decadal time scales. The chronology of the event was:<br>(a) Before 08.11 h –volcano in 'normal' strombolian state<br>(b) 09.11 h emission of dark ash-laden plume than dispersed ash on the SW slopes of the island<br>(c) 09.52 h—two closely spaced extremely violent explosive events, depositing proximally metre-sized blocks on the volcano slopes and distally ash on the NE flank. 10.40 h—Pyroclastic Density Currents (PDCs) moved down valleys trending from the summit<br>(d) 11.00 h until midnight. Minor effusive activity | Several houses were destroyed in the village of Ginostra, the Naval Observatory was badly damaged and a house and vineyard on the rims of the Vallonazzo Valley were destroyed. Six people died, 22 were injured and crops were very badly affected. Previously 4 people had been killed in 1919. Much productive land was sterilised |
| *Italy: Earthquakes* | | |
| 1928—Friuli (Friuli Venezia Giulia—North East Italy) | 27th March. Magnitude 5.7 and Maximum Intensity VIII–IX | Eleven dead, about 40 people were injured and many houses were destroyed and damaged |
| 1930—Irpinia (Basilicata and Campania—South Central Italy) | 23rd of July. Magnitude 6.6 and Maximum Intensity X | Severe damage and 1404 people were killed and between 4000 and 7000 injured. Around 100,000 were homeless |

**Table 1** (continued)

| Location | Date and characteristics | Effects |
|---|---|---|
| 1930—Senigallia (Marche, North East Italy) | 30th October. Magnitude 6.6 and Maximum Intensity VIII to IX | Eighteen people died, many were injured and large numbers were homeless. Much damage to the building stock in several towns and villages |
| 1933—Majella (Abruzzo, Central Italy) | 26th September. Magnitude 5.6 and Maximum Intensity IX | Twelve people were killed and less than 200 were injured. Several villages were severely impacted |
| 1936—Cansiglio (Provinces of Belluno, Triviso and Pordenone, North East Italy) | 18th October. Magnitude 5.9 and Maximum Intensity IX | Nineteen were killed and an unknown number were injured. Caused some damage to more than 40 small towns and villages |
| *Portugal (Azores): Eruptions* | | |
| 1957/8—Capelinhos (Faial Island) | Initial a submarine eruption off the western tip of the island and quickly buildings a new isthmus. Surtseyan, Hawaiian and Strombolian activity. Submarine and subaerial basaltic pyroclastic, volcanic bombs, surges and lava flows. There were also earthquakes on 12th to 14th May 1958. The earthquake of 13th November has a maximum Intensity of VII–VIII | Much damage to the fabric of the island. More than 500 houses were destroyed, and many were evacuated. Much agricultural land was sterilised |
| *Portugal: Earthquakes* | | |
| 1932—São Miguel (Azores) | 5th August—Maximum Intensity VIII | Extensive damage across the south and S E of the island. No deaths, but some injuries and some 3000 were made homeless. Many damaging landslides. In the county (*concelho*) of Povoação: 18% of buildings collapsed and c.51% were affected to some degree |
| 1935—São Miguel (Azores) | 27th April—Maximum Intensity IX. Associated with landslides | One death, several injuries and some building damage |
| 1937- Santa Maria (Azores)<br>1939—Santa Maria (Azores) | 21st November 1937 and 8th May 1939 and occurred close in time. Both had intensities of VII | Masonry buildings showed major damage. No deaths |
| 1950—Terceira (Azores) | Maximum Intensity VII | Relatively minor damage to the northern part of the island |
| 1952—São Miguel (Azores) | 26th June Maximum Intensity VIII. Associated with landslides | Major damage across the southern part of the island and over 300 buildings were destroyed and 600 people were made homeless |
| 1958 Faial (Azores) | See above | See above |
| 1964—São Miguel (Rosais) (Azores) | 21st February—Magnitude 4.8 and Maximum Intensity VIII | Severe damage to the NW part of the island. More than 900 houses were damaged, 400 were destroyed and around 5000 people had to be evacuated |

**Table 1** (continued)

| Location | Date and characteristics | Effects |
|---|---|---|
| 1969—Algarve (Southern Portugal) also affecting Morocco and S W Spain) | 28th February—Magnitude 7.8 and Maximum Intensity VII | Twenty-five deaths and around 80 injured in the Algarve, Morocco and Spain. Much housing damage in the Algarve |
| 1973—Pico and Faial (Azores) | Magnitude 5.5 and Maximum Intensity VIII | No deaths 600 houses were damaged on Faial and c.2000 on Pico, and 5000 were made homeless |

For Italy, data are from: Barberi et al. (1993), Degg (1991) Dickie et al. (2002), Di Roberto et al. 2014, Guest et al. (2003), Kilburn and McGuire (2001) and other sources. Data for Portugal are from: Degg and Doornhamp (1994), Silveira (2002) and Chester et al. (2022)

traditional resilience which are deeply embedded in Portuguese and Italian society (García-Acosta 2002, p. 65). These historical continuities constitute a second objective of this study and are more fully discussed in Sects. 4 and 5.

In the southern Italian peninsula and Sicily, the assumption of State control over emergency management is often taken to date from the 1908 Messina earthquake and to the 1928 highly destructive eruption of Etna, concerning volcanic activity (Branca et al. 2017; Duncan et al. 2023 and see below). Earlier emergencies in the late 19th and early twentieth centuries show the increasing importance of the State, with responses to the 1906 eruption of Vesuvius being transitional. Following the dismissal of Pombal by the monarch in 1777, Portugal reverted to being once more a typical *pre-industrial* self-sufficient society with respect to disaster responses (White 1974, p. 5; Chester et al. 2022, p. 41). Although there are isolated examples of the State being involved, it was during the rule of the *Estado Novo* that it became reluctantly more concerned with responding to disasters, with the 1957/8 eruption and earthquake on Faial Island (Azores) marking a transition from a typically locally self-sufficient to a state-based mode of coping.

## 2 Italian fascism, earthquakes and eruptions 1922–1943

In Italy, responses to earthquakes and eruptions took a singular turn in the 2 decades of fascist rule with the government using interventionist policies, not only to relieve the suffering of victims but also to demonstrate state power and concern for the people through propaganda aimed at both domestic and foreign audiences. In this enterprise Mussolini assumed a prominent role.

### 2.1 Society, politics and culture

All combatant nations suffered in and immediately following the First World War, but few were more severely impacted than Italy. Joining the war in 1915, by its close in 1918 an estimated 600,000 soldiers were dead, a million were wounded and in 3 years the Italian government had spent more on the conflict than it had in total over the previous 50 years of peace. Effectively bankrupted by war debt, the situation in Italy was exacerbated by food shortages caused by bad harvests and by high rates of inflation, with an estimated half a million civilians perishing during the years of conflict and immediately after its conclusion (Anon 2023a).[4] Political divisions widened with the political 'right' and the army blaming defeatists in the Catholic Church, in parliament and socialists, whilst the 'left' and the church felt that Italy's losses justified their long-standing opposition to the conflict.

Benito Mussolini, former journalist, soldier and socialist entered this political maelstrom and from 1920 his armed squads attacked their leftist opponents. In 1921 Mussolini rebranded his movement the *Partito Nazionale Fascista* (or Fascists) and in 1922 they came to power through a combination of repression, street violence, paramilitary organisation

[4] Casualties in Italy are still uncertain more than a century after end of the Great War. An alternative source gives figure of 460,000 military deaths, c.700,000 civilian casualties and a total morality of 1,160,000 (Corum 2012).

and parliamentary action (Reynolds 2013, pp. 48–50).[5] Although there were similarities with authoritarian governments in Austria, Germany, Japan, Portugal and Spain, the regime in Italy had a distinctive hue. Policy was focused around: national self-sufficiency (i.e. autarky); the desire to build a strong, well-organised and well-armed nation; the subjugation of individual, local and regional interests to a centralised State and the unquestioned authority of the leader, also known in Italy as the *Duce*. Mussolini had considerable gifts as a propagandist and especially, though not exclusively, during his first decade in power he strengthened his position by pursuing populist policies focused on society, the economy and foreign affairs all setting the context in which hazard management in general, and responses to earthquakes and eruptions in particular, were to operate (Mack-Smith 1983; Branca et al. 2017—see Table 2).

