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Developmental Policies, Long-Term Land-Use Changes and the Way Towards Soil Degradation: Evidence from Southern Italy

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ABSTRACT *This paper discusses the relationship between state-driven developmental policies, considered as potential drivers of land degradation, and post-war territorial transformations in southern Italy, a disadvantaged Mediterranean region. Since the early 1950s, state-driven development policies aimed at balancing the socio-economic disparities between coastal and inland areas in southern Italy have sometimes impacted negatively on the quality of land. Three national and one European Union post-war policies have been considered in this study: (i) the Agrarian Reform promoting the realignment of land ownership and a new agricultural organization, (ii) the* Cassa per il Mezzogiorno *intervention stimulating economic development and reducing territorial unbalances, (iii) the measures for industrial recovery and settlement reconstruction after the 1980 earthquake in Campania and Basilicata regions and (iv) the European Common Agricultural Policy. The impact of these policies on soil resource depletion and land degradation in ecologically fragile, arid areas has been discussed using three case studies: Basilicata region, Sele river plain and Fortore river valley (both located in Campania region). The paper illustrates the multiple links between post-war economic policy and the downward environmental spiral observed in southern Italy as a contribution to the Mediterranean strategy for combating soil degradation, drought and desertification. It raises valid concerns about the negative implications of national and international political policies for land degradation in Italy which share resonance with similar developments in other countries.*

KEY WORDS: development policies, soil degradation, disadvantaged areas, southern Italy, territorial disparities

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1. Introduction

Soil degradation (SD) is a complex phenomenon requiring an integrated approach to assess the multiple biophysical and socio-economic dimensions of human–nature interaction at the heart of the desertification process (Blaikie 1995). Since the 1960s, the concept of desertification has evolved through a transition towards definitions centred upon the static interaction between anthropogenic factors, landscape and ecosystem functioning to achieve a more holistic focus (Gisladottir & Stocking 2005; Wilson & Juntti 2005; Salvati *et al.* 2011). According to the United Nations Convention to Combat Drought and Desertification (UNCCD), desertification embraces all the phenomena of 'land degradation in arid, semi-arid and dry sub-humid areas, resulting from various factors, including climatic variations and human activities'. In particular, SD reflects the progressive reduction of biological and economic productivity of land resulting from mismanagement or a combination of processes such as the deterioration of soil and the long-term loss of natural vegetation cover (Basso *et al.* 2012).

Annex IV of the UNCCD addresses SD in the Mediterranean region by outlining the importance of socio-economic disparities between northern and southern regions, urban and rural areas, and coastal and inland belts (Briassoulis 2011). Moreover, Annex IV links the sensitivity of agro-forest ecosystems to climate change and human-derived environmental pressures (Rubio & Recatala 2006). The increased severity of SD processes in the Mediterranean region is mainly due to biophysical factors (Montanarella 2007). Primary causes include soil sealing, compaction, salinization, erosion, contamination/acidification and loss of organic matter (Salvati *et al.* 2011) possibly associated with arid or semi-arid climate, poor vegetation cover, decreasing land-use quality and unsustainable land management (Salvati & Bajocco 2011). However, it was demonstrated that SD in the Mediterranean region also derives from the complex interplay between environmental processes and anthropogenic pressures (Wilson & Juntti 2005). These latter include social, economic, demographic, cultural, institutional and political factors (Briassoulis 2004; Gagliardo 2004). Soil degradation management requires a holistic approach which takes into account its various determinants at all spatial levels as well as over time and necessitates coordinated local-scale interventions to alleviate the desertification risk.

More effort is required to investigate how policy agendas contribute to shape the spatial complexity of SD processes (Batterbury *et al.* 1997), and specifically how multi-scale developmental policies are related to SD (Blaikie 1989; Scoones 1997; Gagliardo 2004; Prager *et al.* 2011). Design principles of developmental policies are in fact rarely holistic and only occasionally propose effective solutions for the complex relationships among all environmental resources and stakeholders. Often developmental policies are not congruent with environmental carrying capacity thresholds and the advanced solutions can produce unanticipated impacts and risks, limiting the possibility of an integrated environmental management and the attainment of sustainable development goals (Briassoulis 2004). Developmental policies, especially those which target land tenure, agricultural prices, crop profitability and technological change in agriculture, can deeply modify the spatial structure of land use and may reduce the availability and quality of soils (Lestrelin & Giordano 2007). For example, in the Laotian village of Ban Lak Sip, government developmental policies for rural areas in the period 1970–2003 aiming to improve socio-economic and environmental conditions resulted in livelihood systems changes which have contributed to environmental deterioration. Resettlement and land policy led to a reduction

in land availability and an increase in population density. In consequence, deforestation, intensification of land use, abandonment of traditional agricultural rotations for market-oriented agriculture and an increase in the total cultivated area have undermined the long-term viability of land resources, leading to soil erosion (Lestrelin & Giordano 2007). Furthermore, developmental policies are not able to effectively address the complexity of SD. Prager *et al.* (2011) claim issues of coherence and efficiency arise in relation to agri-environmental and rural policies in the European Union. Unexpected trade-offs have emerged between policies that directly or indirectly relate to soil conservation and measures that incentivize farming practices which cause or foster SD. Despite the importance of this topic, empirical analyses of national development policies as drivers and contributors of SD are still largely underexploited.

