

Osvaldo Gervasi · Beniamino Murgante ·
Ana Maria A. C. Rocha · Chiara Garau ·
Francesco Scorza · Yeliz Karaca ·
Carmelo M. Torre (Eds.)

LNCS 14107

Computational Science and Its Applications – ICCSA 2023 Workshops

Athens, Greece, July 3–6, 2023
Proceedings, Part IV

4
Part IV



 Springer

Lecture Notes in Computer Science

14107


Founding Editors

Gerhard Goos
Juris Hartmanis

Editorial Board Members

Elisa Bertino, *Purdue University, West Lafayette, IN, USA*

Wen Gao, *Peking University, Beijing, China*

Bernhard Steffen , *TU Dortmund University, Dortmund, Germany*

Moti Yung , *Columbia University, New York, NY, USA*

The series Lecture Notes in Computer Science (LNCS), including its subseries Lecture Notes in Artificial Intelligence (LNAI) and Lecture Notes in Bioinformatics (LNBI), has established itself as a medium for the publication of new developments in computer science and information technology research, teaching, and education.


LNCS enjoys close cooperation with the computer science R & D community, the series counts many renowned academics among its volume editors and paper authors, and collaborates with prestigious societies. Its mission is to serve this international community by providing an invaluable service, mainly focused on the publication of conference and workshop proceedings and postproceedings. LNCS commenced publication in 1973.

Osvaldo Gervasi · Beniamino Murgante ·
Ana Maria A. C. Rocha · Chiara Garau ·
Francesco Scorza · Yeliz Karaca ·
Carmelo M. Torre
Editors

Computational Science and Its Applications – ICCSA 2023 Workshops

Athens, Greece, July 3–6, 2023
Proceedings, Part IV


Editors

Oswaldo Gervasi 
University of Perugia
Perugia, Italy

Ana Maria A. C. Rocha 
University of Minho
Braga, Portugal

Francesco Scorza 
University of Basilicata
Potenza, Italy

Carmelo M. Torre 
Polytechnic University of Bari
Bari, Italy

Beniamino Murgante 
University of Basilicata
Potenza, Italy

Chiara Garau 
University of Cagliari
Cagliari, Italy

Yeliz Karaca 
University of Massachusetts Medical School
Worcester, MA, USA

ISSN 0302-9743

ISSN 1611-3349 (electronic)

Lecture Notes in Computer Science

ISBN 978-3-031-37113-4

ISBN 978-3-031-37114-1 (eBook)

<https://doi.org/10.1007/978-3-031-37114-1>

© The Editor(s) (if applicable) and The Author(s), under exclusive license
to Springer Nature Switzerland AG 2023

Chapters “Natural Fracture Network Model Using Machine Learning Approach” and “Agricultural Crops and Spatial Distribution of Migrants: Case Studies in Campania Region (Southern Italy)” are licensed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>). For further details see license information in the chapters.

This work is subject to copyright. All rights are reserved by the Publisher, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, reuse of illustrations, recitation, broadcasting, reproduction on microfilms or in any other physical way, and transmission or information storage and retrieval, electronic adaptation, computer software, or by similar or dissimilar methodology now known or hereafter developed.

The use of general descriptive names, registered names, trademarks, service marks, etc. in this publication does not imply, even in the absence of a specific statement, that such names are exempt from the relevant protective laws and regulations and therefore free for general use.

The publisher, the authors, and the editors are safe to assume that the advice and information in this book are believed to be true and accurate at the date of publication. Neither the publisher nor the authors or the editors give a warranty, expressed or implied, with respect to the material contained herein or for any errors or omissions that may have been made. The publisher remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

This Springer imprint is published by the registered company Springer Nature Switzerland AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Contents – Part IV

Integrated Methods for the Ecosystem-Services Accounting in Urban Decision Process (Ecourbn 2023)

Research, Development and Innovation Projects for Territorial Cohesion in Inland Marginal Areas: Economic Analysis of Social and Cultural Benefits	3
<i>Gabriella Maselli, Pasquale Persico, Antonio Nesticò, and Federica Russo</i>	
The Role of Renewable Energy Communities in the Sustainable Urban Development	19
<i>Maria Rosaria Sessa and Francesco Sica</i>	
The Infrastructure Sector Sustainability: Using of the Deterministic Frontier Analysis for Performance-Accounting Measurement	31
<i>Raffaele Maria Sica, Francesco Sica, Maria Rosaria Sessa, and Nicola Sica</i>	
Unveiling the Potential Use of Euler Equations in the Utility Additive Analysis for Mass Appraisal	42
<i>Francesco Tajani, Francesco Sica, Maria Rosaria Guarini, Pierluigi Morano, and Rossana Ranieri</i>	
Evaluation Aspects in the Strategic Planning of a Reticular DMO for the Promotion of Inner Areas of Calabria	54
<i>Francesco Calabrò and Immacolata Lorè</i>	
Integrating Ecosystem Services Value in the Economic Assessment of Urban Projects. Proposal of an Analytical-Operative Approach	73
<i>Maria Rosaria Guarini, Francesco Sica, Pierluigi Morano, and Francesco Tajani</i>	
Ethical AI Applications for a Human-Centered Cyber Society (EthicAI 2023)	
Ethical Artificial Intelligence in Telerehabilitation of Neurodevelopmental Disorders: A Position Paper	87
<i>Aurora Castellani, Mariagrazia Benassi, and Giulia Balboni</i>	

Natural Language Processing Techniques for Hate Speech Evaluation
for Brazilian Portuguese 104
Cássia C. S. Rosa, Fábio V. Martinez, and Renato Ishii

From Black Box to Glass Box: Advancing Transparency in Artificial
Intelligence Systems for Ethical and Trustworthy AI 118
Valentina Franzoni

**13th International Workshop on Future Computing System
Technologies and Applications (FiSTA 2023)**

Towards a Dynamic Computation Offloading Mechanism with Twin
Delayed DDPG in Edge Computing 133
Aiichiro Oga and Bernady O. Apduhan

Data-Flow Visual Programming Environment for Small IoT Devices 150
Sota Ogura, Kazuaki Tanaka, Ko-ichiro Sugiyama, and Miu Kawahara

Tweets Sentiment Analysis of Putin’s Participation at the G20 Summit
in Indonesia 162
*Syifa Auliyah Hasanah, Isal Firmansyah, Farid Azhar Lutfi Nugraha,
Anindya Apriliyanti Pravitarsari, Eka Novita Sari, and Tutut Herawan*

Droneways: Definition of Unmanned Aircraft Vehicles Airways and Traffic
Management for Urban and Interurban Environments – A Survey 179
*Rafael Marinho de Andrade, Elcio Hideiti Shiguemori,
and Rafael Duarte Coelho dos Santos*

Geomatics for Resource Monitoring and Management (GRMM 2023)

Integration of Copernicus Data and Services to Assess Local Aridity
Conditions in the Apulian Context: The Case of Marina di Ginosa 201
Carlo Barletta, Alessandra Capolupo, and Eufemia Tarantino

Integrated Use of Geomatic Methodologies for Monitoring an Instability
Phenomenon 217
*Noemi Pagano, Alberico Sonnessa, Federica Cotecchia,
and Eufemia Tarantino*

Crowdsensing Close-Range Photogrammetry for Accurately
Reconstructing a Digital Twin of a Cultural Heritage Building Using
a Smartphone and a Compact Camera 234
Cristina Monterisi, Alessandra Capolupo, and Eufemia Tarantino

