



Viggiano Peer Review Feedback Report

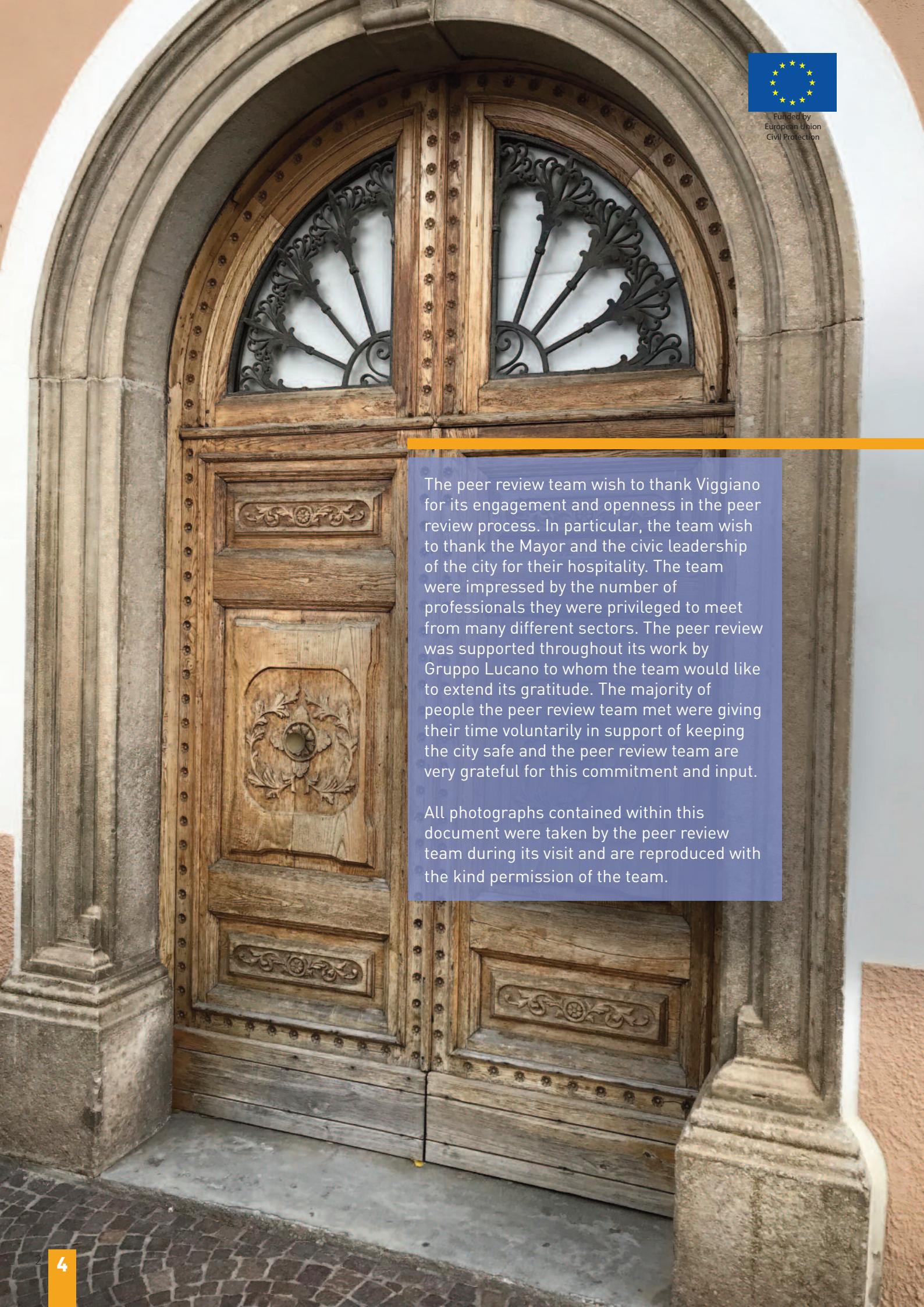
Uscore2: City-to-city peer review tool

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The peer review team wish to thank Viggiano for its engagement and openness in the peer review process. In particular, the team wish to thank the Mayor and the civic leadership of the city for their hospitality. The team were impressed by the number of professionals they were privileged to meet from many different sectors. The peer review was supported throughout its work by Gruppo Lucano to whom the team would like to extend its gratitude. The majority of people the peer review team met were giving their time voluntarily in support of keeping the city safe and the peer review team are very grateful for this commitment and input.

All photographs contained within this document were taken by the peer review team during its visit and are reproduced with the kind permission of the team.

EXECUTIVE SUMMARY

In 2015 Viggiano was declared an international Role Model City in the United Nations Making Cities Resilient campaign. This was based on the extensive work undertaken over the previous two decades to both reduce disaster risk, improve disaster response, and build an internationally acclaimed approach to community engagement and participation.

In 2017 Viggiano joined an international EU-funded project (Uscore2) to design and pilot a new city-to-city peer review tool to assist cities around the world to strengthen their approaches to disaster risk reduction. This report is based on the outcomes of the first pilot of this tool.

The peer review team were particularly impressed by the maturity in the city's approach to disaster risk reduction and this is clearly demonstrated through its participation in the Uscore2 project which aims to build a generic city-to-city peer review tool to assess disaster risk reduction measures based on the UNISDR Ten Essentials.

The peer review took place between 25th -27th October 2017 and was the first international city-to-city peer review anywhere in the world in disaster risk reduction. This pioneering work could not have occurred without the political engagement and leadership of both the incumbent Mayor and previous political leaders, as well as the wide diversity of stakeholders engaged in the process, including academia, government, utility companies, the private sector, the community and voluntary agencies. It allowed technical and detailed information to be presented, as well as giving

the review team the opportunity to hear the experiences and views of community organisations. This level of participation gave the review an important balance of views and perceptions which reflected the diversity of actors working to improve resilience within Viggiano. In addition, the multi-level government involvement in the peer review greatly assisted in helping the peer review team understand the governance mechanisms and arrangements for much of the resilience building activity that takes place.

This peer review has used both interviews and workshops in order to develop this report. In addition, Viggiano put a huge amount of effort to providing the peer review team with a wide range of background information, much of which is reflected in this report. Finally a number of site visits were made by the peer review team, including attendance at an emergency exercise. These activities were important in helping to understand local context and to get a real sense of the range and complexity of the risks the city faces.

This report runs through the outcomes of the peer review team's findings, detailing good practice, identifying areas that potentially could be strengthened, and finally offering a set of recommendations which could form the basis for a Resilience Strategy and associated Action Plan. The recommendations are designed to build upon the work already underway in Viggiano. This is a city which consistently punches above its weight in disaster risk reduction and within which learning and improvement are at the heart of its approach.

PURPOSE OF DOCUMENT

This report presents the findings, analysis, conclusions and recommendations relating to a city-to-city peer review of disaster risk reduction (DRR) arrangements in Viggiano, Italy. The peer review was carried out between 25th and 27th October 2017 using the Uscore2 city-to-city peer review tool.

The team conducting the peer review was as follows:

Kathy Oldham	Chief Resilience Officer, Greater Manchester
Julie Walker	Senior Business Partner, AGMA CCRU
Jon Percival	Project Manager, Uscore2
Elliot Joddrell	Graduate Urban Designer, AECOM, Greater Manchester
Christine Gough	Department for Communities and Local Government, UK
Patricia Pires	Head of Unit, Unit for Risks and Land Use Planning, ANPC
Bárbara Lopes Dias	Assistant to Head of Unit, ANPC
Luis Carvalho	Civil Protection Chief & Municipal Commander, OA/Protecção Civil Amadora
António Farinha	Assistant to Civil Protection Chief, Amadora
Abhilash Panda	Deputy Chief for Europe and Central Asia, UNISDR
Christopher Smith	University Of Manchester
Manuel Lopez-Ibanez	University Of Manchester
Jennifer Bealt	University Of Manchester

The Uscore2 project is grateful to Viggiano, both for the hospitality in hosting the peer review, but also for agreeing to be peer reviewed and thereby piloting the peer review tool developed by the project team. This peer review was the first international city-to-city DRR peer review to be conducted anywhere in the world.

VIGGIANO'S PARTICIPATION IN DISASTER RISK REDUCTION

VIGGIANO: A ROLE MODEL CITY

Viggiano joined the United Nation's Making Cities Resilient campaign in 2011. Four years later, in 2015, at the Third UN World Conference on Disaster Risk Reduction, Viggiano was recognised as one of a small number of cities globally that are role models in the campaign. This recognition was for the introduction of an innovative, bottom-up approach to risk reduction and resilience. Of particular note is the work done to make schools safe in one of the most seismic areas of Italy, together with the manner in which urban planning includes actions aimed at environmental protection, security and local awareness of disaster risks.



COLLABORATION IN INTERNATIONAL WORK TO ENHANCE EFFORTS IN DISASTER RISK REDUCTION

In 2017 Viggiano joined an international EU-funded project to design and pilot a new city-to-city peer review tool to assist cities around the world to strengthen their approaches to disaster risk reduction.

The project, Uscore2, aims to design and test a generic, practical, city-to-city, disaster risk reduction peer review tool for cities across EU member states and beyond via the United Nations International Strategy for Disaster Reduction (UNISDR) Making Cities Resilient campaign (MCR). The project involves collaborative work between the municipalities of Salford (UK), Amadora (Portugal) and Viggiano, The University of Manchester, UNISDR, The Department of Communities and Local Government (UK), Portuguese National Authority of Civil Protection and the Associazione di Protezione Civile Gruppo Lucano (Italy).

The project recognises that the last decade has seen a rising trend in natural and man-made disasters. EU Civil Protection legislation advocates that Member States share best practice and help each other to identify where additional effort is needed to reduce risks. Practical translation of this includes cities conducting better risk assessment and developing action plans. Beyond the EU, the Sendai Framework for Disaster Risk Reduction (DRR) 2015-2030, endorsed by the UN General Assembly in June 2015, established seven global targets including to “substantially

increase the number of countries with national and local DRR strategies by 2020” and emphasising the need to empower local governments to reduce disaster risk.

Disasters, and their impacts, have been seen to have increasingly destructive consequences on the societies they affect. In 2016 alone, a number of devastating earthquakes were reported in Japan, Ecuador, Tanzania, Italy and New Zealand, while severe flooding was recorded across the US, Europe and Asia, and abnormal weather events reached a record high in the US. The resultant effects of global adverse events have resulted in approximately 11,000 people losing their lives or going missing (Swiss Re, 2017). In addition, economic losses have substantially risen from USD 94 billion in 2015, to USD175 billion in 2016; the highest they have been since 2012 (Swiss Re, 2017).





These figures demonstrate the magnitude of disaster effects, and provide critical insights into disaster trends. Whilst reduction in disaster mortality has been observed in the last decade, many countries are still unable to reduce the risk of hazards faster than their hazard-exposed populations increase (UNISDR, 2015). In addition, global loss trends indicate that the rapid growth of economic assets in hazard-prone regions is increasing disaster risk (UNISDR, 2015).

These issues are particularly salient in urban environments which now house the majority of the world's growing population (Meerow et al., 2016). Cities in both developing and developed nations face increased risks. Whilst developing nations have seen large influxes in forms of informal urbanisation, where urban planning and land use remain unregulated (Meerow et al., 2016), developed nations face emerging and evolving threats related to climate change and population expansion (Gilissen et al., 2016). Research indicates that around 54.5 per cent of the world's population were living in urban settlements in 2016; a figure which is expected to increase to 60 per cent by 2030, with one in every three people living in cities with at least half a million inhabitants (United Nations, 2016).

Local governments are closest to citizens and communities, playing a vital role in responding to emergencies and delivering essential services which must be resilient to disasters. To respond to calls to prevent and prepare for disasters, municipalities need better access to policies, tools and rigorous, expert critique. Peer review of local civil protection mechanisms could offer an independent/ transparent assessment, adding clear value to building local and national resilience. It is also designed to aid the implementation of the Sendai Framework at local and therefore national/international levels through alignment to local indicators developed in accordance with the Sendai Framework.

By October 2017, the peer review tool developed through Uscore2 was at a stage to be piloted in a city. Viggiano agreed to have its DRR arrangements peer reviewed to help to validate the tool and to support its further development. The effectiveness of the peer review tool was also evaluated using a methodology developed by the University of Manchester albeit this is subject to a separate report (Uscore2 Deliverable 2.4).

VIGGIANO: INTERNATIONAL CITY-TO-CITY PEER REVIEW

Prior to inviting the peer review of Viggiano's arrangements for disaster risk reduction, Viggiano completed the full preliminary assessment set out in the UN's Disaster Resilience Scorecard. This was achieved through four workshops held with the following groups of stakeholders:

- Local administrative agencies
- Community representatives
- Non local agencies involved in resilience issues related to Viggiano
- Local stakeholders from the private sector

Stakeholders were given the choice to answer the questions individually or to work together as focus groups with discussion of the questions to arrive at collective answers. In all four workshops, stakeholders opted to work together in focus groups.

