

MODERN AND CONTEMPORARY RESEARCH IN SOCIAL, HUMAN AND ADMINISTRATIVE SCIENCES



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Rural Gentrification: Conceptual Approaches, Dynamics, and Socio-Spatial Transformation

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ABSTRACT

Rural gentrification has become an increasingly important concept for understanding the class-based, economic, and socio-spatial dimensions of contemporary rural change. This study examines rural gentrification through its conceptual and theoretical foundations, major dynamics and actors, and its economic, social, and spatial consequences. Particular attention is given to the relationship between rural gentrification and processes such as counterurbanisation, lifestyle migration, tourism, and second-home development, as well as to the role of capital, property relations, planning, and state intervention. The study also discusses displacement and exclusion, including their indirect and socio-cultural forms, as important but context-dependent dimensions of rural gentrification. Drawing on the international literature and studies conducted in Türkiye, the study demonstrates that rural gentrification does not follow a single trajectory; rather, its forms and consequences vary according to local economic, social, and spatial conditions. It therefore argues that not every form of rural transformation should be defined as gentrification. The analytical value of the concept depends on considering class change, the revalorisation of capital and property, socio-spatial transformation, and pressures of exclusion or displacement together.

Keywords – Rural gentrification, counterurbanisation, rural change, socio-spatial transformation, Türkiye

INTRODUCTION

The concept of gentrification was introduced by Ruth Glass in her 1964 work *London: Aspects of Change* to describe the social and spatial transformation of London's working-class neighbourhoods following the arrival of the middle classes (Glass, 1964). In the following decades, different theoretical explanations were developed to account for the causes of gentrification. While Smith (1979) emphasised the reinvestment of capital in urban space and the rent gap, Ley (1986) focused on the emergence of the new middle class, consumption preferences, and lifestyle. Hamnett (1991), in turn, argued that treating production- and consumption-side explanations as competing alternatives was insufficient to account for the complexity of gentrification. Over time, the scope of the debate expanded to include state intervention, public policy, displacement, and the diverse geographical manifestations of gentrification (Smith, 1996; Lees et al., 2008). The literature on rural gentrification developed within this broader debate (Phillips, 1993, 2004, 2005; Phillips and Smith, 2018).

Over time, changes in rural areas have contributed to the development of the concept. The declining importance of agriculture in rural employment and income, improvements in transport, the expansion of tourism and recreational activities, and the movement of some segments of the urban population towards rural living have contributed to making the traditional rural-urban divide increasingly permeable (Nelson et al., 2010; Phillips and Smith, 2018). In this process, some rural settlements have been revalorised as places of residence, investment, tourism, and lifestyle consumption, while the arrival of new population groups with different class characteristics has affected housing and land markets, local economies, and social relations (Nelson et al., 2010; Phillips and Smith, 2018). Phillips and Smith (2018) note that rural gentrification does not take the same form across different rural contexts. While studies in England have largely focused on rural areas characterised by intensive commuting, North American research has also examined settlements located farther from metropolitan influence.

Rural gentrification does not treat this movement from urban to rural areas merely as a demographic shift. The class characteristics of incoming populations, the revalorisation of rural housing and land, changes in property ownership, and their effects on local residents lie at the core of the concept. Phillips's (1993) discussion of rural gentrification through processes of class colonisation became one of the key references in this literature. Subsequent research has shown that the process does not unfold in the same way across different rural contexts (Phillips, 2005; Guimond and Simard, 2010). Rural gentrification is therefore better understood within the distinctive economic and social relations of rural space rather than as a simple rural counterpart of urban gentrification.

A strand of the rural gentrification literature focuses on why particular social groups move to rural areas. The desire to move away from urban life and the search for proximity to nature, tranquillity, privacy, quality of life, and authenticity are among the main factors discussed in this context (Smith and Phillips, 2001; Nelson and Hines, 2018). The middle and upper-middle classes moving into rural areas often differ from local residents in terms of their economic resources, education, occupations, consumption preferences, and lifestyles, giving this mobility a distinct class character. Although this perspective is useful for explaining the demand side of rural gentrification, it cannot by itself explain the conditions under which rural property and land become attractive for investment.

Studies foregrounding capital and property relations offer a different explanation. Agricultural restructuring, the conversion of rural buildings to new uses, and the shift of land towards more profitable uses can create new opportunities for capital accumulation in rural space. Supply-side

explanations, most notably Smith's (1979) rent-gap approach in the urban gentrification literature, have been used more sparingly in studies of rural gentrification. Nelson and Hines (2018) examine the potential of this approach for explaining rural gentrification through the case of Jackson, Wyoming. From this perspective, the gap between the value of rural land under its current use and the potential value generated by alternative uses provides an important explanation for the movement of capital into rural space. Tourism and second-home demand may also contribute to the revalorisation of rural property and land (Nelson and Hines, 2018).

The overlap between rural gentrification and processes such as counterurbanisation, lifestyle migration, second-home development, and rural tourism makes the boundaries of the concept difficult to define. Not every movement from urban to rural areas can be considered rural gentrification; nor does the development of tourism, the proliferation of second homes, or the renovation of older buildings in a rural settlement necessarily indicate the presence of gentrification. What matters is the class character of population change and its consequences for property relations, housing markets, and the local social structure. The question of whether rural transformations in which direct displacement is not observed should be considered gentrification has also been debated in the literature. Accordingly, scholars have cautioned against extending the concept to encompass every form of rural transformation (Depraz, 2017, as cited in Phillips et al., 2021: 71).

Displacement is one of the central issues in this debate. In rural areas, displacement does not always take the form of direct eviction or forced relocation. Rising housing prices may prevent younger and lower-income groups from securing housing in the places where they live, while reductions in transport provision or changes in retail, education, and social services may also place pressure on existing residents. Phillips et al. (2021: 72) note that the loss of services in rural gentrification contexts can restrict access to resources necessary for everyday life and thereby encourage out-migration. The experience of people who remain physically in place but no longer feel that they belong within a changing spatial and cultural environment is also discussed in terms of socio-cultural displacement (Phillips et al., 2021: 72).

The consequences of rural gentrification vary according to local conditions and the groups involved in the process. Incoming populations may stimulate economic activity, bring unused housing back into use, and contribute new resources to local social life. At the same time, the same process may raise land and housing values, making access to housing more difficult for some segments of the local population. In their study of Québec, Guimond and Simard (2010: 458-459) found that newcomers' participation

in local organisations, expertise, and economic contributions were viewed positively, while rising land values and housing shortages were identified as major concerns.

A similar pattern can be observed in Catalonia. Solana-Solana's (2010) study of the Empordanet area reports that people arriving from major cities, particularly Barcelona, purchased abandoned or underused rural dwellings as primary or second homes, contributing to the renewal of the housing stock. At the same time, rising housing prices made access to housing increasingly difficult for younger local residents and increased their tendency to leave the area (Solana-Solana, 2010). This case illustrates the contradictory nature of rural gentrification, as physical renewal does not necessarily produce equally positive outcomes for the local population.

Academic interest in rural gentrification in Türkiye is relatively recent. Nevertheless, a number of studies have examined different settlements through tourism, second homes, cultural heritage, the expanding spheres of influence of major cities, and urban-to-rural population movements. Studies of the relationship between tourism, property change, and the arrival of urban newcomers in Assos (Kılıç, 2020; Göçer et al., 2021), the seasonal gentrification approach focusing on the temporal dimensions of rural change in Ağlasun (Kocabıyık and Loopmans, 2021), and research on the Çaygören and Kertil neighbourhoods of Sındırgı (Demirözer, 2022) illustrate this diversity.

In this chapter, rural gentrification is not used as a general label for every economic or demographic change occurring in rural areas. Rather, it is approached as a concept that brings together the class character of rural transformation, changing relations of capital and property, and their socio-spatial consequences. The chapter first examines the theoretical foundations of rural gentrification, followed by the dynamics that drive the process and the actors involved. It then considers its economic, social, and spatial consequences before discussing the different manifestations and conceptual boundaries of rural gentrification through studies conducted in Türkiye.

CONCEPTUAL AND THEORETICAL FRAMEWORK OF RURAL GENTRIFICATION

Although rural gentrification emerged through the extension of an urban concept to rural areas, it has gradually developed its own theoretical debates. A central question in these debates is whether population change in rural areas can be adequately explained solely through concepts such as migration, counterurbanisation, or rural revitalisation. In particular, the

movement of middle- and upper-middle-class groups into rural settlements, changes in housing and land markets, and their effects on local populations have made the class dimension of rural transformation increasingly visible. Guimond and Simard (2010) note that newcomers to rural areas often belong to economically more advantaged groups.

From Gentrification to Rural Gentrification

Although the gentrification literature initially developed around class and spatial transformations in urban centres, the concept has gradually been approached within a broader framework in terms of both its actors and the geographies in which it occurs. Gentrification cannot be explained solely by individual residential preferences or market dynamics; public policies, planning decisions, and state interventions may also shape the direction and character of the process. In the context of Türkiye, Yarım Altunay and Beyazıt (2022) draw attention to the state's capacity to move beyond its regulatory role and become a direct actor in urban gentrification processes. As the range of actors associated with gentrification has expanded, so too has its spatial scope, making forms of gentrification beyond urban centres increasingly visible in the literature.

Early studies of rural gentrification developed particularly in England, and the concept was subsequently applied across different countries and rural contexts. Phillips's (1993) study is widely regarded as one of the key references in this literature. His conceptualisation of "class colonisation" indicates that population movement into rural areas should not be understood as a simple demographic shift; rather, the class characteristics of newcomers and their effects on local communities need to be considered together (Phillips, 1993). Phillips (2004) further argued that the concentration of gentrification research on urban centres had left its manifestations in other geographical contexts relatively underexplored. This perspective makes it possible to understand rural gentrification not simply as the extension of an urban process into the countryside, but as one of the forms that gentrification takes across different geographical contexts.

This perspective also highlights a key distinction between rural gentrification and counterurbanisation. Counterurbanisation is primarily a demographic concept describing population movement from cities towards smaller settlements and rural areas. Rural gentrification, by contrast, places greater emphasis on the class character and consequences of such movement. Phillips's discussion of the relationship between counterurbanisation and rural gentrification similarly emphasises that, although the two concepts overlap, they do not offer the same analytical framework (Phillips, 2010).

The arrival of new residents in rural areas is therefore not, in itself, sufficient evidence of gentrification.

Applying the concept to rural contexts has also required some assumptions in the urban gentrification literature to be reconsidered. In cities, gentrification is often associated with the revalorisation of neighbourhoods that have previously experienced physical and economic decline, whereas rural gentrification does not necessarily begin from the same conditions. In their study of Québec, Guimond and Simard note that gentrification does not necessarily occur in places that have previously undergone devaluation and that the exclusion of vulnerable groups may take forms different from those observed in urban contexts (Guimond and Simard, 2010: 460).

These differences make it difficult to explain rural gentrification through a single, fixed model. The differences identified by Guimond and Simard (2010: 460) between Brome-Missisquoi and Arthabaska indicate that the process can take different forms depending on local and regional conditions. The economic structure, location, property patterns, composition of the local population, and planning context of a settlement should therefore be taken into account when applying the concept to rural areas.

Demand-Side Approaches: Lifestyle and the Rural Idyll

A significant strand of rural gentrification research seeks to explain why more affluent urban populations are attracted to particular rural areas. Proximity to nature, tranquillity, privacy, a slower pace of life, recreational opportunities, and perceptions of rural life as more “authentic” figure prominently in this approach. Nelson and Hines (2018) note that demand-side explanations have been particularly influential in the US literature, where groups moving to rural settlements are often described as seeking qualities such as a better quality of life, natural surroundings, and tranquillity.

These preferences are not simply matters of individual taste. The ability to acquire a house or land in particular rural areas, maintain economic ties with the city, and establish rural living as a matter of choice depends on access to certain economic resources. Differences between newcomers and long-term residents in terms of income, education, occupation, and consumption patterns make the class character of this population movement more apparent. Guimond and Simard (2010) similarly note that newcomers settling in rural areas are generally more affluent than long-term residents.

The “rural idyll” occupies an important place within these demand-side explanations. The valuation of rural areas through such attributes is addressed more explicitly in Smith and Phillips’s (2001) conceptualisation of “greentrification.” In their study of transformation in the Pennine countryside, the authors draw attention to the relationship that relatively affluent newcomers establish with “green” rural spaces and to the socio-cultural meanings they attach to rurality. This perspective suggests that rural gentrification can be understood not simply through changes in housing and population, but also through the reinterpretation of rural space according to particular class-based tastes (Smith and Phillips, 2001). Such representations also influence which rural areas are perceived as attractive and how newcomers seek to use them. The US studies discussed by Nelson and Hines (2018) likewise show that affluent newcomers tend to favour lifestyles associated with tranquillity, privacy, and natural surroundings.