In the context of Mediterranean Europe, Italy is a hotspot for SD (Salvati 2012). Crop intensification, unsustainable water management, forest fires, overgrazing, land-use changes, urban sprawl, industrial concentration and pressure from tourism are possible SD drivers (Salvati & Zitti 2008; Salvati & Forino 2014). All these factors especially threaten southern Italy (the *Mezzogiorno* region) where more than one-third of land has been classified as highly vulnerable to SD (Salvati & Bajocco 2011). The intimate relationship between national development policies and SD in southern Italy is underexplored (Salvati & Carlucci 2011). This paper is a first attempt to fill this gap. It analyses and discusses the long-term relationships between post-war development policies and socio-economic factors possibly triggering SD in southern Italy. The paper hypothesizes that a series of state-driven policies implemented since the early 1950s, aimed at promoting economic development, caused diffused soil quality loss, habitat deterioration, landscape fragmentation and soil erosion (Bonamici *et al.* 2012, 2013). Three areas of southern Italy have been considered as test sites for our hypothesis: Basilicata region (with a focus on the specialized agricultural area of Metaponto), the Sele River plain and the Fortore river valley, both located in Campania region (Figure 1). The paper develops a narrative of the relationships between development policies and SD in the selected areas. Through a desk-based review of Italian and international literature on development policies and SD in southern Italy, the paper addresses the territorial complexity reflected in long-established interventions on the three selected areas. The paper provides valuable evidence for policy-makers, practitioners and researchers about the environmental risks directly or indirectly driven by national and international policies promoting regional development.

2. A Narrative for the Multiple Environmental Impacts of Post-war Developmental Policies in Southern Italy

2.1. A Tipping Point for the Agricultural Sector in Southern Italy: The Agrarian Reform

Since World War II, land tenure has been part of a broader range of socio-economic issues impinging upon the primary sector in Italy (Mori 1957). Until the early 1950s, southern Italian agriculture was characterized by low productivity and modest investments, while land was fragmented within large private estate holdings (*latifondi*) (Rossi-Doria 1948). Agrarian Reform was enforced in law in 1948 to modify and modernize this traditional, feudal agricultural structure. It entailed two objectives: the expropriation of the most unproductive portions of *latifondi* and their redistribution to landless peasants under a form of fragmented small holdings (Rossi-Doria 1948, 2003; Bevilacqua 2005; Martinelli 2009,

Figure 1 The 20 administrative regions of Italy and the 3 study areas.

2012). The Reform covered nearly 8.4 million hectares of land through a scheme of land expropriation, incorporation and reallocation of farms >200 ha. Land was more equally distributed among farmers and local districts were strongly supported in the transitional period from wartime austerity to more acceptable working conditions. This also helped to transform peasants into a new class of small landowners, to relieve the unemployment pressure and to increase agricultural production and productivity; however, it did not prevent a massive exodus of rural population from the mountains and the most marginal areas (Martinelli 2009). The nature of agricultural enterprise was radically modified and the crop systems forming the traditional, high-diversity southern Italian rural landscape were forced to shift towards market-oriented production (Sereni 1961; Rossi-Doria 2003; Bevilacqua 2005). This led to the intensification of crops, the consolidation of intensive crop rotations and the growing use of chemical fertilizers and pesticides (Sereni 1961; Phillips 1998a). The Agrarian Reform also reduced dependency on labour-intensive techniques and promoted agricultural mechanization through the introduction of machinery adaptable to up- and down-slope tillage, the development of road and irrigation infrastructures and the creation of cooperatives for machine hire (Phillips 1998b). Furthermore, the Agrarian Reform re-organized land ownership rights, and helped to create new rural settlements and reshape the rural landscape (Vanzetti & Meissner 1953; Sereni 1961). However, the reforms have potentially had a detrimental impact on soil fertility traditionally preserved through organic manure practices (Phillips 1998b). The fragmentation of *latifondi* and

the breakdown of family-run farms also led to rapid changes in traditional demographic and social structures (Salvati 2012) and to a shortage of small-scale farm investment, indirectly favouring intensive agriculture (Coppola 1977).

Therefore, although rural development was certainly pivotal to the economic growth of southern Italy, the Agrarian Reform also produced leapfrog agricultural clusters with diverging structures resulting from different crop production, farming practices, topographic and biophysical features, and the fine grain of the local communities. Furthermore, the Agrarian Reform consolidated a 'backwardness dualism' between mountainous areas with a modest economic potential and flat areas, more accessible and closer to urban markets (Coppola 1977). This indirectly triggered SD through the abandonment of rural areas and soil sealing in urban and peri-urban areas (Salvati & Bajocco 2011).