From 1929 conditions became economically more difficult for many industrialised countries including Italy. A further issue was the League of Nations economic sanctions imposed following Mussolini's invasion of Abyssinia in 1935 and these factors together meant that there was less money available in the 1930s to invest in infrastructure projects including reconstruction following disasters (see Table 2). In addition to land-use planning, urban planning looked to remodel towns and cities to reflect fascist ideology and State power. Some city planning and rebuilding had occurred from the time of Italian unification in the 1860s, but 'the difference was that … (this) … programme of urban renewal, … (was) … done in the name of a fascist ideology of *purification* and *progress*' (Zamagni 1993, pp. 312–3—our *emphasis*). The aim was to impose the State's ideology of centralised power and progress on to the landscapes and townscapes of the peninsula and islands, and architects frequently designed imposing out-of-scale and classically inspired buildings with tall arcades, extensive enclosed spaces and used expensive building stones including exotic marble (Borlotti 1978; Burdett 2003; Armiero 2014; Kallis 2018; Carillo 2022). These styles also featured in new towns, individual new buildings being associated with areas of land reform and not least in reconstruction following disasters, with re-development including public buildings and housing appropriate to residents of differing socio/economic status.[6]

## 2.2 Responding to disasters

On assuming power in 1922 the regime was immediately faced with a legacy of inadequate earthquake responses which had left people suffering the consequences of disasters years after they had occurred. In addition, within a year of coming to power, in June 1923 Etna erupted and the regime faced the first of many challenges of organising effective responses and longer-term programmes of recovery and reconstruction.

[5] The word *fascist* is derived from the *fasces,* a roll of sticks bound by straps and including an axe, which was the symbol of power in ancient Rome. 'A flaming torch was also symbolic, and both were to figure prominently in the iconography of … (disaster) … reconstruction' (Branca et al. 2017, p. 57).

[6] Mussolini, *fascism* and Italian public works programmes often received a favourable press in liberal democratic countries. For example a report in, *Studies: An Irish Quarterly Review* (Meenan 1934) is very favourably disposed to the regime.

**Table 2** A summary of the principal social, economic and foreign policies adopted by Italian fascism

| | Politics |
|---|---|
| Economy | In the 1920s, the *fascists* benefited from an economic boom that affected all industrialised and semi-industrialised nations regardless of their style of government. In Italy industrial output was 50% greater in 1929 than in 1918, tax receipts increased considerably, and unemployment fell. Desires for a stable currency and self-sufficiency were reflected in policies to stimulate the agricultural and industrial sectors to reduce imports. A wheat campaign was launched in 1925 and attracted much favourable and sometimes uncritical international attention. Before Mussolini came to power, Italy's weak parliamentary government had been plagued by poor labour relations and the *Fascist* government sought to impose firm control over a militant labour movement with revolutionary tendencies. The *Labour Charter* of 1927 subordinated the interests of the individual to those of the State and allowed the latter to intervene directly in the economy<br>Under the *Mussolini Law* of 1928, Italy focused much attention on public works often with a considerable propaganda value. These included: agricultural improvement (e.g. land reform or *bonifica*); creating 'new' land through draining the Pontine Marshes near Rome; road, railway and telecommunications investment and the construction of public buildings, including schools and often employing the most eminent architects of the time, using the highest quality materials. These policies carried over into State policies of hazard response including mitigation and future planning (see text) |
| Society | Major policy themes involved avoiding unrest by encouraging traditional stabilising structures including: the family; increasing the size of the population and seeking a *rapprochement* with the Catholic Church which had been in un-official opposition to the secular state since the unification of Italy in the early 1860s. Especially in the hazardous south of the country including Sicily, the church was highly regarded and its leaders respected and the *concordat* with the Vatican in 1929 represented effective statecraft<br>If Italy were to become a major global power and especially if large armed forces were required in the future, then according to *fascist* ideology the country required a larger population than the c.37 million recorded in 1920. Mussolini claimed that a population of *c*.60 million was required by 1950. He was a natalist and to achieve this: emigration was discouraged; premiums were paid to new mothers; bachelors were taxed and there was tax relief for large families. Although social security for disability and pensions date from the late nineteenth century, being further enhanced in 1919. Between 1927 and 1941 the *fascist* authorities extended the provision to include insurance against tuberculosis, family allowances and funds to supplement low incomes<br>To keep people on the land to maximise agricultural output and to keep workers away from proletarian cities, internal migration was strongly discouraged<br>As with economic policy, these social programmes also influenced policies of hazard management (see text) |
| Foreign affairs | Foreign prestige was a major theme of *fascist* ideology and was reflected in policies regarding emigration suppression and autarky. In the 1930s the regime became more expansionist and aggressive on the world stage and, despite international opprobrium including the imposition of *League of Nations* sanctions, propaganda remained effective and foreign newspapers continued to provide favourable coverage of Italian affairs including the handling of emergencies (see text) |

Based on information in: Meenan (1934), Glass (1957), Mack-Smith (1959, 1968, 1983), Clough (1964), Lyttleton (1973), King (1987), Zamagni (1993), Duggan (2012) and Reynolds (2013)

### 2.2.1 Legacy issues

The challenge of the effects of previous disasters was daunting. Not only had major earthquakes occurred between Italy's entry into the First World War and 1922, which occurred in 1917 (Monterchi, Upper Tiber Valley—magnitude 6), 1919 (Tuscany, magnitude 6.4) and 1920 (Garfagnana, magnitude 6.5), but there were also still unresolved issues following the catastrophic earthquake in Messina in 1908. The Messina earthquake was such a devastat-

ing event that policies to deal with its consequences required considerable national effort (Guidoboni and Valensise 2012; Comerci et al. 2015; Rovida et al. 2022).

Reconstruction began well with temporary wooden buildings being constructed and the formulation in 1910 of a City Master Plan, which envisaged new seismic-resistant buildings and changes to the urban fabric especially concerning the width of streets and the size and heights of buildings. However, it quickly ran into the problem of financing such a large enterprise whilst at the same time funding a colonial war in Libya (1911–12) and the First World War (Cardullo 1993; Vermiglio et al. 2023). Mussolini visited Messina soon after becoming head of government and 'expressed well-publicised shock that more than a decade and a half after the earthquake … (many) … victims were still living in makeshift accommodation and grinding poverty. He promised comprehensive action' (Chester et al. 1999, p. 33). Mussolini's interest in Messina coincided with the appointment of a new interventionist-minded Archbishop, Angelo Paino, and support for the reconstruction of both secular and religious buildings, not only served to generate welcome publicity for the *Duce*, but also increased his popularity within this staunchly Catholic region of Italy.[7]

Judgment by later historians of the reconstruction programme instituted by Mussolini and the fascists has traditionally been harsh, as style has been contrasted with substance and effective comprehensive planning with actual achievement (Admiralty 1944; Mack-Smith 1959, 1968, 1983). This opinion has recently been revised. Thus, Botta (2022) notes that administrative failures following the 1919 and 1920 earthquakes encouraged the new government to reorganise the Ministry of Public Works (*Ministero dei Lavori Pubblici*). This allowed it to coordinate the efforts of other ministries together with those of local Fascist Militias and foster relationships between central and local government which became more effective in times of crisis.[8] It also established a clear chain of command, with local government autonomy ceasing when the Minister of Public Works or an appointed deputy assumed control over crisis management. Additional achievements noted by Vermiglio et al. (2023) include: the acceleration of land clearance and reconstruction following the intervention of the fascist government; the investment of c.550 million US$ (at 2023 values) in the reconstruction of privately owned buildings and funds to support the ecclesiastical heritage.

By 1937 nearly 5500 social houses had been constructed, together with 30 schools, a new hospital, a city hall and 132 new churches, with a further 72 being restored. Construction and restoration also occurred in other settlements, but by the time Italy entered the Second World War in 1940, reconstruction was still far from complete (King 1973, p. 93).[9] In addition, although the fascists garnered favourable publicity both at home and abroad, conditions did not improve for Italy's population as a whole, especially for the cohort living

[7] Angelo Paino (1870–1967), served from 1923 to 1963. His predecessor, Letterio D' Arrigo Ramondini (1849–1923), also distinguished himself by remaining in the city when some secular leaders fled the scene of destruction following the 1908 earthquake (Bosworth 1981).

[8] The *milizia Volontaria per la Sicurezza Nazionale*, is popularly known in Italian as the *squadristi* and in English as the Fascist Militia or 'Blackshirts'. It was originally a paramilitary force associated with the *Fascist Party* during their rise to power and unquestioning loyalty was to the *Duce*. After 1923, it became a volunteer militia and, as well as enforcing the policies of the regime, in the 1920s and 1930s was used in many Civil Defence operations (Bosworth 2005, p. 117).

[9] Much of the city was subsequently destroyed by allied bombing in the Second World War, with 5,000 citizens being killed (King 1973, p. 93).

in the many shanty towns of the region where poverty-stricken families were still housed in insanitary conditions (Farinella and Saitta 2019).[10]

Another major earthquake in 1915 affected the city of Avezzano, its environs and cities and towns in central Italy, with a magnitude of 7.1 and an intensity of XI. It caused damage in Rome 100 km away and was felt as far as the Po valley in the north of the country. The earthquake killed c.30,500 people (Servizio Sismico Nazionale 2000). A considerable effort was made in responding to the earthquake and planning reconstruction in this economically crucial area when Italy entered the First World War a few months later (Robinson 1915). The initial response involved the use of Italian troops who were later largely replaced by prisoners of war, with other parts of Italy showing solidarity and providing practical help to victims. Re-construction of the major settlements was well underway by the time the fascists came to power in 1922 and the new government merely had to endorse plans that were already in place. A feature of this disaster was that some villages were spontaneously abandoned, for others evacuation was considered and, in some instances, new settlements were planned in alternative locations (Galadini 2022), a pattern that was to repeat itself in later post-disaster plans during the fascist era (Natalia 2016, p. 30 see below).