The limitation of demand-side approaches becomes apparent at this point. Explaining why the new middle classes are attracted to rural living is not the same as explaining why particular rural areas become viable sites for investment. Understanding the economic foundations of rural gentrification therefore also requires attention to land, property relations, and capital flows.

Supply-Side Approaches: Capital, Property, and the Rent Gap

One of the theoretical foundations of supply-side explanations of rural gentrification is the rent-gap approach developed in the urban gentrification literature. Rather than explaining gentrification solely through middle-class preferences for particular areas, Smith (1979) conceptualised the process in terms of capital moving towards areas that had become suitable for reinvestment. The rent gap refers to the difference between the rent generated by land under its current use and the potential rent that could be realised under a higher and better use (Smith, 1979). Once this gap becomes sufficiently large, conditions become favourable for capital to return to the area.

Supply-side explanations of rural gentrification focus on how rural areas become revalorised from the perspective of capital. The central question is under what economic conditions particular rural properties and land become available for more profitable uses. Agricultural restructuring, the weakening of productive functions, declining values associated with the existing uses of some land, and the prospect of higher returns from residential or recreational uses can all contribute to this transformation.

Nelson and Hines (2018) note that the US rural gentrification literature long placed greater emphasis on demand-side explanations, while

supply-side approaches such as the rent gap received comparatively less attention. In their case study of Jackson, Wyoming, increasing housing demand widened the gap between the returns generated by agricultural land under its existing use and the potential returns from residential development, creating an incentive for land-use conversion. This case demonstrates that rural gentrification cannot be explained solely through the lifestyle preferences of newcomers; changes in the investment value of rural property also form an important part of the process (Nelson and Hines, 2018).

A supply-side perspective does not treat rural areas as spaces detached from capital flows. According to Nelson and Hines (2018), rural areas can be reproduced through their connections to global capital networks even when they are geographically remote. This may become particularly visible in rural areas where tourism, second homes, and recreational uses are concentrated. Tourism and second-home demand may therefore also contribute to the revalorisation of rural property and land (Nelson and Hines, 2018).

Conceptual Boundaries of Rural Gentrification

Rural gentrification should not be used as an umbrella concept encompassing all forms of change in rural areas. Counterurbanisation, lifestyle migration, second-home development, tourism, and recreation may intersect with rural gentrification, but none of these processes constitutes gentrification in itself.

Urban-to-rural migration, for example, may produce a marked change in the composition of the rural population. Yet if there is no significant class differentiation between newcomers and local residents, no revalorisation of housing and land markets, and no substantial change in spatial patterns of use, it is debatable whether such movement should be described as rural gentrification. Solana-Solana's (2010) study of Catalonia illustrates how class-based population change and housing-market transformation can be considered together. In this case, the purchase of rural housing by people arriving from major cities, the renewal of the housing stock, rising housing prices, and the departure of younger local residents unable to access housing emerged as interconnected elements of the same process (Solana-Solana, 2010).

Another feature distinguishing rural gentrification from other forms of rural mobility concerns class relations and exclusion. Rural gentrification asks not only who moves into rural areas, but also how such mobility affects the ability of different groups to remain in place, secure housing, and use

rural space. This critical dimension is one of the key features distinguishing rural gentrification from counterurbanisation.

Displacement, moreover, need not take the form of direct physical relocation in every case. Restricted access to housing markets, the inability of younger local residents to secure housing, or the exclusion of existing residents within a changing class and cultural environment may generate more indirect forms of displacement. Assessing rural gentrification therefore requires attention not simply to population movement, but to how class change, the revalorisation of capital and property, spatial transformation, and pressures of exclusion emerge in combination.

The explanatory value of rural gentrification lies precisely in this capacity. Rather than merely indicating whether rural populations are increasing or declining, the concept makes visible the class and political-economic dimensions of changes in rural space. At the same time, as Guimond and Simard (2010) emphasise, urban theories need to be reinterpreted in light of local and regional conditions rather than transferred unchanged to rural settings. Assessments of rural gentrification should therefore consider property relations, spatial change, and effects on local populations alongside the class character of population movements.

DYNAMICS AND ACTORS OF RURAL GENTRIFICATION

Rural gentrification emerges through the intersection of different economic and social processes within the same space. Urban-to-rural population movements, lifestyle preferences, tourism and second-home development, changes in housing and land markets, planning decisions, and the attitudes of local actors are among the main components of this process. Their relative importance, however, varies from one settlement to another. In some rural areas, the arrival of new residents may be the dominant factor, while in others tourism or real estate investment may be more prominent. Rural gentrification should therefore not be attributed to a single cause; rather, attention should be paid to how the different dynamics underlying the process interact with one another.

Urban-to-Rural Mobility and Changing Population Structure

Population movement from cities to rural areas is one of the most visible elements of rural gentrification. What matters here is not simply the direction of population movement, but the social and economic characteristics of those moving into rural areas. The concentration of groups that differ from local residents in terms of income, education, occupation, and lifestyle can also alter the class structure of rural settlements.

Solana-Solana's (2010) study of the Empordanet area in Catalonia clearly illustrates this relationship. People arriving from major cities, particularly Barcelona, purchased dwellings in rural settlements valued for their natural and cultural qualities as primary or second homes. This mobility contributed both to the reuse of the existing housing stock and to changes in the housing market (Solana-Solana, 2010).

The age and life-course characteristics of rural gentrifiers have also received increasing attention over time. While earlier studies tended to focus on urban professionals and middle-class families, subsequent research has shown that those who move to rural areas upon retirement, as well as earlier in-migrants who grow older in place, may also form part of the process (Smith et al., 2019). Smith et al. note that gentrifiers who age "in place" in rural areas may affect the supply of housing, potentially creating indirect pressures of exclusion, particularly for younger residents (Smith et al., 2019: 149).

The continuity of the process therefore depends not only on who arrives, but also on who remains, how long housing is withdrawn from the market, and how access to housing changes across generations within rural settlements.

Spatial Preferences and Emerging Tensions

The lifestyle preferences of newcomers to rural areas also bring expectations concerning the physical and social characteristics of the settlement. Demands for the preservation of the natural environment, low population density, traditional buildings, or the rural landscape may not always coincide with local residents' expectations regarding housing, production, and economic activity.

Solana-Solana's study identifies a clear tension between local residents' demands for additional housing and economic activity and newcomers' desire to preserve the rural landscape, low population density, and traditional built environment (Solana-Solana, 2010: 509).

Such tensions make the cultural dimension of rural gentrification more visible. Preferences concerning how rural areas should look, which activities are considered "appropriate" to them, and which values should be preserved are not merely aesthetic choices. They reflect different class positions and differing expectations of rural life as they become inscribed in space.

Tourism and Second-Home Development

Tourism and second-home development are among the dynamics that can accelerate gentrification, particularly in rural areas with significant natural and cultural appeal. Demand for second homes can alter the use of the existing housing stock while integrating rural housing into a broader market extending beyond local needs.

The impact of second homes on the rural housing market is particularly evident in the Catalanian case. Solana-Solana (2010) notes the increasing prevalence of second homes in rural Spain and the effects of demand for seasonal or permanent use on local housing markets. The study also discusses the spread of a “residential tourism” model into more inland rural settlements as a development generating debate at the local level (Solana-Solana, 2010: 509).

The economic consequences of second-home demand are contradictory. The purchase and renovation of rural housing may stimulate local construction and restoration activities. In the Empordanet case, the restoration of old village houses and farm buildings created a new area of economic activity for small businesses operating in this sector. At the same time, the same demand increased housing values, making it more difficult for younger local residents in particular to obtain housing on the market (Solana-Solana, 2010: 512-513).

Tourism can similarly transform the use of rural space. The conversion of rural dwellings into accommodation, the adaptation of traditional buildings for tourism, and the restructuring of local economies around visitor demand may introduce new uses alongside the existing functions of rural areas. The presence of tourism alone, however, is not an indicator of rural gentrification. What matters is how tourism-related change affects property relations, housing markets, class structures, and patterns of spatial use.

Real Estate Markets and the Revalorisation of Space

One of the central dynamics of rural gentrification is the revalorisation of housing and land markets. As urban middle-class groups move into particular rural areas, demand increases, while the replacement of agricultural or other relatively low-return uses by more profitable residential, tourism, or recreational uses may encourage capital investment in rural space.

In rural areas, this process is not limited to the renovation of existing housing. Phillips et al. discuss the conversion of agricultural buildings into housing, the amalgamation of former workers' dwellings, and the release of agricultural land for new housing development within cycles of devaluation and revalorisation of rural property. Land ownership, land-use regulations, and decisions over which areas can be brought onto the market are also important determinants of this process (Phillips et al., 2021).

Rising property values do not affect all local groups in the same way. Property owners may benefit economically from higher prices, while tenants and younger people who do not yet own property may be adversely affected. Guimond and Simard's study of Québec shows that rising land and housing values associated with more affluent newcomers do not necessarily result in direct displacement in every case, but may restrict access to the housing market for younger and more vulnerable groups (Guimond and Simard, 2010). It is therefore misleading to treat the "local population" as a single interest group. Property ownership, age, income, and forms of economic activity can shape who benefits from rural gentrification and who becomes more vulnerable.

The State, Planning, and Local Policies

Rural gentrification is not simply the spontaneous outcome of market forces and individual residential preferences. The urban gentrification literature has shown that the state can create the conditions for spatial transformation through planning, investment, and regulatory instruments and, in some cases, become a direct actor in the process (Yarim Altunay and Beyazıt, 2022). In rural areas, planning decisions, conservation policies, land-use regulations, infrastructure investments, and housing policies can likewise affect the value and accessibility of particular areas.

These effects may operate in different directions. While conservation policies can contribute to the preservation of natural and cultural assets, they may also restrict the supply of developable land, thereby reducing housing supply and increasing prices. Housing and family policies, by contrast, may serve as instruments for mitigating exclusion. In Guimond and Simard's study, Lac-Brome's policy of supporting property acquisition among young families and the development of housing and family policies by local authorities in Arthabaska provide examples of such interventions (Guimond and Simard, 2010: 459).

Solana-Solana's study of Catalonia also demonstrates that shortcomings in housing and planning policies can be significant in shaping rural transformation. The study notes that deficiencies in rural housing and

zoning policies exacerbated problems in local housing markets in the face of growing demand for second homes and new residential development (Solana-Solana, 2010: 509).

The role of the state in rural gentrification cannot therefore be adequately understood simply in terms of either promoting or preventing the process. The same policy may contribute to environmental or cultural conservation while simultaneously restricting property supply and reducing accessibility for particular groups. The institutional dimension of rural gentrification should be understood through such contradictions.

Actors and Changing Positions

The actors receiving the greatest attention in the rural gentrification literature are incoming middle- and upper-middle-class groups. Reducing the process solely to these groups, however, obscures a substantial part of local social relations. Local residents, second-home owners, tourism and real estate investors, community organisations, and local governments may all influence rural transformation at different stages.

It is also important to recognise that newcomers do not constitute a homogeneous group. Drawing on the case of Hebden Bridge, Smith and Holt (2005) demonstrate that rural gentrification may involve groups with different identities and lifestyles. Their study suggests that defining rural gentrifiers through a single middle-class profile may obscure important differences within the class itself.

In their Québec study, Guimond and Simard (2010) show that newcomers, long-term residents, representatives of local and regional organisations, and municipal officials assess rural gentrification in different ways. Managers of local organisations viewed newcomers' expertise and economic contributions positively while identifying rising land values and housing shortages as significant concerns. Municipal officials, by contrast, placed greater emphasis on newcomers' contribution to tax revenues (Guimond and Simard, 2010: 458-459).

The same study demonstrates that actors' attitudes also vary according to local context. In Arthabaska, the assessments of newcomers and long-term residents were relatively similar, whereas in Brome-Missisquoi the effects were perceived as more pronounced and more contested (Guimond and Simard, 2010: 459). This difference indicates that a fixed opposition between "local residents" and "gentrifiers" does not apply to every case.

Actors' positions may also change over time. Groups that settled in rural areas at an earlier stage may gradually become part of the established population and assume a different position in relation to subsequent waves of gentrification. This demonstrates that the distinction between "newcomers" and "established residents" in rural gentrification is not fixed (Smith et al., 2019). The actors involved in rural gentrification should therefore be understood not as static and homogeneous categories, but as social groups whose interests and positions may change over time.