Landsat 9 Satellite Images Potentiality in Extracting Land Cover Classes in GEE Environment Using an Index-Based Approach: The Case Study of Savona City	251
<i>Alessandra Capolupo and Eufemia Tarantino</i>	
Collaborative Planning and Designing for the Future with Geospatial Applications (GeoCollab 2023)	
Geodesign Education: Case Studies from the US, Brazil and Italy	269
<i>Ana Clara Mourão Moura, Michele Campagna, Alenka Poplin, Rosanna G. Rivero, and Francesco Scorza</i>	
Geomatics in Agriculture and Forestry: New Advances and Perspectives (GeoForAgr 2023)	
Enhanced Map Composition and Diachronic Land Cover Classification of Landsat Data in Google Earth Engine	289
<i>Marco Vizzari, Cecilia Parracciani, and Daniela Gigante</i>	
Intra-network Analysis Based on Comparison Between Graph Theory Approach and Pathwalker	300
<i>Giovanni Lumia, Samuel Cushman, Salvatore Praticò, and Giuseppe Modica</i>	
MEDALUS Model Evolutions and Prospects Case Study Sicily	310
<i>Rachele Castro, Simone Lanucara, Vincenzo Piccione, Giovanni Pioggia, Giuseppe Modica, and Maria Alessandra Ragusa</i>	
Predictive Modelling of Maize Yield Using Sentinel 2 NDVI	327
<i>Andrea Soccolini and Marco Vizzari</i>	
UAV LiDAR Survey for Forest Structure Metrics Estimation in Planning Scenario. A Case Study on a Laricio Pine Forest in the Sila Mountains (Southern Italy)	339
<i>Giandomenico De Luca, Salvatore Praticò, Gaetano Messina, Enrico Borgogno-Mondino, and Giuseppe Modica</i>	
Palm Tree Dataset Construction with Plant Height Estimation and Plant Counting Tasks	350
<i>Phisit Srijan and Chantana Chantrapornchai</i>	



**Geographical Analysis, Urban Modeling, Spatial Statistics
(Geog-An-Mod 2023)**

Grid-Based Generalisation of Area Polygons for Automated Application in Small-Scale Statistical Maps	371
<i>Marion D. Simon and Hartmut Asche</i>	
Natural Fracture Network Model Using Machine Learning Approach	384
<i>Timur Merembayev and Yerlan Amanbek</i>	
Indicators Engineering for Land Use Changes Analysis. A Study on the Mediterranean Coastal Strip	398
<i>Francesco Zullo, Cristina Montaldi, Lorena Fiorini, Alessandro Marucci, and Bernardino Romano</i>	
Agricultural Crops and Spatial Distribution of Migrants: Case Studies in Campania Region (Southern Italy)	411
<i>Giovanni Mauro, Maria Ronza, and Claudio Sossio De Simone</i>	
Simulation of Total Phosphorus in Biscayne Bay, USA	427
<i>Vladimir J. Alarcon, Paul F. Mickle, Christopher R. Kelble, Anna C. Linhoss, and Alexandra Fine</i>	
Mapping Political Extremism on Twitter in Brazil	439
<i>Geisa Tamara Bugs, Agnes Silva de Araujo, Diego Saez-Trumper, and Rodrigo Firmino</i>	
Increasing Urban Sustainability Designing Vertical Garden: The Experience of Pisticci Municipality (Southern Italy)	455
<i>Beniamino Murgante, Giuseppe Trabace, Veronica Vespe, and Domenico Laviola</i>	
The 15-minute City Model: Assessment of the Socio-Economic and Environmental Impacts Associated with the Location of Essential Amenities	468
<i>Dino Molinaro, Valentina Santarsiero, Lucia Saganeiti, and Beniamino Murgante</i>	
Spatial Multi-criteria Analysis for Identifying Suitable Locations for Green Hydrogen Infrastructure	480
<i>Rossella Scorzelli, Shiva Rahmani, Annamaria Telesca, Grazia Fattoruso, and Beniamino Murgante</i>	

<p>Urban Regeneration in the Age of Transitions</p> <p style="padding-left: 20px;"><i>Celestina Fazia, Dora Bellamacina, Giulia Fernanda Grazia Catania, and Federica Sortino</i></p>	<p>495</p>
<p>Emerging Technology Trends in Geocomputation Methods: A Literature Review</p> <p style="padding-left: 20px;"><i>Simone Corrado and Francesco Scorza</i></p>	<p>510</p>
<p>Optimising a Virtual 3D City Model for Citizen-Based Urban Development in East Jerusalem</p> <p style="padding-left: 20px;"><i>Andreas Fricke, Jürgen Döllner, Hartmut Asche, and Fadi Isaac</i></p>	<p>521</p>
<p>Transport and Logistics Performance Assessment: Beyond the Conventional Approach</p> <p style="padding-left: 20px;"><i>Francesco Bruzzone, Federico Cavallaro, and Silvio Nocera</i></p>	<p>536</p>
<p>Agrovoltaic as an Answer to the Difficult Relationship Between Land Use and Photovoltaics. A Case Study from Apulia Region</p> <p style="padding-left: 20px;"><i>Andrea Gallo and Claudio Sossio De Simone</i></p>	<p>547</p>
<p>Implementing a Development Strategy for Revitalizing Industrial Areas in Crisis. The Experience of the Tito Industrial Area in the Basilicata Region (Southern Italy)</p> <p style="padding-left: 20px;"><i>Beniamino Murgante, Luigi Vergari, Canio Alfieri Sabia, Giuseppina Lo Vecchio, Michele Micucci, and Francesco Scorza</i></p>	<p>560</p>
<p>Combining Tourism Revitalization with Environmental Regeneration Through the Restoration of Piano del Conte Lake in Lagopesole (Southern Italy)</p> <p style="padding-left: 20px;"><i>Beniamino Murgante, Giuseppe Trabace, and Veronica Vespe</i></p>	<p>575</p>
<p>A Machine Learning Method for the Analysis of Urban Italian Mobility</p> <p style="padding-left: 20px;"><i>Gabriella Schoier and Giuseppe Borruso</i></p>	<p>590</p>
<p>Author Index</p>	<p>605</p>



Agricultural Crops and Spatial Distribution of Migrants: Case Studies in Campania Region (Southern Italy)

Giovanni Mauro¹ , Maria Ronza² , and Claudio Sossio De Simone³

¹ Department of Humanities, Vanvitelli University, Caserta, Italy
giovanni.mauro@unicampania.it

² Department of Humanities, University of Naples Federico II, Naples, Italy
mronza@unina.it

³ Department of Humanities, University of Roma Tor Vergata, Rome, Italy
claudiosossio.desimone@students.uniroma2.eu

Abstract. In the current context of increasing stabilization of migrants permanently residing in the Campania region (southern Italy), this paper aims to investigate the relationship between the spatial distribution of migrants and the work opportunities in the agricultural sector. We analyse data in the agriculture and population censuses currently available at the municipality level (referring to 2011) and we apply spatial autocorrelation techniques, using the Local Indicator of Spatial Association (LISA) and Getis-Ord G_i^* statistic. The maps clusters of migrants (classified by continent) and agricultural crops or breeding (horticulture, orchards and citrus, buffalo and poultry farms), highlight a positive spatial correspondence between resulting hot spots. Finally, we overlay the resulting cluster maps to understand the significance of any external factors, such as the employment opportunities in the areas where migrants have settled.

Keywords: Migrations · Agriculture · Campania Region · Spatial autocorrelation · Cluster analysis

1 Introduction

Italy's booming economy began attracting workers from surrounding countries during the early 1970's. Over the next fifty years, migration has become a significant component of the Italian population: according to official sources¹, in Italy there are now more than five million migrants, about 8.5% of the total population. This percentage is in line with that of the European Union (currently home to 37.5 million migrants²), often dubbed

¹ *Immigrati.stat*, <http://stra-dati.istat.it/>, last accessed 2023/04/15.

