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The “Fan of the Terre Peligne”: Integrated Enhancement and Valorization of the Archeological and Geological Heritage of an Inner-Mountain Area (Abruzzo, Central Apennines, Italy)

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Received: 27 May 2019; Accepted: 20 June 2019; Published: 24 June 2019



Abstract: The outstanding cultural heritage of Italy is intimately related to the landscape and its long-lasting history. Besides major cities, famous localities, and park areas, several minor places and areas hide important features that allow the enhancing of inner-mountain and hilly areas as well as local natural reserves. This enhancement is supported by combining different types of cultural tourism, such as the archeological and geological ones. In this paper, an integrated geological–archeological itinerary is presented, which aims to valorize both these aspects in the inner-mountain areas of the central Apennines. The itinerary, called the “Fan of the Terre Peligne”, is focused on the Terre Peligne area located in the Sulmona basin, in the central-eastern part of the Apennines chain (Abruzzo region, central Italy). It is composed of five sectors (one for each of the municipalities included) and incorporates traditional physical tools and digital ones. Here, the evidence of the Apennines formation is preserved from the origin of marine carbonate rocks to their deformation and the landscape shaping. The Terre Peligne intermontane basin became—and still is—one of the main transit areas for crossing the Italian peninsula since before Roman times and here many stages of Italian history are preserved. This allows outlining of the presence of man since prehistoric times, and here the name “Italia” was defined for the first time, in Corfinio, and to testify the connection between human and landscape history. A SWOT (strengths–weaknesses–opportunities–threats) analysis highlighted the main strengths, weaknesses, opportunities, and threats. Combining geological and archeological elements, which are intimately connected in this area, this itinerary intends to be an instrument for the enhancement and awareness of the natural and cultural heritage of a poorly known area that features outstanding geological, landscape, and human elements of the history of the inner Apennines.

Keywords: geotourism resources; cultural tourism; archeology; touristic itinerary; valorization; inner-mountain areas; Apennines; central Italy

1. Introduction

The cultural heritage of Italy is one of the most noticeable in the world and is intimately related to the landscape and its long-lasting history. This is valued mainly in the major cities, popular localities, and national parks [1–8], while it is poorly developed in many minor villages, country areas, local natural reserves, and less-known areas, such as in the inner-mountain areas of the Apennines. However, there are many places, archeological sites, and landscapes that preserve the geological history of our country, as well as important stages of human history [9–14]. Tourism, in particular cultural tourism and geotourism combining natural and cultural features with geological and geomorphological ones, is constantly expanding in the management, use, and enhancement of geological and cultural heritage of poorly known areas [15–18]. The valorization of natural and cultural features combined with geological and geomorphological features is the base of this kind of tourism, which can become a crucial promotion tool for inner-mountain areas and for connecting them to the most known touristic places and park areas. It can also become a contribution to resilience, turning geological hazards (e.g., earthquakes, landslides, flooding) into opportunities to raise the people's awareness, to set up a culture of preventing natural hazards and also to create new job opportunities in inner-mountain areas [19]. Many different types of activities have been realized in recent decades to enhance these valuable elements with varying kinds of approach. To well-known major and less-known minor archeological sites, abiotic elements of geodiversity were added (in the meaning of Brilha [20]). These include geosites—elements, areas, or places of geological interest of significant value and important witnesses of Earth's history [21]—as well as geomorphosites—as areas with geological features and landforms that have acquired a scientific, cultural/historical, aesthetic and/or social/economic value due to human perception or exploitation [7,22–24]. The realization of maps, itineraries, and illustrative materials in this area has aided not only in disseminating information about geological features and heritage but also in increasing awareness of geo-environmental and historical issues through sustainable tourism [10–14,25–29]. Moreover, in recent years, integrated proposals were defined based on tried and tested itineraries incorporating geological elements (e.g., geosites) combined to more common topics, such as flora and fauna, architecture, archeology, etc. [28,30–35].

This paper presents an integrated geological–archeological itinerary in its overall structure and main features. It aims to enhance the natural (geological) and cultural (archeological) heritage of an inner-mountain area of the Apennines, precisely of the Terre Peligne in the Sulmona basin (Abruzzo, central Italy; Figure 1, Figure 2). The itinerary is located between the main national parks of Abruzzo. It connects the Majella National Park and the Velino-Sirente Regional Park, crossing the Natural Reserve of the San Venzano Gorges. It is also placed south of the Gran Sasso Laga mountains National Park and north of the Abruzzo, Lazio, and Molise National Park. To contribute to the enhancement of the precious elements of the “Terre Peligne”, various activities have been carried out so far. Concerning the archeological aspects, several sites have been investigated as places keeping evidence of human activities in different historical periods. For geological and geomorphological aspects, geosites and geomorphosites have been identified, as areas with specific characteristics that have acquired a scientific value [4,36].

The integrated itinerary of the “Terre Peligne” combines geological–archeological sites trying to enhance them in an overall integrated view under the historical, cultural, aesthetic, social, and economic profiles [20,22,28]. The itinerary was realized, in a collaboration among geologists and archeologists of the “G. d’Annunzio” University of Chieti-Pescara, local authorities (the municipalities of Roccacasale, Prezza, Raiano, Vittorito, Corfinio, gathered in the Terre Peligne Association), professionals, and technicians, working in the area. It stems from the awareness of the poor sensitivity of the population on: (i) the long-lasting geological and geomorphological history that has created the current mountain landscape from an ancient tropical sea (and that today determine natural hazards) and (ii) the poor dissemination and popularization of the archeological features that bear witness to the human history of the inner mountainous areas of Abruzzo.



Figure 1. (a) Location Map of the Terre Peligne area (black line) within the central Apennines (three-dimensional view from 90 m DEM, SRTM). (b) Panoramic view of the Terre Peligne area within the Sulmona basin (view from western sector, in the municipality of Vittorito).

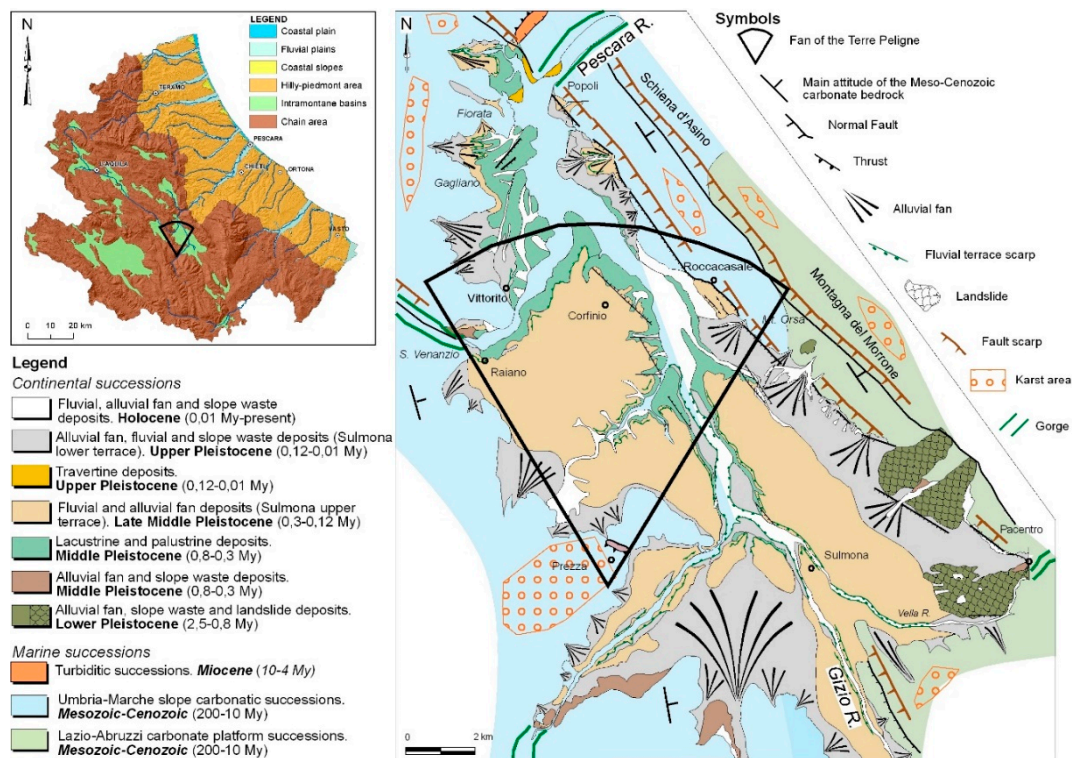


Figure 2. Location of the Terre Peligne (black line) in the Abruzzo Region (top left) and Geological scheme of the Sulmona basin showing the location of the “Fan of the Terre Peligne” (black line) (modified from [37,38]).

The “Fan of the Terre Peligne” itinerary focuses on how the landscape and geological features can be intimately related and connected to human history, settlements, and activities. It incorporates in five sectors dedicated to different themes, one for each of the Terre Peligne Association municipalities. These sectors define a fan-shaped area that named the itinerary as “Fan of the Terre Peligne”. The purpose is the integration of archeological elements with geological-geomorphological and other attractive aspects

of the territory, including all forms of cultural heritage (both tangible and intangible), to increase the tourist attractiveness of this area. Here, the evidence of the geological history of the Apennines is preserved from the origin of marine carbonate rocks to their deformation and from the formation of the major mountain ridges to the landscape shaping. From an archeological point of view, the territory has maintained significant evidence, which allows reconstruction of the settlement evolution as well as the development of the relationship between man, rocks, and landscape in these internal areas of Abruzzo. The economy of this region in ancient times was based on the wise exploitation of available landscape resources in an integrated economic system through agriculture, forestry/herding, and sheep farming [39]. Moreover, in this area, the name “Italia” was defined for the first time, in Corfinio, the capital city of the ancient Italic League.