### 2.2.2 Disasters in the early fascist era

In June 1923 and less than a year after Mussolini's so-called 'march on Rome', the new government was faced with having to deal with an eruption of Etna (Chester et al. 2012, p.71). Although it appeared threatening at first, damage was only minimal (Table 1) and it allowed the government to enhance its reputation for competence in handling an emergency. Making full use of a favourable domestic and foreign press (e.g. Anon 1923a, b, c), when news of the scene of destruction reached Rome the Minister of Public Works immediately departed for Sicily to organise emergency operations and later the *Duce* visited along with King Vittorio-Emanuele III, making sure that the *fascist* militia was fully involved in the rescue operation by assisting people to remove their possessions to places of safety from homes thought to be threatened. As reported by Mack-Smith (1983, p, 118), quoted by Chester et al. (1999, p. 34):

> Christian symbols and images were recruited into the service of the propaganda machine during natural disasters and it was even claimed by one pro-fascist *newspaper* that the arrival of the Duce was messianic … being the principal reason why the 1923 eruption ended so promptly and caused so little damage.

Five years later, a magnitude 6.0 earthquake occurred on 27th March 1928 in Friuli in the extreme N E of Italy. It represented a challenge for the fascists because its greatest impact was on poor isolated mountain communities where many traditionally constructed buildings showed little resistance to seismic shaking (Gortani 1928; Cavasino 1929; Curulli and

[10] At a *League of Nations* Conference in July 1927, an Italian delegate 'proudly claimed that from the start of fascist rule, 1.6 billion lira had been spent on the reconstruction of Messina and 2.5 billion lira on Reggio as opposed to 150 million lira on the reconstruction of Messina and 188 million lira on Reggio in the time before … (Mussolini came to power). He omitted … (to say) …, however, that living conditions did not improve in the shantytowns' (Schemper 2019, pp.10–11). Many of these were constructed on the periphery of the urban area. These were meant to be a temporary housing solution, but some were still occupied in the early years of the twenty-first century (Farinella and Saitta 2019, p. 121).

Muscio 2015). The earthquake struck in the early hours of the morning and by the evening the State was already organising a response involving the evacuation of many of those made homeless, with people being transported on special trains and with many troops and fascist militia being deployed to assist the population (Anon 2021a). Matters were exacerbated by damage caused by a large foreshock. Medical teams arrived on the following day (28th March), but tents supplied by the army proved unsuitable because of heavy rainfall in the region. An inspector appointed by the Minister of Public Works, commissioned an urgent report for the government in Rome and argued that temporary housing was required rather than tents.

Careful news management stressed the benevolence of the government, fascist organisations and cadres. Coverage emphasised that the *Duce* had made a substantial personal financial donation to the relief effort, with the press stressing the generosity and solidarity shown towards victims both within the region, from the Italian nation as a whole and by the government (Guidoboni et al 2018). Though the initial response was impressive, the overall operation has been criticised for a lack of effective state action in planning longer-term (and more costly) reconstruction (Curulli and Muscio 2015).

### 2.2.3 The 1928 and 1930 eruptions

Responses to the 1928 and 1930 eruptions, respectively of Etna and Stromboli (Table 1), could not have been more contrasting, with the former being used to highlight the achievements of the regime whereas news about the latter was very low key. Of all geophysical disasters that occurred during the fascist era responses to the 1928 eruption of Etna was well documented by Imbo (1928) and researched by three of the authors of the current paper (Duncan et al.1996; Chester et al. 1999; Branca et al. 2017). As Table 1 and Fig. 2 indicate, the eruption caused major damage, with the almost complete destruction of the large village of Mascali together with parts of Nunziata and Portosalvo (Fig. 2b), with housing worth over 1.5 million US$ being destroyed. Other damage included: a 2.5 million US$ loss of agricultural land and industrial plant; around c.4 million US$ damage to communications and a high yet un-quantified cost of providing shelter for nearly 5000 homeless people, constituting a total loss of more than 8 million US$ in 1928 or about 143 million US$ at 2023 values (Branca et al. 2017, p. 65). In contrast to the 1908 and 1915 earthquakes, where the costs of a comprehensive response would have been too large for any Italian government given the country's parlous financial position at the time, this eruption was more localised, had areally limited impacts and a more thoroughgoing response was possible by a strongly interventionist regime. The eruption represented an ideal opportunity for the fascist government to demonstrate the effectiveness of its policies in responding in a concerted manner in the immediate aftermath of the disaster and in the longer-term reconstruction of Mascali and its surroundings.

The principal policies adopted by the government are summarised in Table 3 (see also Figs. 2, 3 and 4). The initial responses and longer-term recovery were successful in restoring the fortunes of the area and the standard of living enjoyed by the people of Mascali, with incomes higher in 1937 than they had been a decade earlier (Chester et al. 1999; Branca et al. 2017), however this was not the whole story. When compared with foreign reports, censored accounts by the government and the pro-fascist press—in newspapers such as *Corriere di Catania* and *Corriere della Sera*—are shown to be at worst false and at best

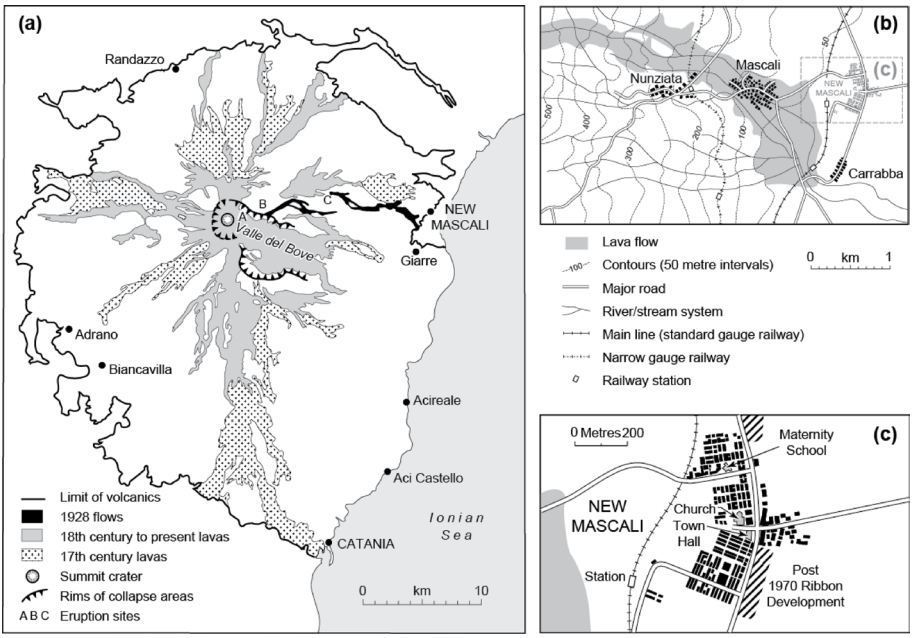


**Fig. 2** The 1928 eruption of Mount Etnain 1928. (**a**) Location of the eruption sites and the principal lava flows, The location of the first eruption site active on 2nd November is marked (**A**). The location of the second eruption site on 3rd November is marked (**B**). The third and principal eruption site at Ripa della Naca which was active 4th–19th November is marked (**C**). (**b**) The area covered by the lava flow in Mascali and its environs. (**c**) Map of the new town of Mascali built following the eruption. Based on: Duncan, A.M., Dibben, C., Chester, D.K. and Guest, J.E. The 1928 eruption of Mount Etna, Sicily, and the destruction of the town of Mascali. *Disasters* 20 (1), Fig. 7, page 10, with modifications

exaggerated, with the State not being so benevolent as it appeared to be at the time. For instance, many of those made homeless were not housed by the government as claimed but were accommodated by immediate and extended family as well as friends in other Etnean settlements or in rented housing. Exaggerating the effectiveness of government also applied to funded recovery costs with values ranging up to an inflated figure of than 3 million US$ (Table 3). The final bill was c.1.3 million US$ (c.23 million US$ at 2023 values), which was met by the *Confederazione Generale del Fascista Italiana*, with other costs being borne by a variety of government departments and the Catholic Church (Fichera 1988).

In contrast, the longer-term rebuilding was impressive. Unlike the situation in most Western countries at the time where it was a portfolio of minor significance, in fascist Italy the Minister of Public Works was an important government figure, and at the time of the eruption the minister was Giovanni Giuriati, a long-term supporter and associate of Mussolini.[11] A rebuilding plan was published in 1929, which not only represented a great improvement in living conditions (Table 3), but also a forward-looking attitude by embracing aspects of *proactive* planning. New Mascali was located on a safer site on sedimentary rocks beyond the limit of historic lava flows and was built according to building codes that had been revised following the Messina earthquake: streets were widened and the number of sto-

[11] Giovanni Giuriati (1876–1970) was a lawyer, able administrator and fascist. He served as Minister of Public Works from 1925 to 1929 (Cannistrano 1983).