2.2. Industrialization and Polarized Development in Southern Italy: The CASMEZ Experience

Together with the Agrarian Reform, a government programme of public works was set up by the national agency named *Cassa per le Opere Straordinarie di Pubblico Interesse per il Mezzogiorno* (CASMEZ, the fund for extraordinary works of public interest for southern Italy) from 1950 to 1980. It aimed to stimulate employment and support low-income families through private investments in disadvantaged areas in southern Italy (Cafiero 2000). In its first phase (1950–1957), CASMEZ shared the main goals of the Agrarian Reform, supporting agricultural modernization (land reclamation, irrigation systems and rural infrastructure) and civilian infrastructure (transport, aqueducts and sewage) (Dickinson 1954; Martinelli 2009). In the second phase (1957–1975), CASMEZ launched a pragmatic 'special' programme of 'pre-industrialization' through the establishment of new *Aree di Sviluppo Industriali* (ASI) (Industrial Development Areas) (Cafiero 2000; Martinelli 2009). The growing role of State holdings in strategic industrial sectors (steel, chemicals and energy) led to direct support for further industrialization in southern Italy. Therefore, in addition to infrastructural investment, a programme of financial incentives for industrial investment – initially to small and medium firms, and then extended to large corporations – and a growth-poles strategy were launched (Martinelli 2009). The third phase (1975–1980) was mainly based on further fiscal exemptions for industrial firms investing in southern Italy and a new form of financial incentive to support the creation of employment, in particular, a 10-year full subsidization of social security payments for any new industrial job created (Martinelli 2009).

The CASMEZ programme had a powerful impact on southern Italy. The southern economy and society rapidly modernized and were integrated into the Italian capitalist model, and the economic gap between the region and the rest of the country was significantly reduced (Martinelli 1985, 2009, 2012). However, according to Felice (2010), the CASMEZ programme attempted to change the southern economy without changing its society. The programme was not implemented through a participatory process and did not create the pre-conditions for autonomous development for entrepreneurs to invest in southern Italy without state subsidies (Felice 2010). Large subsidies for agriculture led to an imbalance among the economic sectors, and the increases in irrigated land, mechanization and crop intensity rapidly became indicators of the poor environmental sustainability in the agricultural sector (Martinelli 2009). The CASMEZ programme also facilitated some

unwanted demographic changes, for example, stimulating out-migration from disadvantaged areas to more productive areas and causing the abandonment of marginal, remote inland areas (Coppola 1977; Martinelli 2009).

2.3. Land Abandonment in the Basilicata Region: The Contribution of the Agrarian Reform and CASMEZ

The Basilicata region has experienced SD for many decades (Alexander 1980; Phillips 1998a; Basso *et al.* 2000, 2012; Ferrara *et al.* 2005, 2010; Clarke & Rendell 2006a, 2006b, 2010; Capolongo *et al.* 2008), for example, in the form of landslides, soil erosion and environmental degradation. Salvati *et al.* (2013a) suggest that afforestation and urbanization were the result of land abandonment, overgrazing and repeated forest burning between 1975 and 2006. Bonamici *et al.* (2012, 2013) identify land abandonment and intensive farming as potential drivers of SD, coupled with soil sealing and increased human pressure especially along coastal areas. However, potential linkages between ecological processes and the socio-political context are substantially underexplored. Therefore, Basilicata is a relevant case to illustrate the multifaceted environmental impacts of developmental policies in southern Italy.

In the early 1950s, Basilicata was an economically underdeveloped region with complex geomorphology and hydrology, a fragmented agricultural system, inaccessible lowland areas and a weak industrial sector (Milone 1955; Viganoni 2007). The economic backwardness resulted in massive emigration: 431,000 and 251,000 inhabitants migrated abroad between 1876–1925 and 1951–1971, respectively (Stanzione 2009). The Agrarian Reform and CASMEZ supported incentives for irrigated cropland and increased livestock raising capacity. The Agrarian Reform contributed to the economic growth of the coastal plain of Metaponto and the fertile area of Mt Vulture, improving irrigation performance through water infrastructure. From 1959, CASMEZ supported industrialization with the establishment of industrial hubs in Potenza, the regional capital, which was relatively well connected to the national transport infrastructure. In 1961 a manufacturing and chemical industrial hub was created within the Basento river valley, centred around methane deposits in the small town of Ferrandina (Figure 2) (Biondi & Coppola 1974; Cafiero 1975). Following the post-earthquake reconstruction law 219/1981, a second industrialization wave occurred in areas affected by the earthquake of 23 November 1980 (see Sections 2.4 and 2.5). Eight ASI were created, the most important of which was the FIAT automotive plant in Melfi, established in 1991 (Sommella 1997).

These interventions led to crop intensification triggering soil deterioration and water resource depletion. Furthermore, the mechanization of cereal production promoted erosion by rilling, while attempts to cut terraces and plant trees increased the likelihood of landslides (Alexander 1980). The implementation of ASI also re-defined local settlement patterns. Due to the shortage of labour, a large number of workers were employed in the industrial poles (Stanzione 2009), altering the demographic dynamics of coastal and inland areas. This created a demographic polarization around the cities of Potenza and Matera, in the ASI of Melfi and in the Metaponto area (Viganoni 2007), contributing to regional disparities in soil and water availability in coastal and inland areas, and leading to land abandonment in rural areas.