2. Materials and Methods

The “Fan of the Terre Peligne” itinerary runs across the Sulmona basin and is defined as a multicolor fan. The selection of the path and the main stop sites was qualitatively based on three main criteria similar for archeology and geology: (i) location and spatial connection along the Terre Peligne area; (ii) site type and origin, and (iii) temporal distribution in the geological/archeological time scale [28,40–42]. Even if at this stage we did not run a quantitative assessment of the sites [20], this approach is in agreement with what has been done in many cases for geosites evaluation (e.g., within Environmental Impact Assessment and territorial planning [11,12,43]; inventories of natural heritage sites, [31,35,40,44]; tourist promotion [14,45]; management of nature parks [4,6,22,46,47]).

The “Fan of the Terre Peligne” results from the fan-shape of the itinerary and is composed of five geological and archeological thematic sectors, one for each of the municipalities joined the Association of Terre Peligne (Figure 3). The sectors are identified by a geographic orientation: north-east, south, west, north-west, north. Each of them is associated with a color that refers to the geological-geomorphological theme, according to the international coded conventions (Geological Survey of Italy, ISPRA, and International Association of Geomorphology, IAG) (Figure 3): red for tectonics, which created the ridges; orange for karst landscape and dark green for fluvial and water-related processes shaping the main ridges; light green for lacustrine environments and blue for hydrography and rivers-related processes in the Sulmona basin. Each sector is also connected to a specific archeological theme: protect and dominate, the invisible history, water and stone, man and highlands, from the capital of the italics to Pentima. This arrangement is realized to enhance the intrinsic value of the villages, the variable views of the landscape and the geological features of the area, as well as the various archeological elements. It is defined to shed a new light on the values of this territory rich in cultural heritage, in which natural and human history are strictly combined.

The geological-geomorphological features presented in the different sectors and sites along the itinerary were selected and defined through research activity and studies in the Sulmona area and the central-eastern Apennines in recent decades. The studies were mostly based on field geological-geomorphological investigations and mapping, as well as morphometric and morphotectonic investigations, focused on the geological features and geomorphological landforms of this area [37,38,48–54]. From these studies, the primary and most exciting findings were selected and underwent specific field investigations in order to be presented to a broad public, mainly focusing on the evidence of the different stages of the geological and landscape evolution as well as the hazard connected to the recent tectonic and geomorphological processes. The latest field investigations provided the best sites and outcrops to show and explain the formation of marine and continental sedimentary rocks and to outline their structure. The best exposures of fault plains were selected to explain their role in the landscape shaping, as well as their connection to earthquakes and seismic hazard. The geomorphological analysis outlined the most interesting and well-exposed landforms shaped by water-related processes (i.e., fluvial and lacustrine processes, gorges/valley incisions, karst processes), which explained of the landscape evolution.

The archeological findings presented in the selected sites are also the results of several activities and studies carried out in the Terre Peligne area during recent decades [36].

The stages of development and transformation of this territory—and their extensive diachrony—were reconstructed, being so crucial for the understanding of the settlement history in this part of the central Apennines area. From the late 90s of the last century extensive archeological excavations have been carried out in Corfinio, thanks to an urban archeological project from the Abruzzo Archeological Department, the University of Chieti and the University of Rome “La Sapienza” as well as the municipality of Corfinio [55–60]. Excluding these large projects, the Terre Peligne area has not been studied systematically from an archeological point of view. Previously, the findings have been mostly occasional, except for some broader research carried out between the end of the 19th and the beginning of the 20th centuries by Antonio De Nino, gathered mainly in the volume of *Forma Italiae* published in 1984 by van Wouterghem [61].

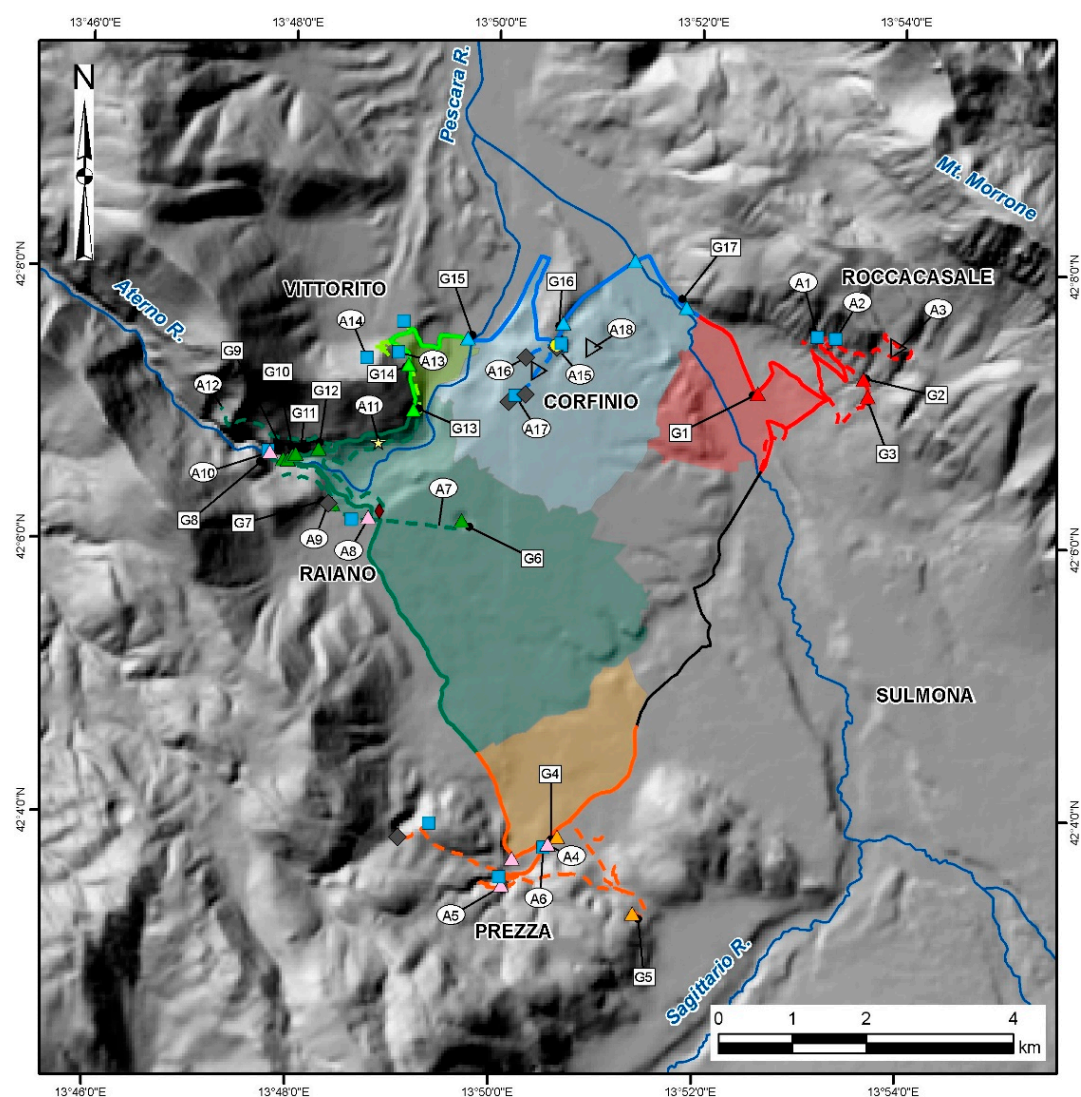


Figure 3. Scheme of the “Fan of the Terre Peligne” path (see Table 1 for details). The colors are those officially coded for the geological and geomorphological features (Geological Survey of Italy, ISPRA, and International Association of Geomorphology, IAG) that characterize each sector: red for tectonics, orange for karst landscape, dark green for fluvial processes, light green for lacustrine environments, and blue for rivers and hydrography.

These overall studies highlighted the high value of the archeological heritage, which however in most cases is hardly usable by the general public and is disseminated throughout the territory, often in areas of high landscape value. In this study, the main sites were selected across the area defining main groups or themes, which combines historical perspective and landscape connections. These thematic groups and the single sites were then organized and explained with lay and easy to understand language to make them suitable for the general public and for enhancing these sites in a touristic and educational perspective.

The geological and archeological element of the “Fan of the Terre Peligne” are therefore arranged in five sectors. Each sector of the itinerary features a triangular “totem” with the introduction to the geological and archeological setting of the specific area and municipality. In the most significant sites, geological and archeological stops are defined, marked by plates and logos, which through digital devices (tablet, smartphone) allow access to the information about the site. For the main sites (1–2 for each sector), larger and more descriptive panels are defined. The entire itinerary features five triangular totems, ten panels in the main stops and 26 plates or logos, as summarized in Figure 3 and Table 1. In each sector, stops of geological (G1, G2, etc.) and archeological (A1, A2, etc.) interest are identified. Secondary routes are connected (by walk or bicycle, dashed in Figure 3) are connected to the main ones.