² Statistics on migration in Europe, https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/promoting-our-european-way-of-life/statistics-migration-europe_en, last accessed 2023/04/18.

Fortress Europe [1] to describe the way in which legal immigration is controlled³. These, often underestimated, numbers concern a heterogeneous collection of illegal immigrants who very frequently consider Italy as only a transit territory to other European countries.

Due to the different job opportunities, their distribution in Italy is uneven: nearly 60% live in the North, 25% in the Centre, while only 12% in the South⁴ [2]. They represent about 10% of the current workforce in Italy, mainly employed in the services (64.1%) and manufacturing (28.6%) sectors. The remaining 7.3% (about 165,000 people) work in agriculture; these are mainly Romanians (about a quarter, but this number has declined in recent years), Moroccans (10%), Albanians (10%) and Indians (10%). Conversely, African (e.g., Senegalese, Nigerian, Malian, etc.) and South Asian (e.g., Pakistani and Bangladeshi) groups have rapidly increased in recent years [3].

Their presence is today a structural factor for the agricultural sector and their ratio in relation to the Italian farmers is constantly increasing [4]. Despite this, their working conditions are frequently characterized by precariousness; illegal exploitation, undeclared work, and earnings below allowable limits [5], so much so as to be referred to as a *new slavery*. This situation, frequently conditioned by short-term employment, has created a so-called *disposable* form of slavery [6]. This is a widespread trend throughout the entire country from Friuli to Sicily, but it is most prevalent in the South, where the proportion of migrants employed in the agricultural sector (about 40%) [7] is much higher. Hired as herdsmen, fruit and vegetable pickers, shepherds, woodcutters, etc. the migrants are agricultural workers willing to do any job. This *cost-cutting* migrant labor force [8] is composed of invisible people, scattered across farmland, often occupying abandoned or disused farmhouses or creating new ghettos [9].

A prevailing uncertainty about the data makes any research about migration more difficult. In fact, even though it is a highly relevant geographical topic, the bibliography concerning the use of GIS technology in this field is rather scarce. There are, however, several studies investigating the spatial distribution of migrants using geo-statistics. For instance, spatial autocorrelation techniques are used to analyze migration flows in Italy [10, 11] and in other European cities [12]. Some research to evaluate the potential of spatial network analysis to analyze migration patterns such as research by Di Mario [13] in the case of Libya has been undertaken. Other research, conducted by Rashid [14] considers the capability of a GIS-based multicriteria decision analysis approach in formulating a spatial migration mode.

The spatial distribution of immigrants in a territory, considered sometimes as a key integration indicator [15], may be random and scattered, mixed (mainly in the urban areas) or in isolated enclaves. Although theoretically the reasons for this choice could be individual, the studies in this area highlight that it is often not a free choice at all. According to *Spatial Assimilation Theory*, «immigrants will concentrate in the same ethnic area, not only to overcome disadvantages associated with language barriers, information uncertainty, and low socioeconomic status, but also to make the best use of employment and welfare conditions attributable to being in a community of immigrants» (see Murayama and Nagayasu, 2021, 3849) [16]. Instead, the *Differential Incorporation*

³ Since 1988, *Fortress Europe* is also a press review remembering the victims of the European border, <http://fortresseurope.blogspot.com/>, last accessed 2023/04/15.

⁴ The residual 4% live in the main islands (Sicily and Sardinia).

Theory emphasizes how this process depends mainly on external factors, closely linked to the host population (the dominant group), which often discriminates against migrants based on ethnicity and skin colour [17].

Without being exhaustive, this paper aims to investigate the relationship between the spatial distribution of migrants in the Campania Region (southern Italy) and the work opportunities in the agricultural sector. We will briefly describe the regional context, mainly with reference to agriculture and the current presence of migrants. Then, we will analyse Census data from the Italian National Institute of Statistics (ISTAT) of 2011. Unfortunately, we had to choose this old data because these are the only figures currently available on agriculture at the municipal scale. Upon this dataset, we can apply spatial autocorrelation techniques to map significant clusters of municipalities characterized by: 1) migrant groups, classified by continent; 2) some agricultural crops or breeding activities, in which migrants are usually involved. Finally, we will discuss our results to understand the significance of these external factors (i.e. work opportunities) on the spatial distribution of migrants.

2 The Regional Context: Agriculture and Migrants in Campania

Campania is a predominantly hilly (more than 40%) and mountainous Region, traversed by the Apennine chain with some particularly prominent mountain groups, such as Matese, Partenio, Picentini and Alburni. The remaining plains (Caserta, Sarno and Sele) account for about a quarter of this territory and are generally very densely populated (Fig. 1). Despite very strong urban growth in the last fifty years, this territory maintains a very high biodiversity. The contraction of agricultural land and traditional farming systems in favor of natural reforestation (especially in internal areas) and an increase in arable land are some of the most significant transformations in recent decades [18]. The cultivation of the so-called *Mediterranean triad* (wheat, olives, and wine) has always characterized agriculture in this area. There are, however, other excellent agri-food products, some known internationally, the most famous of which being the Buffalo Mozzarella.

The European quality labels, such as the protected designation of origin (PDO) or the protected geographical indication (PGI), promote and protect these products by banding them to the territory and landscape in which they are made⁵.

The number of farms in the region, sharply declining over the last twenty years, is still quite relevant (almost 80,000). Usually, these are family farms (about 97%) of small size (about 6.5 ha) [19] in which more than 65,000 people (the 4.1% of regional employed) find employment [20]. Although the trend in the average farm area is growing (in 2000 the average size was 2.5 ha), it is still an *atomized* agricultural structure; the largest average farm sizes are mainly located along the Apennine ridge (Roccamonfina, Matese, Picentini, etc.) and in the Caserta and Sele Plains [21, 22]. Areas cultivated with cereals (wheat and maize) are predominant (about 25%), but the fruit and vegetable sector also remain very important (more than 10%). The number of farms with livestock

⁵ Other famous examples of typical products from the Campania Region are the Sorrento lemon (PGI) or the Amalfi Coast lemon (PGI), the Cilento extra virgin olive oil (PDO), the Vesuvius Piennolo tomato (PDO), etc.

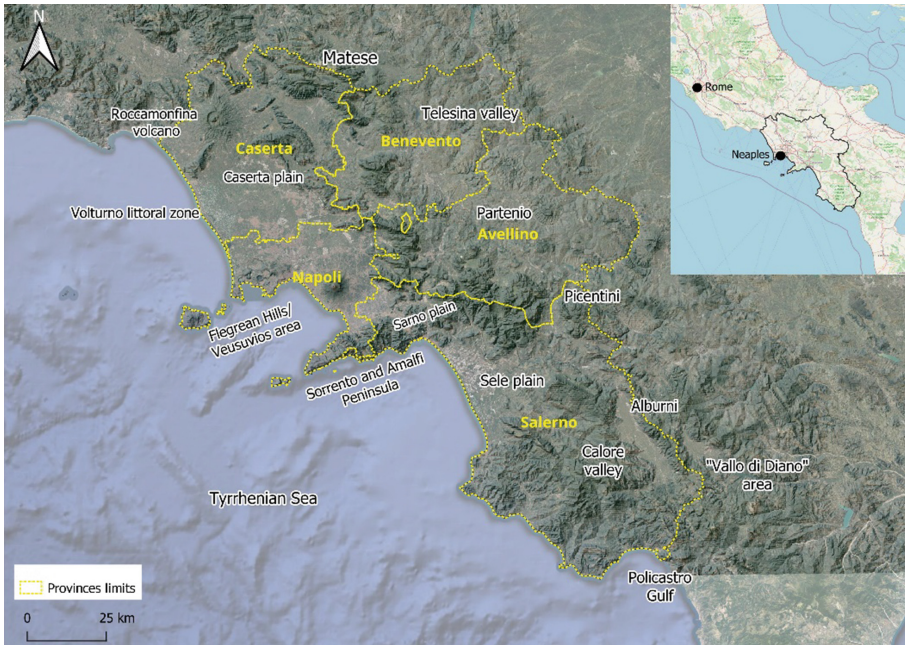


Fig. 1. Overview of principal regional rural landscapes.

and livestock-only farms is also significant, accounting for more than 6% of the national total. Buffalo breeding remains a Campanian brand; the farms involved total nearly 1,100, more than 70% of total livestock nationwide [19, 23].