ECONOMIC, SOCIAL, AND SPATIAL CONSEQUENCES OF RURAL GENTRIFICATION

The economic, social, and spatial consequences of rural gentrification often emerge in ways that are difficult to separate from one another. Rising housing and land values constitute an economic change, but they also have social consequences insofar as they affect access to housing and spatial consequences insofar as they transform the use of the housing stock and the settlement pattern. Similarly, the arrival of new population groups may bring new resources into the local economy while also altering the class and demographic structure of the settlement. The consequences of the process should therefore be understood not as independent domains, but as different dimensions of the same transformation (Nelson et al., 2010).

Economic Consequences

Rising housing and land values are among the most frequently observed economic consequences of rural gentrification. Demand from higher-income newcomers can drive up prices, particularly in rural settlements where housing supply is limited. While this may generate capital gains for property owners, the same process can reduce housing affordability for those who do not yet own a home.

This dual effect is particularly evident in the Catalan case. Solana-Solana's study shows that the purchase and restoration of older rural dwellings by urban newcomers stimulated the local construction and renovation sector, leading some small businesses to concentrate much of their activity in this field. At the same time, growing demand increased the market value of older family homes, making it more difficult for younger people seeking to purchase their first home to compete with higher-income buyers from outside the area (Solana-Solana, 2010: 512-513).

This case demonstrates that the economic consequences of rural gentrification are not uniform for the local population. A household that sells property or benefits from rising values may experience the process very

differently from a tenant or a household seeking to purchase a home. Guimond and Simard likewise show that rural property owners may benefit from increasing values, while younger and more vulnerable groups face greater difficulties in accessing the housing market (Guimond and Simard, 2010).

Economic change is not confined to the housing market. The consumption preferences of newcomers can also alter the character of local services and commercial activities. Such demand may contribute to the emergence of new areas of economic activity in rural economies, while at the same time making local economic structures more responsive to the consumption preferences of incoming populations.

Social and Demographic Consequences

One of the principal social consequences of rural gentrification is a change in the class composition of the settlement. The arrival of populations with greater economic and cultural capital may produce a social structure increasingly differentiated by income, education, occupation, and lifestyle. Rising housing prices may, in turn, restrict the ability of low- and middle-income groups to remain in the settlement or secure new housing. Solana-Solana (2010) draws attention to the possibility that rising prices may lead to a form of population selection based on purchasing power.

Class change does not necessarily generate conflict between local residents and newcomers. In some cases, newcomers' economic resources, expertise, and participation in local organisations are viewed positively. In Guimond and Simard's study of Québec, the participation of newcomers in local associations and their economic contributions were positively assessed, while the same actors regarded rising land prices and housing shortages as significant concerns (Guimond and Simard, 2010: 458-459).

This suggests that the social consequences of rural gentrification cannot be explained through a simple opposition between "local residents" and "newcomers." Property status, age, income, occupation, and position within the local economy may create divergent interests even within the same social group. The demographic structure of rural settlements may also be affected by this process. In particular, high housing costs may make it more difficult for younger people to remain in rural settlements, with implications for the age structure of the population and intergenerational continuity.

Another, less visible dimension of social transformation concerns belonging and local identity. Changes in rural landscapes, housing,

commercial uses, and everyday practices may affect the relationship that long-term residents have with place (Phillips et al., 2021: 72). Social consequences should therefore be assessed not only in terms of who remains in or leaves the settlement, but also in terms of whose needs and ways of life shape the changing rural space.

Spatial and Environmental Consequences

The spatial consequences of rural gentrification are most clearly visible in the housing stock and patterns of land use. The renovation of unused or physically deteriorated buildings, the reuse of traditional dwellings, and the conversion of former production buildings into housing can substantially alter the physical character of rural settlements. While such transformation may contribute to the preservation of cultural heritage, it can also change how these buildings are used.

In Solana-Solana's study, the restoration of abandoned village houses and traditional rural buildings contributed to improvements in the physical environment and the reuse of the housing stock (Solana-Solana, 2010). Yet the conversion of these properties from homes occupied by local households into primary or second residences for higher-income groups demonstrates that physical preservation and social continuity do not necessarily coincide.

Changes in land use are equally important. Rural gentrification studies frequently discuss the conversion of former agricultural buildings into housing, the release of agricultural land for new residential development, and the transformation of areas previously used for production into recreational or residential spaces. Phillips et al. identify the residential revalorisation of devalued agricultural properties and land as one of the prominent forms of this transformation in rural areas (Phillips et al., 2021).

The environmental consequences of spatial transformation do not always move in the same direction. Newcomers' demands for the preservation of the natural environment and traditional landscapes may strengthen conservation-oriented tendencies, while growing demand for housing, second homes, and tourism may intensify development pressures and land-use change. Rural gentrification is therefore a process in which demands for environmental conservation and new forms of consumption and investment may come into tension within the same space.

Displacement and Exclusion

Displacement is one of the most contested consequences of rural gentrification. In the urban literature, displacement is often discussed in terms of direct eviction or forced relocation resulting from rising rents. In rural areas, however, it may take more indirect forms. Particularly in settlements with limited housing supply, high prices may exclude low- and middle-income groups from the housing market.

Phillips et al. (2021) emphasise that rural displacement does not occur solely through departure from an existing dwelling. Their study discusses the exclusion of low- and middle-income groups from local housing markets due to high housing prices as a major form of exclusionary displacement associated with rural gentrification. The relevant question is therefore not only “who has been displaced?” but also “who can no longer obtain housing in this settlement?”

Displacement pressures are not confined to the housing market. Reduced access to public transport, retail, education, and social services may make everyday life more difficult for some residents and encourage out-migration. The loss of a sense of belonging among those who remain physically in place within a changing spatial and cultural environment can also be understood as another form of socio-cultural displacement (Phillips et al., 2021: 72).

This broader interpretation needs to be used with care. Labelling every cultural change or local tension as displacement risks blurring the analytical boundaries of the concept. Direct physical displacement, exclusion from the housing market due to rising costs, reduced access to services, and socio-cultural alienation do not describe the same outcomes. Distinguishing among these forms makes it possible to assess more clearly which groups are affected by rural gentrification and through which mechanisms.

Taken together, the consequences of rural gentrification suggest that the process can be understood neither as an unqualified form of rural revitalisation nor as a one-directional process of loss. The renewal of the physical environment and the emergence of new economic activities may generate positive outcomes for some settlements. The same developments may make housing less accessible, intensify class differentiation, and place economic or cultural pressures on particular segments of the local population. Assessing the consequences of rural gentrification therefore requires attention not only to what changes in a particular place, but also to which groups benefit from those changes, which groups bear the costs, and the local conditions under which these differences emerge.

A GENERAL ASSESSMENT OF RURAL GENTRIFICATION IN TÜRKİYE

The literature on rural gentrification in Türkiye is relatively recent compared with studies of urban gentrification, and existing research has largely concentrated on specific settlement cases. Nevertheless, the growing examination of different types of rural settlements through this conceptual lens has made diverse patterns of rural transformation in Türkiye increasingly visible. Existing studies show that rural gentrification is not confined to settlements surrounding major cities; it may also take different forms in villages where tourism and cultural heritage are prominent, in areas with high levels of natural amenity, and in small settlements characterised by seasonal population movements.

One of the prominent cases in Türkiye is Assos. Kılıç (2020) and Göçer et al. (2021) show that the transformation of the settlement cannot be reduced simply to the arrival of an urban middle-class population. Kılıç (2020), based on qualitative fieldwork, relates the process to the transition of the local economy from agriculture towards tourism, the arrival of higher-income and better-educated groups from metropolitan areas, and the changing use and ownership of traditional stone houses. Tourism, which initially developed on a relatively small scale, gradually became one of the principal economic activities of the settlement, while newcomers became increasingly prominent in tourism-related businesses (Kılıç, 2020). Göçer et al. (2021), examining the period between 2000 and 2017, similarly identify changes in demographic and socio-economic structure, property ownership and prices, and the physical organisation of the settlement.

The Assos case also demonstrates the complex relationship between heritage conservation, state intervention and rural gentrification. Kılıç (2020) identifies the designation of Assos as a first-degree archaeological conservation site in 1983 as an important turning point in this transformation. Conservation regulations restricted alterations to the historic building stock and introduced costly and lengthy procedures for local residents, while traditional stone houses were increasingly purchased and restored by more affluent newcomers. The resulting transformation also acquired a distinct spatial dimension: newcomers became concentrated in the historic Yukarı Mahalle, whereas a substantial part of the local population moved towards Aşağı Mahalle, producing a form of socio-spatial differentiation within the settlement (Kılıç, 2020).

Göçer et al. (2021) show that the relationship between conservation and gentrification in Assos/Behramkale is not unidirectional. While the renovation of historic buildings and preservation of the physical environment may be regarded as positive developments, changes in the users of these buildings have also transformed the social structure of the settlement. The purchase and restoration of historic houses in the Upper Neighbourhood by urban newcomers produced a marked improvement in the physical environment, whereas new reinforced-concrete construction in the Lower Neighbourhood generated a different pattern of spatial development (Göçer et al., 2021). Rural gentrification in Assos can therefore be understood as a process shaped by changes in property ownership and spatial differentiation alongside tourism and cultural heritage.

A different pattern can be observed in Ağlasun. Kocabıyık and Loopmans (2021) introduce a temporal dimension into the analysis of rural gentrification by examining second-home owners, students, and tourists as groups that use rural space at different times. The concept of “seasonal gentrification” is employed to bring these different forms of mobility within a common framework. The study finds that direct material displacement in Ağlasun is limited, whereas the pressures of experiential displacement and the distribution of costs and benefits vary across different groups. One of the study’s important contributions is to demonstrate that rural gentrification can be understood not simply in terms of where populations move from and to, but also through the periodicity, rhythms of everyday life, permanence, and historical sequencing of such mobility (Kocabıyık and Loopmans, 2021).

The Ağlasun case is particularly important for assessing the relationship between tourism, second homes, and rural gentrification in Türkiye. The presence of second-home owners, tourists, or students does not in itself constitute gentrification. What matters is how these groups affect local housing markets, economic activities, everyday uses of space, and the experiences of established residents. This perspective also calls into question definitions of rural gentrification based exclusively on the permanent settlement of incoming populations.

Research on the Çaygören and Kertil neighbourhoods of Sındırgı demonstrates that rural gentrification may be at different stages even within two settlements in the same district. Demirözer’s (2022) master’s thesis employed a survey of 181 participants, interviews, and participant observation to examine gentrifiers’ reasons for choosing the area and the economic, social, and spatial consequences of the process. Natural beauty, the desire to move away from urban life, and demand for green space were among the main reasons for choosing these areas. The study concluded that

gentrification was at a more advanced stage in Çaygören than in Kertil (Demirözer, 2022).

The difference between the two neighbourhoods is particularly evident in property values and landscape change. According to Demirözer's field findings, land prices increased approximately tenfold in Çaygören and fivefold in Kertil over the preceding decade. The proliferation of new buildings such as hotels, duplexes, and triplexes in Çaygören also produced more visible changes in the rural landscape (Demirözer, 2022: 80-82). Local residents' attitudes towards newcomers also differed between the two neighbourhoods and were associated with the stage reached by the gentrification process. In Çaygören, the initially positive attitude towards newcomers reportedly weakened over time, whereas Kertil continued to display a more receptive attitude towards incoming residents (Demirözer, 2022: 82).

The Ankara-Sirkeli case differs from the others in illustrating the form rural gentrification can take on metropolitan fringes. In her doctoral dissertation, Ercoşkun (2023) examined the Sirkeli Yeşilova and Yeşilyurt neighbourhoods in Ankara's Pursaklar district using qualitative and quantitative methods and a set of rural gentrification indicators. The study reports that new housing typologies, temporary uses such as weekend and summer occupancy, and speculative expectations have altered the rural landscape. However, because the incoming population does not reside there permanently, an equally pronounced transformation of the social structure has not yet been observed (Ercoşkun, 2023: iv).

Spatial change in Sirkeli is particularly pronounced. Calculations based on orthophotos covering the period from 1969 to 2021 show that while the population increased approximately 3.5-fold, the built-up area expanded approximately sevenfold after 2008, largely over land previously used for dry farming (Ercoşkun, 2023: 73). Another notable finding is that transformation occurred less through the renovation of the existing traditional housing stock than through new construction on vacant land and designated development plots (Ercoşkun, 2023: 106). This feature demonstrates that rural gentrification does not necessarily take the form of restoring older housing; it may also become intertwined with new development and metropolitan expansion.

The more recent study of Yunt Mountain further illustrates the diversity of research in Türkiye. Arslan, Gürbıyık, and Şenlik (2024) examined changes in the rural landscape through fieldwork conducted between 2019 and 2024 across 11 neighbourhoods on Yunt Mountain in Manisa. In addition to field observations, the use of mapping and

photographic archives enabled the researchers to trace the physical and landscape dimensions of rural gentrification (Arslan et al., 2024).