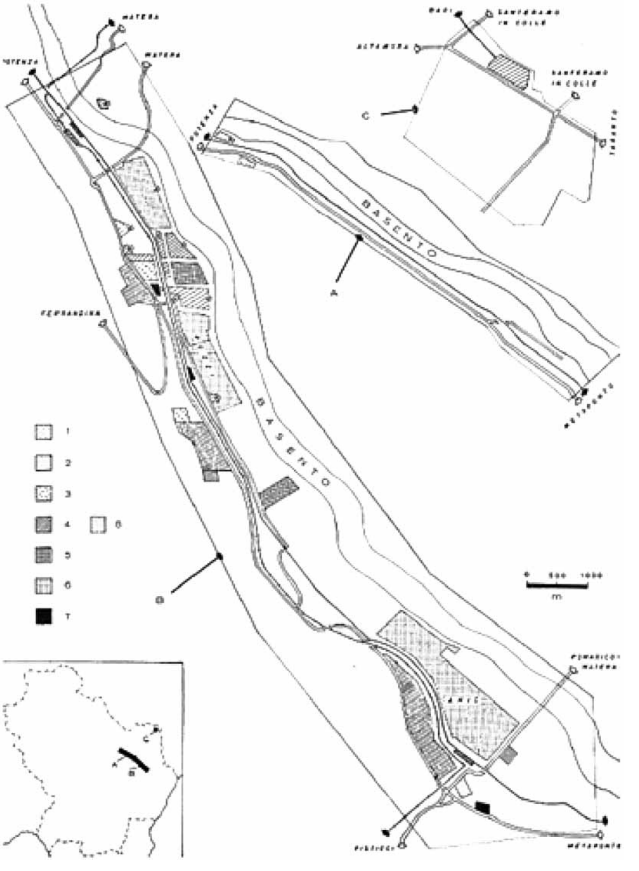

Figure 2 Industrial development pole in Val Basento as planned by CASMEZ.
Source: Biondi & Coppola (1974).

2.4. Development as a 'Paradigm'? Recovery after the 1980 Earthquake in Campania and Basilicata

On 23 November 1980, a 6.8 M earthquake struck the Campania and Basilicata regions. The epicentre was the small town of Teora (Avellino province). The affected area included: the conurbations of Naples and Salerno; the commercial cities of Avellino and Potenza; the agricultural and coastal plains around Naples and Salerno; and hills and mountainous areas of the Apennines (Littlewood 1985). Because of their economic backwardness, these areas were already beneficiaries of CASMEZ funds (see Sections 2.2 and 2.3).

The Italian government enforced law no. 219/81 for allocating resources to the post-disaster reconstruction process. It provided an opportunity to modernize and improve socio-economic conditions in the affected places and was considered as a turning point for eradicating economic under-development in depressed areas (Becchi 1993; Guidoboni & Valensise 2011). Local and external industries were opened in the already selected ASI areas, while the new University of Basilicata in Potenza, the University School of Engineering in Salerno and the 'extraordinary' public housing project (20,000 apartments) in

the metropolitan area of Naples were financed. Furthermore, the refurbishment and reconstruction of damaged buildings and infrastructure in the whole of Campania, Basilicata and partially Apulia regions were promoted. Although the affected area was initially limited to 283 municipalities in 1981, legislative updates in 1986 confirmed that 688 municipalities received public subsidies (Guidoboni & Valensise 2011). This strategy has been called 'economy of catastrophe' and 'drugged economy', because it allocated reconstruction funds without control (Becchi 1989, 1993). 'Real' needs were, in fact, contaminated through speculation, corruption and criminality, and national and local governmental systems were used as a patronage machine (Caporale 2010).

2.5. Post-disaster Recovery in the Sele River Plain Towards Soil Sealing

Post-World War II, significant land-use changes have occurred on the Sele river plain, an agricultural area close to the city of Salerno (Migliorini 1949; Barbero 1956; Fuller 1962). The river plain is now heavily fragmented by low-density settlements and threatened by SD such as soil pollution, sealing and salinization (Forino *et al.* 2014 and references therein). This area is also at risk of coastal (Diodato *et al.* 2011b) and soil erosion (e.g. Diodato *et al.* 2009, 2011a; Alberico *et al.* 2012a, 2012b). Increased human pressure (e.g. anthropic structures and infrastructures, land-use changes and urban sprawl) has further increased the vulnerability of these landscapes to SD (Alberico *et al.* 2012a, 2012b). These issues have been exacerbated by real estate speculation promoted by law 219/81 (Forino *et al.* 2014) and post-earthquake reconstruction based upon planning deregulation, which has altered the former mixed agricultural landscapes. The increase of seasonal tourism during the 1960s (Aversano 1976) and land-use changes following state-driven industrialization (Cardarelli & De Sivo 1964) consumed fertile land. Infrastructure development connecting the Sele area with Naples, Salerno and Potenza through highways and diffused road networks are considered as additional drivers of SD (Forino *et al.* 2014), for example, the *Fondo Valle Sele* highway cost 204,198 billion lira to connect Sele river lowlands with the highlands of Salerno province (Munarin & Tosi 1989).