3. Geological and Archeological Values of the Terre Peligne Area

The study area is located in the Sulmona intermontane basin (also known as Peligna valley or Terre Peligne area) on the eastern side of the central Apennines chain. This area is located in a key node in terms of both geological (junction of marine paleogeographies Mesozoic–Cenozoic era, tectonic features, and Quaternary terrestrial landscape) and archeological framework (transit zone from the mountain areas to the Adriatic and Tyrrhenian coast for the entire central Apennines). The itinerary runs all along the northern part of the Sulmona intermontane basin and incorporates the main elements of the geological and human history of this area (Figure 1, Figure 2, Figure 3).

3.1. Geological Setting

The landscape of the Abruzzo Apennines, as well as of the entire chain, is the result of the geological evolution in the Neogene–Quaternary period (from ~15 My ago to present) of an east-verging orogenic system composed of several Neogene thrust sheet displaced by Pliocene (5–2.5 My) strike-slip and Quaternary (2.5 My to present) extensional tectonics and regional uplift [52,62]. These tectonic processes led to the emersion of the Apennines orogen and the progressive development of the main ridges with the beginning of the geomorphological evolution forming an initial landscape (at least from the Late Miocene–Early Pliocene, ~5 My). From the chain area to the piedmont and coastal area, the landscape evolution was closely connected with a complex combination of endogenous (morphotectonics) and exogenous processes (slope, fluvial, karst and glacial processes) [38,45,63–66]. During the Quaternary, regional uplift combined with extensional tectonics defined a system dominated by calcareous ridges, by valleys incised in Neogene sandstone and claystone rocks, and by intermontane basins filled by Quaternary continental (mainly slope and fluvial) deposits.

The Sulmona basin (Figure 1, Figure 3) is one of the main and more eastern intermontane basins of the Apennines surrounded by main NW–SE elongated ridges (Mt. Morrone, Maiella Mts., Peligne Mts. [37,49–51,67]). These ridges are composed of calcareous rocks formed in different paleogeographic marine environment from Jurassic to Miocene (200–10 My): a thick sequence of shallow sea carbonate platform rocks (southern and central sector of Mt. Morrone) and a sequence of slope to basin limestone-marl-chert rocks (northern sector of Mt. Morrone and Peligne mountains in the western side of the basin) (Figure 2) [53,54,67]. They are affected by N–S thrust faults and systems of NW–SE normal faults. Specifically, the Sulmona basin is bordered by a primary NW–SE normal fault system along the Mt. Morrone SW slope, affected by Quaternary and recent (~1 My to present) tectonic activity responsible for the formation of the basin [49–51,53,54,68,69]. The basin was occupied by a large lake during the Middle Pleistocene (~0.8–0.3 My) and is partially filled by slope, alluvial fan

deposits, and by a thick sequence of lacustrine deposits related to an ancient Peligno lake [50,70] covered by fluvial deposits during the late Middle Pleistocene (~0.3–0.12 My) and incised by river valleys (Late Pleistocene-Holocene, 0.12 My to present). The combination of extensional tectonics and lacustrine-fluvial processes defined the formation of the gentle landscape of the intermontane basins in which the Terre Peligne are placed. The combination of fluvial and karst processes, also controlled by tectonic features, is well documented along the slopes and in the valleys. This combination defined the shaping of the rugged landscape of the ridges and the formation of deep valleys, gorges, and incisions, parallel or transversal to the main ridges (e.g., Aterno Gorges, Sagittario Gorges, Popoli Gorges; [38]), which define the main transit routes across the Apennines since historic and protohistoric times.

In the “Fan of the Terre Peligne” itinerary, the most significant geological and geomorphological themes are therefore related to (i) the origin and formation of the calcareous rocks in marine environment, (ii) the junction between marine and continental environment testifying the emersion of the ridges, (iii) the tectonic processes affecting the landscape through major fault systems; (iv) the formation and evolution of the ancient Peligno lake, and finally (v) the progressive development of the main ridges and the shaping of the landscape due to fluvial, slope, and karst processes.

3.2. Archeological Framework

The area of the Terre Peligne is a significant node of the Abruzzo territory also for the human history testified by archeological findings. This area has been an obligatory transit point since prehistoric times for those who moved from the internal mountain areas of the central Apennines to the hilly and coastal Adriatic sector. An articulated network of paths closely connected to the morphology of the territory has allowed and supported the link of various settlements that tells a story thousands of years long marked by the interaction of man with the environment. Significant findings dating back to the prehistoric age testify the presence of man in this area. Thereafter, the Italic population settled in the Peligna valley before the Roman conquest. In addition, here, in Corfinio, the capital city of the ancient Italic League, the name “Italia” was defined for the first time [71]. The Roman conquest led to a widespread occupation focused on high-ground sites, where massive defensive walls are still visible, and around sanctuaries located in places with geological and landscape features strictly related to road links [55,72,73].

Corfinio, even after the Social War, continued to be the primary center in this area, a Roman municipality which, especially between the first century B.C. and the first century A.D., would show the presence of significant monuments [55]. His role as a political and religious center in the territory would continue throughout the Early Middle Ages. The extensive reconstruction of the Episcopal complex in Valva carried out by the bishop Trasmondo at the end of the XI century may represent the last large-scale work in this area [74]. Since then, the settlement layout has been increasingly centered on the close network of castles, some of them built on previous pre-Roman settlements, which in many cases still exists in the old centers of present towns. These events gave rise to the arrangement of Corfinio’s archeological areas which are now preserved also in the local Municipal Museum “Antonio De Nino” [75].

In the itinerary, the main archeological elements are therefore related to (i) the history from the capital of the Italics to Pentima, (ii) the protection and domination of the Terre Peligne area from the surrounding ridges, (iii) the man occupation in the highlands, (iv) the role of water and stones in the transitways from the inner Apennines to the Adriatic area, and finally (v) the invisible history hidden in the landscape of the Terre Peligne.

4. The “Fan of the Terre Peligne”: Five Villages, Five Colors, Five Themes

The “Fan of the Terre Peligne” connects five different municipalities (Roccacasale, Prezza, Raiano, Vittorito, and Corfinio) across the Terre Peligne area. As mentioned above, each village corresponds to a sector and a specific geological-geomorphological theme as well to an archeologic one and includes two to seven stops for geological and archeological observations (Figure 3, Table 1).

Table 1. Main sectors of “Fan of Terre Peligne” itinerary, geological and archeological themes and local stops along the path (see Figure 3 for location). The colors are those officially coded for the geological and geomorphological features (Geological Survey of Italy, ISPRA, and International Association of Geomorphology, IAG) that characterize each sector: red for tectonics, orange for karst landscape, dark green for fluvial processes, light green for lacustrine environments, and blue for rivers and hydrography.

EASTERN SECTOR (Roccacasale)	Geology the born of the basin and the slope	Stop G1: Panoramic view on the Mt. Morrone fault escarpment (plate) Stop G2: The Roccacasale fault and the fault rocks (panel) Stop G3: The alluvial fans of the Mt. Morrone fault escarpment (plate)
	Archeology protect and dominate	Stop A1: The Roccacasale Castle (plate) Stop A2: The San Michele cave (plate) Stop A3: The hill of Fairies (plate)
SOUTHERN SECTOR (Prezza)	Geology The karst landscape of the slopes: the water dissolves the rocks:	Stop G4: Small lakes in the plain, sinkholes (plate) Stop G5: Dolines and the karst landscape of Prezza (panel)
	Archeology The invisible history	Stop A4: The fortification and the village (plate) Stop A5: The Roman inscription and the Santa Lucia Church (plate) Stop A6: Colle village: the Roman inscription and the Santa Maria Church (panel)
WESTERN SECTOR (Raiano)	Geology From ancient rocks to new mountains	Stop G6: The Quaglia Lake (plate) Stop G7: The San Venanzio Gorges (panel) Stop G8: A hermitage in the Apennines, the San Venanzio Hermitage (panel—connected to A9) Stop G9: The mill turns like the rocks (plate) Stop G10: The join of two complex and ancient geological “world” join: the marine and the continental (plate) Stop G11: The climate changed, and the rocks from red turn white (plate) Stop G12: The history of the ancient Peligno Lake and human presence in this area started here (plate)
	Archeology The water and the stone	Stop A7: The Transhumance Route (plate) Stop A8: Santa Maria Maggiore Church (plate) Stop A9: The Vuccole aqueduct (plate—connected to G8) Stop A10: A hermitage in the Apennines, the San Venanzio Hermitage (panel) (connected to G8) Stop A11: Santa Maria di Contra Church (panel) Stop A12: Cave paintings (plate)
NORTH-WESTERN SECTOR (Vittorito)	Geology Appearance and disappearance of a lake	Stop G13: A panoramic view on the ancient Peligno Lake (panel) Stop G14: The sediments of the ancient lake (plate)
	Archeology Men and highlands	Stop A13: San Michele Arcangelo Church (panel) Stop A14: the Castle (plate)
NORTHERN SECTOR (Corfinio)	Geology From ancient to new rivers	Stop G15: The ancient rivers (Upper and Lower Terrace) and the present-day rivers (panel) Stop G16: The Aterno River (plate) Stop G17: The Sagittario River (plate)
	Archeology From the Italics’ capital to Pentima	Stop A15: The theatre (plate) Stop A16: San Giacomo plain (plate) Stop A17: Valvensis complex, San Pelino Church (panel) Stop A18: Sant’Ippolito Church (panel)

4.1. Roccacasale: Eastern Sector (Red)

The east part of the itinerary is in the municipality of Roccacasale and starts the “Fan of Terre Peligne” itinerary (Figure 2) and run at the boundary of the Majella National Park. From the Roccacasale castle, it shows a glance on the overall landscape of the Terre Peligne area explaining the formation of the Sulmona basin and the steep south-west slope of the Mt. Morrone (north-east side of the basin). In this sector, it is also well documented how this landscape was exploited for human activities along historical time, specifically for defense and protection as well as for domination of the settlements on the plain.