Officially, the current number of migrant residents in Campania is approximately 240,000 (4.8% of residents in Italy). Although the presence of irregular and illegal migrants has always been a significant component, this number has increased in recent decades whenever there is an amnesty [24]. Until the early 2000s, this region was often considered a transit area for migrants, who usually later moved on to northern Italy or other European countries. However, over the last two decades, Campania has become a stable settlement area for migrants [25], so their numbers have consistently grown.

Naples has always been the region's main area of attraction, where about half of the migrants live, while approximately 20% inhabit the coastal provinces of Caserta and Salerno. The remaining 10% live in the inland provinces of Avellino and Benevento. This situation is very similar to that of 2011, the year to which the data analyzed in this research paper refers to. Ten years ago, the migrants were almost 150,000, with the same spatial distribution within the Region. They were mostly Europeans (almost 60%), while Asians and Africans were equally proportionate (about 17%).

In addition to better job opportunities than in the country of origin, currently the main reasons for migration are family reunification and asylum seeking, while in the past migrants were predominantly middle-aged women, they are now young men. The migrant community is becoming larger (in absolute terms) and at the same time, more diverse by place of origin: the most prominent groups are Ukrainians and Romanians,

followed by Moroccans, Sinhalese and Chinese. These first five communities account for more than 50% of the migrants in Campania, although there has been a strong growth of South Asian (e.g., Bangladeshi and Pakistani) and sub-Saharan (e.g., Nigerian, Senegalese, and Ghanaian) communities since 2000 [26]. The 2021 ISTAT data [19] estimates that migrants employed in the agriculture sector in Campania number more than 25,000 people, almost a quarter of all people working in this sector. They are equally divided between EU and non-EU in origin, and over 80% are employed on fixed-term contracts.

3 Data and Methodology

3.1 Source of Data

ISTAT Censuses data were considered for analysis at the municipal level to evaluate the potential relationships between job opportunities and the spatial distribution of migrants. We analyzed the data of the 6th General Census of Agriculture (2011) and the 15th General Census of Population and Housing (2011). We had to consider these old data because the first results of the current Census of Agriculture (2021) are available only at a regional level [19].

Regarding the census data on agriculture [27, 28], we have considered variables closely related to employment opportunities in which migrants are generally involved. For this reason, we analyzed data on horticultural cultivations and orchards (also including the citrus class). Usually, as is well known, migrant labor is favored for harvesting because of its extremely low costs. This is seasonal work, but nevertheless quite prolonged and, therefore, different from the decidedly more occasional grape or olive harvest. We evaluated the total acreage (Ha) of horticultural and fruit crops at the municipal level, expressed as percentage of *utilized agricultural acreage*. For similar reasons, buffalo and poultry number were also examined; in this case migrant labor is often required for the routine management (feeding, milking, dung cleaning, etc.) of these animals. In this case, we considered the absolute value of animal heads for each municipality of the Campania region.

We also observed the number of migrants per municipality. The population Census of 2011 [29] provided these data by classifying migrants by continent (European, Africans, Asians, etc.). Also in this case, the figures were expressed as a percentage of the total number of inhabitants per municipality.

3.2 Theoretical Overview

In order to map the sharper boundaries between wealth and poverty or the unexpectedly high rates of cancer in a specific area, the analysis will need to employ a growing collection of spatial and nonspatial information [30]. According to this consideration, this research aims to integrate analytical geo-computation and modelling practices to place events and facets of human society in the analytical space, a framework typical of GIScience [31, 32].

For these reasons, it has been decided to employ a specific model of classification, a cluster analysis workflow, to highlight whether there were units with similar values

clustered, randomly distributed, or dispersed [33]. Indeed, as it is such a fruitful method to analyse and examine events, patterns, and relationships in space and time they are employed in various geographic research projects. For example, in physical geography it has been used to select regions based on their climatic parameters or to identify patterns of regional climate change. In social and economic geography, clustering is used to identify crime hotspots or study spatio-temporal patterns of socio-economic change. Moreover, in a multidisciplinary project, it is also utilised to identify the variables representing the social, economic, agriculture, and health sectors as the main resilience indicators [34].

The purpose of cluster analysis is to create groups of statistical units as a collective, so that the units included in the same group are as similar to each other as possible and there is maximum dissimilarity to the units comprising the opposing groups [35]. The cluster analysis, related on geographical objects has been utilised as the principal aspect of spatial autocorrelation, that elaborate on the first law of geography [36].

According to Goodchild (1986) [37], spatial autocorrelation is defined as a descriptive index, which measures how a set of units are correlated and distributed in space. The measurement of the indices is at a global or local level. Global measures of spatial autocorrelation estimate a single measure of the relationship between observations. However, local measures provide a value at each location, considering the relationship between both its neighbouring sites and the entire dataset [38]. It must also be noted that this measure can be expressed in the positive or negative. Positive spatial autocorrelation results when nearby locations have correlated attribute values. In turn, negative spatial autocorrelation occurs when dissimilar values are correlated [39, 40].

The most common GIS software utilises specific tools for calculating indices of Spatial autocorrelation, like the Global Moran's and Geary's c or Local Indicator of Spatial Association (LISA), that help in statistically validating the representation of identified clusters [41]⁶.

3.3 Spatial Autocorrelation: Techniques on GIS

We used the Local Indicator of Spatial Association (LISA) to define the highest values of foreigners in our study area in relationship with the highest level of similarity with neighboring municipalities. We did the same to check the correlation to spatial distribution of foreign people and the work opportunity in the primary sector. In particular, the indices used are local Moran's I (LISA) and G_i^* statistic measures.

Starting from the described database (see Sect. 3.1), spatial clusters of features with high or low values were identified. In the GIS toolset, it is computed a value for the local index, a z score, a pseudo p value, and a code representing the type of cluster for each statistically significant feature. The z scores and pseudo p values represent the statistical significance of the calculated index values [42]⁷.

In particular, the Local Moran's I_i is defined in compliance with the hypothesis of Anselin (1995) [43] and it allows, for each location, to evaluate the similarity of each

⁶ Regarding the mathematical properties of the above-mentioned indices see Serra-Sogas *et al.* [38].

⁷ The p -value is a probability that the observed spatial cluster was created by some random process while z -scores are standard deviations, see Mitchell 2005 [42].

observation to the surrounding elements in four scenarios [11]: distinguishes between statistically significant clusters of high values (HH), clusters of low values (LL), clusters in which a high value is surrounded mainly by low values (HL), and clusters in which a low value is surrounded mainly by high values (LH). Statistical significance is given by features with p-values and z-values. In the specific case, the p-value results less than 0.05 are considered statistically significant, while a low z-score (e.g., less than -3.96) indicates a statistically significant cluster of spatial data⁸. Instead, The G_i^* statistic, in according to the Getis and Ord (1992, 1996) [44, 45], measures the degree of this association that results from the concentration of weighted points (or the area represented by a weighted point) and all other weighted points within a distance radius of the original weighted point [46]. The Getis-Ord G_i^* map was constructed based on z-values. At statistically significant positive z scores, the higher the z score, the greater the clustering of high values (named hot spot). Moreover, significant negative z scores, the lower the z score, the most intense is the clustering of low values (named cold spot) [38]⁹.