2.6. The Common Agricultural Policy and the Territorial Re-organization of Southern Italy

In the last 40 years, European Union agricultural/rural policies, such as the Common Agricultural Policy (CAP), have largely substituted their national counterparts (Briassoulis 2011). Their implementation varies among the member states owing to differences in the national agricultural systems, rural socio-economic contexts, political priorities, extent and severity of target environmental issues (Briassoulis 2011). The CAP stimulated crop production through a system of market price support aimed at protecting producers' income, and attempted to stimulate the competitiveness of EU agriculture by guaranteeing food safety. However, these measures encouraged overproduction and impacted negatively upon both the environment and local markets. Before the McSharry reforms in the early 1990s, the CAP resulted in agricultural surpluses. Since 1992, the CAP has been adapted to better serve the paradigm of sustainability, shifting from policy-supported prices and production towards direct income subsidies and rural development measures through two main tools: Pillar 1, oriented to market price support and direct income payments; Pillar 2, oriented to incentivise payments for rural development. Furthermore, the European Strategy

Agenda 2000, presented in 1997, established integrated CAP measures for promoting the sustainable development of rural landscapes. Consequently, since 2003, farmers applying for single farm payments had to comply with the subsequent limitations of Good Agricultural and Environmental Conditions and with the Statutory Management Requirements which defined standards for environment, food safety and animal welfare (Pointereau *et al.* 2008).

For southern Italy, an assessment of the consequences of post-war agricultural policies is challenging (Fearne 1997; Burell 2009; De Castro *et al.* 2011; Henke & Coronas 2011), and the socio-economic aspects related to the CAP are underexplored (ISMEA 2004). The CAP directly influenced the development of rural areas, especially traditionally agricultural ones. The CAP distorted the national food market, impacted negatively on farmers' incomes and contributed to depress the social capital of inland areas. Moreover, the shift from extensive agriculture towards intensive production in cereals, livestock and dairy products caused the abandonment of traditional crops and farming techniques and farmland, favouring more productive species and increasing the environmental vulnerability of rural landscapes (Bencardino *et al.* 2005). In many cases, the support to intensive production depressed the quality of soil resources, favoured the abandonment of unproductive and poor land and led to uncontrolled soil erosion and land degradation. For example, in the mountainous and landslide-prone area of Craco (Basilicata), the support of CAP measures to the reclamation of shrub land and badlands for durum wheat cultivation led to large-scale abandonment of fertile farmland (Capolongo *et al.* 2008).

2.7. Demographic Changes and SD in the Fortore River Valley

The Fortore river valley is characterized by an economy based on a traditional agricultural system consisting of non-irrigated arable land, cereals and permanent crops. The primary sector plays a significant role in the local economy, comprising 6% of the local value added (2008 data), compared with a 3% and 2% share of the primary sector, respectively, in the regional and national value added (Bencardino *et al.* 2005; Ciccarelli 2012).

The Fortore river valley is traditionally subjected to landslides and severe soil erosion (Ruocco 1965; Leone *et al.* 1995; Leone & Sommer 2000) (Figure 3), and is classed as one of the areas with the highest risk of SD in Italy (Diodato & Ceccarelli 2004). The Fortore basin is considered to be an economically depressed area with a very high

Figure 3 Land fragmentation and soil erosion in the Fortore valley. Left: Land fragmentation. Right: Soil erosion (S. Ciccarelli).

emigration rate (Bonamici *et al.* 2012, 2013). In the past, the agricultural system was not able to support the resident population needs, so waves of overseas emigration have occurred since the late nineteenth century. After WWII, northern Italy and central-western European countries became the preferred destinations of emigrants (Ruocco 1965). The resident population decreased by 26% between 1971 and 2010 with the highest emigration rate recorded for young people (Ciccarelli 2012). Population density is now only 57 inhabitants/km^2 (Italian average: 200 inhabitants/km^2). This emigration led to significant land abandonment and lack of territorial control against landslides and soil erosion. In 2003, the CAP reform introduced subsidies on the basis of land ownership rather than quantity and typology of production. This means that subsidies are assigned to landowners even if they have emigrated and left behind uncultivated land (Bencardino *et al.* 2005). Therefore, although the CAP reform attempted to increase the competitiveness of the local agricultural sector through crop intensification, it appears to have exacerbated, at least indirectly, pre-existing natural risks and trajectories of land abandonment (Ciccarelli 2012).