This helped to:

- Enable effective information sharing between stakeholders
- Encourage participants to develop a broader understanding of disaster risk reduction and resilience
- Illustrate that a more coordinated approach could be possible between stakeholders who may not be in the normal course of business share information relevant to disaster risk reduction between their agencies
- Identify that some regional and national organisations may not be clear about the impact of their projects and actions on resilience at the local, city level
- Obtain and organise information for the peer review.

Viggiano chose not to share the detailed outcomes of the preliminary assessment with the peer review team, instead opting to validate them on considering the findings of the peer review.

Viggiano identified the following areas for assessment through the peer review process:

Uscore2 Peer Review Modules	Making Cities Resilient 10 Essentials
2. Risk Assessment	Essential Two: Identify, Understand and Use Current and Future Risk Scenarios
4. Urban Development and DRR	Essential Four: Pursue Resilient Urban Development and Design
5. Climate Change Adaption and DRR	Essential Five: Safeguard Natural Buffers to Enhance Ecosystems' Protective Functions
7a. Community Resilience	Essential Five: Understand and Strengthen Societal Capacity for Resilience
9. Disaster Response	Essential Nine: Ensure Effective Disaster Response

Viggiano also defined the specific objectives for the peer review. These were to:

- Improve the level of understanding, participation and coordination on DRR among the different stakeholders.
- Spread the results among the population to improve not only understanding on DRR but also the level of trust towards the institutions.

Over the course of the peer review, Viggiano fielded over 50 stakeholders to meet with the peer review team. The team would like to express its gratitude to all those who participated and in particular to:

Mr. Amedeo Cicala	Lawyer - Mayor of Viggiano
Mrs. Antonella Amelina	Architect - Head of the City Urban and Environment Office
Mr. Giuseppe Guarino	Physicist - General Director of Gruppo Lucano Association and member of city HIA Health Impact Assessment) committee
Mr. Antonio Priore	Geologist – consultant, editor of the City Emergency Plan
Mr. Giuseppe Priore	Dr. in Natural Science – City Council Member and President of Gruppo Lucano Association
Mr Luciano Garramone	Engineer - Senior Researcher of Italian Space Agency – Matera
Mr. Davide Amorosi	Lawyer - Head of City Administrative Office
Mrs. Maria Teresa Angeli	Member of Viggiano “University for Elderly” Association (UNI3)
Mr. Alessandro Attolico	Engineer - Head of the Province of Potenza Civil Protection and Environment Office
Mrs. Simona Aulicino	Head of City Local Development Office
Mr. Salvatore Bruno	Architect - consultant, editor of the city Urban Plan
Mr. Gerardo Calvello	Engineer - expert on regional civil protection laws and regulations
Mr. Giuseppe Cianciarulo	Retired - founding member of the Gruppo Lucano Association
Mrs. Giusi Costantini	Technologist - Regional Agency CREA - Centre of Politics and Bioeconomy
Mr. Sergio Costanzo	Maresciallo of Viggiano Carabinieri Police Force
Mr. Gianluca Delia	ENI Oil Company
Mr. Andrea Di Pierri	Engineer - Mayor Emeritus of Viggiano and president of G.A.I.A. (Engineering Structural Testing Company) operating in the city Industrial Area

Mr. Remo Fortunato	Member of the Fire Fighters "Distaccamento Val d'Agri"
Mrs. Simona Loperte	Environmental researcher – National Research Centre IMAA
Mrs. Rosita Gerardi	Lawyer - Deputy Mayor of Viggiano
Mr. Girelli	Head of Viggiano Municipal Police
Mr. Roberto Laneve	Geologist - consultant, editor of the city Urban Plan
Ms. Michaela Lauletta	Nurse -member of the Viggiano Youth Forum Association
Mr. Federico Lorenzo	Engineer - industrial safety consultant
Mrs. Teresa Marsicovetere	Family medical doctor in Viggiano
Mr. Gianluca Massari	Engineer – Director Oil Centre Val d'Agri
Mr. Gianbattista Mele	Medical doctor - HIA Health Impact Assessment committee
Mr. Giuseppe Natale	Engineer - ENEL - Electrical Energy Service Provider
Mrs. Lucia Nicolia	Lawyer - member of Viggiano "Bene Comune" Association
Mrs. Camilla Nigro	Gronomist - ALSIA Regional Agency and member of Libera Association
Ms. Cristiana Nigro	Italian National Civil Service volunteer
Mr. Angelo Polidoro	High school student and Youth Group civil protection volunteer
Mr. Vittorio Prinzi	School teacher - Mayor Emeritus of Viggiano
Mr. Domenico Priore	Retired - founding member of the Gruppo Lucano Association
Mr. Vito Romaniello	Engineer – consultant, city of Viggiano - analysis of Environment Monitoring Data
Mr. Gianluca Sarapo	School teacher - Deputy Director of Viggiano high school
Mr. Nicola Sellitti	Retired - founding member of the Gruppo Lucano Association
Mrs. Silvia Sgrosso	Dr. in Natural Science - Environmental Education Association (ACEA-Viggiano)
Mrs. Rosalia Smaldone	Engineer - office of Civil Protection and Environment of the Province of Potenza
Mr. Marco Stigliano	Engineer - Lucano Aqueduct Regional Agency
Mrs. Margherita Triunfo	Engineer - Appennino Lucano National Park
Mrs. Maria Teresa Vignola	Engineer - Head of City Public Works and Planning Office Representative of Viggiano elementary school Representative of the Fire Fighter Regional Command Representative of Viggiano Guardia di Finanza

The review was conducted according to the timetable set out below:

Day/Time	Oct 25 – Module 4 Urban Development	Oct 25 – Module 5 Climate Change	Oct 26 – Module 7a Community Resilience	Oct 26 – Module 2 Risk	Oct 27 – Module 9 Response
08.30 - 09.00	Review team preparation	Review team preparation	Review team preparation	Review team preparation	Review team preparation
09.00 - 10.30	Meeting with person in overall authority for Urban Development / presentations and interviews	Meeting with person in overall authority for Climate Change / presentations and interviews	Meeting with person in overall authority for Community resilience / Site visit	08.30 start - Meeting with person in overall authority for Risk management / Site visit	Meeting with person in overall authority for Disaster response / Stakeholder interviews
10.30 - 11.00	Break	Break	Break	Break	Break
11.00 - 12.30	Urban Development presentations and interviews	Climate Change presentations and interviews	Focus group (stakeholders to be identified)	Stakeholder interviews	Stakeholder interviews
12.30 - 13.30	Lunch break	Lunch break	Lunch break	Lunch break	Lunch break
13.30 - 15.00	Urban Development presentations and interviews	Climate Change presentations and interviews	Stakeholder interviews	Stakeholder interviews	Review Team wrap up and initial findings
15.00 - 15.30	Break	Break	Break	Break	Break
15.30 - 17.00	Urban Development presentations and interviews	Climate Change presentations and interviews	Stakeholder interviews	Stakeholder interviews	Review Team wrap up and initial findings
17.00 - 17.30	Review of day	Review of day	Review of day	Review of day	Public event

PEER REVIEW RECOMMENDATIONS

The recommendations made by the peer review team are listed under each Essential and then collected together at the end of this document. The preliminary assessment completed ahead of the peer review by Viggiano can be used to complete a strategic assessment and action plan for those Essentials not covered by the peer review. As a partner in the Uscore2 project, Viggiano will also have the opportunity to reassess its approach to disaster risk reduction as it participates in the peer review teams conducting reviews in Amadora and in Salford, Greater Manchester.

The Sendai Framework for Disaster Risk Reduction 2015-2030 in paragraph 27(b) calls for signatories:

“ To adopt and implement national and local disaster risk reduction strategies and plans, across different timescales, with targets, indicators and time frames, aimed at preventing the creation of risk, the reduction of existing risk and the strengthening of economic, social, health and environmental resilience ”

This report and recommendations, together with the findings of Viggiano's preliminary assessment, could form the basis of a Sendai-compliant local disaster risk reduction strategy and plan.



VIGGIANO: A RESILIENT CITY

- Viggiano town Population: 3,122 (2011 census)
- Dwellings: 1,654 (about 500 on Alta Val D'Agri and around half of these are vacant)
- Region: Basilicata, South Italy (580,000 inhabitants),
- 2 provinces: Potenza and Matera,
- Potenza area: 6,500km²,
- Potenza population: 378,000,
- Potenza population density: 60inh/km²,
- Municipalities: 100,
- Capital city: Potenza (67,000 inhabitants),
- Location: Basilicata, Province of Potenza, Val D'Agri: 8,903ha,
- Val D'Agri forested area: 5,213ha.

SHOCKS & STRESSES

SHOCKS

Shocks are the disasters or emergencies a city may face. Identifying risks enables proportionate and appropriate risk mitigation measures and preparedness in case of an emergency. Key risks in Viggiano include:

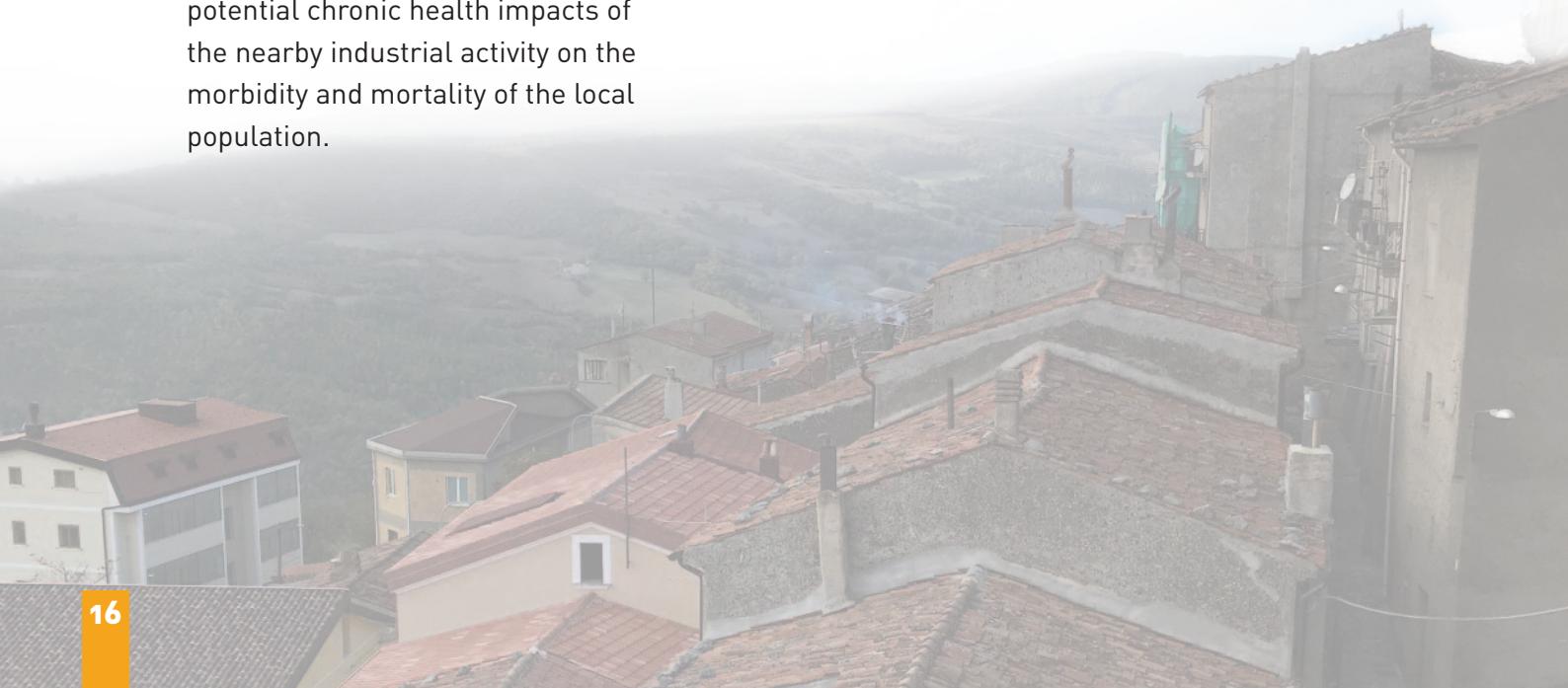
- Earthquakes
- Forest fires
- Landslides
- Snow and rain
- Industrial hazards including industrial sites and pipelines
- Reservoir dam collapse
- Infrastructure damage such as to roads and the hospital servicing the city

STRESSES

Stresses are the chronic pressures that a city faces that weaken the fabric of the city, making it difficult to absorb, respond to and recover from disasters. Over time, they can become disasters in their own right.

The information shared with the peer review team in 2017 both before and during the peer review suggested a number of stresses may be present, although this needs confirming by Viggiano:

- Population decline
- Increasing percentage of residential property being second homes rather than permanent residents
- Migration of younger generations with professional and university qualifications
- A recent VIS (Health Impact Evaluation) study of industrial activity in the area has demonstrated potential chronic health impacts of the nearby industrial activity on the morbidity and mortality of the local population.