In summary, the cluster analysis workflow of research is the following.

- i. Collecting and analysed the data of ISTAT about foreigners from 15th General Census of Population and Housing and about 6th General Census of Italian Agriculture (2011).
- ii. Designed a spatial dataset about the foreign people and some variable of the primary sector at regional level (Campania region) in GIS-platform. In this case, in addition to the data in (i), the Regional Land Use Plan (Campania) is also integrated.
- iii. LISA and Getis-Ord G_i^* cluster maps of foreign people (total foreign values; Europeans; Asians; Africans) can be constructed in Mapping Clusters toolset (ArcGIS pro software). The LISA maps are developed in the Cluster and Outlier Analysis (Anselin Local Moran's I) tool, instead, the Getis-Ord G_i^* cluster maps in Hot Spot Analysis tool.
- iv. Analyzed the data from the LISA and Getis-Ord G_i^* cluster maps in computational software and selected the best cluster maps, specifically the Getis-Ord G_i^* cluster maps.
- v. Overlaid, in GIS-platform, the cluster analysis data of foreigners with those of agricultural classes. The overlay algorithm used combines features from the *input layer* and the *intersect layer*, resulting in features that cover both layers' features. The *overlay maps* symbology are setting colours based on discrete groups of attribute value, in detail the sum of the GIN_{bin} values of the hot spots (see Sect. 4).

⁸ In this research it is not taken into account The FDR correction, that reduces the p-value threshold from 0.05 to a value that better reflects the 95% confidence level given, <https://pro.arcgis.com/en/pro-app/latest/tool-reference/spatial-statistics/h-how-cluster-and-outlier-analysis-anselin-local-m.htm>, last accessed 2023/04/24.

⁹ <https://pro.arcgis.com/en/pro-app/latest/tool-reference/spatial-statistics/h-how-hot-spot-analysis-getis-ord-gi-spatial-stati.htm>, last accessed 2023/04/24.

4 Results

The presence of migrants in Italy and their contribution to the country’s economy, and thus to agriculture, must be framed in the broader perspective of the demographic and structural changes of the country. By using the available data from the recent agricultural and population censuses at the municipal level (source ISTAT), the cluster analysis aims to understand to what degree the variables involved (e.g., horticultural areas, presence of foreign men, etc.) are connected.

By comparing the clusters obtained from the two cluster analysis indices, local Moran’s I (LISA) and Getis-Ord Gi* statistic measures, it can then be decided which are the most significant clusters for the study area. In particular, the Getis-Ord Gi* index is more suitable for the research’s dataset and is able to track an increasing number of clusters at the opposite end of a smaller number of elements that are un-clustered (Fig. 2) Indeed, among the 550 units consider (municipalities in the Campania region) 386 units were detected with high cluster values (hot spot clusters) compared with 187 (HH and HL clusters) concerning the LISA index.

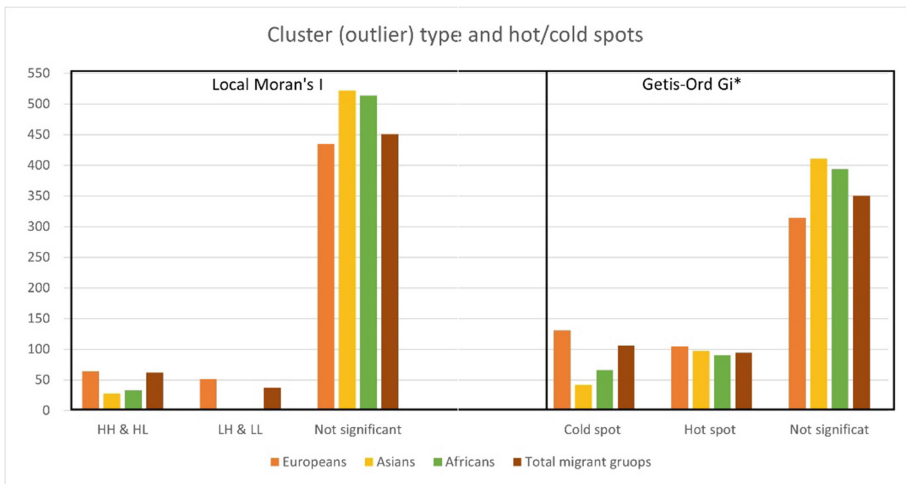


Fig. 2. Comparison of local Moran’s I (LISA) and Getis-Ord Gi* statistic measures: number and type of clusters.

The Getis-Ord Gi*’s map clusters (Fig. 3), identified the different spatial distribution of each group of migrants assessed by continent (Europeans, Asians, Africans) and the cluster of total migrants.

It should also be noted that the Getis-Ord Gi*’s maps have a set of fixed, statistically significant ranges¹⁰. The features, therefore, adhere to the following structural ranges; organized in a 99%–95% confidence, a 95%–90% confidence and a 90% and lower confidence threshold. In addition, the maps utilize a color gradient scale based on that

¹⁰ Statistical significance can be expressed as a percentage degree of significance.

regions' confidence level¹¹. The degree of percent significance of hot and cold spots offers a more uniform outlook on the location of migrants in different areas of Campania. It is certainly a possibility that migrants are present in large numbers in one or two municipalities, but their location can be characterized as nucleated or dispersed on a regional scale (see Sect. 2).

The largest number of migrant hot spot clusters are in the western area of Caserta province (around the Volturno littoral cost area) and in the central area of the Salerno province at the border of Salerno city. In contrast, the cold spot clusters are in Benevento province and in the Naples area. By examining the individual groups, it can be observed that the Europeans have a denser population in the Salerno province; the Asians groups occupy the Phlegrean Fields near Naples and Sele Plain (Salerno); whilst the African population is clustered in the Caserta province.

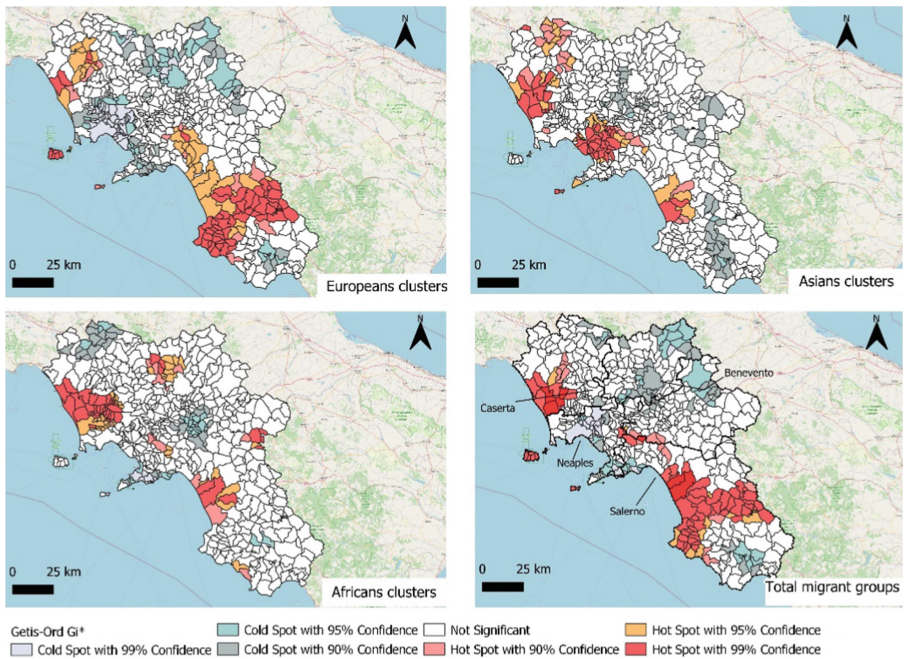


Fig. 3. Getis-Ord G_i^* 's map clusters of migrant groups in the Campania region.