Taken together, these studies show that rural gentrification in Türkiye does not follow a single pattern. In Assos, cultural heritage, conservation, tourism, and changes in property ownership are prominent; in Ağlasun, seasonal mobility and the periodic presence of different user groups; in Çaygören and Kertil, natural amenities, property revalorisation, and different stages of the process; and in Sirkeli, metropolitan expansion, new housing development, and the conversion of agricultural land. The Yunt Mountain study, meanwhile, draws attention to the physical traces of transformation in the rural landscape. These differences indicate that rural gentrification may take different forms depending on the location of the settlement, its relationship with tourism and metropolitan centres, its property structure, housing market, and local economic conditions.

Does Every Rural Transformation Constitute Gentrification?

The diversity of cases in Türkiye raises a more fundamental question about the boundaries of the concept. The arrival of urban populations in a rural settlement, the proliferation of second homes, the development of tourism, or the renovation of older buildings does not in itself demonstrate the existence of rural gentrification. Some of these processes may also be explained through counterurbanisation, touristification, lifestyle migration, or rural restructuring.

The first consideration in distinguishing rural gentrification from these processes is the class character of population change. A marked difference between newcomers and the local population in terms of economic and cultural capital is an important indicator of rural gentrification. Yet the arrival of middle-class populations alone is insufficient to establish gentrification unless this difference also has spatial and economic consequences.

The second dimension is the revalorisation of housing, land, and property relations. The transfer and restoration of traditional dwellings in Assos, rising land prices in Çaygören and Kertil, and the conversion of agricultural land into residential areas in Sirkeli represent different manifestations of this dimension. These examples demonstrate that rural gentrification is not confined to the renewal of the existing building stock; in some cases, it may proceed through new construction and changes in land use.

The third dimension is socio-spatial transformation. Changes in the housing stock, rural landscape, commercial uses, and population composition also transform the everyday use of rural space. The nature of this transformation varies from one settlement to another. Although the restoration of historic housing in Assos, new residential and tourism development in Sındırgı, and metropolitan-style new housing development in Sirkeli may all be examined under the same concept, they do not represent the same spatial process.

Displacement and exclusion constitute a fourth dimension that requires greater caution. Excluding a case from rural gentrification simply because direct physical displacement is absent may overlook the exclusionary and experiential forms of displacement discussed in the literature. Conversely, interpreting every increase in prices or every social tension as displacement risks extending the concept too broadly. The significance of the Ağlasun study lies precisely here: although direct material displacement is limited, the effects of different seasonal groups on local residents and the pressures of experiential displacement vary considerably (Kocabıyık and Loopmans, 2021).

Taken together, the theoretical debates and the Turkish cases examined in this chapter suggest four analytical dimensions for the study of rural gentrification: (i) class change, (ii) the revalorisation of capital and property, (iii) socio-spatial transformation, and (iv) pressures of exclusion/displacement. These dimensions should not be expected to emerge with the same intensity or in the same sequence in every case. Nevertheless, this distinction provides a useful analytical framework for avoiding the tendency to label every urban-to-rural population movement, tourism development, or physical renewal of rural space as gentrification.

CONCLUSION

Rural gentrification provides a framework for understanding transformations in rural areas through the relationships between class, capital, property, and space. One of the concept's main contributions is that it does not treat urban-to-rural mobility merely as demographic change. The characteristics of incoming populations, the revalorisation of rural housing and land, transformations in local economic structures, and the ability of existing residents to access resources under changing conditions can all be considered within the same analytical framework.

Studies in the literature demonstrate that rural gentrification cannot be explained through a single actor or dynamic. While lifestyle preferences and the pursuit of a rural idyll help explain demand for rural living, property

relations and capital's search for new opportunities for revalorisation constitute the economic foundations of the process. Tourism, second-home development, conservation policies, planning decisions, and local government practices may, in turn, generate different forms of transformation at the intersection of these dynamics.

The cases from Türkiye likewise confirm this diversity. Rural gentrification may become visible through the restoration of historic buildings and tourism in one setting, through second homes and seasonal population movements in another, or through the conversion of agricultural land into new residential areas elsewhere. These differences make it difficult to speak of a single "Turkish model of rural gentrification." A more meaningful approach is to identify the common processes connecting these cases while also recognising the dimensions along which they diverge.

From this perspective, not every change occurring in rural areas should be labelled as gentrification. To preserve the explanatory value of the concept, the class dimension of rural transformation, capital and property relations, spatial restructuring, and the effects on existing or potential local populations need to be considered together. The significance of the rural gentrification debate lies not simply in demonstrating that rural areas are changing. The central issue is the social and economic relations through which this change takes place, how the value generated by the process is distributed among different groups, and for whom access to rural space becomes easier or more difficult.

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Extreme Heatwaves in Europe and Their Impact on the Health Sector: Health Consequences, Economic Burden, Climate Adaptation, and Policy Responses

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ABSTRACT

Climate change is reshaping health risks across Europe, with increasingly frequent and intense heatwaves placing growing pressure on healthcare systems. This chapter explores the implications of extreme heat for population health, healthcare delivery, hospital operations, workforce capacity, and healthcare expenditure. Drawing on recent European climate and health reports, policy documents, and scholarly literature, it examines how rising temperatures contribute to heat-related mortality and morbidity, particularly cardiovascular, respiratory, renal, and mental health conditions. The chapter also considers the increasing demand for emergency services, hospital care, and intensive care, alongside operational challenges such as cooling requirements, infrastructure stress, power disruptions, supply-chain vulnerabilities, and workforce fatigue. Particular attention is given to climate adaptation within healthcare, including heat-health warning systems, resilient hospital infrastructure, urban heat mitigation, sustainable financing, and climate-informed planning. The chapter concludes by highlighting the need for coordinated investment and policy action to build sustainable, climate-resilient healthcare systems.

Keywords – Climate change; Heatwaves; Europe; Healthcare systems; Heat-related mortality; Climate adaptation; Hospital resilience; Sustainable healthcare; Health policy.

INTRODUCTION

Climate change has become one of the greatest public health challenges of the twenty-first century, increasing the frequency, intensity, and duration of extreme heat events worldwide. These changes have resulted in rising morbidity, mortality, and healthcare costs, particularly across Europe, where climate warming is occurring at approximately twice the global average rate (Copernicus Climate Change Service [C3S], 2025; European Environment Agency [EEA], 2025).

Europe has experienced an unprecedented rise in extreme summer temperatures during the past decade. According to the Copernicus Climate Change Service (2025), the summer of 2024 was the warmest on record, with an average land temperature 1.54°C above the 1991–2020 climatological average, surpassing the previous record established in 2022 (C3S, 2025). Similarly, the European State of the Climate Report indicated that 2024 was the warmest year ever recorded across the continent, reflecting the continuing acceleration of climate change (C3S, 2026).

The health implications of these extreme temperatures are substantial. Heat exposure has been associated with increased rates of heatstroke, dehydration, cardiovascular disease, respiratory illness, acute kidney injury, and excess mortality, particularly among older adults and individuals with chronic diseases (World Health Organization, 2024; The Lancet Countdown, 2025). Recent estimates indicate that heat-related mortality in Europe has increased considerably over the past two decades, placing growing pressure on emergency departments, ambulance services, and intensive care units (EEA, 2025; OECD, 2025).

In addition to direct health effects, prolonged heatwaves have disrupted healthcare operations through increased energy demand, cooling system failures, workforce fatigue, pharmaceutical storage challenges, and higher operational expenditures (OECD, 2025; European Commission, 2021). These pressures have highlighted the urgent need to develop climate-resilient healthcare systems capable of adapting to increasingly frequent and severe heat events (WHO Europe, 2026).

Europe has emerged as the fastest-warming continent globally, experiencing a rate of temperature increase approximately twice the global average since the 1980s (Copernicus Climate Change Service [C3S], 2025; European Environment Agency [EEA], 2025). This accelerated warming is primarily attributed to the combined effects of anthropogenic greenhouse gas emissions, changes in atmospheric circulation, declining snow and ice cover, and positive land-atmosphere feedback mechanisms that amplify regional warming (Intergovernmental Panel on Climate Change [IPCC], 2023). The increasing frequency, duration, and intensity of extreme heat events have transformed heatwaves from isolated meteorological phenomena into recurring public health emergencies affecting millions of Europeans annually (World Meteorological Organization [WMO], 2025).

According to the European State of the Climate Report, 2024 was the warmest year ever recorded across Europe, with an annual average temperature approximately 2.92°C above the pre-industrial (1850–1900) baseline, demonstrating the unprecedented pace of regional climate change (C3S, 2025). More significantly, the summer of 2024 (June–August) recorded an average land temperature anomaly of 1.54°C above the 1991–2020 climatological average, surpassing the previous European summer record established in 2022 (C3S, 2024). These findings reinforce projections that Europe is likely to experience increasingly frequent and prolonged heatwaves under future climate scenarios (IPCC, 2023).

The spatial distribution of extreme heat has also expanded considerably across the continent. Southeastern Europe experienced the most severe thermal conditions during the summer of 2024, with up to 66 days

classified as experiencing strong heat stress according to the Universal Thermal Climate Index (UTCI) (C3S, 2025). On several days during August 2024, approximately 93–99% of southeastern Europe was exposed to strong or very strong heat stress, creating unprecedented environmental conditions that significantly increased health risks for vulnerable populations (C3S, 2025). These prolonged episodes of extreme heat were accompanied by exceptionally high nighttime temperatures, limiting physiological recovery and increasing cumulative heat exposure among urban populations (EEA, 2025).

Although 2024 represented the warmest European summer on record, subsequent years have demonstrated that extreme heat events are becoming increasingly persistent rather than exceptional. The summer of 2025 ranked as the fourth warmest summer ever recorded in Europe, while western Europe experienced its hottest June since systematic observations began, with an average regional temperature of 20.49°C (C3S, 2025). Furthermore, unusually intense heatwaves occurred during late spring 2026, with several regions of France, Spain, Portugal, Italy, and the United Kingdom recording temperatures exceeding seasonal averages by more than 10°C, indicating an earlier onset and longer duration of the European heatwave season (WMO, 2025; WHO Regional Office for Europe, 2026).

The consequences of rising temperatures extend beyond atmospheric warming to include profound hydrological and ecological changes. Southern and southeastern Europe have experienced persistent drought conditions associated with declining precipitation and increased evapotranspiration, resulting in below-average river flows across approximately 70% of monitored European river systems during recent summers (C3S, 2025; EEA, 2025). Reduced freshwater availability has affected drinking water supplies, agricultural productivity, hydroelectric power generation, and healthcare facility operations, particularly in Mediterranean countries already experiencing chronic water scarcity (European Commission, 2024).

Marine ecosystems have also experienced unprecedented thermal stress. During the summer of 2024, approximately 86% of European seas were affected by marine heatwaves, with sea surface temperatures reaching record levels across the Mediterranean Sea, North Atlantic Ocean, and Baltic Sea (C3S, 2024). Elevated sea temperatures contribute to harmful algal blooms, altered marine biodiversity, and the proliferation of pathogenic microorganisms such as *Vibrio* species, increasing the risk of waterborne infections and food safety concerns in coastal communities (EEA, 2025; WHO Europe, 2024).

Extreme heat has simultaneously intensified wildfire activity throughout southern Europe. During 2025 alone, approximately 1.03 million hectares of European land were affected by wildfires, making it one of the

most destructive wildfire seasons in recent decades (C3S, 2025). Wildfires generate substantial quantities of particulate matter (PM_{2.5}), nitrogen oxides, ozone precursors, and other airborne pollutants that can travel hundreds of kilometres beyond the fire source. Numerous epidemiological studies have demonstrated strong associations between wildfire smoke exposure and increased hospital admissions for respiratory diseases, cardiovascular disorders, asthma exacerbations, and premature mortality (EEA, 2025; Romanello et al., 2025).

Urbanization further amplifies heat-related risks through the Urban Heat Island (UHI) effect, whereby densely built environments absorb and retain substantially more heat than surrounding rural areas (EEA, 2025). Materials such as asphalt, concrete, and glass store solar radiation during daylight hours and release heat slowly overnight, resulting in persistently elevated nighttime temperatures that reduce opportunities for physiological cooling (Santamouris, 2023). The Urban Heat Island effect is particularly concerning because more than 75% of Europeans live in urban areas, where high population density, limited vegetation, and ageing infrastructure collectively increase vulnerability to extreme heat (European Commission, 2024). Hospitals located within metropolitan regions are especially susceptible, as increased cooling demands coincide with peak electricity consumption, creating risks of power shortages and infrastructure failure during severe heatwaves (OECD, 2025).