KEY CONSIDERATIONS IN THE CONTEXT OF DISASTER RISK REDUCTION

WATER COURSES

Agri River

The river varies substantially in flow and depth with full flow in autumn and much less in the summer. However in comparison to the other rivers in the region, it has a much more consistent medium and a minimum flow ($3.5 \text{ m}^3 / \text{s}$), due to the presence of several springs along its high course and a significant average annual rainfall throughout its basin.

Alli and Casale Rivers

There are two tributaries to the west of the Agri River. The Alli, characterised by a torrential hydrometric regime that during the dry season makes it a stream, is the only perennial stream of water in the territory of the municipality.

The Pertusillo Water Dam

Located at the south-east exit of the Upper Agri Valley the existence of the dam has allowed many industrial and agricultural activities to be developed.

Built between 1957 and 1963, normal operation began in 1969.

- Construction type: gravity arch
- Height: 101 m
- Crown development: 340 m
- Surface of the basin submerged by the barrier: 530 Km².
- Capacity: 160.000 m³
- Usage: 75-90% drinkable; 10-25% agricultural
- Hydroelectric energy plant of 130kW



URBAN DEVELOPMENT IN VIGGIANO

The formation of the urban fabric of Viggiano dates back to the time of the Roman Empire 476 AD. The town's historic development in the Agri Valley (Val D'Agri) was on a hillside for defensive reasons. Viggiano developed in spindle-shaped layout defined by the morphology and the orientation of the area, this has had undoubted advantages in terms of building layouts, ensuring an effective sewerage system and allowing for reduction of face to face buildings.

These advantages were counterbalanced by the complexity of the construction due to the rather sunken orography, and the difficulty of transporting materials. Roads in the centre were constructed to avoid the dominant winds and are composed of segments running in levelled parallels connected by stairs or staircases with landings and intermediate squares.

Building expansion has concentrated in recent years on the south side of Viggiano after taking into consideration the impossibility of enhancing the area around the Rinascita Avenue due to the geological constraints and the exposure of the slope.

With regard to population growth, the population reached its greatest number of 6,634 inhabitants in 1871 (source: Istituto nazionale di statistica).

Viggiano's historic centre is located on the top of the Alta Val D'Agri at an altitude of over 1,020m above sea level (a.s.l.), with the Montagna Grande di Viggiano ski area and resort close by which supports the local tourist industry. The town has the potential to receive 1670 visitors of which 270 can be accommodated in hotels and 1400 in tourist residences (about 400 real estate units).

The relief of the Alta Val D'Agri is characterised by two steep limestone cobwall constructions, one of which reaches 1,020 metres in height (a.s.l.). Above it lies the ruins of the ancient castle, and beneath the ancient inhabited centre.

Today Viggiano has a trunk road passing through it, the SS 598 "Val d'Agri" from Atena Lucana to Policoro road which joins the Salerno-Reggio Calabria motorway. There are also some communal roads connecting Viggiano to the wider motorway network.



SEISMIC RISK

The whole of Italy is designated as a seismic risk area. Risk areas are categorised in four levels of risk, Category 1 being the most at risk. The Basilicata region of Italy is one of the most seismically active areas and Viggiano is in a Category 1 risk area. The most significant seismic event on record that affected Viggiano was in 1857 when a 7.0 magnitude earthquake caused more than 15,000 deaths.

There have been a number of earthquakes that have had severe consequences during the last millennium. In the period since 1857, the Basicilicata region has been affected by a number of catastrophic seismic events at mean intervals of 22 years.

Since 1980 new properties have been built to meet seismic regulations. In addition, over the past 20 years the city of Viggiano has been able to secure funds at national level for the seismic retrofit of more than 60% of the historic city centre buildings and for most of the critical public ones, in particular all school buildings.

VAL D'AGRI OIL FIELDS

The Val d'Agri oil fields have become of significant importance for Italy. Discovered in 1988, the Viggiano Oil Centre was built in 1996 and since 2011 has been undertaking a modernisation programme.

Since the highly productive oil fields became operational it has been calculated that the reserves located near Viggiano contribute up to 10% of the oil required by Italy. In addition the ENI oil company, which is an international company operating in over 70 different countries worldwide is seeking to increase the production of these fields. The Viggiano oilfield is one of the largest in continental Europe with the oil centre currently processing 100,000 barrels of crude oil per day with production set to increase to 150,000 barrels per day. Viggiano hosts an oil centre where pre-treatment of the oil is undertaken before injection into the national pipeline.



TIMELINE OF KEY EVENTS

1857

A 7.0 Magnitude earthquake caused more than 15.000 deaths and the wholesale destruction of villages and cities in the Agri Valley.

1981

A 4.1 Magnitude earthquake hit the area.

1993

Twenty citizens of Viggiano started an Association of Civil Protection Volunteers (the Gruppo Lucano). The aim was to break old localised and administrative divisions by synergizing human and instrumental resources into a broad-based territorial project. The local government provided the volunteers with a headquarters and initial funding to acquire resources. The first activities of the volunteers were related to forest fire and snow emergencies. By 2017 Gruppo Lucano had c.6000 volunteers in more than 100 cities.

2011

Viggiano enters in the UNISDR MCR campaign.

2012

25 other cities in Lucania, through the Gruppo Lucano network, join in the MCR campaign.

2015

In Sendai Viggiano receives the recognition of Role Model City of Resilience.

2017

Viggiano become involved in the Uscore2 Project funded by the European Commission.

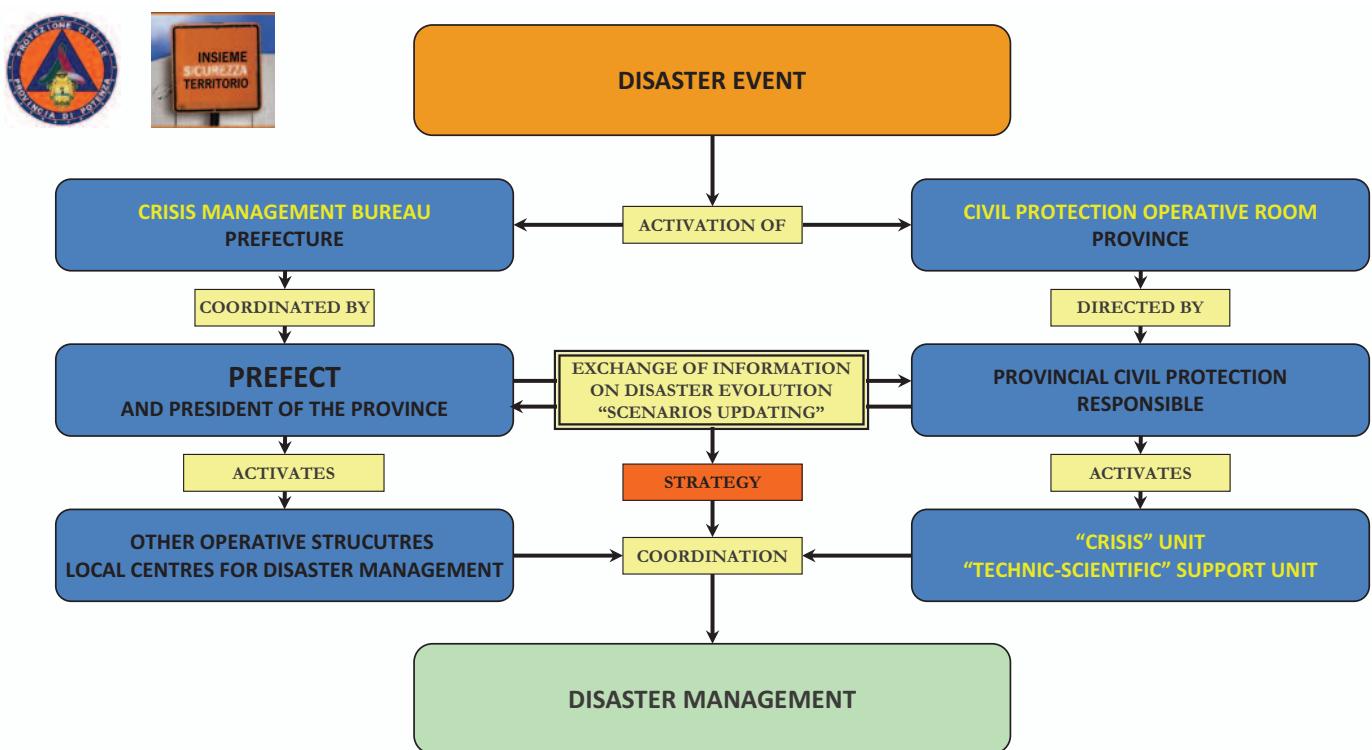
“City to City Peer Review on Disaster Risk Reduction”

2017

October 25-27 Viggiano hosts a Peer Review covering 5 of the 12 peer review modules.

ESSENTIAL ONE: ORGANISE FOR DISASTER RESILIENCE

Although this Essential was not reviewed by the peer review team, an understanding of governance structures was necessary to help to inform the findings. The two images below were shared with the peer review team to help it to understand the structures.



ESSENTIAL TWO: IDENTIFY, UNDERSTAND AND USE CURRENT AND FUTURE RISK SCENARIOS

Why?

Disaster risk management needs to be based on an understanding of disaster risk scenarios in all of its dimensions; hazard characteristics, local exposures, capacity and vulnerability. Risk scenario analysis and assessment is therefore essential for informed decision making, prioritizing projects and planning for disaster risk reduction measures (prevention, mitigation, preparedness and response). Unless we have a clear understanding of the risks and fully discuss with the public and other stakeholders about risk scenarios, implementation of meaningful disaster risk reduction measures may be ineffective.

Disaster Resilience Scorecard for Cities Assessment Criteria

The following table describes the preliminary, high level indicators for this Essential. These were used in the peer review as indicators against which to gather evidence and make recommendations.

Ref	Subject / Issue	Question / Assessment Area
P 2.1	Hazard assessment	Does the city have knowledge of the key hazards that the city faces, and their likelihood of occurrence?
P 2.2	Shared understanding of infrastructure risk	Is there a shared understanding of risks between the city and various utility providers and other regional and national agencies that have a role in managing infrastructure such as power, water, roads and trains, of the points of stress on the system and city scale risks?
P 2.3	Knowledge of exposure and vulnerability	Are there agreed scenarios setting out city-wide exposure and vulnerability from each hazard, or groups of hazards (see above)?
P 2.4	Cascading Impacts	Is there a collective understanding of potentially cascading failures between different city and infrastructure systems, under different scenarios?
P 2.5	Presentation and update process for risk information	Do clear hazard maps and data on risk exist? Are these regularly updated?

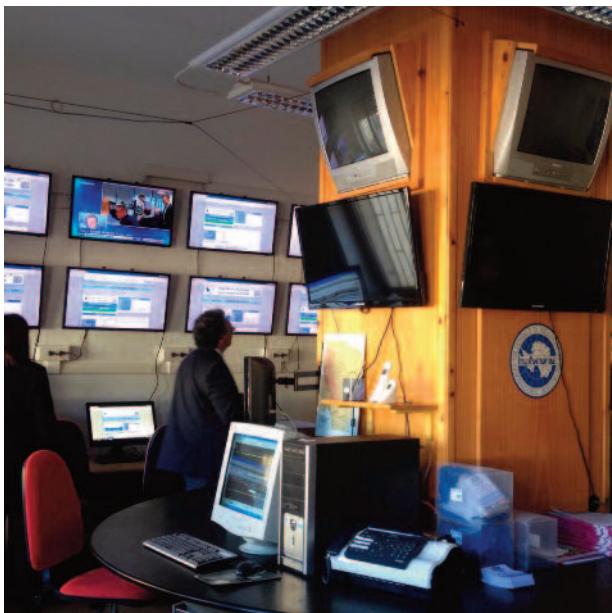
ESSENTIAL TWO: IDENTIFY, UNDERSTAND AND USE CURRENT AND FUTURE RISK SCENARIOS

Methodology

The methods used by the peer review team to understand Viggiano's approach to understanding civil protection risks included:

- consideration of documentation provided by Viggiano ahead of the peer review team visit
- interviews with key stakeholders
- presentations to explain the risk assessment process
- site visits were made to:
 - a) a geological area on the outskirts of the City where it is possible to see the Plio-pleistocene Fault that runs beneath the urban area;
 - b) the COVA (Oil Processing Centre);
 - c) the Gruppo Lucano operational base "Sandro Pertini" where the heliport and logistic equipment for managing large scale disasters are located;
 - d) the Gruppo Lucano headquarters and integrated Crisis Room;
 - e) the Italian Space Agency Research Centre in Matera where Earth satellite observation and risk monitoring technologies are being developed.

The data gathered from these processes has been reviewed by the peer review team and provides the evidence base for the assessment made in this section.