We applied the same algorithm (Getis-Ord G_i^* index) to define the significant clusters related to the agricultural variables (horticulture and orchard areas, number of buffalo and poultry).

The Getis-Ord G_i^* cluster map generated from official data highlighted a specific cluster system centered around the principal agricultural production area (Fig. 4). The main cluster hot spot of horticulture value is centrally placed in the Plain Systems,

¹¹ The red colour scale concerning the hot spot records and blue colour scale concerning the cold spot records.

between the Volturno Plain and the Sele Plain. In addition, according to the 6th Census, the hot spot cluster of citrus and orchards values is located around the Phlegraean Hills and the Sorrento area. However, in the Benevento area this production area is represented by cold spots. Furthermore, regarding buffalo farms, clusters have been established in the traditional production areas, Volturno Plain, Volturno littoral cost area and Sele Plain.

Finally, an overlap analysis was carried out between the cluster analysis data of migrants and the agricultural classes. We combine features from migrant hot spots layer (Fig. 3) and the agricultural hot spots layer (Fig. 4). Their intersection resulted in a new feature that covered both layers. If the input feature(s) only partially lie within the other layer's feature(s), they are split along the boundary of the other layer's feature(s). Then, we sum the *GIN_bin* values of the hot spots¹² (see Sect. 3.3); the *overlay maps* utilize a color gradient scale based on discrete grouping of the final attribute values (Fig. 5).

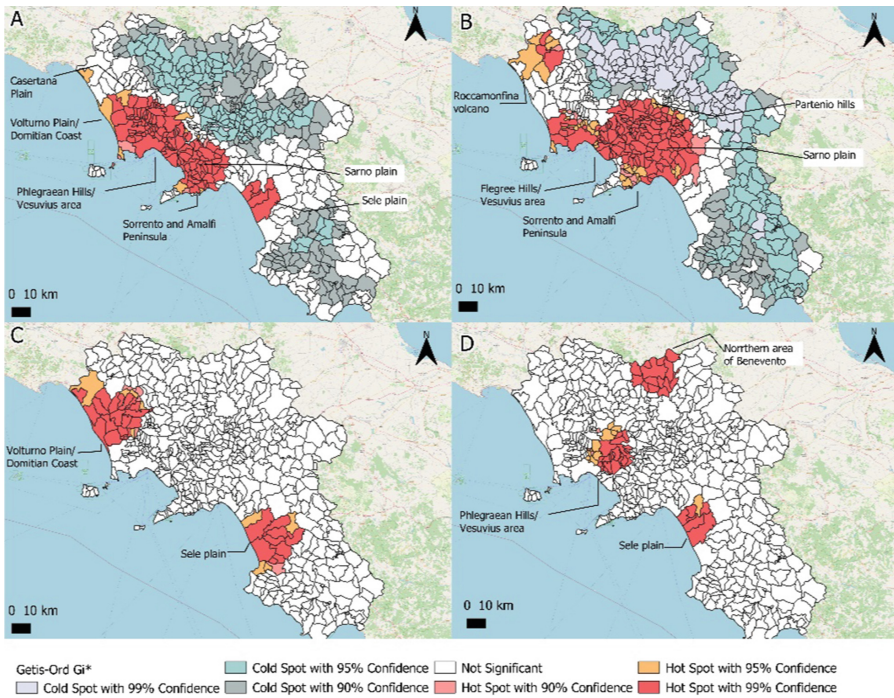


Fig. 4. Getis-Ord G_i^* 's maps clusters of agriculture dataset at region scale: A horticulture; B) Citrus and orchards; C) buffalo farm D); poultry farm.

¹² The value is equal to *GIN_bin* hot spot foreign records added to *GIN_bin* hot spot agricultural records.

5 Discussion and Final Remarks

The uncertainty of data about migrants and the relevance of their workforce in a specific sector are difficulties in defining a geographic relationship between the job opportunities and the spatial distribution of migrants. The uncertainty of data concerning migrants and the relevance of their workforce in a specific sector demonstrate the difficulties in defining a geographic relationship between the job opportunities and the spatial distribution of migrants. This is especially true in agriculture, a sector where illegality and migrant labor often coexist for lower production costs. In a field employing only a marginal share of immigrant workers (less than 8%), the reasons behind their residential choice may be obscured. Employment in the manufacturing or services sectors, lower rental costs, a concentration of the same ethnicity in the same geographic area could all be factors, so any associations between the type of work and the resident population can only indicate a general trend, and not necessarily the rule. It is equally difficult to define precisely in which areas of agriculture (i.e., horticulture, livestock, etc.) a national or ethnic group is involved, since migrants working in the agricultural sector are *transversal* [8], namely they adapt well to any task. In view of this, we can analyze the overlap maps between migrant residents and agricultural activities (Fig. 5).

Urban concentration of migrants in the metropolitan area of Naples and conspicuous migratory flows towards the rural areas in the Phlegrean Fields, Caserta, Sele and Sarno plains have characterized the migration in Campania since the 1980s [24]. While being a dynamic and complex phenomenon, our results highlight how much recent changes in the agricultural sector have weighed on the different migration components. In fact, in a regional context, characterized by a pulverized agricultural structure (Sect. 2), the farms in the Caserta and Sele low plains were an exception even ten years ago [27]. This implies the development of a more organized, modern, and competitive agricultural sector capable of stabilizing its workforce, even for seasonal activities. Although undergoing a strong restructuring of the agri-food system (with a contraction, for example, of tomato production), in these areas horticultural production and buffalo breeding (flanked by other forms of breeding such as poultry breeding) remain very important (Fig. 4). And this is probably why the presence of African migrants (especially Maghrebi and sub-Saharan), like Asian migrants (mainly Indians and Pakistanis) in the Caserta and Sele plains, acquires more of a residency characteristic over time [8]. During the early 1990s, this situation generated some precarious agglomerations in the Province of Caserta, such as the ghetto of Villa Literno (where several hundred Senegalese, Ivorians, etc. lived) or the African enclave of Castel Volturno¹³, or in the ghetto of the San Nicola Varco in the Province of Salerno close to Eboli (created in the first decade of the 2000s). Caserta remains one of the *blackest* provinces in Italy, but now the presence of African immigrants, although concentrated along the coastal area, is certainly more scattered within its territory (Fig. 3). In this context, the presence of Europeans is

¹³ Castel Volturno is small town on the mouth of the Volturno River in the province of Caserta. In the late 1980s, the collapse in the cost of real estate, mainly due to the presence of local displaced people from the 1982 earthquake, attracts many sub-Saharan migrants (often farm workers in the surrounding areas), transforming in a short time this seaside resort into an *ethnoburb* [47].