**Table 3** Summary of short and longer-term responses to the 1928 eruption of Etna

| Planning strategies | Remarks |
|---|---|
| Initial responses | Evacuation of the threatened settlements, in particular Mascali, was well handled by the authorities. Although religious processions were held and people prayed for a miracle, at the same time they were more realistic and followed the clear instructions of the appointed *fascist* official (the Vice-*Podestà* of Catania[a]). State employees were used in unprecedented numbers including large drafts of *fascist* militia, fire fighters and soldiers. Transport was provided to allow the people affected to remove their possessions and household effects. Newsreels show that even parts of the fabric of homes—such as doors, window frames and tiles—were removed for re-use. Work was found for the unemployed and a temporary 1.5 km railway was constructed to remove rubble and later transport building materials. Initial recovery costs were estimated between 0.8 to more than 3 million US$ (c.14–54 million US$—at 2023 values—see text), with the higher values coming from *fascist* officials and their sympathisers in the press |
| *Longer term recovery* | |
| Urban planning | 'New' Mascali is a town laid out on a rectilinear plan and is quite atypical of a southern Italian or Sicilian settlement. Public buildings dominate by size, sight line and modernist architecture, and leading architects were employed to capture the *fascist* vision. Noteworthy are: the town hall (*Municipio*); a large elementary school; a maternity school (named after Mussolini's mother, the Duce being a natalist—see text); a cathedral-sized parish church and a large out-of-scale railway station would have graced a substantial town (see Figs. 2 and 3)<br>Private and public housing was built to a defined standard with the provision: of running water; piped sewerage and electricity, which were almost unknown in southern Italy or Sicily at the time. The public buildings were complete by 1933 and the whole 'model' village by 1937 |
| Financing | Both academic literature and local press reports give a misleading impression that State funding was more comprehensive than it was, but later interviews with survivors indicated that this was not the sole source of re-development finance. The State fully funded public buildings and infrastructure but gave grants (of c. 60%) towards the building costs of a new house, grants representing between 525 and 1050 US$, or equivalent to c. 9500-c.19,000 US$ at 2023 values |

Based in information in: Duncan et al. (1996), Chester et al. (1999) and Branca et al. (2017)

[a]The *fascists* re-used the Medieval northern Italian term *podestà* for the leader of a municipality. In 1926 the autonomous powers and functions of *comuni* (municipalities) were abolished and replaced by an authoritarian major with full executive and legislative powers. The system was in place from 1927 until 1945 (Born 1927)

reys in domestic dwellings was restricted (Fichera 1988). Visually and aesthetically Mascali stood for the values of a powerful State imprinted on the landscape (see Figs. 2, 3 and 4; Duncan et al. 1996; Chester et al. 1999, pp. 40 and 43).

In 1930 the eruption of Stromboli in the Aeolian Islands (Table 1) represented a major challenge to the authorities because, although short-lived, the event had a catastrophic impact on a tiny island . With an area of only 12.6 $km^2$ and with much of its productive land being damaged by volcanic products, it could no longer support its pre-eruption population making evacuation the only viable policy option. As noted above and in contrast to most disasters that occurred during the fascist era particularly the 1928 eruption, responses of the authorities were hardly given any publicity even by newspapers normally favourably disposed towards the *Duce* and his regime. For a government that prided itself on effective central government action to mitigate the effects of disasters and aid recovery at the local level, a response focused on out-migration and the rapid reduction in population numbers did not accord with this ideal, even though it is difficult to see how any alternative that did

**Fig. 3** The church of San Leonardo Abate in Mascali. Reconstructed following the 1928 eruption. Note the fascist torch is placed above the cross of Christ. The inscription *Ignem veni mittere in terram* ('I come to send fire on the earth' - Luke 12: 49), reflects a divine punishment ideology that was prevalent at the time and is still to be found across the region (see text). The photograph were taken by David Chester and were first published in: Chester, D.K., Duncan, A.M., Dibben, C., Guest, J.E. and Lister P.H. 1999, Mascali, Mount Etna Region, Sicily: An example of fascist planning during and after the 1928 eruption. Natural Hazards 19 (1), Fig. 4, page 40

not involve the evacuation of at least some of the people could have been avoided. From a population of 2447 in 1911, Stromboli's population declined rapidly to reach only 293 by 1971 (King and Young 1979; Anon 2019a; Anon 2019b).[12]

### 2.2.4 Earthquakes in the 1930s

Responses to the 1928 eruption of Etna represent the high point of fascist disaster planning. In contrast in the 1930s the government had to deal with four significant seismic disasters (Table 1), the scale of which and the size of the regions affected severely taxing the ability of the government to deliver effective responses. This was despite policies like those adopted in earlier emergencies being applied and which were in some instances more comprehensive. In addition, the number of seismic emergencies over such a short time, two in 1930 and one each in 1933 and 1936 (Table 1), stretched the government's ability to act effectively to finance recovery in a decade which coincided with both the global economic downturn

[12] Population only recovered from the late 1970s when Stromboli became a major tourist destination. In the 2021 census a population of 616 was recorded (Anon 2024). The first farmers only returned to the island some 20 years after the eruption (Cincotta 2023) and Mussolini's principal use for the Aeolian Islands was to exile political dissidents. There were also internment colonies and prisons on Ustica and Lipari (Angelini 2009).


**Fig. 4** The imposing Town Hall (*Municipio* or *Casa Del Comune*), was built by the *fascist* authorities following the 1928 eruption. This imposing building is out of scale for a medium sized village and represents the power and authority of the State over local people. The photographs were taken by David Chester and were first published in: Chester, D.K., Duncan, A.M., Dibben, C., Guest, J.E. and Lister P.H. 1999, Mascali, Mount Etna Region, Sicily: An example of fascist planning during and after the 1928 eruption. *Natural Hazards* 19 (1), Fig. 5, page 41

known as the Great Depression and when Italy's aggressive foreign policies were causing international sanctions to be imposed.

The earthquakes of July and October 1930—Irpinia (M 6.7) and Senigallia (M 5.8), September 1933—Majella (M 5.9) and October 1936—Cansiglio (M 6.1) (see Table 1) were at the other end of the spectrum, being more destructive, impacting larger areas and requiring vast expenditure by the government. In terms of initial responses, many of the features typified by earlier eruptions and earthquakes were in evidence including strong centralisation of decision-making by the Minister of Public Works or his nominee (Anon 1930a; Fahnestock 1930; Pallone and Galli 2016; Spiga and Porfido 2021); morale-boosting visits by members of the royal family and/or the *Duce* (Anon 1930b; Pallone and Galli 2016); favourable propagandistic press reports (Anon 2023b); the efficient provision of food supplies, medical aid, temporary accommodation and, where necessary, evacuation (Anon 1930c; Pallone and Galli 2016; Spiga and Porfido 2021). There were also innovations such as a specially equipped rescue train being used for the first time following the July 1930 Irpinia earth-

quake (Fahnestock 1930; Botta 2022; Table 1) and a strongly expressed desire to prevent temporary accommodation from becoming permanent as had occurred following the 1908 Messina disaster (Spiga and Porfido 2021).

At first sight longer-term recovery appeared well prepared and included some aspects of *pro-active* planning. For instance, there are examples of new housing being constructed in geologically more stable areas (Gizzi and Masini 2004), villages being moved to safer locations (Galadini 2022), more seismically resistant homes being built, known as *Ricoveri stabili* (stable shelters) or *Casette asismiche* (aseismic housing) (Spiga and Porfido 2021)[13] and the widespread use of a 1924 statute that allowed municipalities (i.e. *comuni*) to be declared seismic zones and where detailed building codes would be applied (Anon 2023b).[14] A major concern was affordability, an issue that was exacerbated by statements by the *Duce* that for reasons of national pride the government did not want to rely on charitable donations from home, the church or from the Italian diaspora (Anon 1930a). For instance following the July 1930 disaster, the initial 100 million lire (1.8 billion US$ at 2023 values) allocated by the Council of Ministers proved inadequate, the sum being raised to 2.8 billion US$ but was then capped by the Ministry of Public Works despite lobbying from local political and administrative interests (Anon 2021b). There were also cases when local economic interests were allowed to negate seismic zoning. Following the 1936 earthquake some *comuni* were removed from the list of municipalities subject to building codes on economic grounds following representations by local political and vested economic interests (Anon 2023b).