ESSENTIAL TWO: IDENTIFY, UNDERSTAND AND USE CURRENT AND FUTURE RISK SCENARIOS

Key risks in Viggiano

Viggiano has identified the following probable hazards that may have to be addressed in the event of an emergency in its territory:

Seismic Risk

An assessment of the likely reasonable worst case scenario for an earthquake has been assessed including the likely magnitude and impacts, including the vulnerability of buildings and the estimated number of homeless people.

The risk assessment for seismic activity is based in part on a national classification system but also regional seismic micro-zoning studies that have defined the possible seismic effects on each single city territory. These studies have carried out precise measurements for geological and geomorphological emergencies.

The territory of the municipality of Viggiano falls under Seismic category 1 (Zone 1 - the most dangerous zone where severe earthquakes can occur), where peak rigid accelerations (OPCM 3519/2006) of $a_g \rightarrow 0.25$ are expected.

The peer review team heard how all new buildings are certified with local and regional checks made during construction. During the construction process samples of materials are laboratory-tested and conditions imposed if they are found to be sub-standard. In an earthquake the city can initially accommodate 1,000 displaced people and plan for 600 people to be homeless for a longer period of time.

Hydrogeological Risk

A geomorphologic and hydrogeological study has allowed the evaluation of the areas at risk of landslides and flooding, taking into account the presence of man-made objects in these areas.

The risk assessment has considered several aspects, such as: rainfall precipitation, distribution on the territory and the hydraulic response of the main river axes. The hydrogeological risk includes assessing the likelihood of landslides together with the degree of danger.

The Panel understand that Viggiano does not have substantial fluvial flood risk but landslides are a risk to the city.

Meteorological Risk

Snowfall, particularly abundant between the months of December and March, can create problems with the management of social and economic activities. Violent and heavy rainfall can also affects the territory, causing damage to crops and creating flood hazard situations.

National systems assist in dynamic identification of meteorological risk with national bodies (Military Air Force and National Civil Protection Monitoring Centres) issuing reports to the Prefecture (Civil Protection Body), which in turn communicates it to all municipalities that may be affected by the meteorological phenomenon. Municipalities activate all local alert procedures to safeguard the most exposed territory (e.g. bridges, floodable areas, monitoring of landscaped areas) and to enable sites that may be cut-off in situations of snowfall or breakdown of road structures to prepare.



ESSENTIAL TWO: KEY RISKS IN VIGGIANO

Forest Fire Risk

This risk has been evaluated to understand land use, wooded areas and the interface between wooded areas and human activity. A forest fire database monitors the frequency of events such as repeated activity of arsonists and maps areas that are more vulnerable to fires. This mapping also informs regulatory processes that restrict the future use of areas affected by forest fires. Over time, the Civil Protection institutions have initiated actions to help to control and mitigate the impact of malicious acts or natural events.

Industrial Risk

The industrial risk is concentrated in the industrial area of the city and near the drilling rigs used for the extraction of crude oil. An oil pre-processing centre owned and operated by ENI lies in the valley below the ancient city and delivers a first phase separation of crude oil from gases and water. Therefore, in addition to the City Emergency Plan, there is an Internal Emergency Plan (prepared by an ENI Manager) and an External Emergency Plan (prepared by the Prefecture). The risks associated with this site include explosions, fires, oil spillages, and exposure to air pollution with ENI having modelled over 300 scenarios in preparing the on-site plan.

The city of Viggiano, together with the neighbouring city of Grumento Nova funded a VIS (Health Impact Evaluation) study. The study has been carried out by National Research Centers (CNR) and Universities specialising in environmental monitoring and health impact assessments. The study was concluded in June 2017 and its findings were presented to the peer review team.



ESSENTIAL TWO: KEY RISKS IN VIGGIANO

The peer review team welcomed ENI's participation in the peer review. ENI described comprehensive on-site plans, however the peer review team considered that the existing working relationships between ENI and neighbouring cities could be potentially further developed to ensure response planning around the oil centre was strengthened to ensure the community would be protected in an incident. The peer review team understand there are some regulatory issues that may need to be considered to enable this. ENI also undertake work to ensure any risks posed by pipelines and wells are reduced. Areas through which the pipelines run and in which wells are sited are subject to seismic and landslide risk.

NaTech Risk

Viggiano has considered the possibility of severe natural events, in particular earthquakes, triggering cascading impacts including on civil infrastructure, industry, the population and the environment. In particular the presence of a large water dam used for agricultural and civil purposes and the presence of a National Park with high biodiversity could create a complex emergency scenario extending beyond local level. Such a scenario could assume national importance due to the value of the strategic resources involved. This NaTech scenario where communities, infrastructure and economic activities would be simultaneously involved would prove to be particularly complicated to handle. The impact on the environment would greatly affect the costs of restoring sensitive infrastructures and territories.

One example of how this is approached is the emphasis the municipality places on the inter-relationship between risks of forest fires close to the industrial area.



Risk Assessment Methodology

Risk assessments have been undertaken into a range of specific risks. Overlapping of risk maps covering human activities, vegetation characteristics, floodable areas, expected seismic accelerations, and activities and structures present within the territory has allowed the dangers and the vulnerability of the territory to be assessed. The definition of hazard has been evaluated numerically with a degree of approximation due to unverifiable variables such as the damage and the loss of territory during an extreme event.

For a small community like Viggiano risk assessment, which is part of the City Civil Protection Plan, is completed by external consultants with professional expertise. During the process the consultants work with different offices in the city administration to obtain necessary local information.

The risk assessment is subsequently communicated to the Civil Protection Regional Authority which has the responsibility to analyse it and to approve it. This is an iterative process with several stages of feedback between the local authority and the regional authority.

ESSENTIAL TWO: KEY RISKS IN VIGGIANO

Risk mitigation

For each individual risk, both nationally and locally, regulatory procedures offer protection and seek to mitigate risks. At a high level, research centres and control bodies provide specific studies on single-risks, in addition to local level local authorities carrying out more detailed locally specific studies which help develop regional and municipal Emergency Response Plans.

The Italian regulatory framework, in the context of seismic risk and other hazardous situations, has enabled both public and private sectors to finance projects to strengthen anti-seismic adaptation of existing buildings and structures with the intention of mitigating the risk.

The city of Viggiano has been able over the last 20 years to secure funds at national level for the seismic retrofit of more than 60% of the historic city centre buildings and for most of the critical public ones, in particular all the school buildings. As another example of risk mitigation, with respect to the hydrogeological risk, most of the areas in the urban centre are now protected from the risk of landslides.



Risk Communication

The National Civil Protection Department promotes awareness-raising campaigns dedicated to various topics including seismic risk, hydrogeological risk and forest fire risk. The municipality of Viggiano is responsible for training the population and for encouraging the public to participate in emergency drills. Information on risks is communicated to the community through the presentation of the Municipal Emergency Plans. The local radio is also used to communicate to the public risk educational events and warning of emergencies and accidents.

At the local level the Civil Protection volunteers organize an annual school presentation on seismic risk and support the schools in carrying out evacuation drills of their buildings on a six monthly basis. The peer review team were interested to hear from a geologist about his experience of working in schools to inform children about natural risks.

The Civil Protection Volunteer Organization also play a key role in disseminating information through:

- public workshops where experts and professionals from different research and professional organizations are invited
- training courses and practical drills for the volunteers on different risks
- presentations to other grass-root local organizations on resilience and risk reduction (e.g. elderly people).

The peer review team were privileged to observe an exercise in the city during their visit and were impressed by the level of engagement of the general population.

ESSENTIAL TWO: IDENTIFIED GOOD PRACTICE

The peer review team were impressed by the level of knowledge and professional expertise brought to understanding risks. The team identified a number of areas where the municipality demonstrates good practice. Whilst not exhaustive a number of key areas are highlighted below:

1. Viggiano's emergency management plan is a comprehensive document which takes into consideration the wide range of risks Viggiano faces including geological, hydro-meteorological, forest fires and industrial risks, and successfully utilises data, assessment and guidance from national and regional government to make locally applicable risk assessments. The city therefore has knowledge of the key hazards it faces and their likely occurrence (P 2.1).
2. The assessment of geological and of seismic risk analysis is particularly advanced and this is a potential area of national / international best practice.
3. Viggiano works in collaboration with provincial and regional governments in understanding risks.
4. The city and the wider region have been successful in identifying the most severe and probable scenarios which have in turn been used to inform urban development strategies (P 2.3).
5. With the assistance of national government the city has completed a comprehensive analysis of the housing sector which has been identified as the most exposed sector from geological risks. This is unlike other Italian cities and again is a potential area of national / international best practice.
6. Viggiano has successfully used nationally developed seismic maps which are frequently updated, made them locally applicable, and utilised them in their DRR and urban development planning activities (P 2.5).



ESSENTIAL TWO: AREAS TO CONSIDER STRENGTHENING

Based on the stakeholder interviews and other information supplied to the peer review team, the team has identified a number of areas which the municipality may wish to consider further:

1. The review team felt that a more joined up approach to sharing information and knowledge of risks could be explored. Everyone the peer review team met had a clear understanding of key risks, however it was less clear how well the information was shared between different sectors and across administrative boundaries (including with adjacent municipalities as well as different levels of government).
2. The review team felt that although there was evidence of communicating risk to the wider public, this could be strengthened and enhanced. Considerable information is made available to those working and volunteering in the area of disaster risk reduction but it was less clear how the general public could easily access information on risk. A range of mechanisms, including through use of websites and social media, communities could perhaps be further educated, informed and kept updated on risk and exposure. Having said this, the peer review team note that a remarkable proportion of the city's population participated in the exercise held during the visit which does demonstrate awareness of risk.
3. Whilst some work to understand the cascading impacts of disasters has taken place, such as the NatTech risk discussed earlier, a full understanding of the cascading impacts of risks has not been explored across the whole risk spectrum. The current emergency plan could contain more considerations about how the municipality and other organisations would deal with these risks, including how regional and national assistance would be obtained. This work could support all sectors, stakeholders and groups to plan together to ensure the community is supported in the event of the reasonable worst case cascading failure (P 2.4).
4. Understanding of the full spectrum of risks could be expanded to include for example:
 - a. Health related risks such as pandemic influenza
 - b. Plant and animal diseases
 - c. Environmental risks such as pollution
 - d. Risks related to climate change such as drought and the subsequent impact on the water supply
 - e. Risks to critical infrastructure such as the aqueduct
 - f. Industrial risks including from pipelines and wells



ESSENTIAL TWO: RECOMMENDATIONS

These recommendations are offered for consideration to help Viggiano to build on an already significant understanding of risk:

1. The assessment of seismic risk and the work to analyse the housing sector's vulnerability to geological risks could both be put forward as areas of best practice within Italy and across the wider international community.
2. Each risk is currently assessed separately. The number of risks assessed potentially could be expanded and the risk assessments combined into a risk register to give better understanding of comparative likelihood and potential severity. In terms of broadening the understanding of risk, those associated with climate change could usefully be a particular focus.
3. The city could explore mechanisms for improving data sharing across sectors and across geographical boundaries to ensure a shared understanding of risks between the city and various utility providers and other regional and national agencies. This could include jointly understanding cascading impacts and failures (P 2.2).
4. The city could explore how to improve the dissemination of risk information to the public, potentially through better utilisation of the well-established voluntary community groups in the area.
5. The city could utilise the VIS (Health Impact Evaluation) study of industrial activity in the area in any subsequent assessments of risk and use it to inform mitigation, response and recovery planning.



ESSENTIAL FOUR: PURSUE RESILIENT URBAN DEVELOPMENT AND DESIGN

Why?

The aim of the Urban Development and Disaster Risk Reduction (DRR) peer review module is to undertake a review of the city's current level of integration of risk reduction practices into land zoning, urban planning and development policies and building codes.

This module evaluates the ability of the city government to:

- have a clear overview of the existing urban situation and related risk issues, thinking about all potential risks in a comprehensive manner
- Incorporate the city risk reduction analysis into urban planning policies and codes
- Maintain and update urban policies, standards and codes and enforce them
- Have a participatory approach to definition of urban development policies including trans-boundary coordination with knowledge centres for the introduction of new development models
- Address the issues arising from the growth of informal settlements and their specific needs

Disaster Resilience Scorecard for Cities Assessment Criteria

The following table describes the preliminary, high level indicators for this Essential. These were used as indicators against which to gather evidence and make recommendations.

Ref	Subject / Issue	Question / Assessment Area
P 4.1	Land use zoning	Is the city appropriately zoned considering, for example, the impact from key risk scenarios on economic activity, agricultural production, and population centres?
P 4.2	New urban development	Are approaches promoted through the design and development of new urban development to promote resilience?
P 4.3	Building codes and standards	Do building codes or standards exist, and do they address specific known hazards and risks for the city? Are these standards regularly updated?
P 4.4	Application of zoning, building codes and standards	Are zoning rules, building codes and standards widely applied, properly enforced and verified?

ESSENTIAL FOUR: PURSUE RESILIENT URBAN DEVELOPMENT AND DESIGN

Methodology

In understanding Viggiano's approach to urban planning and DRR, the peer review team held interviews with key stakeholders and a range of documentation was provided ahead of the peer review. The data gathered from these processes has formed the evidence base for the assessment made in this section.