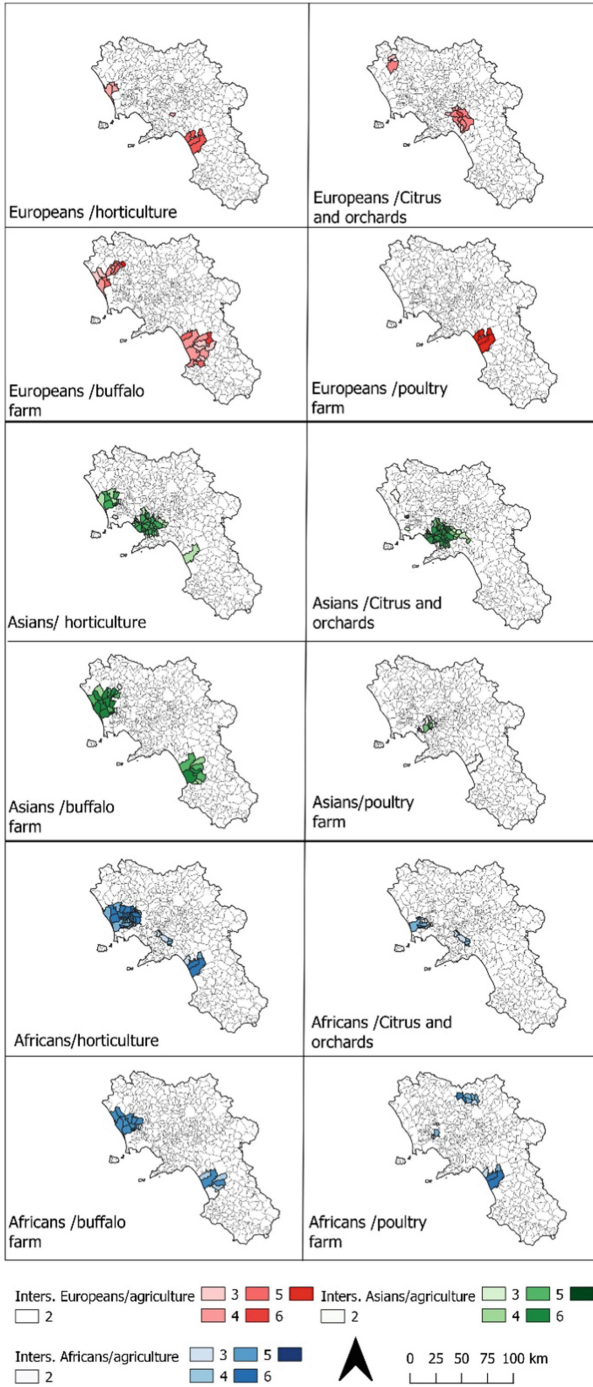


Fig. 5. Overlap between hot spot cluster: migrant groups and agriculture.

also quite important: these are mainly Albanians, Bulgarians, Romanians, and Ukrainians, mostly engaged in other crops (e.g. Albanians with tobacco). Additionally, in the province of Salerno, Eastern European migrants are often employed in valuable horticulture such as that practiced in greenhouses [48], as well as in the livestock sector. They are also involved in fruit-picking and pruning activities in the orchards of the Salerno hills, between the Sarno plain and the Picentini mountains. More difficult to define, due to its complexity, is the relationship between Asian groups and horticultural and citrus fruit-related work in the Vesuvius area. In addition to their involvement in the agricultural sector, this cluster is probably also due to the significant presence in these territories of the Chinese community, which participates extensively in the manufacturing of textiles and clothing [24].

In a Region that until a few years ago was only a transit territory, the process of stabilization and integration of migrants is slowly progressing. However, the proposed methodology, which uses 2011 data, shows that ten years ago there were clusters of migrants, partially connected to agricultural sector activities. Sometimes, these rural concentrations of migrants induced territorialization processes with negative outcomes, triggering social and territorial tensions. But migration is dynamic and complex by nature. For this reason, to understand how much the spatial permeability of migrants residing in Campania has now taken on post-migration characteristics [49], it will be necessary to update this research using current data on immigration in Campania and the forthcoming data from the recently concluded 2021 Census of Agriculture. Acquiring greater awareness of the increasing role of migrants in our society and the reasons driving their settlement choices can help normalize, even in Italy, this demographic process. Migration has always been experienced as a constant emergency from which the country seems unable to escape, but conscious national and EU policies could turn this phenomenon into a structural reality that can be governed [50].

Author Contribution. This paper is a result of the full collaboration of all the authors. However, G. Mauro wrote Sects. 1 and 5, M. Ronza wrote Sects. 2 and 3.1, while C.S. De Simone wrote Sects. 3.2, 3.3 and 4. The figures layout is edited by C.S. De Simone.

References

1. Fassman, H., Haller, M., Lane, D.: *Migration and Mobility in Europe: Trends, Patterns and Control*. Edward Elgar, Cheltenham (UK) (2009)
2. ISTAT: *Statistiche, Report Stranieri residenti*. ISTAT, Roma (2023)
3. Centro Studi e Ricerche IDOS: *Dossier Statistico Immigrazione 2022*. IDOS, Roma (2022)
4. Macrì, M.C.: *Gli stranieri nella popolazione e nell'economia italiana. Analisi multi-temporale dal 2008 al 2017*. In: Macrì, M.C. (a cura di) *Il contributo dei lavoratori stranieri all'agricoltura italiana*, pp. 9–13. CREA, Roma (2019)
5. Longo, A.: *Immigrazione e lavoro nero in Italia: attualità di un fenomeno socioeconomico*. *Geotema* **43**, 158–164 (2012)
6. Bales, K.: *I nuovi schiavi. La merce umana nell'economia globale*. Feltrinelli, Milano (2002)
7. De Leo, S., Vanino, S.: *Immigrati in agricoltura in Italia: chi sono e da dove vengono*. In: Macrì, M.C. (a cura di) *Il contributo dei lavoratori stranieri all'agricoltura italiana*, pp. 21–36. CREA, Roma (2019)
8. Amato, F.: *Atlante delle migrazioni in Italia*. Carocci Editore, Roma (2008)