## 3 Portugal, the *Estado Novo,* earthquakes and eruptions 1928–1974

### 3.1 Estado Novo: its ascent to power and its policies

In the twentieth century and until the Carnation Revolution of 1974 and the establishment of democratic government in Portugal, the most significant political era in terms of both foreign policy and domestic affairs including the management of emergencies, was that of the *Estado Novo* (New State) led by a self-effacing economist from the University of Coimbra, António de Oliveira Salazar, who had already made a reputation as an expert in national financial management. The impact of the First World War on Portugal was disastrous. Joining the war in 1916 on the allied side following armed clashes with Germany in Angola and tensions over submarine warfare, with a population in 1918 of just over 6 million the toll exacted on Portugal was severe, with 12,000 military deaths and civilian casualties of c.220,000 caused by food shortages (c.82,000) and influenza (c.138,000) (Oliveira Marques 1991). Despite positive trends in the nineteenth century, Portugal was economically the least developed Western European state and in the immediate post-war years 'daily life was dominated by high inflation, declining wages, pensions and rents … (and) … political unrest.' Out of a population of 6 million in 1920, 1.7 million were illiterate and life expectancy at birth was only 40 years for men and c.36 years for women, with child mortality on a rising

[13] Characteristics of the seismic resistant housing built in the aftermath of the October 1930 (Senigalia) earthquake are given by Dolce and Speranza (2005) and Spiga and Porfido (2021). Housing was to be of restricted height and constructed of concrete (or stone), with much reinforced concrete being used. Light wooden trussed roofs were to be adopted and offsite fabrication was encouraged to aid rapid reconstruction.

[14] The Law of 1924 was widened in scope 3 years later (Anon 2023b).

trend since 1914 (Guimarães 2023, p.1). In 1926 the military assumed power, repression increased and in 1928 the new regime, known as the *Ditadura Nacional* (National Dictatorship), invited Salazar to become Minister of Finance with financial control over all other ministries (Birmingham 1993, p. 158).

Adopting a new constitution in 1933 the *Ditadura Nacional* became the *Estado Novo* with Salazar appointed *Presidente do Conselho de Ministros* (i.e. President of the Council of Ministers or Prime Minister) and thereafter acted as the dictatorial Head of Government (Baiôa 1994). Although the regime led by Salazar was contemporaneous with Mussolini's Italy and Franco's Spain, leading its opponents to term it fascist, this description does not capture the specifics of the Portuguese government and the character of its leader both of which influenced their approach to disasters (Birmingham 1993; Gori and de Carvalho 2020). Salazar's role as a leader has been subject to differing evaluations (Gallagher 2020). Despite claims that his policies reflected Christian moral principles, the regime imprisoned dissidents, forced the unemployed to work, sponsored a secret police force, the *Polícia Internacional e de Defesa do Estado* (PIDE), and, most notoriously, ordered the assassination of a political opponent, the former presidential candidate Humberto Delgado (1906–1965). For the French historian Jacques Georgel (1981 p. 302),[15] Salazar embraced:

> A fascism deprived of all attributes of fascism; a kind of travesty governed pettily by a man of extraordinary power lust who lived in solitude for forty years … (and) … claimed to be chosen by destiny for an exceptional mission, … who wished to prove his genius through an entirely idiosyncratic concept of the happiness of his people.

Nevertheless, through his skilful manipulation of groups such as the church, the army, urban middle-class elites and monarchists, Salazar was able to survive and implement his policies by promoting financial prudence, paternalism and patriotism. The policies of the regime were focused on four principles (Chester et al. 2022, pp. 22–23):

(a) Promoting a highly managed and state-controlled market economy that was neither capitalist nor communist in character.
(b) Financial prudence, with the government limiting government expenditure to ensure a balanced budget.
(c) Avoiding a focus on popularist interventionist policies, Salazar kept in the background and eschewed personal promotion (Adinolfi 2012, p. 610).[16]
(d) Controlling the country in a highly centralised manner. This not only applied to the administration of metropolitan Portugal but also affected the Atlantic Islands (i.e. the Azores and Madeira), the empire, civil service and the press (Baklanoff 1992; Guill 1993; Anderson 2000).

[15] This quotation is quoted and translated by David Birmingham (1993, p. 159).

[16] Although in contrast to Mussolini Salazar disliked personalised propaganda, the State established a party newspaper, *Diario da Manhã* and promoted its values through communications between the centre and local elites and through its youth movement (Adinolfi 2012). The latter, known as the *Mocidade Portuguesa*, was a compulsory youth movement formed in 1936 and modelled on similar organisations in Italy and Germany (Bártolo 2015, p. 63).

The regime survived the incapacity of Salazar in 1968 and continued under the leadership of his associate, Marcelo Caetano (1906–1980). It was Caetano and his ministers who managed the 1969 Algarve earthquake, but the regime had evolved and policies differed in important respects from those of his predecessor.

### 3.1.1 The Estado Novo and disaster management

Up to and including the 1957/58 emergency on Faial Island, all geophysically-based disasters with which the regime had to deal occurred in the Azores and were associated with earthquakes (Table 1 and Fig. 5). These isolated islands situated c.1400 km west of Lisbon were occupied by Portuguese settlers from the fifteenth century, who were forced to cope with disasters in a self-sufficient manner using largely indigenous resources of building materials, capital, labour and administrative expertise (Chester et al. 2022, pp. 170–187). This continued for the first two decades of the *Estado Novo's* time in power. One lesson to emerge from disasters occurring between the fifteenth and the middle of the twentieth century was that effective local leadership was vitally important if initial responses and longer-term recovery were to be successful (Duncan et al. 2023).[17]

Despite being an otherwise authoritarian government, for 2 decades the *Estado Novo* allowed the Azores to continue its self-sufficient pattern of responses relying on community initiatives, local leaders and indigenous resources in the same way it had for hundreds of years. For instance, following the 1932 earthquake on São Miguel, government involvement was minimal and confined to supplying tents and improvised shelters in its immediate

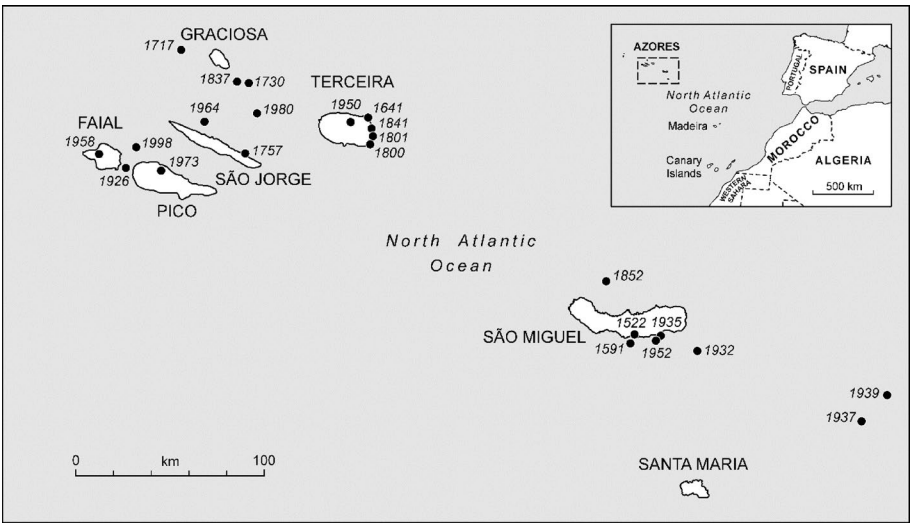


**Fig. 5** Azores: location map. From: Chester et al. (2022). *Earthquake and volcanic activity on Islands. History and contemporary perspectives from the Azores.* Routledge, London, Fig. 1.1, page 62

[17] In 1766 the Marquês de Pombal reorganised the administration into two areas which in 1835 became three districts: Angra do Heroismo (capital of Terceira, with responsibility for São Jorge and Graciosa); Ponta Delgada (on São Miguel, also in charge of Santa Maria) and Horta (capital of Faial which administered Pico, Flores and Corvo). Each district was administered by a governor who was supported by a *Junta Geral* (general council). This system continued until the 1974 Portuguese Revolution (Chester et al. 2022, pp. 14–15).

aftermath (Anon 1932a, b). As far as we can ascertain from the limited records available the same pattern of responding was true following the 1935, 1937, 1939, 1950 and 1952 earthquakes, but all changed in the devastation that occurred on Faial in 1957 and 1958 (see Chester et al. 2022).

### 3.1.2 The Capelinhos eruption and earthquake 27th September 1957 to 24th October 1958

The Capelinhos eruption began in September 1957, 1.2 km off the NW coast of Faial, a small island of only 173 km$^2$ (Castello Branco et al. 1959; Cole et al. 1996, 2001; Chester et al. 2022, pp. 93–96). As the eruption developed, new cones formed progressively to the east, and in November an isthmus formed linking the new volcano to Faial (Fig. 6). The style of activity was initially *Surtseyan* caused by sea water interacting with magma and producing large quantities of fine ash which was distributed downwind to blanket much of the western part of the island. As the cone formed the sea became excluded from the vent and the eruption became magmatic showing Hawaiian and Strombolian behaviour. Between the 12th and 14th May over 400 earthquakes were recorded, with a major event of maximum intensity X occurring on the night of 12th May, which caused extensive damage to several settlements. The eruption ended on 24th October.