The Viggiano Urban Plan

The Viggiano Urban Plan (PU) was prepared by three external consultants in collaboration with the Technical and Urban Development Office of the City Administration and is composed of the following parts:

- Technical-descriptive report
- Urban Balance Report, which contains the description of the zoning and building standards and codes
- Environmental Balance Report
- Implementing Technical Standards and Codes Report, which contains in detail all the standards and the codes (in relation also to the national and regional laws)
- Technical Tables
- Consistency Checks Report, relative to the recommendation of the Provincial Structural Plan (PSP) prepared by the Potenza Province in relation to the protection of the physical, territorial and environment integrity
- Geological Report, which includes the recommendations in the City Civil Protection Plan
- Hydraulic Report, which includes the recommendations in the City Civil Protection Plan.

National law ensures that the approval of the PU by the city and by the regional office is subject to the preparation by the city of the Civil Protection Plan and its approval by the Civil Protection Regional Authority.

ESSENTIAL FOUR: PURSUE RESILIENT URBAN DEVELOPMENT AND DESIGN

Integration of DRR with urban codes and standards

The following is an excerpt from the PU that was shared with the peer review team to illustrate the integration of urban planning with DRR.

"The risks that characterize the territory of the Commune of Viggiano, which can be deduced from the Urban Emergency Plan and Civil Protection are as follows: Seismic Risk, Hydraulic Risk, Hydrogeological Hazard, Meteorological Risk, Interface and Forest Fire Hazard and Risk Frame (P.A.I.), and Industrial Risk (ENI). [...] The Urban Regulation of the Municipality of Viggiano has been prepared in such a way that it does not foresee any kind of construction in the areas to be used as spaces necessary for the implementation of the Civil Protection Plan. [...] preserving and protecting the territory where there is a strong presence of risk factors.

The City undertakes to take care of - as far as its own competence and where there are no risk mitigation measures - the adoption of compensation measures in implementing urban planning instruments, buildings, expertise etc., to promote / raise awareness and / or to become an active participant in

addressing these issues with competent institutional levels in order to identify ways of improving the security of the territory. Moreover, where the planning tool does not provide specific measures (mitigation and adaptation) to contrast Climate Change, or specific risk mitigation measures for degradation and desertification of the soils and for waterproofing of the soils, the City undertakes to take charge of - as far as its own competence - the adoption of such measures in implementing urban planning instruments, buildings, interventions, etc., to promote / raise awareness of these issues within their communities, and / or to become an active participant in addressing these issues at the level competent bodies in order to identify ways of improving the security of the territory. The City is committed to satisfying, as far as its own competence, the 10 Essential of the UN Campaign on Resilient Cities and to become active in its implementation"



ESSENTIAL FOUR: GOOD PRACTICE

Identified good practice

The peer review identified a number of areas where the municipality demonstrates good practice. Whilst not an exhaustive list, a number of key areas are highlighted below:

1. Viggiano's urban planning system is designed to avoid creating new risks and to reduce or mitigate the impacts of existing risks.

2. Viggiano sets out a series of standards for planning which promote the allocation of land to different uses including for homes, schools, parking, public space and green areas, thereby avoiding over-densification and promoting resilience through a balanced approach to land use (P 4.2).

3. Where it lies within Viggiano's authority, the city is zoned according to seismic risk and building codes augment the city's resilience through promoting risk prevention and encouraging individual's to take responsibility in relation to the safety of the community and wider society (P 4.1).

4. The urban development plan for Viggiano is strongly informed by Viggiano's emergency management plan. The urban development plan considers risk scenarios to define land use planning, both the most severe (earthquakes) and most probable (hydrogeological risk and forest fires). Local urban planning maps are made available to the public (P 4.1; P 4.2).



5. Viggiano applies building codes and standards with technical norms in place for construction, engineering expertise used to address seismic risk and a formal checking and verification system in place. In recognition of seismic risk modern houses have reinforced structures and are limited in both height and the minimum permitted distance between buildings. Similarly, a risk-informed approach is taken with respect to forest fires with consideration of distance of buildings from forested areas and agricultural land use constraints after fires (P 4.2; P 4.3).

6. Zoning rules, building codes and standards are widely applied and enforced, with regional controls applied and certification needed for formal completion of new buildings (P 4.4).

7. Viggiano draws down on financial benefits to retrofit buildings against seismic risk and to implement sustainable energy standards. The retrofitting of historic buildings helps protect the cultural heritage of the ancient city centre.



ESSENTIAL FOUR: AREAS TO CONSIDER STRENGTHENING

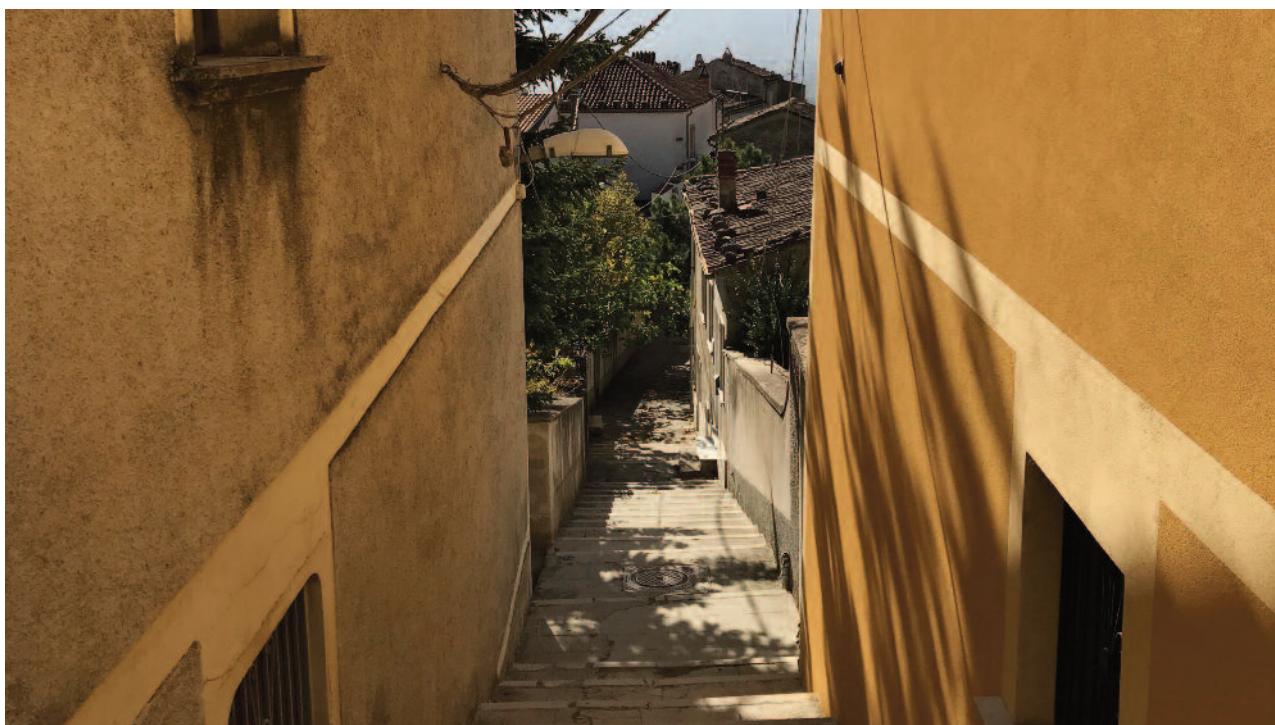
Identified areas to consider strengthening

The peer review team was impressed with the risk-informed approach that Viggiano takes to urban planning. However, the information presented through stakeholder interviews and documentation suggested a few areas which the municipality may wish to consider strengthening and which are described here in case they are helpful:

1. Viggiano could consider an overall city strategy that sets out its future ambitions including those for economic growth. The strategic plan could include issues such as the balance of 2nd homes, how the city wishes to promote tourism (religious, archaeological, enjoyment of natural landscapes whether skiing or walking, vineyards and wine tasting), future development plans for the industrial area, protection of productive agricultural area etc.

As the city develops this plan and the use of land in the city and in its environs changes, the plan can be assessed against DRR risks such as those associated with climate change and how to promote risk-awareness in parts of the population for whom this is not their first home or whom are visitors.

2. The peer review team heard about the retrofit of historic buildings to protect them against seismic risk and the ambitions that the city has for tourism. Viggiano offers a beautiful ancient hilltop city for the visitor to explore and this has been recognised through the marking out of a historic trail around the city. However the peer review team weren't clear on how intentional the protection of the city's cultural assets is and this may be an area for future focus.



ESSENTIAL FOUR: RECOMMENDATIONS

Recommendations

These recommendations are offered to support Viggiano in building on an already considerable integration of disaster risk reduction measures into its urban planning arrangements.

1. Some decisions about land use are not the responsibility of the municipality but are decisions of regional or national government. However, some of these decisions have a significant impact on the resilience of Viggiano, for example affecting its agricultural or tourist economies, or on Viggiano's risk profile, for example industrial risk. Efforts need to continue to have a strong dialogue between all levels of government to ensure the future of the city and its exposure to risk is informed by local as well as regional or national considerations.
2. The impact of industrial risks on future urban development may need greater consideration, especially given the proposed enlargement of activity in the industrial area. Examples from around the world have provided examples of the need to consider maintaining reasonable distances between residential areas and industrial sites processing hazardous material, pipelines etc.
3. The city may wish to work with utilities companies to understand potential future risks from climate change. Future predictions may have implications for snow, snow melt, spring water etc. and therefore the water supplies to the area including drought scenarios.



ESSENTIAL FIVE: SAFEGUARD NATURAL BUFFERS TO ENHANCE ECOSYSTEMS' PROTECTIVE FUNCTIONS

Why?

Ecosystems provide critical services for disaster risk reduction as protective barriers against hazards. They are central to hazard mitigation by offering, for example, flood regulation and protecting steep slopes. They also enhance the resilience of community to withstand, cope with and recover from disasters through providing many livelihood benefits, such as food, firewood and clean water. A degraded ecosystem is thus unable to provide these mitigation and resource benefits, which in turn significantly increase community vulnerability. Through the process of urban expansion, cities transform their ecosystems and often generate new risks.

Recognising the economic value and multiple benefits of healthy ecosystems acting as natural buffers are important for reducing risks and contributing to urban resilience and sustainability.

The aim of the Safeguard Natural Buffers to Enhance Ecosystems' Protective Functions peer review module is to undertake a review of the city's current awareness and understanding of the link existing between Climate Change Adaptation and DRR as well as to identify the critical ecosystem services that may contribute to improve city resilience.

Disaster Resilience Scorecard for Cities Assessment Criteria

The following table describes the preliminary, high level indicators for this Essential. These were used as indicators against which to gather evidence and make recommendations.

Ref	Subject / Issue	Question / Assessment Area
P 5.1	Awareness and understanding of ecosystem services / functions	Beyond just an awareness of the natural assets, does the city understand the functions (or services) that this natural capital provides for the city?
P 5.2	Integration of green and blue infrastructure into city policy and projects	Is green and blue infrastructure being promoted on major urban development and infrastructure projects through policy?
P 5.2	Transboundary environmental issues	Is the city aware of ecosystem services being provided to the city from natural capital beyond its administrative borders? Are agreements in place with neighbouring administrations to support the protection and management of these assets?

ESSENTIAL FIVE: SAFEGUARD NATURAL BUFFERS TO ENHANCE ECOSYSTEMS' PROTECTIVE FUNCTIONS

Methodology

In understanding the approach of Viggiano to safeguarding natural buffers and protective ecosystems, the peer review team:

- Reviewed documentation provided to the team ahead of its visit
- Interviewed a range of key stakeholders from a diverse specialisms and sectors
- Received presentations about relevant topics
- Made a number of visits around the area that enabled an appreciation of the local geography and flora/fauna.

The data gathered from these processes forms the evidence base for the assessment made in this section.



Key Environmental Considerations in Viggiano

Effects of climate change in Viggiano

In the last two centuries annual average temperatures in Italy have risen by 1.7 ° C with the most significant contribution to this increase in the last 50 years. The current climate trends will give a tendency for the ecological, forestry and natural environment of the Mediterranean to change. However, the rapidity of climate change is far greater than the rate of colonization of new plant species therefore progressive "disintegration" of many ecosystems is expected. There are likely to be profound implications, especially for agriculture, tourism and leisure, and in the

residential sector. Climate change will also affect fauna with colonization of the territory by different species that can damage the entire ecosystem.

Due to temperature increase, the overall water resources will decline in the coming decades, caused by rainfall and snowfall reduction and rising evapo-transpiration and water withdrawals. The situation will be more critical in southern Italy, where water stress already exists. Again this will have profound implications for agriculture, tourism, health, industrial production, urbanization and, last but not least, the insurance industry.