Climate projections indicate that, under high greenhouse gas emission scenarios, Europe could experience a two- to five-fold increase in the frequency of extreme heat events by the end of the century (IPCC, 2023). Even under moderate emission reduction pathways, heatwaves are expected to become longer, hotter, and more geographically widespread, posing escalating challenges for public health systems and healthcare infrastructure (WHO Europe, 2024). These projections emphasize that climate adaptation should no longer be viewed solely as an environmental priority but as an essential component of healthcare planning, public health preparedness, and sustainable health system development.

Table 1. Recent Climate Indicators Demonstrating the Intensification of Extreme Heat in Europe

Climate Indicator	Recent Evidence	Health Significance	Source
Summer 2024 temperature anomaly	+1.54°C above the 1991–2020 average	Increased heat-related illnesses and mortality	C3S (2024)
Annual European temperature (2024)	+2.92°C above pre-industrial levels	Accelerated climate warming	C3S (2025)
Strong heat stress days	Up to 66 days in southeastern Europe	Prolonged population exposure	C3S (2025)
Area affected by strong heat stress	93–99% of southeastern Europe	Increased vulnerability of healthcare systems	C3S (2025)
Marine heatwave coverage	86% of European seas	Increased waterborne disease risk	C3S (2024)
River flow reduction	Approximately 70% below average in affected regions	Water scarcity affecting healthcare and sanitation	EEA (2025)
Wildfire-affected land (2025)	Approximately 1.03 million hectares	Increased respiratory disease burden	C3S (2025)

Note. Adapted from the *Copernicus Climate Change Service* (2024, 2025), the *European State of the Climate 2025* report, and the *European Environment Agency* (2025).

HEALTH IMPACTS OF EXTREME HEAT ON POPULATION HEALTH IN EUROPE

Extreme heat is increasingly recognized as one of the most significant climate-related health hazards affecting Europe. Unlike many natural disasters, heatwaves exert widespread and cumulative impacts across entire populations, resulting in increased morbidity, premature mortality, and substantial pressure on healthcare systems. As the frequency and duration of extreme heat events continue to increase, evidence demonstrates that heat affects virtually every organ system, while disproportionately impacting older adults, children, individuals with chronic diseases, socially disadvantaged populations, and healthcare workers (World Health Organization, 2024; European Environment Agency, 2025). Consequently, extreme heat has evolved from an environmental concern into a major public health emergency requiring coordinated healthcare and policy responses.

Heat-Related Mortality

Heat-related mortality represents the most serious consequence of extreme heat exposure. Europe has experienced a marked increase in excess deaths associated with prolonged heatwaves over the past two decades. According to the European Environment Agency (2025), heat-related

mortality has increased by approximately 30% since the early 2000s, reflecting the combined influence of rising temperatures, demographic ageing, urbanization, and increasing prevalence of chronic diseases. Similarly, the Lancet Countdown reported that heat exposure has become one of the leading climate-sensitive causes of premature mortality across Europe (Romanello et al., 2025).

Recent epidemiological analyses estimate that severe European heatwaves account for more than 60,000 excess deaths during particularly intense summers, with mortality concentrated among individuals aged 65 years and older (Ballester et al., 2023; Romanello et al., 2025). Older adults possess reduced thermoregulatory capacity, impaired sweating mechanisms, diminished cardiovascular reserve, and higher prevalence of chronic illnesses, making them particularly susceptible to heat-related complications (WHO Europe, 2024). Furthermore, medications frequently prescribed to older individuals including diuretics, beta-blockers, anticholinergics, and psychotropic drugs may impair heat dissipation or increase dehydration, further elevating mortality risk (Arbuthnott & Hajat, 2024). Heat-related mortality is not solely attributable to classical heatstroke. Instead, most excess deaths occur through exacerbation of pre-existing cardiovascular, respiratory, renal, and metabolic diseases that become unstable during periods of prolonged heat exposure (Romanello et al., 2025). Consequently, mortality estimates based exclusively on heatstroke substantially underestimate the true burden of heat-related illness.

Cardiovascular Diseases

Cardiovascular diseases account for the largest proportion of heat-related hospital admissions and deaths during European heatwaves (OECD, 2025). Elevated ambient temperatures increase cardiovascular workload by stimulating peripheral vasodilation and excessive sweating, resulting in dehydration, reduced plasma volume, electrolyte imbalance, and increased blood viscosity (Bunker et al., 2024). These physiological responses increase myocardial oxygen demand while simultaneously reducing cardiac efficiency, particularly among patients with hypertension, coronary artery disease, and heart failure.

Several multicountry studies have demonstrated that cardiovascular hospital admissions increase significantly during extreme heat events. OECD (2025) estimated that cardiovascular hospitalizations increase by approximately 4–5% for every 1°C rise above local temperature thresholds, while mortality from ischemic heart disease rises substantially during prolonged heatwaves. Individuals with implanted cardiac devices, diabetes mellitus, obesity, and chronic hypertension exhibit particularly high

vulnerability because their cardiovascular systems possess reduced adaptive capacity during thermal stress (Romanello et al., 2025).

Heat also contributes to increased incidence of thromboembolic events through dehydration-induced haemoconcentration, increasing the risks of myocardial infarction, stroke, and venous thrombosis (Bunker et al., 2024). Consequently, emergency cardiology services frequently experience substantial increases in patient admissions during prolonged periods of extreme heat.

Respiratory Diseases

Extreme heat substantially affects respiratory health through both direct physiological mechanisms and indirect environmental changes. Elevated temperatures accelerate photochemical reactions that increase ground-level ozone formation while simultaneously worsening particulate air pollution generated by wildfires, industrial emissions, and traffic congestion (European Environment Agency, 2025). These pollutants irritate respiratory epithelium, impair pulmonary function, and increase airway inflammation, particularly among individuals with asthma and chronic obstructive pulmonary disease (COPD).

The 2025 Lancet Countdown reported consistent increases in emergency department attendance and hospital admissions for respiratory illnesses during major European heatwaves (Romanello et al., 2025). Wildfire smoke further compounds these effects by increasing exposure to fine particulate matter (PM_{2.5}), which penetrates deep into pulmonary tissue and is associated with increased asthma exacerbations, pneumonia, bronchitis, and respiratory failure (EEA, 2025).

Children and older adults are particularly vulnerable because their respiratory systems possess reduced physiological reserve and increased susceptibility to airborne pollutants (WHO Europe, 2024). Urban populations experience additional risks due to persistent exposure to ozone and traffic-related air pollution enhanced by the Urban Heat Island effect.

Heat Stroke, Heat Exhaustion, and Acute Kidney Injury

Heatstroke represents the most severe form of heat-related illness and constitutes a medical emergency with mortality rates exceeding 30% when treatment is delayed (WHO Europe, 2024). Classical heatstroke develops when core body temperature exceeds approximately 40°C, resulting in neurological dysfunction, systemic inflammatory responses,

multiorgan failure, and coagulation abnormalities (Arbuthnott & Hajat, 2024).

Less severe but considerably more common conditions include heat exhaustion, dehydration, electrolyte disturbances, and acute kidney injury. During prolonged heat exposure, excessive sweating reduces circulating blood volume, impairing renal perfusion and increasing the risk of acute tubular injury (OECD, 2025). Emergency departments across Europe consistently report increased presentations involving dehydration, syncope, electrolyte imbalance, urinary tract infections, and renal failure during heatwaves (Romanello et al., 2025).

Agricultural workers, construction workers, healthcare professionals, and other outdoor occupations experience elevated occupational exposure, increasing risks of exertional heat illness and chronic kidney disease associated with repeated dehydration episodes (WHO Europe, 2024).

Mental Health Consequences

The health burden of extreme heat extends beyond physical illness to include significant psychological consequences. Increasing evidence indicates that elevated temperatures adversely affect emotional wellbeing, cognitive performance, sleep quality, and psychiatric stability (Romanello et al., 2025). Individuals with schizophrenia, bipolar disorder, depression, dementia, and anxiety disorders exhibit particularly high vulnerability because several psychotropic medications impair thermoregulation and sweating (WHO Europe, 2024).

Large epidemiological studies have reported increases of approximately 5–8% in psychiatric emergency department visits and suicide rates during periods when temperatures exceed historical regional thresholds (Romanello et al., 2025). Heat-related sleep disruption further contributes to impaired concentration, irritability, anxiety, reduced workplace productivity, and increased accident risk (World Meteorological Organization, 2025).

Another emerging concern is eco-anxiety, characterized by chronic psychological distress resulting from awareness of climate change and repeated exposure to environmental disasters such as wildfires, droughts, and extreme heat (Clayton, 2024). Younger adults and adolescents appear particularly susceptible because of concerns regarding future environmental conditions and perceived inadequacy of societal responses to climate change.

Climate-Sensitive Infectious Diseases

Climate change has altered the epidemiology of infectious diseases throughout Europe by expanding the geographical distribution of disease vectors and environmental pathogens. Rising temperatures have facilitated the northward spread of the Asian tiger mosquito (*Aedes albopictus*), increasing the likelihood of local transmission of dengue, chikungunya, and Zika viruses across southern and central Europe (European Centre for Disease Prevention and Control [ECDC], 2025).

Similarly, increasing temperatures have contributed to greater transmission of West Nile virus, with outbreaks reported across multiple European countries during recent summers (ECDC, 2025). Higher sea surface temperatures have also expanded habitats suitable for pathogenic *Vibrio* species, increasing risks of wound infections, gastroenteritis, and septicemia among coastal populations (EEA, 2025).

These emerging infectious disease patterns present new challenges for healthcare systems that historically focused primarily on non-communicable diseases associated with heat exposure. Consequently, surveillance systems, laboratory capacity, and clinician awareness must evolve to address climate-sensitive infectious diseases within increasingly warm environments.

Vulnerable Populations

Although heat affects all population groups, certain individuals experience disproportionately greater health risks due to biological, socioeconomic, occupational, and environmental factors (WHO Europe, 2024). Older adults represent the highest-risk group because ageing reduces sweating efficiency, cardiovascular reserve, thirst perception, and renal function. Infants and young children are also vulnerable because their thermoregulatory mechanisms remain incompletely developed, increasing susceptibility to dehydration and hyperthermia.

Pregnant women experience increased cardiovascular strain during pregnancy, making prolonged heat exposure associated with higher risks of preterm birth, low birth weight, gestational hypertension, and maternal complications (Romanello et al., 2025). Individuals with diabetes, obesity, chronic kidney disease, respiratory disease, neurological disorders, and cardiovascular illness similarly experience elevated risks because these conditions reduce physiological resilience during thermal stress.

Socioeconomic inequalities further amplify vulnerability. Individuals living in poorly insulated housing, urban neighbourhoods with limited green space, homelessness, and low-income communities often lack access to adequate cooling systems and healthcare services (European Commission, 2024). Healthcare workers themselves constitute an increasingly recognized vulnerable occupational group because prolonged use of personal protective equipment, physically demanding work, and inadequate cooling increase fatigue, dehydration, and burnout during heatwaves (OECD, 2025).

Overall, the health impacts of extreme heat extend across multiple physiological systems and disproportionately affect already vulnerable populations. These findings highlight the necessity of integrating climate adaptation into healthcare planning, preventive public health strategies, and health equity initiatives to reduce future climate-related disease burden.

Table 2. Major Health Impacts of Extreme Heat in Europe

Health outcome	Evidence	Most affected populations	Key references
Heat-related mortality	>60,000 excess deaths during severe heatwave summers	Older adults, people with chronic diseases	Ballester et al. (2023); Romanello et al. (2025)
Cardiovascular disease	~4–5% increase in admissions per 1°C above threshold	Hypertension, heart disease, diabetes	OECD (2025); Bunker et al. (2024)
Respiratory illness	Increased asthma, COPD, pneumonia and respiratory failure	Children, older adults	EEA (2025); Romanello et al. (2025)
Acute kidney injury	Increased dehydration and renal admissions	Outdoor workers, older adults	OECD (2025); WHO Europe (2024)
Mental health	5–8% increase in psychiatric emergencies during extreme heat	Individuals with psychiatric disorders, adolescents	Romanello et al. (2025); Clayton (2024)
Vector-borne diseases	Expansion of dengue and West Nile virus transmission	Southern and Central Europe	ECDC (2025); EEA (2025)

IMPACT OF EXTREME HEAT ON EUROPEAN HEALTHCARE SYSTEMS

The increasing frequency, intensity, and duration of extreme heat events have substantially affected the functioning and resilience of healthcare systems across Europe. Heatwaves not only increase the incidence of heat-related illnesses but also amplify the burden of pre-existing diseases, resulting in higher healthcare utilization, increased operational costs, workforce challenges, and infrastructure vulnerabilities (World Health Organization, 2024; Organisation for Economic Co-operation and Development, 2025). As Europe continues to experience unprecedented climatic conditions, healthcare systems face the dual challenge of responding to immediate clinical demands while simultaneously adapting infrastructure and service delivery models to ensure long-term climate resilience.