The eruption and seismicity that impacted the island of Faial (Fig. 7) were so severe that the government was forced to become more actively involved and responses by the State occurred over a lengthy period. Achieving policy goals required skilled personnel, political commitment on the part of the central government and not least a large financial investment, which was a major change of direction not just for a fiscally prudent national exchequer but for Salazar, a notably parsimonious leader. It was not just the scale of the disaster and its severity that threatened the economic and social viability of the island and prompted a sea-change in national policy. Other important factors included: the widespread reporting of the plight of the islanders by the foreign media, especially English language newspapers of record such as the *New York Times* and London *Times*, and newsreels, which put pressure on the government to act; international, particularly American, humanitarian concerns were raised because of Cold War defence interests in the Azores,[18] and of lobbying by members of diaspora communities within the USA; and a successful campaign to put pressure on the government by an activist and locally highly respected Civil Governor, António de Freitas Pimentel (1901–1981).[19]

Whereas the *Estado Novo* encouraged earth scientists to study the volcano (e.g. Castello Branco et al. 1959), any discussion of government actions and their motivation was not welcomed by the regime and were not researched at the time. Several retrospective studies have revealed how the initially reluctant national government became progressively pressured to adopt a more interventionist strategy (Ramos Villar 2006; Coutinho et al. 2010; Kueppers

[18] In 1943 at the height of the Second World War, Salazar granted base facilities in the Azores first to the United Kingdom and later to the USA. By the time of the 1957/58 emergency the principal USAbase was a huge airfield (Lajes) on Terceira. The military presence in Terceira was viewed with suspicion by the secret police (PIDE) because it represented an Americanisation of Azorean culture in general and, more specifically, the spread of anti-regime democratic values (Contreras and Keese 2022).

[19] Born on Flores, Pimentel was a local medical practitioner and served as governor from 1953 to 1973. His jurisdiction included Faial, Pico, Floresand Corvo.

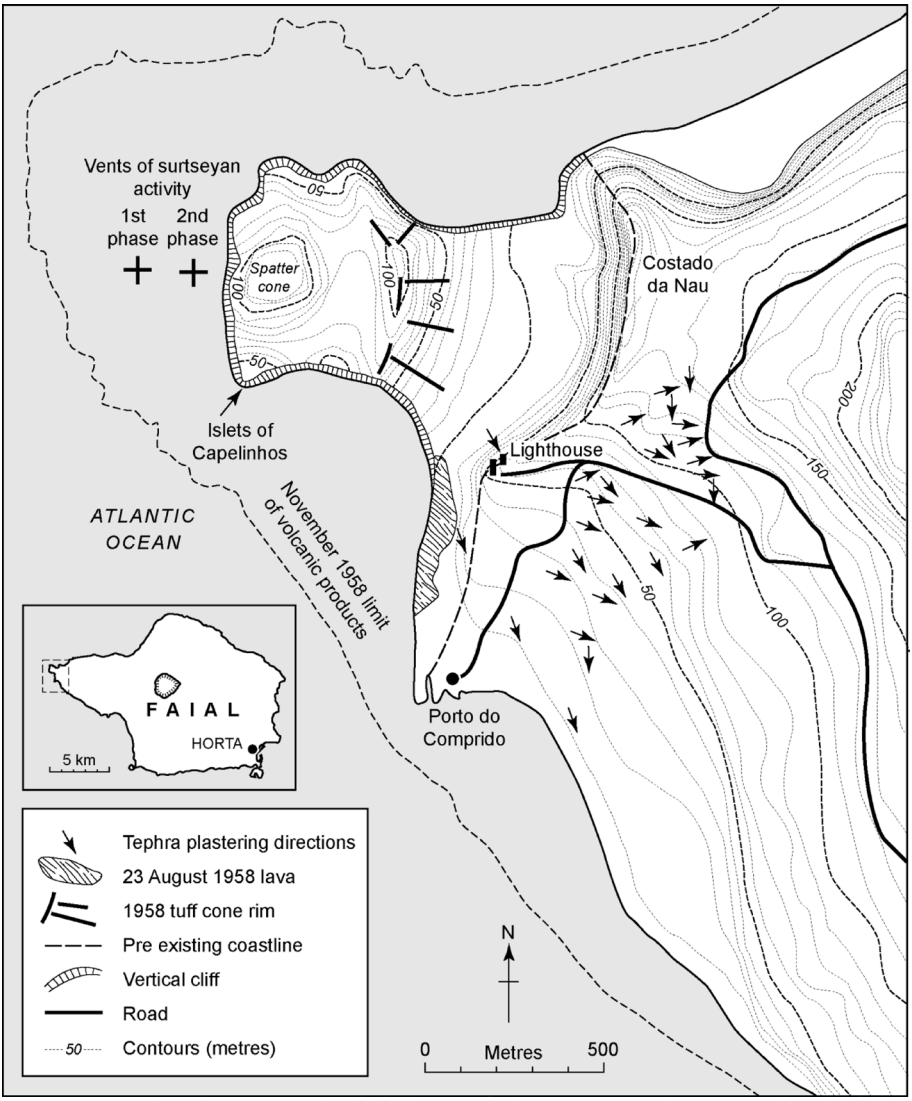


**Fig. 6** The 1957/1958 Capelinhos eruption and earthquake. Capelinhos during and after the 1957/1958 eruption. Modified after Cole et al. (2001, p. 205, Fig. 2). Copyright permission Springer Nature

and Beier 2018; Chester et al. 2022; Gebauer et al. 2022). Together, they have highlighted three principal contributing factors.

First, Governor Pimentel's role was pivotal and early in the eruption he not only organised medical aid and transport, accommodation and food for victims, but also established excellent working relationships with local and national government, co-ordinating the relief efforts of fire-fighters (*bombeiros*) and the Portuguese Legion (*Legião Portuguesa*).[20] In

[20] The *Legião Portuguesa* was a paramilitary organisation of the Portuguese State founded in 1936. It was dissolved in 1974 (Rodrigues 1997).

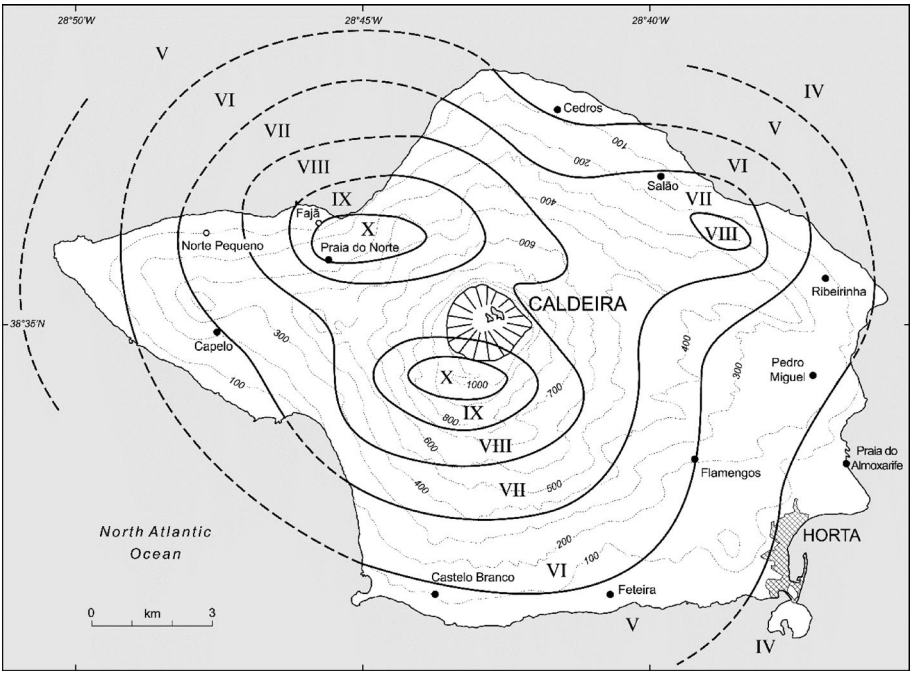


**Fig. 7** Map showing locations and the maximum earthquake intensity during the night of the 13th to 14th May 1958. From Coutinho et al. (2010, Fig. 3, p. 270). Copyright permission Elsevier with additional information. An intensity of X equates to a magnitude of c.7-7.6.

late 1957 the Ministry of Public Works sent a technical mission to Faial (see below) headed by Professor Orlando Ribeiro (1911–1997), the doyen of Portuguese geographers. Pimentel quickly established excellent relationships with Ribeiro and later in the emergency kept the central government informed of developments, constantly lobbying for more assistance both financial and involving skilled personnel. Following the seismic crisis in May 1958, the governor and his colleagues ordered further out-migration and feared that the eruption might become more violent and require a whole island evacuation. To meet these contingencies inquiries were made about chartering ships, but in the event these were not required. Governor Pimentel showed considerable political skill in establishing relationships with both the government in Lisbon and personally with Salazar, for whom he made strongly argued cases for more assistance;[21] with diasporic communities in the USA and Canada, asking them to provide moral and financial support; and from American political leaders from whom he requested aid and later the facilitation of emigration from the islands (see below).