3. Discussion: Can Developmental Policies Create New Environmental Risks?

In southern Europe, the complex interaction between biophysical and socio-economic factors is a key element shaping the level of soil vulnerability to degradation (Salvati 2012). Although the role of biophysical factors is extensively acknowledged, a research gap persists on the contribution of national development policies in shaping SD. The present study has contributed to partially fill this gap by investigating the role of the post-war developmental policy agenda as a factor of SD in three structurally vulnerable areas of southern Italy (Basilicata region, Sele and Fortore rivers' valleys). Four policies have been considered: the Agrarian Reform, the CASMEZ programme supporting disadvantaged areas, the measures promoted for the recovery after the 1980 earthquake in Campania and Basilicata regions, and the European CAP. Even though these policies aimed to modernize socio-economic structures, their expected outcomes in the long term have not been reached. Such policies allocated subsidies supported by a mere 'exogenous development' vision exported by central institutions and one that was not shared with local communities. For example, Chubb (1982) claims that development through the CASMEZ programme was far removed from the needs of local communities. Between 1950 and 1980 southern Italy radically changed, evolving from an agricultural, semi-feudal, poverty-stricken society into a modern and partially industrialized society. Whilst the CASMEZ programme contributed to integrate southern Italy into the national model of capitalist accumulation, mass consumption and welfare, and to significantly reduce the gap with the rest of the country in terms of production, consumption, investment, physical and social infrastructure (Martinelli 2009), this programme also represented an 'epochal mistake' (Martinelli 2009, p. 453). It that did not stimulate an autonomous, self-sustaining process of industrialization and created a 'vicious circle' (Felice 2010, p. 77), still persisting and affecting the social and political life of most of southern Italy's regions. The promotion of development represents a misallocation of public resources. It did not exploit any regional endogenous entrepreneurial potential, contributed to create 'cathedrals' in the desert, such as industrial areas without territorial and entrepreneurship roots, and failed to generate a self-sustaining development model. This led to the deterioration of social capital and to a parasitic, clientelistic and corrupt political management (Chubb 1982; Martinelli 2009; Felice 2010; Trigilia 2012, 2014).

The three case studies in southern Italy are examples of a 'modernization process without development', combined with a latent increase in environmental degradation. These examples reflect a generalized pattern of development and land degradation that is typical for the southern Mediterranean region, because of the similarity of socio-economic, political and cultural factors contributing to SD. In the Basilicata region, industrialization and agricultural intensification led to radical land-use changes in the newly established industrial districts and to the loss of traditional agricultural practices. Furthermore, demographic changes took place due to internal emigration from inland and less productive areas to the main cities, exacerbating land abandonment and increasing soil erosion. In the Sele river valley, post-disaster recovery measures represented an input for real estate speculation and infrastructural modernization. Public subsidies for the refurbishment and reconstruction of built environment have been often uncontrolled drivers of real estate development. Furthemore, the implementation of five ASIs was planned to restore the damaged economy and required the construction of dense road infrastructures. Speculation trends continued in the 1990s affecting the traditional rural landscape and provoking land consumption and diffused soil sealing. In the Fortore river valley, the revised CAP exacerbated land abandonment, rather than mitigating it. The subsidies for intensive agriculture and the most recent funds for land ownership led to the abandonment of traditional agricultural practices and less productive land.

A first assessment of land degradation in these areas can be summarized by the maps about vulnerability to land degradation in Figures 4 and 5, derived from data from the AGROSCENARI project (Salvati *et al.* 2013b). These maps are based on the Environmentally Sensitive Area (ESA) procedure developed in the framework of the EU-funded Mediterranean Desertification and Land use project. This methodology is a standard procedure to assess land vulnerability to degradation using simplified geographic information systems and statistical tools (Salvati *et al.* 2013a). The ESA Index (ESAI) considers four thematic layers: climate quality, soil quality, vegetation quality and land-management quality (Basso *et al.* 2000; Salvati *et al.* 2013a). These maps clearly show worsening trends in the period 1950–2010 for the regions. In the fragile ecosystems of Campania and Basilicata, crop intensification, land abandonment, tourism development, urban sprawl and overexploitation of water and soil resources contributed to impacts on traditional rural landscapes, habitat alteration and fragmentation, loss of biodiversity and radical land-use changes. These phenomena, combined with climate change effects, can undermine sustainable land management and increase land and soil vulnerability to degradation (Salvati & Carlucci 2010; Salvati & Bajocco 2011; Salvati *et al.* 2013a).

The SD risk of southern Italy has parallels with the paradigm shift from industrial modernity to the 'risk society' (Beck 1992). Population growth, rapid urban development, economic production, international financial pressures and social conflicts can be seen as consequences of the enlightenment rationality (Bulkeley 2001), can increase spatial and social vulnerability and lead to new environmental risk, such as SD, by shaping new contexts or new types of extreme events and disasters (Lambin *et al.* 2001; Sarewitz *et al.* 2003; Howes 2005). In southern Italy, development policies did not promote a clear vision of the local socio-environmental systems for coping with mid- and long-term uncertainties of soil resource management, land use and agricultural production. This short-term perspective has contributed to create a long-term, underestimated and uncontrolled SD risk, through land abandonment, land-use change and soil sealing. Over the past decades, terms such as 'development', 'modernization' and 'growth' have been used as metaphors in developmental policies, with no direct – and positive – impacts on local communities (Forino *et al.*