Increased Demand for Emergency and Acute Healthcare Services

One of the most immediate consequences of extreme heat is the sharp increase in emergency healthcare utilization. Heatwaves are consistently associated with significant rises in emergency department (ED) visits, ambulance dispatches, hospital admissions, and intensive care unit (ICU) occupancy (Romanello et al., 2025). The increased demand is driven not only by classical heat-related illnesses such as heat exhaustion and heatstroke but also by the exacerbation of chronic cardiovascular, respiratory, neurological, renal, and metabolic conditions (Bunker et al., 2024).

A multicountry European analysis demonstrated that emergency department attendance increases by approximately 5–15% during major heatwave events, while hospital admissions among older adults rise even more sharply because of increased vulnerability to dehydration, cardiovascular complications, and respiratory distress (Arbuthnott & Hajat, 2024). During the record-breaking summer of 2022, hospitals in Spain, Italy, France, and Portugal reported unprecedented patient volumes that exceeded seasonal expectations and strained emergency care capacity (Ballester et al., 2023).

Emergency medical services are similarly affected. Heatwaves increase ambulance response times because of simultaneous rises in emergency calls, traffic congestion, and increased operational demands. Delays in emergency response may compromise patient outcomes, particularly for individuals experiencing acute myocardial infarction, stroke, or severe heatstroke, where early intervention is essential (OECD, 2025).

Pressure on Intensive Care Units and Specialized Services

Extreme heat events significantly increase demand for intensive care services. Patients admitted with severe heatstroke frequently require mechanical ventilation, renal replacement therapy, invasive haemodynamic monitoring, and prolonged hospitalization due to multiorgan dysfunction (WHO Europe, 2024). Simultaneously, heat exacerbates chronic illnesses that require intensive medical management, including heart failure, chronic obstructive pulmonary disease (COPD), chronic kidney disease, and severe infections.

Studies conducted across European hospitals indicate that ICU occupancy rates may increase by 10–20% during prolonged heatwaves, particularly in urban centres with ageing populations (Romanello et al., 2025). Increased demand for critical care frequently results in postponed elective surgical procedures, delayed diagnostic services, and reduced healthcare system flexibility to respond to concurrent emergencies such as infectious disease outbreaks or natural disasters (OECD, 2025).

Furthermore, heat-related increases in emergency admissions often create bottlenecks throughout hospital systems. Bed shortages, prolonged emergency department waiting times, delayed patient transfers, and increased hospital-acquired complications may occur when healthcare facilities operate beyond planned capacity (European Commission, 2024).

Healthcare Workforce Challenges

Healthcare professionals constitute both responders to and victims of extreme heat. Physicians, nurses, paramedics, laboratory personnel, and support staff frequently work prolonged shifts under physically demanding conditions while simultaneously caring for increased numbers of critically ill patients (WHO Europe, 2024). High ambient temperatures impair cognitive performance, concentration, decision-making, and physical endurance, increasing the likelihood of medical errors and occupational injuries (Kjellstrom et al., 2023).

Healthcare workers wearing personal protective equipment (PPE), particularly within emergency departments, operating theatres, and intensive care units, experience additional thermal stress because protective clothing restricts heat dissipation (Romanello et al., 2025). Heat exposure contributes to dehydration, fatigue, reduced productivity, and burnout, all of which negatively affect healthcare quality and staff wellbeing.

The European healthcare workforce is already experiencing shortages due to demographic ageing, increasing healthcare demand, and workforce attrition. Climate-related occupational stress may further exacerbate staff retention challenges, particularly in southern European countries that experience prolonged summer heatwaves (OECD, 2025). Consequently, climate adaptation strategies should include occupational heat protection measures, flexible staffing models, adequate hydration facilities, cooling areas, and workforce resilience programmes.

Hospital Infrastructure and Operational Vulnerabilities

Most European hospitals were designed according to historical climate conditions rather than the prolonged extreme temperatures now experienced across the continent (European Commission, 2024). As a result, many healthcare facilities possess limited thermal resilience, making them vulnerable to overheating during heatwaves.

Hospital buildings experience substantially increased cooling demands during periods of extreme heat. Air-conditioning systems frequently operate at maximum capacity, increasing electricity consumption, operational costs, and risks of mechanical failure (OECD, 2025). In several European countries, electricity demand during heatwaves has approached grid capacity, increasing the possibility of power interruptions that may compromise essential medical equipment, diagnostic systems, intensive care units, and surgical theatres (EEA, 2025).

Internal hospital temperatures may exceed recommended thermal comfort thresholds when ventilation systems are inadequate or poorly maintained. High indoor temperatures negatively affect patient recovery, medication storage, diagnostic equipment performance, and healthcare worker productivity (WHO Europe, 2024). Older hospital buildings with limited insulation, poor ventilation, and insufficient shading are particularly vulnerable.

Water scarcity represents another emerging operational challenge. Drought conditions affecting southern Europe have reduced water availability for sanitation, cooling systems, dialysis services, sterilization procedures, and routine clinical operations (European Commission, 2024). Healthcare facilities therefore require integrated climate adaptation strategies addressing both thermal resilience and sustainable water management.

Pharmaceutical Cold Chain and Medical Supply Management

Extreme heat also threatens pharmaceutical safety and healthcare logistics. Numerous medications, vaccines, biological products, blood products, and laboratory reagents require strict temperature control throughout storage and transportation (WHO Europe, 2024). Prolonged exposure to elevated temperatures may reduce medication efficacy, compromise vaccine potency, and increase financial losses associated with product spoilage.

Heatwaves additionally disrupt transportation networks through railway deformation, road surface deterioration, airport operational restrictions, and wildfire-related infrastructure damage, delaying delivery of essential medical supplies (European Commission, 2024). These disruptions highlight the importance of resilient pharmaceutical supply chains, backup refrigeration systems, temperature monitoring technologies, and emergency logistics planning.

Digital monitoring Technologies including Internet of Things (IoT)-enabled temperature sensors and artificial intelligence-based supply chain management systems are increasingly being adopted to improve pharmaceutical resilience during extreme weather events (OECD, 2025).

Economic Burden on Healthcare Systems

Extreme heat imposes substantial direct and indirect economic costs on European healthcare systems. Direct costs include increased emergency department visits, hospital admissions, pharmaceutical utilization, diagnostic testing, intensive care treatment, ambulance services, and rehabilitation programmes (OECD, 2025). Indirect costs include reduced workforce productivity, staff absenteeism, infrastructure maintenance, energy expenditure, and long-term management of chronic illnesses aggravated by heat exposure.

The OECD (2025) estimated that climate-related health impacts could increase healthcare expenditure by billions of euros annually over coming decades if adaptation measures are not strengthened. Rising electricity consumption represents one of the fastest-growing operational costs for hospitals during heatwaves, as cooling systems operate continuously to maintain safe indoor environments (European Commission, 2024).

Beyond healthcare expenditure, climate-related productivity losses among healthcare workers and the wider labour force contribute to broader

economic impacts. High temperatures reduce physical work capacity, increase occupational accidents, and decrease cognitive performance, collectively affecting national economic productivity (Romanello et al., 2025). Investment in climate-resilient healthcare infrastructure therefore represents not only a public health necessity but also a cost-effective economic strategy that reduces future healthcare expenditure while improving health system sustainability.

Building Climate-Resilient Healthcare Systems

Recognizing the growing impacts of climate change, European governments and international organizations are increasingly integrating climate resilience into healthcare planning. The WHO advocates the development of climate-resilient and environmentally sustainable health systems capable of anticipating, preparing for, responding to, and recovering from climate-related hazards (WHO Europe, 2024). Such systems incorporate resilient infrastructure, sustainable energy sources, early warning systems, workforce preparedness, emergency planning, and integrated public health surveillance.

The European Commission has similarly emphasized the modernization of healthcare infrastructure through investments supported by the Recovery and Resilience Facility, NextGenerationEU, and the European Green Deal (European Commission, 2024). Adaptation measures include energy-efficient hospital design, passive cooling technologies, green roofs, improved insulation, renewable energy systems, water conservation strategies, and digital health technologies that strengthen operational resilience during extreme weather events.

Developing climate-resilient healthcare systems requires multidisciplinary collaboration among healthcare leaders, engineers, environmental scientists, policymakers, and public health professionals. Strengthening preparedness before extreme heat events occur will be considerably more cost-effective than responding to repeated climate-related healthcare crises after they have developed.

Table 3. Major Impacts of Extreme Heat on European Healthcare Systems

Healthcare system component	Impact of extreme heat	Evidence
Emergency departments	Increased patient attendance, overcrowding, longer waiting times	Arbuthnott & Hajat (2024); Romanello et al. (2025)
Ambulance services	Higher emergency call volume and delayed response times	OECD (2025)
Intensive care units	Increased admissions, longer hospital stays, greater demand for ventilatory support	WHO Europe (2024)
Healthcare workforce	Fatigue, dehydration, burnout, reduced productivity, occupational heat stress	Kjellstrom et al. (2023); Romanello et al. (2025)
Hospital infrastructure	Overheating, increased electricity demand, cooling system failures	European Commission (2024); OECD (2025)
Pharmaceutical management	Cold-chain disruption and medicine degradation	WHO Europe (2024)
Healthcare expenditure	Increased operational and treatment costs	OECD (2025); Romanello et al. (2025)

5. ECONOMIC BURDEN, CLIMATE ADAPTATION STRATEGIES, AND BUILDING CLIMATE-RESILIENT HEALTHCARE SYSTEMS

Economic Burden of Extreme Heat on European Health Systems

The economic consequences of extreme heat extend well beyond the direct costs of medical treatment. Heatwaves impose substantial financial burdens on healthcare systems through increased emergency department visits, hospital admissions, intensive care utilization, pharmaceutical consumption, infrastructure maintenance, workforce absenteeism, and rising energy demands. As the frequency and severity of heatwaves increase across Europe, these cumulative costs are expected to escalate considerably over coming decades (Organisation for Economic Co-operation and Development, 2025; European Environment Agency, 2025).

Direct healthcare expenditures increase sharply during prolonged heat events due to greater utilization of emergency medical services, diagnostic investigations, inpatient treatment, and rehabilitation services (Romanello et al., 2025). OECD (2025) estimates indicate that climate-related illnesses could increase annual healthcare expenditure by billions of euros if current warming trends continue without adequate adaptation measures. Older adults, who account for the majority of heat-related hospitalizations, contribute disproportionately to these rising healthcare costs

because of longer hospital stays and greater need for intensive medical management (Ballester et al., 2023).

Indirect economic losses are equally significant. High ambient temperatures reduce labour productivity through physical fatigue, cognitive impairment, dehydration, and increased occupational injuries (Kjellstrom et al., 2023). The healthcare sector itself experiences productivity losses as healthcare workers operate under increased physical and psychological stress while managing higher patient volumes. Staff absenteeism due to heat-related illness further increases personnel shortages, overtime payments, and recruitment costs (WHO Europe, 2024).

Hospital operational expenses also increase substantially during heatwaves. Cooling systems, ventilation equipment, refrigeration units, and critical medical technologies require continuous electricity supply, resulting in considerable increases in energy consumption. Rising electricity prices across Europe have amplified operational expenditures for hospitals, particularly during peak summer periods when cooling demand coincides with maximum electricity consumption (European Commission, 2024). Consequently, healthcare administrators increasingly recognize climate adaptation as an economically beneficial investment rather than solely an environmental initiative.

Heat-Health Action Plans (HHAPs)

Recognizing the increasing public health risks associated with extreme heat, the World Health Organization has promoted the implementation of Heat-Health Action Plans (HHAPs) throughout Europe (WHO Europe, 2024). These multidisciplinary plans aim to reduce heat-related morbidity and mortality through coordinated preparedness, early warning systems, public communication, healthcare planning, and intersectoral collaboration.

Effective HHAPs typically comprise several interconnected components:

- Meteorological monitoring and forecasting;
- Heat-health early warning systems;
- Public risk communication;
- Protection of vulnerable populations;
- Healthcare system preparedness;
- Community outreach programmes;
- Continuous monitoring and evaluation.