4.1.1. Geology—The Born of the Basin and The Slope

This sector is arranged to explain the processes that led to the formation of the slope of Mt. Morrone (Figure 4) and of the Sulmona intermontane basin, as well as how these processes are connected to one of the main faults of the central Apennines (the Mt. Morrone fault) forming the structure of the Terre Peligne landscape. The red color is coded in geology for tectonics and faults, the main topic of the sector: what are they and how can be observed, when and where have been formed, how are connected to earthquake and seismicity and what have been their effects on the landscape? Faults are explained as a well-known hazard element connected to earthquakes but also as natural events that contributed to building the variety of the landscape of the Terre Peligne area and the entire Apennines, featuring sharp ridges, wide basins, and deep valleys.

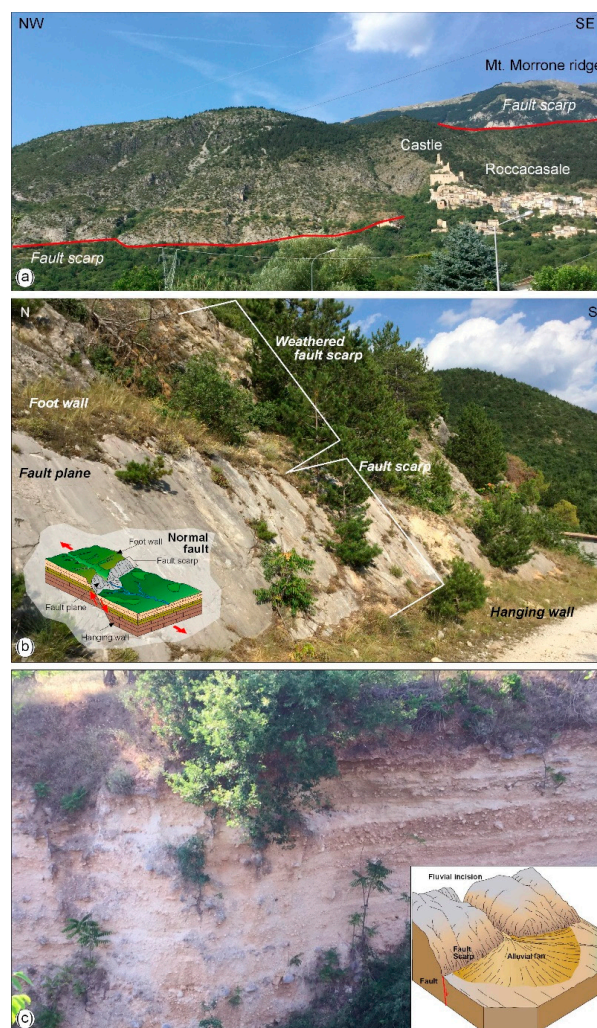


Figure 4. (a) Panoramic view of the SW escarpment of the Mt. Morrone ridge; the landscape is marked by several fault scarp related to the Mt. Morrone fault system (red lines). (b) Fault scarp located SE of the Roccacasale village; it is a well-polished rock fault plane, over 3 m high, NW-SE oriented and SW-dipping of about 50°; in the upper part it weathered and eroded due to the rock jointing; it is a normal fault with the SW side (hanging wall) downthrown and the NE side uplifted (foot wall), as explained in the inset cartoon. (c) Alluvial fan sediments consisting of blocks, gravel, and sand; they result from the fault-related escarpment weathering and erosion and the accumulation at the base of the slope; they are arranged in layers declining from the fault scarp to the plain.

After a panoramic view on the Mt. Morrone fault-related escarpment (Figure 4a), in the Roccacasale area, it is possible to see and touch a large fault plane (Figure 4b). It is part of the Mt. Morrone fault system to which strong historical earthquakes were connected as well as large ancient landslides and recent slope mass movements [51,69]. The fault plane is visible as a flat and smoothed surface on calcareous rocks NW-striking and SW-dipping around 50° forming a steep rock scarp (known as fault scarp; Figure 4b). It is a normal fault, meaning that the SW side (Sulmona plain) has been downthrown while the NE side (Mt. Morrone ridge) has been uplifted forming the steep slope separating ridge and plain. This process induced strong jointing in the calcareous rocks, especially along the fault, and their intense weathering. The last part of this sector outlines how the progressive weathering of the escarpment and the incision of the jointed rocks has produced a significant accumulation of debris deposits resulting in large alluvial fans forming the junction between slope and plain (Figure 4c).

4.1.2. Archeology—Protect and Dominate

The steepness and straightness, strictly connected to the tectonic origin as a fault-related slope, made the escarpment of the Mt. Morrone and the Roccacasale area a key sector for dominating and protecting the whole Terre Peligne area during the human history since pre-Roman times (Figure 5).



Figure 5. Roccacasale hillside: (a) remains of the Roccacasale castle, (b) S. Michele cave located above the village.

The Morrone slope was ideal for placing some natural terraces and settlements to control the valley routes, just close to Roccacasale. Here, within the Terre Peligne area, the principal north–south transit axes parallel to the Apennines chain (from L’Aquila to Sulmona toward Isernia), known as the “via degli Abruzzi” in the Middle Ages, crossed the east–west transit axis, represented by the Tiburtina-Valeria roads perpendicular to the Apennines chain [36]. This situation is already evident in the protohistoric site of Colle delle Fate and in the triangular fortification of Roccacasale. Colle delle Fate (770 m a.s.l.) preserves the remains of a typical high-ground inhabited area, probably built in the late Bronze Age. It bears evidence of three defensive walls, the last and higher one in polygonal bonding, and two cisterns for rainwater [55].

The Roccacasale castle, which dominates the eponymous village expanding like a fan from the base of the triangular enclosure, represents one of the best-preserved examples in the region of this type of fortification. Its specific shape was determined by the need to adapt the defensive requirements to its position on the slope and the slope shape. Specifically, it is located on the steep fault-related escarpment between two minor valleys perpendicular to the slope. The valleys’ incision left a remnant of the fault-related escarpment with triangular shape (also called triangular facet in geomorphology) to which the castle shape is adapted. The upper end of the triangle was reinforced by a high tower meant to protect it from any attacks from higher ground. The original settlement was traced back to between the 10th and the 11th centuries A.D., but in the following centuries, it went through several restorations to be suitable for residential uses, as shown by the structure of the building that sits against the basis of the enclosure [76].

4.2. Prezza: Southern Sector (Orange)

Moving clockwise, the southern part of the itinerary lies in the municipality of Prezza (Figure 3). It outlines an undulated landscape with several small circular depression and lakes, which have controlled the development of the historical settlements of this area. This arrangement let to explain how the slopes surrounding the Sulmona plain and the Terre Peligne area were deeply affected and shaped by karst processes related to water infiltration in the calcareous rocks.

4.2.1. Geology—The Karst Landscape of the Slopes: The Water Dissolves the Rocks

After observing how ridges and slopes are formed leading to the formation of the Terre Peligne landscape in the eastern sector, this sector begins the explanation of the different processes that have shaped the landscape of the plain and the surrounding ridges. This is the “realm” of karst, the water-related process of chemical dissolution of the calcareous rocks, which has led to the slow and progressive weathering of rocks and the shaping of the ridges (Figure 6a). The karst process has created spectacular landforms, both superficial (e.g., dolines) and underground (e.g., caves) (Figure 6a,b), which have often hosted human settlements in prehistoric times. The orange color is the one coded in geomorphology to represent the karst processes and landforms.

The itinerary moves from the plain toward the surrounding Mt. Prezza slope. In the plain, filled by alluvial gravel sediments, the karst landforms consist of small circular-shaped ponds (also known as sinkholes), large up to about 100 m (Figure 6b,c). They are mostly connected to the collapse of underground caves due to the dissolution of buried calcareous rocks. They were useful in ancient and recent times as water resource and led to the growth of stories and myths around these places.

On the slopes, on calcareous rocks that surround Prezza, the karst landforms consist of large dolines, funnel-shaped depressions, up to over 100 m wide and several tens of meters deep (Figure 6b).

This sector of the itinerary shows the karst landforms affecting the landscape, connected to one of the main processes that, combined with slope gravity-induced and fluvial processes, are responsible for the shaping of the landscape as shown in the following sectors.