ESSENTIAL FIVE: SAFEGUARD NATURAL BUFFERS TO ENHANCE ECOSYSTEMS' PROTECTIVE FUNCTIONS

For the city of Viggiano the main effect of these changes will be:

- an increase of severe forest fires
- increased vulnerability of some species
- an increase of landslide risk due to extreme weather, soil erosion and forest fires
- potential increase in pathogens, affecting human, animal and plant health

Viggiano's ecosystems

The National Park of the Appennino Lucano Val d'Agri Lagonegrese

Established in 2007 the park has an area of 67,564 hectares along the Lucan Apennine Mountains and lies within the territory of 29 cities of Basilicata Region. 26% of the Viggiano territory is included in the park area, although the urban center is not included.

Sites of European Interest and Zones with Special Protection

Designation of Zones with Special Protection is a fundamental step for the full implementation of the Natura 2000 Network, ensuring full access to specific conservation measures and offering greater security in achieving the goal of halting the loss of biodiversity in Europe by 2020. Two sites lie within Viggiano's boundaries:

1. Mount Caldarosa - a mountain area covered by woods of beech, spruce, chestnut, cherry, hornbeam and maple. The wildlife includes wolves and numerous species of Sylvia birds.
2. Monte della Madonna di Viggiano - a limestone massif with very rugged morphology with rocky environments of remarkable landscaping interest together with rocky environments host a rich mountain life including a population of coral of great scientific importance.

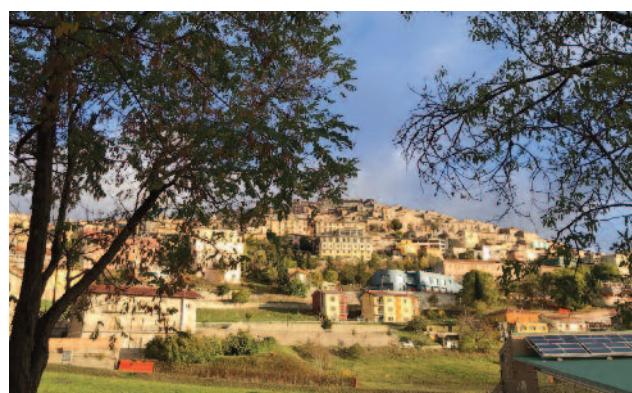
Water resources

The river Agri and the artificial lake "Pietra del Pertusillo" (Pertusillo water dam) located only few kilometers from Viggiano represent an ecosystem service of great importance not only for the Val d'Agri, but for the entire region and for neighbouring regions. The Pertusillo Dam has a capacity of 160 millions of cubic meters of water. The water is used both for agricultural use, civil use (drinking water) and for the hydroelectric power plant in the city of Missanello, and represents a very important buffer in relation to severe droughts.

How Viggiano's ecosystems strengthen resilience

The Appennino Lucano National Park is the most critical ecosystem service in the entire Val d'Agri. It connects the Pollino National Park extending south all the way into the Calabria region and the Cilento National Park extending north into Campania Region. The three National Parks represent the largest ecological corridor in Europe, with a very broad biodiversity.

In consideration of the presence in Val d'Agri of the largest oil extraction and pre-processing activities on continental Europe, the Appennino Lucano National Park is a very important ecological buffer which goes somewhat to compensate for the negative effects of these industrial activities.



ESSENTIAL FIVE: SAFEGUARD NATURAL BUFFERS TO ENHANCE ECOSYSTEMS' PROTECTIVE FUNCTIONS

The benefits that the community of Viggiano obtains from this ecosystem include:

- supporting services - related to the ability to maintain high quality of soil formation, nutrient cycling, maintenance of genetic diversity, providing living space for plants and animals
- regulating services - including maintaining local climate air quality, carbon sequestration and storage, moderation of extreme events and biological control and crop pollination
- cultural / health services - including recreation, maintaining health and wellbeing of citizens, tourism.

How agencies in Viggiano work together to monitor extent, health and buffering capacity of the ecological infrastructures

Environmental risk is a main issue for Viggiano and for the entire Val. The Oil Centre located on the municipal territory processes 100,000 b/day of crude oil and is expanding its structure to be able to process in the near future 150,000 b/day. The oil is extracted through 27 wells (20 of them on Viggiano's territory) and transferred through pipelines to the oil refinery in the city of Taranto (Apulia). The pre-processing undertaken in the Oil Centre consists mainly in the process of desulfurization.

The Oil Centre is classified as Seveso III and extensive monitoring is done by the L'Agenzia Regionale per la Protezione dell'Ambiente della Basilicata (ARPAB), the regulatory agency in the Basilicata Region. Environmental monitoring is growing with measurements for air quality, noise, surface and underground water quality, soil and subsoil pollution. Projects are also planned to analyse issues such as biomonitoring, natural ecosystems, natural and / or induced seismicity and odorous emissions.

The city of Viggiano, together with the neighbouring city of Grumento Nova , has funded a Health Impact Assessment (HIA) study due to concerns expressed by the two municipal administrations and local communities and there is solid epidemiological evidence for the oil pre-processing to be associated with tumor-lung, bronchial tumors, and respiratory and circulatory system diseases in the local population.



ESSENTIAL FIVE: SAFEGUARD NATURAL BUFFERS TO ENHANCE ECOSYSTEMS' PROTECTIVE FUNCTIONS

How are policies and codes on critical ecosystem services incorporated in urban and land use planning?

Some of the major landscape policies and codes incorporated into the Viggiano Urban

Plan include those designed to:

- Define and protect areas of particular environmental interest
- Protect rivers, streams and public watercourses and define priority interventions or people's safety and the protection of the territory
- Consider carefully use of land covered by forests and woods, including fire-damaged areas and those subject to reforestation.
- Conservation of important landscapes such as the Volturino and the Arioso Mountain and their wealth and variety of plant cover
- Promote soil conservation and recovery of degraded areas.



ESSENTIAL FIVE: IDENTIFIED GOOD PRACTICE

The peer review were grateful for the input of so many specialists in understanding this area. The peer review team identified a number of areas where the municipality demonstrates good practice. Whilst not exhaustive a number of key areas are highlighted below:

1. Engagement from the range of stakeholders who participated in the peer review was impressive. Their strong knowledge base, commitment and professional approach was invaluable for providing comprehensive answers to the range of questions from the team (P 5.1).
 2. There was a good understanding of climate change in relation to projections for the future and risks/effects on Viggiano in terms of higher temperatures, risk of fires, potential impact of drought and other environmental risks.
 3. The range of stakeholders in attendance provided a strong understanding of the environmental risks, natural capital value of land and also the promotion of this, for example agriculture and vineyards. The Appennino Lucano National Park has been identified as an ecological buffer against industrial activities particularly for maintaining local air quality (P 5.3).
 4. There was some evidence of policies that are being developed to support the maintenance and enhancement of green and blue infrastructure (P 5.2). For example,
- a. The forest management planning process is a strong example of co-ordinated, consistent and sustained action at national, regional and local levels to manage forest resources. Plans are developed and tailored for each territory to ensure that forest resources are managed in relation to:
 - i. Protection-reducing actual or potential risk e.g. slope/incline, cover or disturbance factors
 - ii. Production-their economic role
 - iii. Environment-protecting and nurturing habitats and ecological landscapes
 - iv. Social use-for recreation.
 - b. The standards/laws, including within the Viggiano Urban Plan, for infrastructure development, provide constraints on the amount of land that is used and protects areas of particular environmental interest.
 - 5. The evidence base and environmental monitoring is wide ranging and strong in many areas and being developed further. For example, the study from the National Research Centre on environmental issues provided useful longitudinal analysis.
 - 6. A positive approach to engaging the community through the use of incentives for homeowners to protect against seismic risk and reduce their carbon footprint. Groups of families and residents have made agreements with the administration with the common goal of establishing a solar city. This is a good example of using the negative effects of climate change positively.
 - 7. Good evidence of working with cities and also multi-agency working, for example, joint commissioning of research to monitor health impacts of oil production and also cross-border work on forest management (P5.3).

ESSENTIAL FIVE: AREAS TO CONSIDER STRENGTHENING

Building on the good practice identified above, through the peer review process the peer review team has identified a number of areas which the municipality may wish to consider strengthening in the future:

1. Collaboration across agencies and boundaries - although there is strong evidence and monitoring on individual aspects of the environment, there doesn't appear to be much evidence of collaboration to analyse and utilise this evidence to improve a bottom-up approach to climate change adaptation and mitigation.
2. Governance and decision making on climate change and related issues – the peer review team wasn't always clear how climate change and some environmental issues are governed particularly in terms of who is responsible for leading and addressing issues at the city-level. For example, the jointly commissioned Health Impact Study provided evidence of concern on the negative impact of the oil pre-processing activities, but it wasn't clear how this evidence would be used for decision making or action.
3. Quantifying the benefits of the national park as an ecological buffer - although a methodologically challenging area, it would be worth exploring the extent to which the benefits of the national park as an ecological buffer can be quantified through natural capital quantification models. For example, this information would be useful when considering necessary actions to reduce the negative health impact on the population of the oil pre-processing activities in the Oil Centre, particularly regarding respiratory and cardiovascular diseases. This would also be useful to consider in the context of expansion of oil pre-processing activities.
4. Engagement with community on climate change-other than the health impact study, there didn't appear to be any coordinated engagement with the community on climate change issues.

ESSENTIAL FIVE: AREAS TO CONSIDER STRENGTHENING

Recommendations

These recommendations are offered for Viggiano to consider in order to improve on an already considerable understanding of how the environment and eco-systems are important to disaster risk reduction.

1. Viggiano could develop a Climate Change Strategy to build on the national and regional strategies. This would enable identification of priority actions from analysis of the current wide ranging evidence base and also key stakeholder responsibilities.
2. The city could identify protective green and blue infrastructure in its immediate vicinity, those ecosystems that protect against environmental risks, and ensure that if these are developed and built upon, compensatory protective areas enhanced.
3. The city could look at potentially increasing available public transport to strengthen the resilience of the tourism offer, to avoid social isolation as the population ages and to avoid compounding air pollution issues.



ESSENTIAL SEVEN: UNDERSTAND AND STRENGTHEN SOCIETAL CAPACITY FOR RESILIENCE

Why?

As citizens are to take part in the collective effort of creating resilient cities, education, training and public awareness programs are critical. The entire community must know about the hazards and risks to which they are exposed so that they are able to prepare and take measures to cope with potential disasters. Education and capacity building programs are also the key for mobilizing citizen and community participation in the city disaster management strategies, for example improving community's preparedness and response to local early warnings. Social connectivity and a culture of mutual help therefore has a beneficial outcome on the impact of disasters of any given magnitude.

Disaster Resilience Scorecard for Cities Assessment Criteria

The following table describes the preliminary, high level indicators for this Essential. These were used as indicators against which to gather evidence and make recommendations.

Ref	Subject / Issue	Question / Assessment Area
P 7.1	Community or "grassroots" organisations, networks and training	Are grassroots or community organisations participating in pre-event planning and post-event response for each neighbourhood in the city?
P 7.2	Social networks "Leave no one behind"	Are there regular training programmes provided to the most vulnerable and at need populations in the city?
P 7.4	Citizen engagement techniques	How effective is the city at citizen engagement and communications in relation to DRR?

ESSENTIAL SEVEN: UNDERSTAND AND STRENGTHEN SOCIETAL CAPACITY FOR RESILIENCE

Methodology

This module was assessed using both a comprehensive set of documentation provided by Viggiano and a focus group, together with some interviews. The peer review team also had an unparalleled opportunity to observe an exercise in Viggiano in which a significant proportion of the population took part.

The documentary information included:

- A Gruppo Lucano: “A civil protection volunteer in every family”
- An article published by the Crisis Response Journal on the bottom-up approach to resilience in the Viggiano community
- A list of active associations present in Viggiano
- A video on the experience of the relief effort in the Abruzzo earthquake by the Gruppo Lucano civil protection volunteers
- A video on the international experience of relief effort providing medical supplies to Syria by volunteers from Viggiano.

The focus group and the interview process included:

- Volunteers of the Gruppo Lucano in Viggiano (from its inception to the present)
- Young people who have been working with National Civil Volunteer projects in Viggiano
- Representatives of the following Organizations:
 - ACEA (Environmental Education)
 - Youth Forum
 - UNI3 (Education for elders)
 - Local radio
 - Bene Comune (Cultural organizing of public debates)
 - Almamundi (Social and Cultural)
- Representatives of the school system
- Representatives of the community
- Political representatives including previous mayors

The exercise included the city administration, Gruppo Lucano volunteers and the general population.

ESSENTIAL SEVEN: UNDERSTAND AND STRENGTHEN SOCIETAL CAPACITY FOR RESILIENCE

Viggiano is a small community of about 3,500 people facing a large spectrum of risks, both natural and man-made. Twenty five years ago a group of 20 citizens of Viggiano started a project on community resilience: the establishment of a civil protection volunteer organization (the Gruppo Lucano). With the support of the city administration this small group of people started acquiring expertise in disaster response through training and the acquisition of kit and equipment. After several years of supporting the community in relation to local snow and forest fire emergencies, they became involved in larger scale emergencies at the national and international level.