Evidence indicates that countries implementing comprehensive HHAPs have experienced measurable reductions in heat-related mortality compared with regions lacking coordinated response strategies (Martinez et al., 2024). Early warning systems enable healthcare facilities to anticipate increased patient demand, adjust staffing levels, expand emergency capacity, and coordinate ambulance services before temperatures reach critical thresholds.

Public education campaigns represent another important element of HHAPs. Information regarding hydration, indoor cooling, medication management, recognition of heat-related illness, and community support for older adults has been shown to reduce preventable hospital admissions during heatwaves (WHO Europe, 2024).

Climate-Resilient Healthcare Infrastructure

Healthcare infrastructure constitutes one of the most critical components of climate adaptation because hospitals must remain fully operational during climate emergencies. However, many European healthcare facilities were constructed decades before current climatic conditions and therefore possess limited resilience to prolonged extreme heat (European Commission, 2024).

Climate-resilient hospitals integrate architectural, engineering, and environmental innovations designed to maintain safe clinical environments while minimizing energy consumption. Key adaptation measures include:

- High-performance thermal insulation;
- Passive cooling systems;
- External solar shading;
- Natural ventilation;
- Green roofs and living walls;
- Reflective building materials;
- High-efficiency HVAC systems;
- Renewable energy integration;
- Rainwater harvesting;
- Sustainable water recycling.

These measures simultaneously reduce greenhouse gas emissions, improve indoor thermal comfort, lower operational costs, and enhance continuity of healthcare services during extreme weather events (WHO Europe, 2024).

Hospitals increasingly incorporate renewable energy technologies such as rooftop solar photovoltaic systems, battery energy storage, and microgrids capable of maintaining electricity supply during grid failures.

These technologies improve energy security while reducing dependence on fossil fuels and lowering long-term operating costs (OECD, 2025).

Digital Technologies and Climate Adaptation

Digital innovation is becoming an essential component of climate-resilient healthcare systems. Artificial intelligence (AI), Internet of Things (IoT) technologies, satellite monitoring, and predictive analytics enable healthcare organizations to anticipate climate-related risks and improve operational preparedness (European Commission, 2024).

AI-based predictive models integrate meteorological forecasts, hospital admission data, demographic information, and environmental monitoring to estimate future healthcare demand during heatwaves (Topol, 2024). These predictive systems support evidence-based resource allocation, staffing decisions, ambulance deployment, and emergency planning.

IoT technologies continuously monitor indoor temperatures, pharmaceutical storage conditions, hospital energy consumption, and medical equipment performance. Real-time monitoring enables rapid identification of infrastructure failures before patient safety is compromised.

Telemedicine has also demonstrated considerable value during extreme heat events by reducing unnecessary hospital visits among vulnerable patients while maintaining continuity of care for individuals with chronic diseases (WHO Europe, 2024). Remote consultations decrease patient travel during hazardous weather conditions while reducing pressure on overcrowded emergency departments.

Green Financing and European Climate Investment

Climate adaptation requires substantial financial investment. Recognizing this need, the European Union has established several funding mechanisms supporting climate-resilient healthcare infrastructure, including the European Green Deal, NextGenerationEU, the Recovery and Resilience Facility (RRF), and the EU Green Bond Framework (European Commission, 2024).

The Recovery and Resilience Facility allocates significant resources toward sustainable public infrastructure, including healthcare modernization. Eligible projects include:

- Hospital energy efficiency improvements;

- Renewable energy systems;
- Digital health infrastructure;
- Climate-resilient healthcare facilities;
- Sustainable water management;
- Green public procurement.

The Do No Significant Harm (DNSH) principle guides these investments by ensuring that publicly funded projects contribute to environmental sustainability while avoiding adverse impacts on climate mitigation and biodiversity (European Commission, 2024).

Green bonds have become an increasingly important financing mechanism for hospital modernization. By issuing sustainability-linked bonds, governments and healthcare organizations can finance renewable energy projects, energy-efficient buildings, and climate adaptation initiatives while attracting private investment into sustainable healthcare infrastructure (OECD, 2025).

Italy as a Case Study in Healthcare Climate Adaptation

Italy represents one of Europe's leading examples of integrating climate resilience into healthcare planning. Due to its Mediterranean climate, ageing population, and frequent heatwaves, Italy faces considerable climate-related health risks (WHO Europe, 2024). In response, the Italian government has incorporated healthcare adaptation into its National Recovery and Resilience Plan (PNRR), particularly through Mission 6 – Health.

One notable initiative is the Safe and Sustainable Hospital Programme, which aims to modernize healthcare infrastructure by improving energy efficiency, seismic resilience, digital technologies, renewable energy integration, and environmental sustainability (Italian Ministry of Health, 2024).

Hospital modernization projects include installation of solar photovoltaic systems, advanced cooling technologies, smart energy management systems, improved insulation, and digital monitoring platforms capable of supporting climate adaptation. These investments simultaneously reduce operational costs, improve patient comfort, and increase healthcare system resilience during extreme weather events.

Italy's experience demonstrates that climate adaptation should not be considered solely as an environmental strategy but rather as an integral component of healthcare quality improvement, patient safety, and long-term

health system sustainability. Lessons learned from Italian initiatives provide valuable guidance for other European countries facing similar climate challenges.

PRACTICAL IMPLICATIONS FOR HEALTHCARE LEADERS AND POLICYMAKERS

The increasing frequency and intensity of extreme heat events across Europe require healthcare leaders and policymakers to transition from reactive emergency response approaches to proactive climate resilience planning. The evidence presented throughout this chapter demonstrates that climate change is no longer solely an environmental concern but has become a strategic healthcare management issue that directly influences patient safety, healthcare quality, workforce sustainability, infrastructure resilience, and healthcare expenditure (World Health Organization, 2024; Organisation for Economic Co-operation and Development, 2025). Consequently, climate adaptation should be integrated into healthcare governance, organizational strategy, and national health policies.

Strengthening Climate Governance within Healthcare Organizations

Healthcare organizations should formally recognize climate resilience as a strategic organizational priority. Hospital governing boards, executive leadership teams, and healthcare administrators should integrate climate risk assessment into institutional strategic planning, quality improvement programmes, and emergency preparedness frameworks (European Commission, 2024). Climate resilience indicators should become part of hospital accreditation standards and organizational performance evaluation.

Healthcare leaders should establish multidisciplinary Climate and Health Committees to assess climate vulnerabilities, monitor heat-related risks, coordinate emergency preparedness, and develop effective adaptation strategies. These committees can also evaluate organizational resilience and support compliance with national climate policies. Integrating climate governance into leadership structures strengthens accountability and supports informed decisions on infrastructure investment, resource allocation, and long-term healthcare resilience.

Modernizing Healthcare Infrastructure

Healthcare infrastructure modernization should be treated as a national priority, as many European hospitals were built for past climate conditions and remain vulnerable to prolonged heat (European Commission,

2024). Investment should focus on resilient and energy-efficient facilities through improved insulation, passive cooling, efficient ventilation, solar shading, reflective roofs, green infrastructure, renewable energy, battery storage, sustainable water systems, and smart monitoring technologies. Such measures can enhance patient comfort, reduce energy use and operating costs, limit emissions, and help maintain essential healthcare services during climate-related emergencies (WHO Europe, 2024)

Enhancing Healthcare Workforce Preparedness

Healthcare professionals are essential to resilient health systems, yet they are particularly exposed to the effects of extreme heat. Heatwaves can increase workload, heat-related occupational stress, fatigue, burnout, and the risk of clinical mistakes (Romanello et al., 2025). Healthcare organizations should strengthen staff protection through heat-health policies, adequate hydration and cooling breaks, flexible workforce planning, heat-specific training, psychological support, fatigue management, improved ventilation, and routine monitoring of heat stress. In addition, climate change and environmental health should be integrated into healthcare education and continuing professional development. Strengthening climate literacy can enhance workforce preparedness, protect staff wellbeing, and improve the resilience of healthcare organizations (WHO Europe, 2024).

Expanding Heat-Health Early Warning Systems

Early warning systems are a cost-effective approach to reducing heat-related illness and mortality (WHO Europe, 2024). Effective heat preparedness requires close coordination among meteorological services, public health agencies, emergency responders, and healthcare providers. Future systems should combine weather forecasts with hospital admissions, ambulance demand, population vulnerability data, environmental monitoring, satellite information, and AI-based prediction. Integrated surveillance can help healthcare organizations identify rising demand early, adjust staffing and critical-care capacity, and activate emergency plans before extreme heat becomes severe (Topol, 2024).

Protecting Vulnerable Populations

National climate adaptation policies should prioritize people most vulnerable to extreme heat, including older adults, children, pregnant women, people with chronic conditions, migrants, homeless populations, and socially disadvantaged groups (WHO Europe, 2024). Healthcare leaders can reduce these risks through targeted health education, home-based follow-up, telehealth, cooling centres, medication assessment, and stronger links with

social care services. At the community level, local authorities should support heat-resilient urban development by expanding green spaces, increasing tree cover, improving access to cooling facilities, and reducing urban heat accumulation (European Environment Agency, 2025).

Investing in Digital Health and Artificial Intelligence

Digital innovation can strengthen healthcare resilience during climate-related emergencies. Technologies such as artificial intelligence, predictive analytics, remote sensing, and the Internet of Things can support demand forecasting, infrastructure monitoring, and efficient resource management (Topol, 2024). Healthcare organizations should invest in AI-enabled forecasting, digital surveillance, smart hospital systems, temperature monitoring for medicines, telemedicine, and climate-health dashboards. These tools can improve operational performance and enable faster, evidence-based decisions during rapidly changing environmental emergencies.

Promoting Sustainable Healthcare Financing

Effective long-term climate adaptation depends on reliable and sustainable financing. Policymakers should make greater use of funding opportunities such as the European Green Deal, Recovery and Resilience Facility, EU Green Bonds, and other climate finance programmes (European Commission, 2024). Priority areas should include resilient healthcare infrastructure, renewable energy, digital systems, sustainable procurement, workforce training, climate-health research, and emergency preparedness. Investing in prevention can reduce future healthcare costs, infrastructure losses, and productivity impacts, while strengthening the overall resilience of health systems (OECD, 2025).

Strengthening Research, Monitoring, and International Collaboration

Effective climate-health policymaking requires reliable surveillance, integrated data, and interdisciplinary research. Governments should develop national climate-health observatories that combine meteorological, environmental, epidemiological, and healthcare information to identify and monitor climate-related health risks (Romanello et al., 2025). European countries should further strengthen cooperation through shared indicators, coordinated surveillance, research partnerships, knowledge exchange, cross-border emergency planning, and aligned adaptation strategies. Regional institutions, including WHO Europe, the European Commission, the European Environment Agency, and the European Centre for Disease

Prevention and Control, have an important role in promoting coordinated action and strengthening health-system resilience.

CONCLUSION

Extreme heat has emerged as one of the most significant climate-related threats to public health and healthcare systems across Europe. As the fastest-warming continent globally, Europe has experienced an unprecedented increase in the frequency, duration, and intensity of heatwaves, with recent summers establishing new temperature records and exposing millions of people to hazardous environmental conditions (Copernicus Climate Change Service [C3S], 2025; European Environment Agency, 2025). The evidence synthesized in this chapter demonstrates that extreme heat affects virtually every component of healthcare delivery, from increasing heat-related morbidity and mortality to disrupting hospital operations, overwhelming emergency services, compromising workforce wellbeing, and substantially increasing healthcare expenditure.

The health impacts of extreme heat extend beyond classical heat-related illnesses. Cardiovascular diseases, respiratory disorders, acute kidney injury, mental health conditions, and climate-sensitive infectious diseases all increase during prolonged periods of elevated temperatures, disproportionately affecting older adults, children, pregnant women, individuals with chronic illnesses, and socioeconomically disadvantaged populations (Ballester et al., 2023; Romanello et al., 2025). These findings highlight that climate change is not solely an environmental issue but a major determinant of population health requiring coordinated action across healthcare, public health, environmental policy, and urban planning.

The chapter further illustrates that healthcare systems themselves are increasingly vulnerable to climate change. Rising patient demand, infrastructure limitations, workforce shortages, pharmaceutical supply-chain disruptions, and escalating operational costs collectively threaten the capacity of health systems to deliver safe and effective care during extreme heat events. Consequently, strengthening healthcare resilience must become a strategic priority rather than a reactive response to individual climate emergencies (Organisation for Economic Co-operation and Development, 2025).

Encouragingly, Europe has made significant progress in developing climate adaptation strategies through Heat-Health Action Plans, early warning systems, climate-resilient hospitals, renewable energy integration, green financing mechanisms, and digital health innovations. Initiatives

supported by the European Green Deal, the Recovery and Resilience Facility, and national adaptation programmes demonstrate increasing recognition that investment in resilient healthcare infrastructure yields substantial public health, environmental, and economic benefits (European Commission, 2024; WHO Europe, 2024). However, important disparities remain in the implementation and effectiveness of these measures across European countries, highlighting the need for greater policy coordination and knowledge exchange.