Second, central government became more actively involved in responses. One reason for Salazar's longevity in office was that he continually renewed his administration and during the 1950s several ministers were young technocrats who were more concerned than their

[21] All major items of State expenditure had to be personally authorised by Salazar and on one occasion Pimentel reminded the dictator that he was the only governor in Portugal who had increased the size of his territory because of new land produced by erupted products. The normally reserved Salazar laughed at this information and authorised further financial assistance (Coutinho et al. 2010).

predecessors with economic development and improving the welfare of the people (Lewis 2002). One of these new faces was the Minister of Public Works, Eng. Eduardo Arantes e Oliveira (1907–1982), and it was he who appointed the technical mission, later announcing a comprehensive recovery and reconstruction plan (*Plano de Recuperação Económica e Reconstrução da Ilha do Faial*) and encouraged the Ministry of Education to provide special grant aid to Faial.

The third finding was that external links between Portugal and North America were improved. These were not just contingent on military and expatriate links with North America and deft political manoeuvring by Governor Pimentel and others, but in the post-Second World War era the Azores Islands were less isolated due to new air transport routes to North America and Europe via the international airport on Santa Maria (Fig. 5). Through newspapers, newsreel films and broadcasts people outside the archipelago knew the plight of the people of Faial in detail and put pressure on their governments to act. The USA facilitated aid to victims and later Congress passed the Azorean Refugee Acts (1958 and 1960) and other enactments so that by 1980 around 80,000 Azoreans had settled mostly in California and New England (Chapin 1989; Ávila and Mendonça 2008).[22] Other migrants went to Canada, Portugal and other European countries, but only a few to the African colonies defying the clear wishes of the regime for whom this was a preferred destination.

Opinions differ about the effectiveness of responses to the 1957/58 crisis. Ramos Villar (2006, p. 14) has argued that, 'recession and the outbreak of insurrection in the African colonies reduced the help that could be provided by the State', while Oliveira (2008, p. 101) has added that 'the Portuguese government did not feel obliged to provide any help' (Chester et al. 2022, p. 193). In contrast, we have argued that 'response, recovery and rehabilitation were generally highly successful' (Coutinho et al. 2010, p. 265). We later concluded, however, that these differences in opinion were,

> more apparent than real for whereas the policy of the *Estado Novo* … and the instincts of Salazar were firmly set against interventionist social policies, especially if these were expensive, the reason why this government was so heavily involved … was because of the role assumed by the governor … who most effectively continued and greatly enhanced the … (established) … notion that a successful response depends on effective local leadership (Chester et al. 2022, pp. 193–4).

### 3.1.3 Earthquake responses in the final years of the Estado Novo

Immediately following the 1974 Revolution, intellectual critiques of the *Estado Novo* focused not just on the regime's repressive character and unsuccessful colonial wars in Africa, but on its economic failings. At the time of the revolution, Portugal had the lowest per-capita income in Western Europe (Nunes et al. 1989), but changes in the regime which had already influenced responses to eruption and earthquake-related emergencies on Faial in the 1950s (see above) continued and, indeed, became more significant for the remainder of Salazar's time in office and during the 6 years up to 1974 when Marcello Caetano served as Prime Minister. These new priorities included: re-orientation from an inward-looking to an outward-facing trade policy and industrial strategy, with foreign investment being

[22] Major areas of settlement in the USA were: Fall River, Massachusetts; Providence, Bristol and Pawtucket, Rhode Island and San Jose, California.

successfully encouraged and overseas businesses welcomed; the use of financial surpluses built up by Salazar since the 1930s to fund infrastructure and social projects; and, following prompting by his more technocratic ministers, Salazar showed a willingness to join international bodies.[23] The result was that between 1961 and 1973, total GDP grew by 120% even allowing for inflation (Baklanoff 1992), enabling more resources to be applied to domestic policy including disaster relief.

Changing policy also influenced the management of disasters, not least following an earthquake in the Azores in February 1964. The 1964 (Rosais) earthquake (M 4.8—maximum intensity VIII) caused major damage on the Island of São Jorge (Fig. 5), emphasising once again the vulnerability of Azorean housing to even moderately sized events (see Table 1). Although responses were still reactive, with no plans being in place before the earthquake, the Civil Governor Teotónio Machado Pires (1902–1993), played a pivotal role in coordinating the response of the government: this involved dealing with an estimated 5000 homeless people many of whom were evacuated by sea to adjacent islands; the widespread use of military personnel; and the provision of relief supplies and medical care. One new feature was the internationalisation of the response with the ready acceptance of assistance from the United States Air Force based on Terceira (Fig. 5), from logistical support and emergency supplies to temporary accommodation (Chester et al. 2022, p.196). Although following the 1957/8 emergency Governor Pimentel prompted the central government to institute a programme of long-term recovery, in 1964 the regime took the initiative (Portuguese Government 1964a, b). Some 21.25 million Escudos (c.733,000 US$ or over 6 million US$ at 2023 values) were spent on urban reconstruction and infrastructure renewal. Although the financial aid package was generous by the austere standards of Salazar's *Estado Novo,* it did not prevent voluntary emigration from taking place, with the population of São Jorge falling from c. 6000 before the earthquake to only 1300 in 1970. Most migrants once again left for North America (Williams and Fonseca 1999).

In 1967 the government had to deal with major flooding in the greater Lisbon metropolitan area and did so with a mixture of both old and new policies and attitudes (Anon 1967a, b; Trigo et al. 2018). The response was only a partial success, but a greater test was dealing with the effects of a severe earthquake that occurred in February 1969. With a magnitude of 7.8 and with an epicentre on the Gorringe Bank in the ocean to the SW of the Algarve (Fig. 8), it was the largest event to strike the mainland since 1755 and caused extensive damage, across the Algarve and as far north as Lisbon.

Accounts of responses by the regime to the 1969 earthquake have been published by Carrilho (2019), Gonçalves (2019), Florido (2019), Oliveira (2019) and Buforn et al. (2020). They show that responses were more comprehensive than had occurred following earlier disasters. The *Direcção de Urbanização de Faro* (Urbanisation Directorate of the Faro District), whose jurisdiction covered the Algarve, estimated that 167 homes would have to be re-built, with a further 438 requiring extensive repair and that damage had been caused to many public buildings, places of worship, commercial properties and infrastructure, with some of the greatest damage occurring in the west in the towns of Aljezur, Bensafrim, Lagos, Portimão, Silves and many smaller villages (Fig. 8). In contrast to earlier events the government acted quickly and made available 40,000,000 Escudos (c.1.4 million US$ or c.12 million US$ at 2023 values) for temporary accommodation and material relief and

[23] These included: the European Free Trade Association (EFTA); the General Agreement on Tariffs and Trade (GATT), the International Monetary Fund (IMF) and the World Bank.

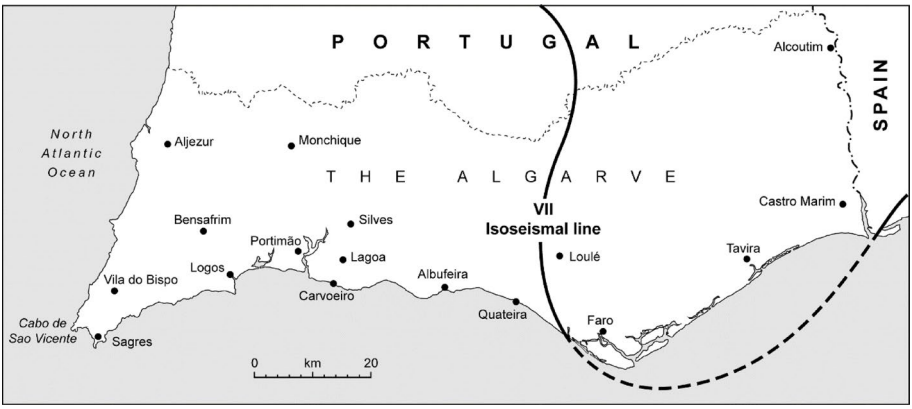


**Fig. 8** Algarve: Location map showing some settlements impacted by the 1969 earthquake and the intensity VII isoseismal line. The epicentre was to the SW o Cabo de São Vincente and attenuation was in a SW to NE direction. Information from: Mezcua (1982), Degg and Doornhamp (1994) and other sources)

commissioned a rapid 30-day survey of damage. Reconstruction aid was even more generous. The Prime Minister was actively involved in coordinating responses, visiting the devastated area with his nephew and Minister of Public Works, the technocratic civil engineer Rui Sanches (1919–2009), and encouraged local leaders. The mayors of the *concelhos* (counties) of Portimão, Lagos, Silves and Vila do Bispo met to review recovery policies with technical advisors from Lisbon. There was a sense of solidarity throughout the country and funds were collected and transferred to victims in the Algarve.