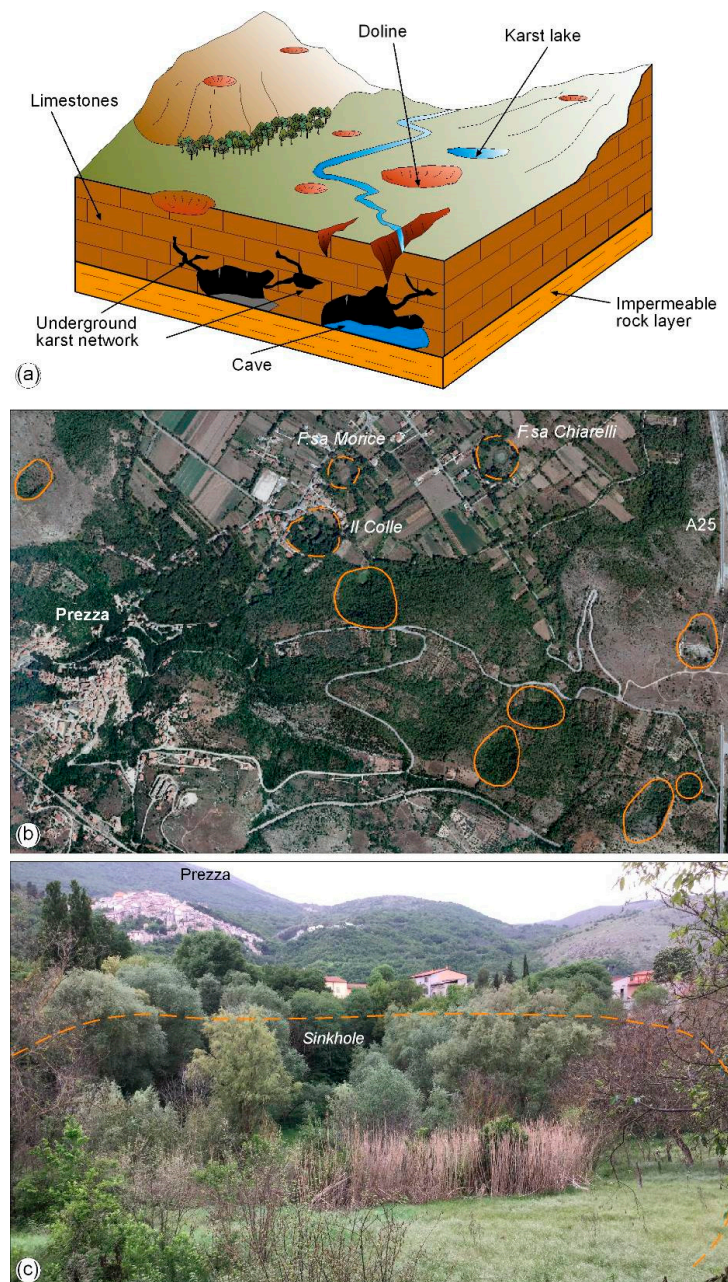


Figure 6. Prezsa areas: (a) Didactic scheme of all forms related to karst processes; (b) Aerial photo of the Prezsa area (from “Portale Cartografico Nazionale”); in orange the main superficial karst forms are highlighted: dolines (continuous line) e sinkholes (line hatched); (c) detail of a sinkhole (in the locality “il Colle”).

4.2.2. Archeology—The Invisible History

The territory of Prezsa has plenty of archeological findings, mostly from the protohistoric and Roman eras, which unfortunately are almost or entirely invisible today, recalling in some way the karst process as a kind of slow “invisible” process affecting the rocks. Anyway, these findings still testify the presence of a diffuse settlement over time, perfectly integrated with the forms and resources of the territory. Near the villages of Castiglione and Castellone, there were probably two protohistoric high-ground sites, and a necropolis with circular tombs (recalling the circular shape of the dolines) traced back to this period (Figure 7).



Figure 7. Prezza area: (a) the Prezza main village incorporating the old castle; (b) rural house in the Colle village.

The Roman Age findings are very numerous, and it is possible to identify at least three medium-small inhabited areas, which were mostly dependent on the exploitation of agricultural resources: one in the district named Colle, one in the hamlet named Campo di Fano, and one at Colle San Giovanni [55]. These were possibly connected to the water resources available in the karst ponds. Here, the presence of a Roman inscription mentioning the names of Magistri Laverneis has prompted the hypothesis that the Roman Vicus of Lavernae, known from the sources, was located in this territory. Prezza is also related to the oldest mention of a castle in the Peligna valley: its fortification was first mentioned in the second half of the IX century [77]. The castle is no longer visible, as it has been “incorporated” and modified by the development of the current residential area. The castle stood on a rocky spur at 580 m a.s.l. (left above the karst landforms), dominating the entire Peligna valley, and it was in sight of other fortifications over the territory (e.g., Roccacasale castle). As the landscape underwent a progressive change due to surface processes (karst one in this area), the castle is the proof of the transformations also occurred in the human settlement layout in this area, determined by the process of fortification during the Middle Ages.

4.3. Raiano: Western Sector (Green)

The western sector of the itinerary runs from the village of Raiano to the San Venanzio Gorges passing through the spectacular homonymous hermitage (Figure 8a) and the Natural Regional Reserve of the San Venanzio Gorges. This sector is a key area not only in the landscape of the Terre Peligne area but also in the whole Apennines geological and archeological history. This has been a primary area of connection through time as a junction through the geological and landscape history of the chain and as one on the main transit routes across the Apennines through human history. For all these reasons, in this area, a specific geosite was defined and included in the ISPRA Geosite Inventory, and a geological touristic map was previously realized [35].

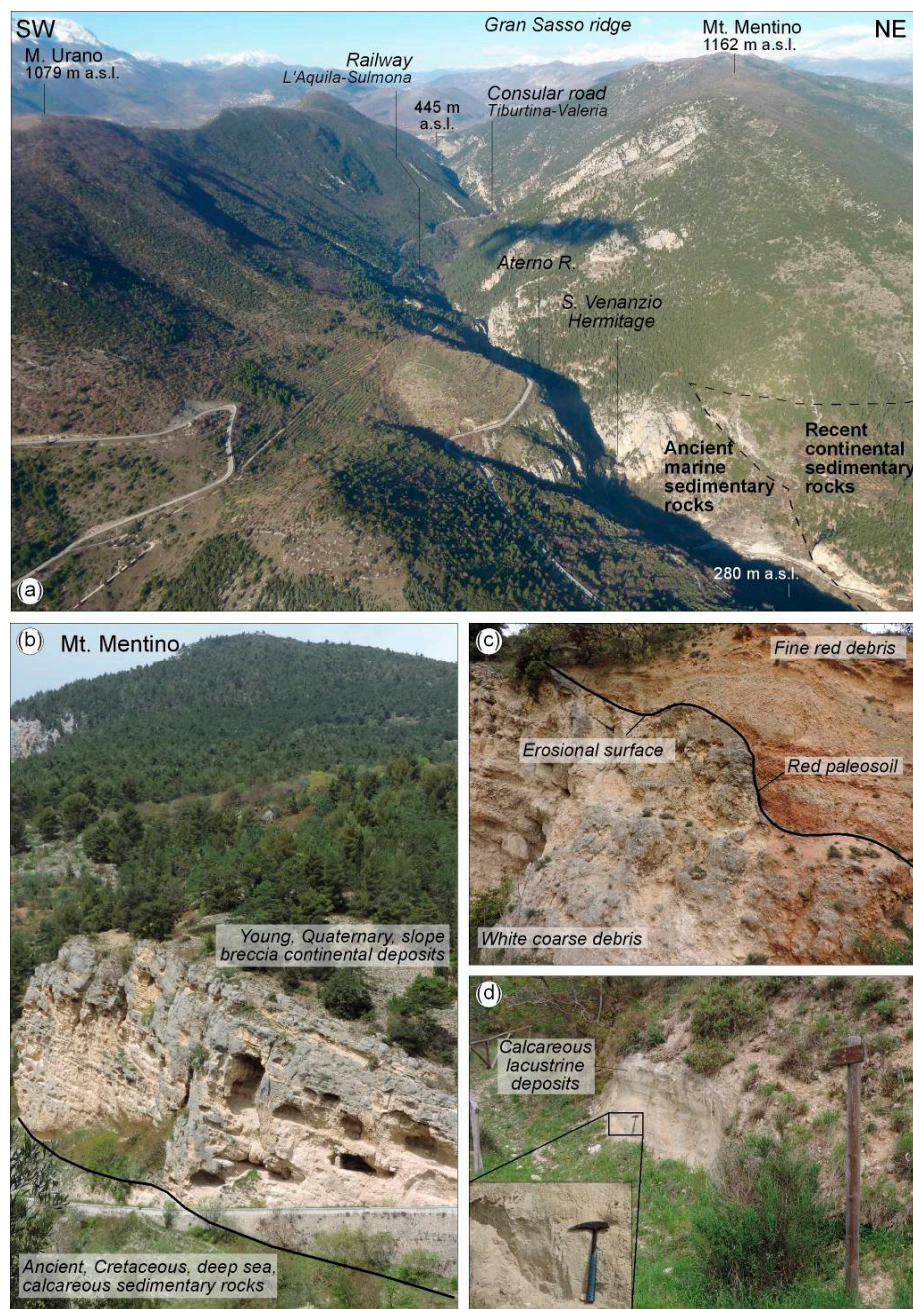


Figure 8. (a) Panoramic of the San Venanzio Gorges. (b) Contact between continental sedimentary rocks, ancient slope deposits (up), and marine sedimentary rocks, limestones (down). (c) Detail of the erosive contact between white calcareous debris (older and coarser) and red limestone debris (more recent and finer). (d) Lake deposits in the San Venanzio Gorges and throughout the northern part of the Sulmona Basin.