The findings of this chapter also emphasize the importance of integrating sustainability into healthcare management. Climate-resilient hospitals should not only be capable of maintaining essential services during extreme weather events but should also contribute to climate mitigation through energy efficiency, renewable energy adoption, sustainable procurement, waste reduction, and environmentally responsible healthcare delivery. Such an integrated approach aligns with the objectives of the European Green Deal, the Paris Agreement, and the United Nations Sustainable Development Goals by simultaneously protecting population health and reducing the environmental footprint of healthcare systems.

Looking forward, responding effectively to climate change will require multidisciplinary collaboration among healthcare professionals, policymakers, engineers, environmental scientists, economists, urban planners, and digital technology experts. Future adaptation strategies should prioritize vulnerable populations, strengthen surveillance systems, modernize ageing healthcare infrastructure, promote workforce resilience, expand research on climate-sensitive health outcomes, and harness emerging technologies such as artificial intelligence and predictive analytics to improve preparedness and decision-making.

In conclusion, climate change has fundamentally transformed the operating environment of European healthcare systems. Extreme heat is no longer an episodic environmental hazard but an ongoing public health challenge requiring sustained investment, evidence-based policy, and innovative healthcare leadership. Building climate-resilient, environmentally sustainable, and equitable healthcare systems will be essential for protecting human health, reducing future healthcare costs, and ensuring that European health services remain capable of responding effectively to the escalating impacts of climate change. Continued research, international collaboration, and long-term strategic planning will be indispensable in safeguarding both population health and healthcare system resilience in an increasingly warmer world.

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Economic Growth, Migration, and Poverty Dynamics in the Western Balkans

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ABSTRACT

The Western Balkans have experienced significant economic and demographic changes over the past decades, characterized by persistent emigration, moderate economic growth, and structural poverty challenges. While migration has become a key livelihood strategy for households, its long-term implications for economic growth and poverty reduction remain ambiguous. This paper examines the interlinkages between economic growth, labor migration, and poverty dynamics in the Western Balkan countries. Using macroeconomic indicators and secondary data from international institutions, the study analyzes how migration flows and remittance inflows interact with growth performance and poverty outcomes in the region. The findings suggest that while remittances contribute to poverty alleviation and household consumption in the short term, high emigration rates may constrain long-term growth through labor market distortions, skill shortages, and demographic decline. The paper highlights the need for integrated policy approaches that link migration management with inclusive growth strategies and social protection mechanisms, in order to support sustainable development in the Western Balkans.

Keywords – Economic Growth; Migration; Poverty; Remittances; Western Balkans; Labor Mobility; Development Economics

I. INTRODUCTION

Over the past three decades, the Western Balkans have undergone profound economic, social, and demographic transformations shaped by post-socialist transition, political instability, and integration aspirations toward the European Union. Despite periods of economic growth and structural reforms, the region continues to face persistent development challenges, including high unemployment rates, widespread poverty, and significant outward migration. These interconnected phenomena have become defining features of the region's development trajectory and remain central to academic and policy debates on sustainable growth and convergence with the European Union. Migration has emerged as one of the most significant responses to limited economic opportunities and structural weaknesses in the Western Balkan economies. Large-scale labor emigration, particularly among young and skilled individuals, has reshaped labor markets, demographic structures, and income distribution patterns across the region. For many households, migration and remittances have become essential coping mechanisms against poverty and economic insecurity. At the same time, the long-term implications of sustained emigration for economic growth, productivity, and institutional development raise critical concerns. While remittance inflows contribute to household consumption, poverty reduction, and macroeconomic stability,

excessive reliance on migration may undermine domestic labor supply, human capital accumulation, and long-term growth potential.

Economic growth in the Western Balkans has been uneven and vulnerable to external shocks, including global financial crises, regional political instability, and more recently, the economic consequences of the COVID-19 pandemic. Although growth has helped reduce poverty levels in certain periods, the benefits have not been evenly distributed across countries or social groups. Structural weaknesses such as low productivity, limited industrial diversification, weak institutions, and informality continue to constrain inclusive growth. In this context, understanding how migration interacts with growth dynamics and poverty outcomes is essential for designing effective development and social policies.

The relationship between migration, economic growth, and poverty is complex and multidimensional. On the one hand, migration can serve as a development tool by easing labor market pressures, generating remittance income, and facilitating knowledge and skill transfers. On the other hand, high and persistent emigration rates may generate adverse effects, including labor shortages, demographic aging, and the loss of skilled human capital, often referred to as “brain drain.” These opposing effects are particularly relevant for the Western Balkans, where demographic decline and emigration intensity are among the highest in Europe.

Despite the growing body of literature on migration and development, empirical evidence on the Western Balkans remains fragmented. Existing studies often examine migration, economic growth, or poverty in isolation, without fully capturing their interdependencies. Moreover, country-specific analyses dominate the literature, limiting the understanding of regional patterns and shared structural challenges. This paper seeks to contribute to the literature by providing a comprehensive analysis of the linkages between economic growth, migration, and poverty in the Western Balkans, adopting a regional perspective.

The objective of this study is to analyze how migration and remittance flows influence economic growth and poverty dynamics in the Western Balkan countries. By combining macroeconomic indicators with evidence from international datasets, the paper aims to assess whether migration acts as a short-term poverty alleviation mechanism or as a long-term constraint on sustainable economic development. The findings are intended to inform policy discussions on migration management, labor market reforms, and inclusive growth strategies in the context of EU integration.

II. MATERIALS AND METHOD

This study uses secondary macroeconomic and demographic data from authoritative sources to analyze the interlinkages between economic growth, migration flows, remittances, and poverty outcomes in the Western Balkan

Six (WB6) countries: Albania, Bosnia and Herzegovina, Kosovo, Montenegro, North Macedonia, and Serbia. The key indicators include GDP growth rates, remittance inflows as a share of GDP, youth unemployment, and emigration/immigration statistics. Data were collected from international economic reports, demographic surveys, and regional migration analyses covering the period 2000–2025 to capture long-term trends and recent developments affecting the Western Balkans.

The study combines descriptive statistics with comparative trend analysis to observe patterns over time. Macroeconomic indicators such as GDP growth projection data were sourced from the World Bank Regular Economic Reports and verified through recent reports indicating projected regional GDP growth of around 3.2 % in 2025 with moderate acceleration through 2026–2027 to support the robust narrative on growth dynamics [1], [5]. Remittance inflows were measured as a percentage of national GDP for each country in the Western Balkans using Eurostat and World Bank datasets, with Kosovo showing the highest remittance dependence (around 17.2 % of GDP) and North Macedonia the lowest (around 3.4 % of GDP) in recent years [2], [3]. Migration and labor market dynamics were analyzed using recent demographic studies on youth unemployment and emigration rates, including data on high youth unemployment reaching 24 %–28 % across several WB6 countries, highlighting migration drivers tied to limited domestic opportunities [3]. The OECD Labour Migration Report was used to supplement interpretation of remittances' impact on human capital and labor participation patterns [5]. The analysis also incorporated national household migration survey findings indicating that an estimated 37 % of Albanian households have at least one member abroad or returned, underscoring the social and economic relevance of migration for poverty and household income dynamics [4].

The synthesis of these data allows for integrated inference on how migration and remittances interact with economic growth and poverty reduction in the Western Balkans context.

Table 1: Key Data on Economic Growth, Migration, and Poverty in the Western Balkans

Indicator	Value / Statistic	Year / Source
GDP growth (WB6 region)	~3.2 %	2025 / [1]
Projected GDP growth	3.1 % (2026), 3.6 % (2027)	2026–2027[1]
Remittances (% of GDP), Kosovo	17.2 %	2022 / [2]
Remittances (% of GDP), Montenegro	13.3 %	2022 / [2]
Remittances (% of GDP), Bosnia–Herzegovina	10.2 %	2022 / [2]
Remittances (% of GDP), Albania	9.2 %	2022 / [2]
Remittances (% of GDP), Serbia	~9.0 %	2022 / [2]
Remittances (% of GDP), North Macedonia	~3.4 %	2022 / [2]
Average Remittances (% of GDP, WB6)	~9.7 %	2019 / [5]
Households with migrants in Albania	~37 %	2024 / [4]
Youth Unemployment (15–24)	~24 %–28 %	2023 / [3]
Regional Emigration Rate	~23.6 %	2024 / [6]

III. RESULTS

The descriptive analysis of macroeconomic and migration data for the Western Balkans shows heterogeneous trends across the region. As presented in the key data table, Kosovo exhibits the highest dependence on remittances, with 17.2 % of GDP, while North Macedonia shows the lowest (3.4 %) [2]. Albania and Montenegro also report substantial inflows, indicating that remittances continue to play a significant role in household income and poverty alleviation [2], [5].

Economic Growth Patterns. The region experienced moderate but uneven GDP growth over the 2020–2025 period, with an estimated 3.2 % growth in 2025, projected to gradually increase to 3.6 % in 2027 [1]. The growth trend varies by country, with Montenegro and Serbia showing relatively stable performance, while Kosovo and Albania rely more heavily on remittances as a short-term economic buffer [1], [2].

Migration and Labor Market Dynamics. High levels of youth unemployment, ranging from 24 % to 28 % across WB6 countries, are associated with

persistent outward migration, particularly among young and skilled workers [3]. Approximately 37 % of Albanian households have at least one member living abroad or returned recently, indicating that migration is a key livelihood strategy for families [4]. Regional emigration rates reach 23.6 % of the population, reflecting demographic pressures and labor force constraints in the domestic economy [6].

Remittances and Poverty Dynamics. The analysis indicates a positive short-term effect of remittances on household consumption and poverty reduction. Countries with higher remittance inflows, such as Kosovo and Montenegro, report improved household purchasing power and reduced reliance on social assistance [2], [5]. However, the long-term implications are mixed: sustained high emigration rates can exacerbate labor shortages, skill gaps, and demographic aging, potentially limiting productivity and future growth prospects [5], [6].

Correlation Analysis. Preliminary correlation estimates suggest that remittances are positively correlated with GDP per capita growth ($r \approx 0.45-0.52$) in the short term, while emigration rates are negatively correlated with labor market participation ($r \approx -0.36$) [2], [5]. These results highlight the dual role of migration: it alleviates poverty temporarily but may constrain long-term economic development if human capital depletion continues [5], [6].

IV. DISCUSSION

The analysis of economic growth, migration, and poverty in the Western Balkans highlights the dual role of migration. On one hand, remittances provide a critical safety net for households, supporting consumption, reducing poverty, and stabilizing local economies in countries such as Kosovo and Albania [2], [5]. These findings are consistent with previous studies showing that remittance inflows have a short-term positive effect on household welfare and can temporarily offset structural economic weaknesses [2], [3]. On the other hand, high emigration rates and persistent labor outflows present a challenge to long-term sustainable development. The loss of skilled labor and young workers can exacerbate demographic decline, reduce domestic labor market productivity, and hinder industrial diversification [5], [6]. This dual effect underscores the complex interplay between migration and economic growth, where remittances mitigate poverty in the short term, but excessive dependence on migration may limit long-term growth prospects [5], [6]. The results also suggest that economic growth alone is insufficient to reduce poverty without complementary measures addressing labor market inefficiencies and social inclusion. Countries with moderate GDP growth but high emigration, such as Albania and Kosovo, show that household welfare gains from growth are unevenly distributed, reinforcing the importance of targeted poverty reduction programs [1], [2].

V. CONCLUSION

The analysis of economic growth, migration, and poverty dynamics in the Western Balkans demonstrates that **migration plays a critical dual role** in the region's development. Remittances provide immediate relief for households, supporting consumption and contributing to short-term poverty reduction, particularly in countries with high emigration rates such as Kosovo and Albania [2], [5]. At the same time, persistent outward migration creates structural challenges for labor markets, including skill shortages and demographic decline, which can constrain long-term economic growth and productivity [5], [6]. These findings highlight that the benefits of migration and remittances are not uniform across countries and that growth alone is insufficient to ensure inclusive development [1], [2].

Effective policy design in the Western Balkans requires a **holistic approach** that integrates migration management, labor market reforms, and social protection measures. Harnessing remittances for productive investment, promoting youth employment, and aligning national strategies with EU integration objectives can maximize the positive impact of migration while mitigating its potential long-term costs [5], [6]. Ultimately, sustainable development in the region depends on balancing short-term household support from remittances with long-term strategies to strengthen domestic human capital, reduce inequality, and promote inclusive economic growth [2], [5].

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