In May 1969 legislation was passed authorising the government to activate a recovery plan based on: the reconstruction or repair of public and private buildings; construction of new housing; temporary accommodation of victims; further urban development and the granting of credit (Carrilho 2019). In addition, the government took its first tentative steps towards a more proactive engagement with earthquake disasters with new seismic stations being established across the country and courses in seismic engineering being taught at the country's universities, both initiatives giving an impetus to the introduction of more effective building codes in the decade following the demise of the *Estado Novo* (see below). There was also an earthquake in 1973 affecting Pico and Faial Islands in the Azores (Fig. 5). It had a magnitude of 5.5 and a maximum intensity of VIII caused no deaths, but damaged 2600 houses, once again emphasising the vulnerability of the housing stock (see text). Despite some 5000 people being rendered homeless, there are no published studies of responses to this event. Whether this was because of continuing 'secrecy' on the part of the regime, or the disruption to academic activity 6 months later because of the 1974 revolution or some other reason remains unknown (Chester et al. 2022, pp. 117–118).

## 4 Discussion

Fascist Italy ended in chaos with the country being invaded, fought over and severely damaged. For much of the central and southern peninsular Italy and Sicily where most disasters occurred, the years of Mussolini's rule were ones of economic stagnation and increasing

poverty (King 1973; Clark 1984), the latter being exacerbated by the partial closure of the 'safety valve' of emigration because it was thought by the regime to be demeaning to national self-esteem (King 1987, p. 20). The *Estado Novo* lasted much longer until 1974 but left a country embroiled in colonial conflict and at its demise Portugal's population was poorer and had higher rates of illiteracy than any other country in western Europe (Birmingham 1993, pp. 167–178).

In Portugal policies of disaster management evolved over 4 decades and, in common with Mussolini, peripheral areas such as the Azores were not central to Salazar's concerns. The Prime Minister and his government never introduced policies that either improved living conditions, which continued to lag those of mainland Portugal, or until the 1950s enhanced the effectiveness of disaster responses (Contreras and Keese 2022). Successful responses to the 1957/58 emergency on Faial and to the 1964 earthquake still depended critically on the effectiveness of local leaders who cajoled the central government to act effectively. It was only following the 1969 earthquake when changes had already taken place in the personnel serving in cabinet and their priorities, that the regime was able to mount an effective policy without prompting or lobbying by local leaders.

Although both regimes enjoyed some success in managing post-disaster responses and longer-term recovery; apart from their authoritarian character, reactive management style, effective news management and lack of any democratic accountability for their actions, the two regimes and the societies in which they operated were very different. In the case of disaster management in Italy, style was as important—and it could be argued more important—than substance, the two coming together successfully in the post-1928 rebuilding of Mascali. This mixture was less successful when disasters were either larger-scale affairs, with costs that strained the regime's long-term commitment to rebuilding or devastated a small area like the Stromboli that could only recover with a much-reduced population. As we have argued for Sicily, but applying with equal force to southern Italy as a whole:

> For Mussolini, the Milanese journalist, with his power base and industrial heartland in the north of the country, Sicily was perceived as being relatively unimportant. … It was a region to be placated at minimal cost and for maximum advantage. The successful rebuilding of Mascali, like the fight against the mafia, fitted his policy admirably, whereas … (the) … long-term recovery of Messina … did not. Messina's planning problems were simply too large in scale and too costly to deal with. In the absence of policy and resources, words alone had to suffice (Chester et al. 1999, pp. 41–42).

Today in both countries disaster responses are *proactive.* Rather than relying on local leadership (Duncan et al. 2023) or national dictators to deliver effective, responses are co-ordinated centrally under democratic mandate. In Italy matters began to change in the 1980s with important milestones being the creation of the Department of Civil Protection (*Dipartimento della Protezione Civile*) and the Istituto *Nazionale di Geofisica e Vulcanologia* (National Institute of Geophysics and Volcanology—INGV), which amalgamated five existing government earth science research bodies. Both have extensive powers of intervention, research and forward planning (Branca et al. 2017, p. 70). What is more, lessons learnt from disaster experience such as the effectiveness of responses to earthquakes such as that of 2009 and several eruptions of Etna have been used to refine policy. In Portugal decision-making in case of an emergency represents a cascade:

> Minor and localized problems are dealt with within individual *freguesias* … (parishes) … larger-scale problems are successively the responsibility of the *concelho* … (county) …, the Azores Autonomous Region and a minister within the national government in Lisbon. (Today a large disaster) … would be under the control of the General responsible for Civil Protection who is located on Terceira … and who would be able to exercise powers very similar to those so successfully employed by Governor Pimentel on Faial in the 1950s (Coutinho et al. 2010, p. 278).

As far as scientific advice is concerned, Portugal like Italy has addressed this issue and, for instance, in the Azores the *Instituto de Investigação em Vulcanologia e Avaliação de Riscos,* or IVAR (Institute for Volcanology and Risk Assessment Research) has a similar role to the INGV in Italy (Chester et al. 2022, p. 239). In Portugal the only major geophysical disasters to have occurred since the demise of the *Estado Novo* have been earthquakes in the Azores.[24] The first occurred on 1st January 1980 (magnitude 7.1), impacted Terceira and caused 59 deaths, more than 400 injuries and damaged more than 15,000 buildings. Although occurring less than 4 years after the end of authoritarian rule, responses were much more effective in both the short and long-term and involved active involvement by national and regional governments. Effective responses also characterised the 9th of July 1998 earthquake that impacted Faial and to a lesser extent Pico and São Miguel islands in the Azores. Features of the response included a commitment to improve the housing stock through a policy of 'build-back' better including seismic reinforcement and generous financial provision. As in Italy there was a commitment to learn future lessons from disasters (Chester et al. 2022, p. 197–205).

## 5 Conclusions

In the introduction the aims of the paper were stated as twofold: first, to examine how two authoritarian regimes in Europe handled earthquake and eruption disasters and, secondly, to assess the extent to which deep-seated continuities in vulnerability and resilience are revealed which continue to affect responses regardless of the regime in power. Many disaster-prone countries have been and are subject to authoritarian regimes and it may be of interest for others to research whether similar long-standing feature of vulnerability and resilience are still present within these societies regardless of wherher an oppressive interventionist regime in power.

In both countries, for instance, traditionally constructed buildings have continued to fail and cause deaths as they have for hundreds of years. These comprise not just dwellings, but churches, palaces and public buildings that are part of the architectural heritage and constitute what David Alexander (1997, p. 292) has termed 'residual un-ameliorated vulnerability'. Although building codes were strengthened in 1983, for new buildings in Portugal (Chester et al. 2022 p. 202) while in Italy 1981 marked the date when codes were enforced on new construction at the local authority (i.e. *comune*) level, older construction remains problematic even when expensive retrofitting of vulnerable structures has been conducted.

[24] In Portugal civil protection is the responsibility of the National Authority for Emergency and Civil Protection (ANEPC—*Autoridade Nacional de Emergência e Proteção Civil*). On the mainland a major issue has been forest fires especially in the summer months.

The dilemma remains of balancing safety against heritage value as was evident in 2009 when the historic centre of the city of L'Aquila (Central Italy) was devastated by a major earthquake. What was more concerning was that some newer construction was severely impacted highlighting the need for vigilance over building codes and their enforcement (Tertulliani et al. 2012). Notwithstanding these issues and controversy over pre-earthquake advice provided by scientists and officials, the overall response to this disaster has been deemed effective both in its immediate aftermath and over the longer term (Contreras et al. 2014).[25]

A second factor to emerge is that, despite strong authoritarian rule, features of traditional resilience continue to be important and are deeply embedded within Portuguese and Italian societies (García-Acosta 2002, p. 65). The persistence of staunch support from, family and extended family networks is one example, and links to diaspora communities particularly in North America is another, although in the case of Italy, Mussolini officially eschewed this (see above). Resilience provided by religious framing was more important in the Azores than in Italy or mainland Portugal because in the former the locally popular and long-established *Culto do Espírito Santo* (Cult of the Holy Spirit—see Chester et al. 2022, pp. 7–21, 186) and other religious charities provided alms and succour in times of crisis. In contrast in southern Italy and Sicily, many people continued to frame disasters as representing divine wrath which could only be appeased through liturgical actions including the procession of sacred objects, although some relief was provided by Catholic charities at the national level (Chester et al. 2019). Mussolini who signed the famous *Concordat* (Table 2), not only came to terms with the Catholic Church, but also used its symbolism both in the 1923 and 1928 eruptions (see Fig. 3).

In summary, despite the control exercised by fascism in Italy and the *Estado Novo* in Portugal aspects of the deep-seated vulnerability and resilience in these two countries continue to be a challenge to policy makers as they are in many societies (Garcia-Acosta 2002, p. 65; Chester et al. 2025, pp. 60–61).

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## Declarations

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[25] The L'Aquila earthquake struck on the 6th of April 2009, had a magnitude of 6.3, killed 308 people, 67,500 were rendered homeless and 100,000 buildings were damaged. The earthquake generated controversy over alleged inaccurate, incomplete and contradictory statements and forecasts made by six scientists and one official, who were initially convicted of involuntary manslaughter, but later were either acquitted or had their sentences reduced on appeal. There were also claims that many years later reconstruction was still in the early recovery phase, but a thorough review by Contreras et al. (2014) shows that effective long-term recovery was in progress albeit at a slow rate.

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