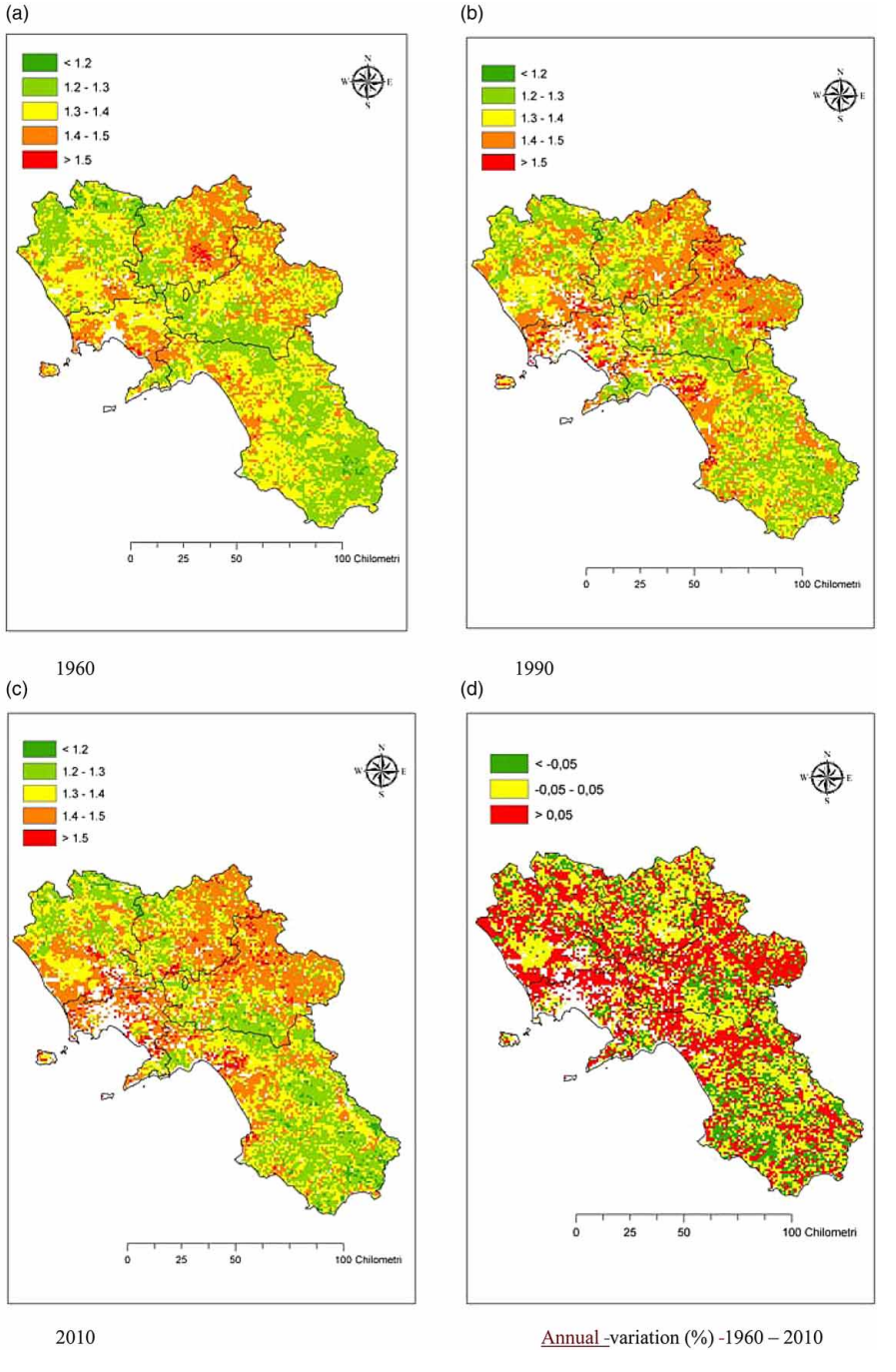

Figure 4 The ESAI maps of Campania by year and class of vulnerability to land degradation: (a) 1960; (b) 1990; (c) 2010; (d) Yearly variation (%) 1960–2010 (Salvati *et al.* 2013b).