4.3.1. Geology—From Ancient Rocks to New Mountains

In the rocks and landforms of this sector, the main stages of the geological history of this part of the Apennines, over 200 million years long, can be recognized: from the formation of the rocks to their deformation; from the creation of the Sulmona basin and the surrounding ridges to their progressive shaping by the water of the Aterno River. The dark green color is coded in geomorphology for the water-related landforms.

The calcareous rocks surrounding the gorges bear witness of a very ancient marine environment along scarps surrounding atolls and carbonate platform environments during the Jurassic and

Cretaceous. In this paleogeographic environment, a thick sequence of calcareous rocks, which now constitute the backbone of the ridges, were formed over several tens millions of years (from 200 to 10 million years). The calcareous strata show evidence of faults and folds that explain the tectonic deformation of the rocks during the formation of the Apennines chain.

In the lower part of the gorges, toward the Sulmona basin, the contact between different types of rocks is well exposed (Figure 8b). It testifies a fundamental change from marine environment to present mountain landscape: marine calcareous rocks are overlain by breccias, gravels, and sands pertaining to slope and alluvial fan continental deposits, as well as siltstone of lacustrine deposits (developed in the last million year). This contact shows the separation of the ancient Jurassic-Cretaceous marine “world”, which led to the formation of the rocks, and the more recent Quaternary continental “world”, which led to the deformation and shaping of the mountain landscape and of the Peligno basin.

Through the Quaternary rocks (from breccias to gravel and siltstones), it is possible to understand the landscape changes from the border of the basin, with slope and alluvial fan deposits, to its center with the presence of an ancient lake (Figure 8c,d). Finally, the last step of the geological history is preserved in the San Venanzio Gorges. A primary fault runs along the valley, and the Aterno River has incised a deep incision, a fluvial gorge, in the calcareous rock, while toward the basins has shaped a wide valley. Once again, as in Roccacasale sector, the combination of tectonics and geomorphological processes control the landscape. In this case, it created the San Venanzio Gorges, which, since Roman times and earlier, have been an essential transit way for crossing the Apennines from the Tyrrhenian coast to the Adriatic coast (one of the main Roman consular roads, the Tiburtina-Valeria road, still runs along the gorges).

Moreover, in this sector of the itinerary, the evidence of a further connection between the geological and human history is presented. The ancient Roman Vuccole aqueduct is dug in the calcareous rocks along the slope of the gorges; the San Venanzio Hermitage overlooks the gorges incision; thanks to San Venanzio, there are ancient testimonies of the “lithotherapy”, according to which some rocks would have healing power.

4.3.2. Archeology—The Water and the Stone

The Aterno River crosses this part of the Peligna valley and, as seen for the landscape, also its archeological evidence has been deeply characterized by the presence of water, and its relationship with human beings, as it was essential for the settlements. On one side the narrow gorges attracted forms of hermit's lives, which in the Middle Ages reached a peak with the building of the impressive S. Venanzio Hermitage (Figure 9a); the same morphological structure allowed the construction of several mills, which before the industrial revolution represented the most essential “factories”, as they were required for the transformation of produce [78]. The presence of the Aterno River provided the catchment for an important aqueduct that during the Roman Age served the Corfinio municipality, through extensive works of hydraulic engineering; that is the Vuccole aqueduct, which was entirely excavated through the limestone [55,79]. Finally, the river has been the major center of the residential area (Vicus/Pagus?) whose memory is preserved today by the church of S. Maria di Contra (Figure 9b). The settlement located along the ancient road connecting the area of Raiano to Vittorito probably dates back to the Roman Age, as confirmed by numerous materials from that age which were reused in the church, as is the case of the roof tiles still covering the oldest part of the building. This settlement was still significant during the Early Middle Ages when the S. Maria church went through substantial building works from the Longobards, who had one of their major power centers (gastald) over the territory in the nearby Corfinio. The splendidly decorated slab that was part of the church ornaments dates back to that period and today is preserved as the altar mensa in the parish church of Raiano [36]. All this evidence shows the close connection between water and landscape evolution from one side and human history from the other.



Figure 9. Raiano area: (a) San Venanzio Hermitage; (b) Santa Maria di Contra Church.

4.4. Vittorito: North-Western Sector (Light Green)

Moving on, the north-western part of the itinerary runs from the San Venanzio Gorges to the Vittorito village. It provides a scenic view on the present landscape of the Terre Peligne and on the ancient landscape of the Peligno Lake, already outlined in the western sector, which was part of a system of lakes, characterizing the landscape of the central Apennines during Middle Pleistocene (~0.8–0.3 million years ago; Figure 10a) [38].

4.4.1. Geology—Appearance and Disappearance of a Lake

The panoramic view from this part of the itinerary is particularly meaningful. It covers the entire Terre Peligne area from Roccacasale to Prezza, Raiano, and Corfinio, and from the Mt. Morrone Ridge to the Sulmona basin (Figure 10b). However, the landscape that can be observed today allows viewing of the evidence of an ancient landscape resulting from a long history dominated first by an ancient lake (the light green color characterizes the lake environments) that occupied the Sulmona intermontane basin, and then by rivers that first filled in the lake and then incised its sediments. In the landforms and the rocks of this sector of the itinerary, the remains of the ancient lake that occupied the entire basin during the Middle Pleistocene (~0.8–0.3 My) can be observed (Figure 10a,b). The valley sides of the Aterno River hide lacustrine deposits as those seen in the Raiano area (Figure 8d). At the top of the valley sides, a sharp scarp borders a vast plain known as Sulmona “Upper Terrace” [50], hanging 90–100 m above the Aterno fluvial plain, developed on ancient (late Middle Pleistocene) fluvial conglomerate deposits (Figure 10a,b). These deposits can be directly observed along the itinerary

(Figure 10c) and outline the disappearance of the lake, filled in by a large fluvial and alluvial plain, which covered the entire basin about 100–300 thousand years ago (late Middle Pleistocene). In the last part of the itinerary is shown how, from this time on, the entire landscape of the Terre Peligne has been dominated by the rivers that have incised the valleys and shaped the landscape that is observed today. This evolution created the present landscape composed of flat surfaces or “terraces” and broad water-rich valleys that made this area very suitable for human settlements since prehistorical times.

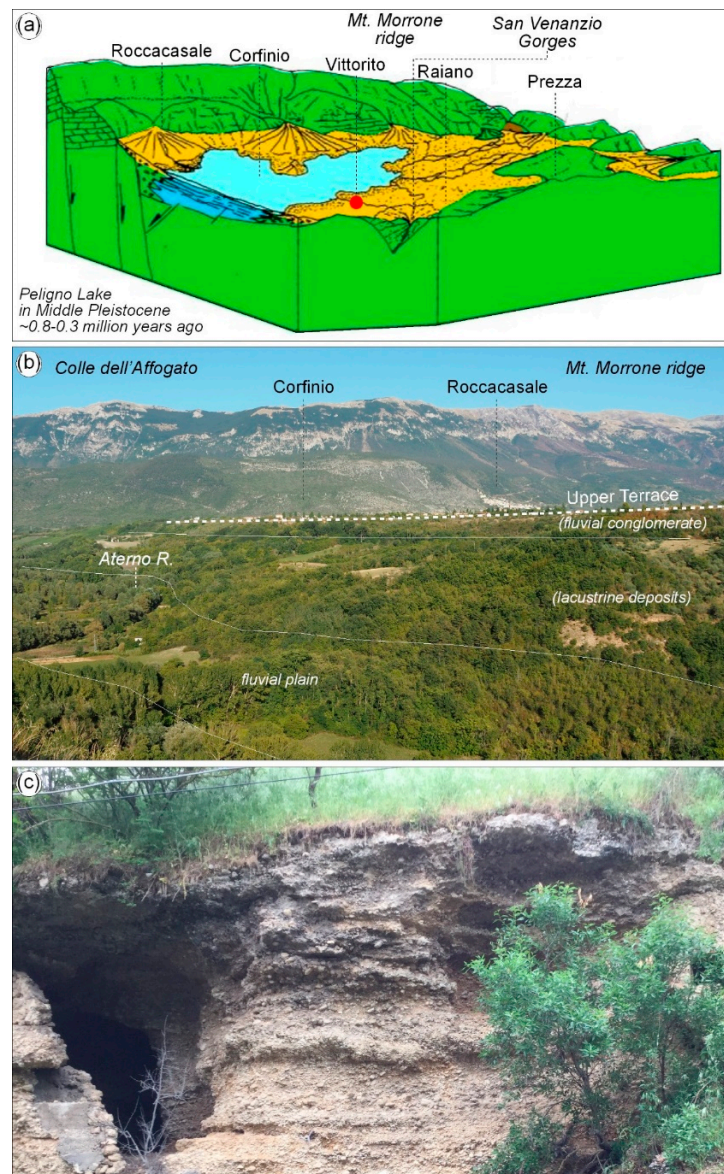


Figure 10. (a) Terre Peligne area landscape during Middle Pleistocene (~0.8–0.3 million years ago), while filled in by the Peligno Lake. Calcareous rocks (green) formed the backbone of the ridges and were cut by faults, and covered by slope deposits and alluvial fans, flowing into the lake and the lacustrine deposits (light blue). (b) Panoramic view of the Terre Peligne area outlining the “Upper Terrace” on the fluvial deposits covering the lacustrine deposits. (c) Vittorito (375 m a.s.l.), conglomerate rocks on the “Upper Surface” referable to the fluvial deposits filling the Peligno Lake during late Middle Pleistocene (anthropic caves are dug into them).