Gruppo Lucano recognise the importance of having access to a critical mass of volunteers and essential equipment. Over the years nearly every city in proximity to Viggiano has created its own group of civil protection volunteers and with the financial support of the local administrations (in particular of Viggiano) and of the Regional Government, the Gruppo Lucano has assembled an effective disaster response organisation.

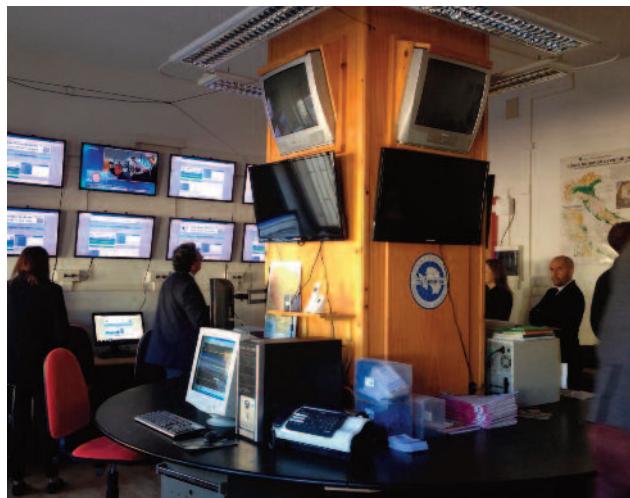
In 2009, the Gruppo Lucano participated in the relief effort for the Abruzzo earthquake (under the direction of the National Department of Civil Protection, installing and managing a large tent city for more than 600 people over a period of six months.



Recognising that the DRR requires access to predictive tools, prevention work, training and education, the Gruppo Lucano has relations with research centres and has launched campaigns on risk reduction in the school system and among the broader population. With a strong support from both the Viggiano community and the administration, the Gruppo Lucano has created:

- A headquarters with a Crisis Room fully equipped to manage the entire network of Volunteers for any type of DRR response
- An educational structure for students
- A facility for training of volunteers in different professional DRR activities
- Mobile assets to install and manage up to 3 tent cities with all the associated support services.

The main benefits of this volunteering network are both the capacity to respond to disasters at a community level, together with building social cohesion and making communities more resilient. This experience of civil protection volunteering has contributed to increasing people's awareness of the value of active citizenship and of the importance of working together and building social networks. It has also increased awareness about resilience and the role that the city can play, becoming an active champion of DRR for other communities as well.



ESSENTIAL SEVEN: GOOD PRACTICE

The level and expertise of volunteering to assist in disaster response is a significant strength in Viggiano and one that is of international importance. The process adopted for the peer review itself was an example of good practice with a public meeting held to highlight the importance of the USCORE2 project and the peer review at local level with this event having the presence of a considerable number of politicians, together with citizens and volunteers.



The good practice in this area is considerable, however a few issues are noted for particular mention by the peer review team:

1. The political leadership and engagement in DRR was very high and reflected the advocacy and commitment for which Viggiano was awarded role model status in the UN's Making Cities Resilient campaign. The Mayor is sensitive to issues important in delivering DRR and set out information about his goals to achieve community resilience in his last electoral programme. The Mayor has clear priorities around DRR including:
 - a. Urban planning in the historical centre
 - b. Urban reinforcement, including retrofitting, to earthquake risk
 - c. Guarantee a safe evacuation in case of disaster
2. The breadth of community stakeholders interviewed by the peer review team demonstrated a high level of engagement and ownership across different areas of society, with all stakeholders being clear about and committed to their roles in community resilience (P 7.1, P 7.3).
3. The community stakeholders had a good understanding of the different risk scenarios for Viggiano, including describing cascading risk scenarios, together with a well-developed understanding the challenges associated with the different risks and their consequences.

ESSENTIAL SEVEN: IDENTIFIED GOOD PRACTICE CONTINUED

4. The number of volunteers in Viggiano is truly impressive with some stakeholders highlighting the role of volunteering in ensuring the community is better prepared for disasters. The strategy for community resilience started in 1993 by Gruppo Lucano is effective and well thought through, with a focus on four main points (P 7.1, P 7.2, P 7.3):
 - a. Critical mass: to have enough capacity for an effective and sustained disaster response
 - b. Financial support: to guarantee that the level of resourcing can be maintained and equipment updated
 - c. Volunteers training: to motivate and engage volunteers drawing on their existing skills whilst also training in new areas of expertise
 - d. Social cohesion: to improve disaster risk prevention and preparedness, whilst also drawing on knowledge to help with forecasting and prediction.
5. Viggiano has a significant number of active citizenship organizations with more than 30 associations covering different interests. Gruppo Lucano is one of the most important organizations in Viggiano that promote resilience (P 7.1). The emergency exercise organized over 2 days was vital to understand:
 - a. the dynamics of the volunteering system
 - b. integration of the volunteer systems with the city's formal administration
 - c. the involvement of local communities in different areas of DRR (prevention, logistics, communication, rescue, recovery, rehabilitation).
6. The peer review team commends the commitment of schools to DRR with schools being one of the most important places in the community in which to build resilience (P 7.2). Resilience-building measures include:
 - a. an earthquake prevention campaign involving 17,000 students
 - b. initiatives for elementary and high schools that give responsibility for DRR to the students
 - c. specific and accredited training for teachers and school staff (4 hours of certificate training per year)
 - d. movies about DRR measures with one student commenting "the experience is useful"
 - e. connecting science classes with the civil protection processes



ESSENTIAL SEVEN: AREAS TO CONSIDER STRENGTHENING

Community resilience is a remarkably strong area in Viggiano's approach to DRR. However, the peer review team have sought to identify a few areas that the city may like to consider as it continues to build on its strengths in this area:

1. Viggiano could explore use of early warning systems to provide clear public information in emergencies and avoid an over-dependence on word of mouth. Viggiano has a complex NaTech risk scenario and the possibility of cascading impacts across wide areas, whether through industrial accidents or earthquakes. An efficient and effective early warning system providing public information is important. There is a siren system for the oil centre however the peer review team was not clear how effective it would be and how much the public would understand its different warnings during an emergency. The peer review team heard that the city has adopted a system to communicate to the population through SMS on mobiles when public events are happening and any pre-alerts to risks which have early warning mechanisms in place. Websites, social networks, audio visual material and mobile phone apps could also be used to inform the community.
2. The Mayor is clearly an advocate of DRR and the municipality works well with the volunteer organisations. However, the peer review team was not clear whether the municipality could assume a clearer role in coordinating the different stakeholders and organisations engaged in community resilience, holding regular meetings with all the relevant stakeholders in the DRR process. It was unclear to the peer review team whether the Gruppo Lucano assume this coordination and where the leadership of the municipality lies in this process.
3. The municipality could consider extending its financial support for DRR and provide a budget to develop more educational programmes with young people in the community and deliver media campaigns to foster resilience. It may be possible under the leadership of the municipality to call for greater investment and financial support for resilience from the private sector.
4. Despite the impressive community engagement, there are varying levels of participation in different areas of the community and it may be beneficial to guard against Gruppo Lucano being seen as having everything planned in terms of prevention, preparation and emergency response without others having to play a part. It may be helpful to empower existing community groups that are not involved in civil protection by providing them with "unvarnished" data on risk scenarios and current levels of response capabilities and procedures. By doing this those groups can actively contribute in raising awareness among the population by cascading this information to individual community members so that they are aware of what actions they might need to take should that scenario arise.

ESSENTIAL SEVEN: RECOMMENDATIONS

The peer review team are confident that based on past achievements, Viggiano and Gruppo Lucano will continue to develop the reach and strength of their community resilience programmes. The following recommendations are offered in case they are helpful in this process:

1. With well-equipped response units at the local level, Viggiano and Gruppo Lucano could promote their expertise to engage and offer training and exercising to other civil society organisations.
2. It may be a useful exercise to map community capabilities and capacity across the region to help ensure that the correct capabilities are targeted and used both in planning and response.
3. In order to continue to attract investment in education and awareness-raising campaigns, an impact evaluation of current public communication methods to enable the population to prepare for emergencies could be commissioned.
4. With his demonstrable commitment to disaster risk reduction, the Mayor could continue to advocate for DRR and the UN's Making Cities Resilient campaign.



ESSENTIAL NINE: ENSURE EFFECTIVE DISASTER RESPONSE

Why?

Even when cities invest time and effort in effective disaster risk reduction measures there will still remain some residual risk that cannot be avoided. In order to respond effectively to emergencies cities should invest time in the development of disaster preparedness, this includes having plans in place that cover the assessment and strengthening of existing policy; technical and institutional capacities; mechanisms for the coordination and exchange of information and early warnings; contingency planning and response readiness and a periodic review, rehearsal and modification of the plan. However, the ultimate objective of the preparedness planning process is not simply to produce a plan, the city should aim to develop joint working between responders and a common understanding and coordination of activities in support of effective preparedness, effective coordination between local and central authorities and a people centred approach that identifies who is vulnerable and why

Disaster Resilience Scorecard for Cities Assessment Criteria

The following table describes the preliminary, high level indicators for this Essential. These were used as indicators against which to gather evidence and make recommendations.

Ref	Subject / Issue	Question / Assessment Area
P 9.1	Early warning	Does the city have a plan or standard operating procedure to act on early warnings and forecasts? What proportion of the population is reachable by early warning system??
P 9.2	Event management plans	Is there a disaster management / preparedness / emergency response plan outlining city mitigation, preparedness and response to local emergencies?
P 9.3	Staffing / responder needs	Does the responsible disaster management authority have sufficient staffing capacity to support first responder duties in surge event scenario?
P 9.4	Equipment and relief supply needs	Does the responsible disaster management authority have sufficient staffing capacity to support first responder duties in surge event scenario?
P 9.5	Food, shelter, staple goods and fuel supply	Would the city be able to continue to feed and shelter its population post-event?
P 9.6	Interoperability and interagency working	Is there an emergency operations centre, with participation from all agencies, automating standard operating procedures specifically designed to deal with “most probable” and “most severe” scenarios?
P 9.7	Drills	Do practices and drills involve both the public and professionals?

ESSENTIAL NINE: ENSURE EFFECTIVE DISASTER RESPONSE

Methodology

This was the final module assessed by the peer review team during their visit. It built on the information already provided about risk assessment, urban planning, environmental protection and community resilience. The peer review team considered documentation provided by Viggiano ahead of their visit, interviewed key stakeholders, listened to a range of presentations and, vitally in the context of this Essential, observed a city-wide, multi-stakeholder emergency response exercise.

The information gathered from these processes has been reviewed by the peer review team and is the evidence base for the assessment made in this section.



Viggiano emergency response procedures

In 2014/15 Viggiano prepared a City Emergency Plan (PEC) identifying the different risks that could affect the city territory. It:

- evaluates the different risk scenarios
- identifies the people responsible for safety
- describes actions to take in case of an emergency
- encourages participation in emergency drills

The Municipal Civil Protection System is the structure that carries out civil protection activities both in ordinary and emergency situations.

The Mayor is, by law, the Municipal Civil Protection Authority and is responsible for activities aimed at safeguarding public and private safety. In an emergency the Mayor is responsible for rescue services and assistance to the affected population. The Mayor is also responsible for notifying appropriate administrations and organizations involved. This includes carrying out a damage assessment and communicating it to the regional and national levels (National Civil Protection Department, Regional Civil Protection Department, Provincial structures).

ESSENTIAL NINE: ENSURE EFFECTIVE DISASTER RESPONSE

The Mayor is supported by a territorial team made up of city officials, local volunteers and others whose roles are pre-agreed through formal agreements. In charge of activities such as the control of critical assembly points, areas at risk, escape routes, relief stockpiles and evacuation areas, the Territorial Team is initially structured by the local Police and volunteering forces present on the municipal territory.

The Mayor also receives direct support from the municipal technical evaluation and planning team who form an operational team to provide data and information, maintain contact with the various administrations and entities concerned and keep lines of communication open.