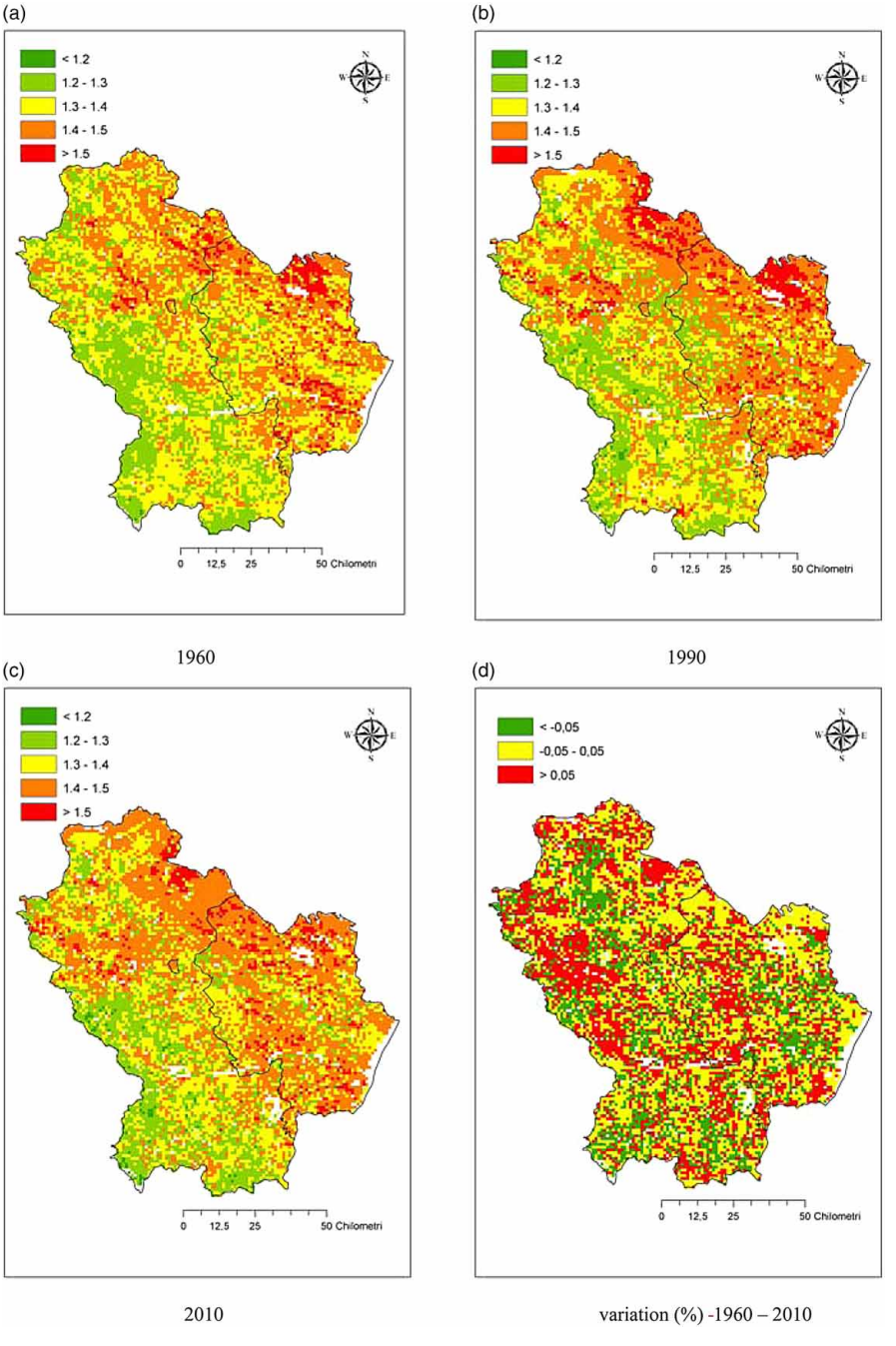

Figure 5 The ESAI maps of Basilicata by year and class of vulnerability to land degradation: (a) 1960; (b) 1990; (c) 2010; (d) Yearly variation (%) 1960–2010 (Salvati *et al.* 2013b).

2014). Much of the expected changes arising from this development process have generally tended towards an economic and environment involution. These changes have been consistently framed within the patterns of modernization, industrialization and shift from underdevelopment; however the patterns themselves remained fixed (Spooner 1984). Even now, the economic and political crisis in Italy reflects the alarming impasse in the developmental process, if it indeed exists, in southern Italy.

When institutions lack knowledge about the complexity of cause and effect relationships and of potential negative externalities, the implemented policies can generate cascade effects on environmental quality (Akhtar-Schuster *et al.* 2011; Chasek *et al.* 2011). National governments should thus plan strategies, set priorities and enact environmental and development policies that can be sustainable in the long term.

4. Conclusions

This paper has shown that SD is contextual (Warren 2002), because it is rooted within national social and political systems (Blaikie & Brookfield 1987; Blaikie 1989, 1995; Stringer & Harris 2014), and shaped through environmental, economic and social policies. Soil degradation is linked to decision-making about the available options and the relevance of the decisions as taken by a state. The paucity of studies taking a longitudinal view to explore SD in southern Italy leaves the narrative approach as proposed in this paper as valuable to stimulate further research. The paper has drawn attention to a dichotomy between the expected outcomes of a state-driven development strategy and real environmental repercussions in selected areas. The paper provides evidence of the difficulties in achieving environmental and sustainable goals within institutional agendas of development policies. It has highlighted the implementation of developmental policies requires an understanding of the complexity of socio-ecological systems to ensure environmental, social and economic sustainability in both core and peripheral Mediterranean regions. The selected case studies demonstrate that when developmental policies are not implemented with a robust awareness of the spatial complexity of their mid- and long-term consequences, they may partially fail and be counterproductive. In this way, in-depth analyses of the developmental policies in southern Mediterranean landscapes are required to minimize both the negative environmental externalities and the exacerbation of land vulnerability, and to explore the possibility of viable and effective, context-specific policy designs to protect soils from degradation. Monitoring SD requires more holistic and integrated approaches than the ones previously adopted, oriented to a deep understanding of the complex interplay among institutional agendas, social systems and the environment.

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