4.4.2. Archeology—Men and Highlands

The Vittorito area has returned archeological findings attesting the presence of human already in the protohistoric age, with a marked propensity to occupy the “terraces” delimiting this area of the valley and originated from the Pleistocene landscape evolution. Some remaining walls in polygonal stonework (currently no longer visible) testify a protohistoric settlement on the Castellano mount. The area where today stands the San Michele Arcangelo church (Figure 11a), which has retained significant evidence from the Early Middle Ages, was the location of a famous sanctuary dedicated to Hercules, occupying a dominant position over a settlement stretching along the Aterno River [36]. Still in the Middle Ages, on the northern side of the Castellano mount, the castle of Vittorito was erected, which later originated the present village (Figure 11b). Today, only a quadrangular tower, dominating the village, remains of the medieval castle. The fortification was shaped like a triangular enclosure, and the village expanded “fanwise” along the sides of the mountain. The fortification was wide enough and divided into residential and functional buildings [76]. The castle tower, *Turris Bectorrita*, was first mentioned in a document from the 1098 A.D. *Chronicon Casauriense*, which indicated, among other things, that it was the property of the Bishop of Valva (present Corfinio). On the edges of the Vittorito village stands the S. Michele Arcangelo church, built in the Middle Ages just over an old pagan temple. Several architectural fragments and funerary inscriptions have been reused in its masonry works. One find of particular interest is an Early Middle Ages slab still holding the signature of the stonecutter URSUS [36].

This intense occupation through time, mainly developed on the upper “terrace”, again confirms and explains, in an easy to understand way, how strong the connection between the human activities and the ancient landscape evolution has been.



Figure 11. Vittorito area: (a) the San Michele Church; (b) the medieval castle above the present-day village.

4.5. Corfinio: Northern Sector (Blue)

The “Terre Peligne fan” ends in the northern sector. It started in Roccacasale, explaining how the landscape of the Terre Peligne was first formed by the tectonics along the Mt. Morrone normal faults. It ends in Corfinio explaining how, particularly in the last stage, the landscape has been shaped by rivers and fluvial processes after being occupied by a large lake for a long time and how this has controlled the occupation of the area in historical times.

4.5.1. Geology—From Ancient to New Rivers

In this area, the itinerary runs across the Aterno River valley and explains the last stages of the landscape evolution (meaning the last 100 thousand years), dominated by river-related processes (blue is the coded color for rivers and hydrography in geomorphological conventions). A large fluvial-alluvial plain was formed in the late Middle Pleistocene (300–100 thousand years ago), as seen in Vittorito sector. In the Late Pleistocene (last 100 thousand years), this plane was carved by the incision of the main rivers incising the Aterno and Sagittario gorges forming large valleys in the Sulmona basin and leaving the “Upper Terrace” hanging (Figure 12a [50]). Further stages of fluvial sedimentation and river incision formed a second smaller hanging surface, known as “Lower Terrace”, preserved on the valley sides, and the present-day fluvial plain (Figure 12b). This arrangement explains how alternating incision and sedimentation have formed a typical staircase landscape in the main valleys of the Terre Peligne area (Figure 12b) and how the fluvial “terraces” are imprinted in the landscape [80].

The landscape shape, defined by planar surfaces hanging over the present valleys and rich of ancient and present water, was very favorable and largely contributed to the development of human settlement since prehistorical times. This arrangement outlines a further connection between landscape evolution and human history, which is explained in the archeological sites.

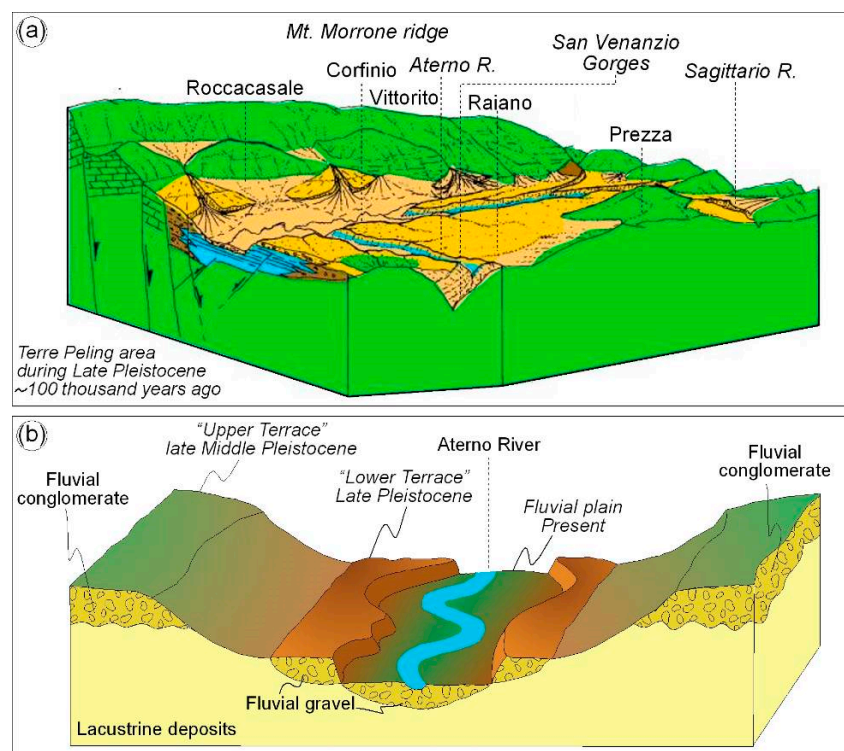


Figure 12. (a) Terre Peligne area landscape during Late Pleistocene (~100 thousand years ago), during the incision of the river valleys. Fluvial deposits (pale orange) filled the river valleys incised in the lacustrine deposits. (b) Geomorphological scheme explaining the fluvial terraces (Upper and Lower Terrace) along the Aterno River.

4.5.2. Archeology—From the Italics' Capital to Pentima

The wide fluvial “terrace” dominating the center of the Terre Peligne area has been occupied since protohistoric times by the principal settlement in the area, Corfinio. This settlement initially occupied the northernmost edge of the fluvial terrace, for its evident defensive qualities, which in the Middle Ages prompted the construction of the Pentima castle (Figure 13a). During the Roman Age and especially after the Social War the city expanded to the south. At this time, Corfinio was the capital of the Italic League and contributed to the first formulation of the name “ITALIA”. The terrace was progressively occupied with monumental buildings, known from epigraphic evidence, and a few archeological remains, punctuating the present village (the temple, mosaic Domus, Morroni) [55]. From late antiquity to the XI century the southern area of the city, along the Tiburtina road, acquired a unique role as the seat of both secular and religious powers and took the name of Valva, which is still connected to the magnificent Romanesque complex of S. Pelino (Figure 13b) [36,81,82]. In the area currently occupied by the cathedral, significant archeological evidence exists concerning a Paleo-Christian funerary area probably related to a venerated burial site; a fortification incorporating the funerary and worship space and connected to the ancient Roman campus, possibly used between the end of Late Antiquity and the Early Middle Ages as “urban” settlement; and finally a *palatium* from the Longobard period. This latter was coexisting with the church built in honor of the martyred Saint Pelino, already in the Early Middle Ages, to define the institution in the southern suburb of Corfinio during the Roman Age, a pole of civil powers (the gastald and later as a county) and religious ones (diocese). This controlled a wide internal area of Abruzzo, from the Popoli Gorges to the high Sangro River valley, from the Morrone to the Sirente mountains.



Figure 13. Corfinio area: (a) a *castrum Pentime* drone view; (b) the valvensis complex of San Pelino.

5. SWOT Analysis

To evaluate the real potential of geological heritage and archeological heritage development in the Terre Peligne area, an analysis was performed summarizing and comparing strengths, weaknesses, opportunities, and threats (SWOT analysis) of the integrated itinerary (see among many others [83,84]).