9. Cristaldi, F.: I nuovi schiavi: gli immigrati del gran ghetto di San Severo. *Rivista Geografica Italiana* **122**, 119–142 (2015)
10. Scardaccione, G., Scorza, F., Casas, G.L., Murgante, B.: Spatial autocorrelation analysis for the evaluation of migration flows: the Italian case. In: Taniar, D., Gervasi, O., Murgante, B., Pardede, E., Apduhan, B.O. (eds.) ICCSA 2010. LNCS, vol. 6016, pp. 62–76. Springer, Heidelberg (2010). https://doi.org/10.1007/978-3-642-12156-2_5
11. Murgante, B., Borruso, G.: Analyzing migration phenomena with spatial autocorrelation techniques. In: Murgante, B., et al. (eds.) ICCSA 2012. LNCS, vol. 7334, pp. 670–685. Springer, Heidelberg (2012). https://doi.org/10.1007/978-3-642-31075-1_50
12. Antczak, E., Lewandowska-Gwarda, K.: Migration processes in European cities: a spatio-temporal analysis using different spatial weights matrices. *Estudios de economía aplicada* **33**(1), 53–80 (2015)
13. Di Maio, M., Leone Sciabolazza, V., Molini, V.: Migration in Libya: a spatial network analysis. *World Bank Policy Research Working Paper*, vol. 9110, pp. 2–38 (2020)
14. Rashid, M.F.A.: Capabilities of a GIS-based multi-criteria decision analysis approach in modelling migration. *GeoJournal* **84**(2), 483–496 (2019)
15. Alba, R.D., Foner, N.: *Strangers No More: Immigration and the Challenges of Integration in North America and Western Europe*. Princeton University Press, Princeton (USA) (2015)
16. Murayama, K., Nagayasu, J.: Toward coexistence of immigrants and local people in Japan: implications from spatial assimilation theory. *Sustainability* **13**(7), 3849 (2021)
17. Darden, J.T., Cristaldi, F.: Immigrants and residential segregation. In: Gold, S.J., Nawyn, S.J. (eds.) *International Handbook of Migration Studies*, pp. 202–214. Routledge, London (2012)
18. Di Gennaro, A.: Il territorio rurale della Campania nelle nuove politiche regionali per l'agricoltura e il paesaggio. In: Del Prete, R., Leone, A.P. (a cura di) *Paesaggi rurali. Percezione, promozione, gestione, sviluppo sostenibile*, pp. 159–175. Regione Campania, Napoli (2017)
19. ISTAT: 7° Censimento generale dell'agricoltura: primi risultati. ISTAT, Roma (2022)
20. Centro di ricerca Politiche e Bioeconomia: *L'agricoltura nella Campania in cifre 2021*. CREA, Roma (2021)
21. Ciaravino, R., Salato, N., Chiara, S.: Analisi degli scenari agricoli in Campania. Interpretazione dei territori attraverso una diversa chiave di lettura. CREA, Roma (2021)
22. Ronza, M., Lapicciarella, V., Giglio, A.: Aziende agricole tra diversificazione e innovazione. Resistenze e prospettive per il Mezzogiorno. In: Amato, V. (a cura di) *Innovazione, impresa e competitività nel Mezzogiorno*, pp. 203–216. Aracne editrice, Roma (2013)
23. Ronza, M.: Buffalo breeding in the Volturno plains between identifying perseverance and prospect for development. In: Bryant, C., Grillotti Di Giacomo, M.G. (eds.) *Quality Agriculture: Historical Heritage and Environmental Resources for the Integrated Development of Territories*, pp. 741–752. Brigati editore, Genova (2007)
24. Amato, F., D'Alessandro, L., Spagnuolo, D.: Gli immigrati in Campania. In: Amato, F., Coppola, P. (a cura di) *Da migranti ad abitanti. Gli spazi insediativi degli stranieri nell'area insediativa di Napoli*, pp. 97–146. Alfredo Guida Editore, Napoli (2009)
25. Russo Krauss, D.: *Geografia dell'immigrazione. Spazi multietnici nelle città: in Italia*. Liguori Editore, Napoli (2005)
26. Strozza, S., Gabrielli, G.: Gli stranieri in Campania: dimensioni e caratteristiche di un collettivo in evoluzione. In: Bruno, G.C. (a cura di) *Lavoratori stranieri in agricoltura in Campania. Una ricerca sui fenomeni discriminatori*. CNR Edizioni, Roma (2018)
27. ISTAT: 6° Censimento Generale dell'Agricoltura. *Atlante dell'agricoltura italiana*. ISTAT, Roma (2013)
28. Regione Campania: *Il territorio rurale della Campania. Un viaggio nei sistemi agroforestali della regione attraverso i dati del 6° Censimento Generale dell'Agricoltura*. Imago Editrice, Dragoni (CE) (2013)

29. ISTAT: 15° Censimento Generale della Popolazione e delle Abitazioni 2011. Il censimento della popolazione straniera. ISTAT, Roma (2012)
30. Gimond, M.: Intro to GIS and Spatial Analysis. <https://mgimond.github.io/Spatial/index.html>. Accessed 20 Apr 2023
31. Goodchild, M.F.: Geography and the information society. In: Kolosov, V., García-Álvarez, J., Heffernan, M., Schelhaas, B. (eds.) *A Geographical Century*, pp. 225–234. Springer, Cham (2022). https://doi.org/10.1007/978-3-031-05419-8_16
32. Yuan, M.: From representation to geocomputation: some theoretical accounts of geographic information science. In: Li, B., Shi, X., Zhu, A.X., Wang, C., Lin, H. (eds.) *New Thinking in GIScience*, pp. 1–10. Springer, Singapore (2022). https://doi.org/10.1007/978-981-19-3816-0_1
33. Fotheringham, A.S., Brunson, C., Charlton, M.: *Quantitative Geography: Perspectives on Spatial Data Analysis*. Sage, London (2000)
34. Opach, T., Scherzer, S., Lujala, P., Ketil Rød, J.: Seeking commonalities of community resilience to natural hazards: a cluster analysis approach. *J. Geogr.* **74**(3), 181–199 (2020)
35. Cerutti, S., De Falco, S., Graziano, T.: Geografia della marginalità dei Comuni italiani: esiti di un'indagine multifattoriale mediante cluster analysis. *Bollettino della Associazione Italiana di Cartografia* **174**, 49–70 (2022)
36. Grasland, C.: Spatial analysis of social facts. In: Bavaud, F., Mager, C. (eds.) *Handbook of Theoretical and Quantitative Geography*, pp. 1–39. FGSE, Lausanne (2010)
37. Goodchild, M.F.: *Spatial Autocorrelation Concepts and Techniques*. Geo Books, Norwich (1986)
38. Serra-Sogas, N., O'Hara, P., Canessa, R., Bertazzon, S., Gavrilova, M.: Exploratory spatial analysis of illegal oil discharges detected off Canada's Pacific Coast. In: Gavrilova, M.L., Tan, C.J.K. (eds.) *Transactions on Computational Science VI. LNCS*, vol. 5730, pp. 219–233. Springer, Heidelberg (2009). https://doi.org/10.1007/978-3-642-10649-1_13
39. Kumari, M., Sarma, K., Sharma, R.: Using Moran's I and GIS to study the spatial pattern of land surface temperature in relation to land use/cover around a thermal power plant in Singrauli district, Madhya Pradesh, India. *Remote Sens. Appl.: Soc. Environ.* **15**, 100239 (2019)
40. Mathur, M.: Spatial autocorrelation analysis in plant population: an overview. *J. Appl. Nat. Sci.* **7**(1), 501–513 (2015)
41. Fu, W.J., Jiang, P.K., Zhou, G.M., Zhao, K.L.: Using Moran's I and GIS to study the spatial pattern of forest litter carbon density in a subtropical region of Southeastern China. *Biogeosciences* **11**(8), 2401–2409 (2014)
42. Mitchell, A.: *The ESRI Guide to GIS Analysis*, vol. 2. ESRI Press, London (2005)
43. Anselin, L.: Local indicators of spatial association—LISA. *Geograph. Anal.* **27**(2), 93–115 (1995)
44. Getis, A., Ord, J.-K.: Local spatial statistics: an overview. In: Longley, P., Batty, M. (eds.) *Spatial Analysis: Modelling in a GIS Environment*, pp. 261–282. Wiley, New York (1996)
45. Getis, A., Ord, J.-K.: The analysis of spatial association by use of distance statistics. *Geograph. Anal.* **24**(3), 189–206 (1992)
46. Kalinic, M., Krisp, J.M.: Kernel density estimation (KDE) vs. hot-spot analysis—detecting criminal hot spots in the City of San Francisco. In: Mansourian, A., Pilesjö, P., Harrie, L., Van Lammeren, R. (eds.) *Geospatial Technologies for All: Selected Papers of the 21st AGILE Conference on Geographic Information Science*, pp. 12–15. Springer, Lund (2018)
47. D'Ascenzo, F.: Disfunzioni migratorie e territorio: gli africani di Castel Volturno. *Meridione* **XVI**(3), 109–148 (2016)
48. Carchedi, F.: Campania: il caso della Piana del Sele (Salerno). In: Carchedi, F., Bilongo, J.-R. (a cura di) *Agromafie e capolarato. Quinto rapporto*, pp. 291–320. Osservatorio Placido Rizzotto FLAI-CGIL, Futura, Roma (2022)

49. Meini, M.: Verso una governance interculturale in Italia? Questioni aperte tra migrazione e postmigrazione. *Geotema* **61**, 25–33 (2019)
50. Aru, S.: Spazi d’asilo. Il sistema di accoglienza in Italia tra norme e politiche alle diverse scale territoriali. *Geotema* **61**, 34–40 (2019)

Open Access This chapter is licensed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter’s Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter’s Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