The Mayor can activate:

- a Municipal Operating Center (COC) and crisis room
- an administrative secretariat
- a press officer who will, amongst other tasks, keep the public updated



ESSENTIAL NINE: ENSURE EFFECTIVE DISASTER RESPONSE

History of disaster response in Viggiano

Viggiano has not had a major emergency for several decades and therefore learning from major and high impact community events to improve the emergency management system has not been possible. However, the ongoing management of local small emergency situations, emergencies that have occurred in neighbouring regions, the experiences accumulated over time through the work of volunteering (e.g. support to populations affected by earthquakes, floods or particularly important social events) and professional input have helped to improve the response system. In particular the following most recent regional and national large scale emergencies, where the Gruppo Lucano has given a strong contribution, have informed current practice:

- 2009:** Abruzzo earthquake where the Gruppo Lucano managed a tent city for 600 people for six months
- 2011:** Basilicata flooding in Metaponto area
- 2012:** Emilia earthquake where the Gruppo Lucano managed a tent city for 650 people for three months
- 2016:** Central Italy earthquake with participation to the relief activity in a tent city



ESSENTIAL NINE: IDENTIFIED GOOD PRACTICE

The municipality has clearly invested time and resources in preparing for a disaster and planning the response. The peer review identified a large number of areas where the municipality demonstrates good practice and, whilst not an exhaustive list by any means, a number of key areas are highlighted below:

1. The Mayor and his administration demonstrate a clear commitment to emergency preparation and response. During the peer review visit, the city's administration undertook a large scale exercise in collaboration with the Gruppo Lucano and general public, in which the city's officials played a key role. There are clear responsibilities for escalating the response to regional and national levels (P 9.2; P 9.3). there was evidence of exercising the response of this network in a live exercise at the local level (P 9.3).
2. For a relatively small city, Viggiano has made a considerable investment in emergency operation centres. The city administration has a control centre located in the old city with a good view over the valley. The city is also investing in a new emergency control centre. The Gruppo Lucano also has a well-designed command and control centre in Viggiano. The fire service has a mobile command centre. Existing efforts need to be continued to ensure these command and control centres all link up with one another and with the regional command centre (P 9.6).
3. Equipment and supplies are available from multiple sources. Potenza holds a database of available kit and the fire service is well equipped. The Gruppo Lucano headquarters also boasts considerable resources including a helipad, vehicles, equipment for managing a tent city, boats and other equipment. The skills of volunteers are used to maintain and to fit out the equipment (P 9.4).
4. The city of Viggiano has a comprehensive civil protection support network with the main supporting organisation being Gruppo Lucano. There are a number of other voluntary organisations that bolster the civil protection effort. During the peer review visit
5. The emergency civil protection response can be sustained for an impressive six months. This clarity about how long the response could be sustained also helps to inform and drive clear recovery timelines (P 9.5).
6. All households in Viggiano have been provided with a leaflet explaining the city's emergency plan. This is good practice as long as the process is repeated on a regular basis in order to take into account new residents arriving in the city.
7. Evidence provided indicated that the local fire service is well equipped to deal with fires and, specifically in relation to a fire at the oil plant, has a response time c. 5 minutes with regional reinforcements being able to respond within c.60 minutes. There is a sufficient water supply to deal with the vast majority of eventualities. This response has been exercised with an additional exercise planned for next year.
8. There are advanced satellite and technological resources available to support the response, such as early identification and warning about forest fires allowing for early detection and intervention before they have been reported from the site (P 9.1). Viggiano hosts a GPS receiver for the Italian GPS Fiducial Network on behalf of the ITRF (International Terrestrial Reference Frame) which was installed by the Italian Space Agency.
9. The city runs drills in schools and other institutions, especially for seismic risk (P 9.7).

ESSENTIAL NINE: AREAS TO CONSIDER STRENGTHENING

The stakeholder interviews and presentations were helpful in understanding Viggiano's comprehensive and well-rehearsed approach to disaster management. The peer review team has identified a number of areas which the municipality may wish to consider as it seeks to further improve its capacity to respond:

1. Although an information conduit exists between the oil plant and the regional government that can be used in the event of an emergency incident, there doesn't appear to be any requirement for direct communication from the oil plant to the Viggiano local government. This could delay response times from the perspective of the local population in reacting to a serious incident at the oil plant. Although there is an audible siren that would be activated in the event of an emergency incident at the oil plant that indicates the local population need to take precautionary measures, the emergency procedures / siren have never been exercised or tested. An SMS (text alert) system has been developed by Viggiano local government, with mobile telephone numbers of the residents of Viggiano, and this could be developed further to inform the local population if an incident occurs, perhaps with direct communication from the oil plant. Any new communications system needs testing through an exercise (P 9.1).
2. Viggiano could build in its existing programme of disaster exercises and its relationship with ENI to rehearse an emergency response involving the Oil Centre either as the site of an accident or as part of a complex scenario where the Oil Centre is part of a wide-area disaster. This would require an exercise that includes different levels of Government, including the regional tier.
3. Viggiano could consider how it will coordinate both with other cities and with provincial/regional government in a wide-area emergency if the current city-based command centres become damaged. All are within line of sight of the Oil Centre and it may be helpful to consider back-up arrangements such as a mutual aid protocol with other cities.
4. It may be useful to consider the provision of DRR related public information for visitors and tourist in varying languages in key locations.
5. With a number of organisations involved in the provision of civil protection, work to ensure resources are coordinated to achieve the best outcomes in joint training, joint exercising and joint deployment of resources in an incident could be helpful.
6. Experience across the world shows that communication is a key point of failure in many responses. The fire service work on a standalone radio communication system that is not accessible to other responders and although the response from the voluntary agencies was highlighted as good practice on a number of occasions it was also identified that some voluntary agencies have not called for back up from the fire service when tackling bush fires. Carrying out exercises that stress test the communications systems between agencies and test to what degree agencies share an awareness of the situation on the ground may be helpful.

ESSENTIAL NINE: RECOMMENDATIONS

Viggiano has indicated a willingness to improve its response capability and the following recommendations are offered as suggestions for the future:

1. Viggiano's plans in case of an industrial accident could be reviewed to include:
 - a. tested protocols for communication lines between an identified local coordinator of civil protection and the Oil Centre to improve emergency response times and mitigate confusion and delays in the event of an emergency
 - b. an exercise involving the local population and based on a scenario requiring siren activation at the Oil Centre to ensure the siren warnings are fit for purpose and achieve the intended population response
 - c. improved information for visitors to the area to describe what, if any, action is required in the event of the emergency siren sounding e.g. emergency action procedures could be included with fire safety information on the rear of hotel room doors or on an easily accessible website
 - d. regular exercises that test the coordination of the fire service's response and the civil protection response to ensure all stakeholders understand what their fellow responders' responsibilities and actions are.
2. It would be beneficial when an exercise is undertaken that debriefs are held to gain an understanding of what went well and can be built on for the future, together with any issues identified and lessons learnt. These can then be incorporated into an action plan to strengthen the emergency response further.

3. The emergency services could consider the provision of a radio system that could be accessed and utilised by all emergency responders to prevent delays in passing on vital information via different radio systems whilst also enabling a more coordinated response. The radio communication system could use multiple channels on the same platform to prevent channel congestion.



INDUSTRIAL SITES KNOWLEDGE EXCHANGE

WORKSHOP : 1ST DECEMBER 2017

As part of the peer review visit, the peer review team had the opportunity to meet representatives from ENI and to discuss industrial risks associated with the Oil Centre. During a subsequent Uscore2 workshop, as a result of the interest in this risk area, Salford extended an invitation to the delegation from Viggiano to take part in a knowledge exchange with the UK/Greater Manchester on the management of potential shocks associated with large industrial sites.

A workshop was developed and hosted in Manchester on the 1st December to facilitate discussions and share ideas and learning between a delegation from Viggiano and Greater Manchester/UK leads for the management of incident planning and response for large chemical installations.

1	Introduction and Welcome	Kathy Oldham, Greater Manchester Chief Resilience Officer
2	Overview of Industrial Sites and Arrangements in Viggiano	Viggiano Delegation
3	Regulation of Industrial Sites in UK and What Works Well	Ian Copland, Inspector for the UL Health and Safety Executive
4	UK National COMAH Network	Norman Powell, Chair of National COMAH Network
5	Local Perspectives	John Fletcher & Steve Thomas, Greater Manchester Fire & Rescue Service and Normal Powell, Chair of National COMAH Network

In the UK the requirements outlined in the Seveso III Directive (2012/18/EU) are delivered in part through land-use planning legislation and through the Control of Major Accident Hazards (COMAH) Regulations 2015. The COMAH Regulations are in place to prevent major accidents involving dangerous substances and limit the consequences to people and the environment of any accidents which do occur.

The regulations are developed and monitored by the Health and Safety Executive (HSE), the UK's national independent watchdog for work-related health, safety and illness. The authority responsible locally to ensure the COMAH regulations are appropriately discharged is the fire service and Greater Manchester Fire and Rescue Service colleagues attended the session to provide their insights.

INDUSTRIAL SITES KNOWLEDGE EXCHANGE WORKSHOP : 1ST DECEMBER 2017

The session discussed issues such as:

- the development of on-site and off-site plans, including the key considerations when assessing the risks associated with a site
- training and exercising requirements and schedules, including roles and responsibilities and integration between site operators, regulators and responder organisations
- warning and informing of accidents, including roles and responsibilities and how risk is communicated to the public

Viggiano delegates were also interested in understanding and reflecting on lessons from the UK's experience of a major incident at a similar type of facility. The group discussed the Buncefield Incident, on the 10th December 2005, when Tank 912 at Hertfordshire Oil Storage Limited (HOSL), part of the Buncefield oil storage depot, was overfilled with petrol due to a technical failure. Large quantities of petrol overflowed from the top of the tank, formed a vapour cloud and ignited causing a massive explosion and a fire that lasted for five days with significant and long-term impacts on surrounding businesses and the community.

Both Viggiano and UK representatives found the session useful to exchange knowledge and to deepen their understanding of common issues.

PEER REVIEW: RECOMMENDATIONS

1. The assessment of seismic risk and the work to analyse the housing sector's vulnerability to geological risks could both be put forward as areas of best practice within Italy and across the wider international community.
2. Each risk is currently assessed separately. The number of risks assessed potentially could be expanded and the risk assessments combined into a risk register to give better understanding of comparative likelihood and potential severity. In terms of broadening the understanding of risk, those associated with climate change could usefully be a particular focus.
3. The city could explore mechanisms for improving data sharing across sectors and across geographical boundaries to ensure a shared understanding of risks between the city and various utility providers and other regional and national agencies. This could include jointly understanding cascading impacts and failures (P 2.2).
4. The city could explore how to improve the dissemination of risk information to the public, potentially through better utilisation of the well-established voluntary community groups in the area.
5. The city could utilise the VIS (Health Impact Evaluation) study of industrial activity in the area in any subsequent assessments of risk and use it to inform mitigation, response and recovery planning.
6. Some decisions about land use are not the responsibility of the municipality but are decisions of regional or national government. However, some of these decisions have a significant impact on the resilience of Viggiano, for example affecting its agricultural or tourist economies, or on Viggiano's risk profile, for example industrial risk. Efforts need to continue to have a strong dialogue between all levels of government to ensure the future of the city and its exposure to risk is informed by local as well as regional or national considerations.
7. The impact of industrial risks on future urban development may need greater consideration, especially given the proposed enlargement of activity in the industrial area. Examples from around the world have provided examples of the need to consider maintaining reasonable distances between residential areas and industrial sites processing hazardous material, pipelines etc.
8. The city may wish to work with utilities companies to understand potential future risks from climate change. Future predictions may have implications for snow, snow melt, spring water etc. and therefore the water supplies to the area including drought scenarios.
9. Viggiano could develop a Climate Change Strategy to build on the national and regional strategies. This would enable identification of priority actions from analysis of the current wide ranging evidence base and also key stakeholder responsibilities.
10. The city could identify protective green and blue infrastructure in its immediate vicinity, those ecosystems that protect against environmental risks, and ensure that if these are developed and built upon, compensatory protective areas enhanced.
11. The city could look at potentially increasing available public transport to strengthen the resilience of the tourism offer, to avoid social isolation as the population ages and to avoid compounding air pollution issues.

PEER REVIEW: RECOMMENDATIONS

12. With well-equipped response units at the local level, Viggiano and Gruppo Lucano could promote their expertise to engage and offer training and exercising to other civil society organisations.
13. It may be a useful exercise to map community capabilities and capacity across the region to help ensure that the correct capabilities are targeted and used both in planning and response.
14. In order to continue to attract investment in education and awareness-raising campaigns, an impact evaluation of current public communication methods to enable the population to prepare for emergencies could be commissioned.
15. With his demonstrable commitment to disaster risk reduction, the Mayor could continue to advocate for DRR and the UN's Making Cities Resilient campaign.
16. Viggiano's plans in case of an industrial accident could be reviewed to include:
 - a. tested protocols for communication lines between an identified local coordinator of civil protection and the Oil Centre to improve emergency response times and mitigate confusion and delays in the event of an emergency
 - b. an exercise involving the local population and based on a scenario requiring siren activation at the Oil Centre to ensure the siren warnings are fit for purpose and achieve the intended population response
 - c. improved information for visitors to the area to describe what, if any, action is required in the event of the emergency siren sounding e.g. emergency action procedures could be included with fire safety information on the rear of hotel room doors or on an easily accessible website
17. It would be beneficial when an exercise is undertaken that debriefs are held to gain an understanding of what went well and can be built on for the future, together with any issues identified and lessons learnt. These can then be incorporated into an action plan to strengthen the emergency response further.
18. The emergency services could consider the provision of a radio system that could be accessed and utilised by all emergency responders to prevent delays in passing on vital information via different radio systems whilst also enabling a more coordinated response. The radio communication system could use multiple channels on the same platform to prevent channel congestion.





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