5.1. Strengths

The itinerary integrates geological and human history in a single framework. Moreover, in geological, archeological, and landscape terms, it is an itinerary of connections through time from hundreds million years to present (i.e., between rocks, landscapes, ancient human histories and present municipalities and park reserve areas). The Terre Peligne area intersects two of the main national and regional parks of central Italy (Maiella National Park and Velino-Sirente Regional Park) and are very close (10–30 km) to two other main national parks (Abruzzo, Lazio, Molise National Park, and Gran Sasso Laga Mountains National Park). Moreover, it intersects the Gole di San Venanzio Natural Reserve. This might provide the support of already existing infrastructures and dissemination policies. One of the main highways crossing central Italy from Rome to the Adriatic coast passes through the Terre Peligne area and easily connect this area to main cities and main airports (>60 km local airport; 180 km international airport) and railway stations. A national road (a former Roman consular road) and two interregional railways pass through the area too. This provides an easy accessibility to the area. Several archeological and geological studies and projects have been carried out in the area in collaboration between local authorities, universities (e.g., University of Chieti-Pescara, University La Sapienza of Rome, University of RomaTre and many others) and research centers (e.g., ISPRA, INGV). These provided valuable scientific information, which already provides a high-level knowledge of this area and are converted into the itinerary for scientific dissemination. The results of scientific and dissemination studies and activities were already presented at national and international scientific congresses. The itinerary combines “on-site” tools (totems and panels) and “digital” tools (explanatory material readable through smartphones and tablets) and might attract people of a wide range of age and digital alphabetization. There are pre-existing cultural, geological, archeological, and landscape attractions and many tools and features already exist and focusing on these valuable elements, such as already known archeological sites (e.g., the Corfinio area and San Pelino), museums (e.g., the Corfinio Archeological Museum [75]) and geosites (e.g., the Gole di San Venanzio geosite [35]), as well as books and geotourist maps [34]. This provides a pre-existing tourist development of this area, which results in at least several thousands of visitors per year in these specific sites. Moreover, local schools have started performing field trip and visits in the Terre Peligne area.

5.2. Weaknesses

The realization of the itinerary and the emplacements of all the structures is not completed. The itinerary is supported by a rather small group of people in the local municipalities and in the universities involved. It is mostly based on regional funding. An actual marketing strategy has not been activated so far. A small reach of the road included in the itinerary is closed due to safety reason related to landslide risk waiting to be fixed; however, an alternative path is possible. There is a poor connection between the itinerary and the other local values, specifically in terms of quality food and wine. More in general, a management system for the identification, assessment, and divulgation of the itinerary and its values in connection with the surrounding areas is still lacking. Community residents have not yet realized the high value and the potential opportunities of geological and archeological heritage and still have poor cognition and consciousness concerning its protection.

5.3. Opportunities

The highway, roads and railways, provide good public accessibility opportunities. The numbers of visitors already coming in the Terre Peligne area could be surely improved by creating a network connecting the “Fan of the Terre Peligne” itinerary with the park and reserve areas in the area. The itinerary focused on a large territorial diffusion networking the resources of the entire Peligna valley, including connections to other internal areas of the Abruzzo and the Apennines area. This might contribute to induce a tourist flow from the main parks of central Italy through the Terre Peligne area. This flow might support an expansion of the tourism offer and an increase of economic opportunities and possible investments, in terms of hospitality (hotels, bed and breakfast, agritourisms, restaurants, etc.), existing and new cultural events, etc. This can also create new jobs as local geological–archeological touristic guides. The economic-touristic opportunities can be specifically supported and increased by integrated management strategy of the archeological and geological itinerary in connection with the surrounding national, regional parks, and natural reserves, with the local landscape features, and the local quality food and wine values.

5.4. Threats

The final realization of the itinerary and the emplacements of all the structures depends on the Terre Peligne Association and on the local municipalities and is mostly supported by regional funding. This can result in management problems (many bodies involved) and in irregular funding (according to the variable funding opportunities and to the variable local-regional political conditions). If an integrated management strategy is not arranged, overlapping management of the geological and archeological sites (e.g., from local municipalities, reserve areas and parks) can result in a poor enhancement of the “Fan of the Terre Peligne” itinerary as a connection through time between rocks, landscapes, ancient human histories, and present municipalities and park reserve areas.

6. Concluding Remarks

The “Fan of the Terre Peligne” is an archeological-geological integrated touristic itinerary along the northern part of the Sulmona intermontane basin in the central-eastern Apennines (Abruzzo). It is organized in five thematic sectors focused on the main elements of the geological history and landscape evolution of this area and outlining the joining of archeological and geological-geomorphological features of the Terre Peligne. Through a combined arrangement of “on-site” and “digital” tools, it contributes to the valorization of the geological and archeological sites and to make them understandable for the general public, through lay language and reliable information. The main stages of the history of the landscape are described, from the formation of the rocks of the mountain ridges (in marine environment in Jurassic-Miocene times) to their deformation, along thrust and folds and normal faults (Miocene-Quaternary); from the formation of the mountain ridges to the shaping of the landscape mostly due to the competition of gravitational, fluvial and karst processes and of recent-active tectonics and seismicity (Quaternary). The tectonics and seismicity are explained as processes inducing seismic hazard but also as positive elements that formed the landscape of the Apennines. For each of the sectors and in the entire “fan” the close connection between man and landscape is revealed in different perspectives outlining that the presence of man since prehistoric times has given rise to a careful interaction with the territory. The landscape is dominated by high standing rocky ridges surrounding the Sulmona intermontane basin, which through history have been used for defensive purposes, castles, and hermitages. Conversely, the low standing hills and plains have been advantageously exploited for farming, as shown by the terracing and the remains from the Roman centuriation, while the valleys and gorges, rich of water resource, have been used as transit ways across the Apennines. This latter element also explains the close connection between the historical economic development and the landscape shape. The archeological heritage, which enriches the entire area, is mostly centered on

Corfinio resulting from historical events in which the city was the protagonist as well as from its placement at the cross of north–south and east–west transit ways across the Apennines.

Therefore, the itinerary features connections among different elements: ancient marine geological environments and recent continental landscapes; between Tyrrhenian and Adriatic coasts through main transit ways across the Apennines from historical to present times; among mountain rugged and plain gentle landscapes; and among the main park areas and natural reserves of the Abruzzo Apennines. It outlines specifically the connection, through time, of water and rocks with the landscape and human history.

In summary, the itinerary mostly focuses on the territory with the intent to network the specificities and resources of the Peligna valley, without neglecting the ramifications and connections to the nearby areas (territorial diffusion). From this point of view, the geological and landscape elements joined to the archeological heritage are the aspects that best showcase the specificities of this territory taking into account a very wide diachrony, so as to give greater prominence to the conditions and times that have shaped this territory in its present forms. This “account”, as well as the connection between landscape and human history and development, have been rendered to be understandable to the general public. This approach, based on scientifically correct information, is an instrument to involve the local population, schools, and tourists and to sensitize them about the “history” of their territory and the related hazard, as well as a useful instrument for enhancing tourism inducing direct and indirect economic return. The purpose of the study is in line with the stream of similar initiatives aimed at the knowledge, valorization, and fruition of the internal mountain areas. Just to remain within the Abruzzo region, among many others see the cases within the Parks of Majella and Velino-Sirente [6,85], or the case of the APSAT (Ambiente e Paesaggi dei Siti d’Altura Trentini) Project for the Trentino region [86] or the transhumance route in southern Italy [87] at international level (e.g., Egypt, Russia, Malta [7,88,89]).

The “Fan of the Terre Peligne” features a strong territorial nature and diffusion, connecting the Peligna valley with other internal areas of the Abruzzo and the whole Apennines area. The SWOT analysis revealed the great strength of the itinerary, in terms of integration of different themes and features, high accessibility, connection with already existing reserve and park areas and tourist attractions. This can lead to wide opportunities for networking the itinerary to the surrounding parks and reserves and for increasing the tourist flow between them, also creating new development and jobs not conflicting with the existing one but enhancing them. This can largely support local communities and economic development [3]. However, the analysis summarized also the weaknesses (e.g., itinerary structures not completed, lacking of an integrated management system) and the threats to be faced (e.g., completion of the itinerary depending on irregular funding and results connected to an integrated management, which should overcome overlapping management from local bodies). On this basis, the itinerary wants to be a resource and instrument to contribute to the popularization and enhancement of the cultural heritage of the human and geological history of one of the key areas of the central Apennines. Finally, improving sustainable tourism developed on valuable and less-known sites, the itinerary aims to strengthen the awareness toward the themes of natural hazards and risks of the territory increasing the development and resilience of the inner areas of the Apennines.

Author Contributions: Conceptualization, E.M. and M.C.S.; methodology, E.M., M.C.S., S.A., T.P. and M.B.; investigation, S.A., T.P. and V.M.; data curation, T.P. and V.M.; writing—original draft preparation, S.A., T.P. and G.E.; writing—review and editing, T.P., M.C.S., E.M., G.E. and M.B.; supervision, E.M. and M.C.S.; funding acquisition, E.M. and M.C.S.

Funding: This research was funded by Regione Abruzzo, “Progetto di valorizzazione e sviluppo dei beni storico-culturali, archeologici, ambientali delle tradizioni delle Terre dei Peligni”, Reg. Abruzzo PAR FSC 2007–2013. L.A. 1.2.4.a. “Definizione ed attuazione di un programma di sviluppo della Valle Peligna”. The APC was funded by University “G. d’Annunzio” of Chieti-Pescara (Miccadei fund, and Piacentini fund).

Acknowledgments: The authors wish to thank the municipalities of Raiano, Roccacasale, Prezza, Vittorito, Corfinio and the Terre Peligne Association for the support in the project and the study for the realization of the itinerary. The authors also wish to thank the Cartographic Office of Abruzzo Region using the Open Geodata Portal (<http://opendata.regione.abruzzo.it/>), for providing the topographic data and orthophotos used for this work.

Conflicts of Interest: The authors declare no conflict of interest.

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