Original scientific paper

SEASONALITY AND SECOND-HOME TOURISM IN NORTH MACEDONIA: DOJRAN CASE

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Abstract:
Seasonal lake destinations often develop unevenly: short summer peaks encourage rapid construction, while many buildings remain empty or weakly used for much of the year. This paper explores this issue through the case of Dojran, North Macedonia, focusing on the relationship between seasonality, second-home tourism and tourism-driven real-estate expansion. It develops a model for assessing whether new residential construction follows demographic needs or is mainly shaped by tourism-related demand. The findings reveal a clear mismatch between housing growth and population trends, indicating that the recent construction boom has contributed to market oversupply, high vacancy rates and "cold beds". The results also suggest possible gentrification effects and uneven local development. The paper contributes theoretically by connecting seasonality and second-home tourism with housing-market imbalance through a measurable indicator. In practical terms, it provides a useful diagnostic tool for sustainable tourism planning in small seasonal destinations.

Keywords: seasonality, second-home tourism, tourism development, Dojran.

JEL classification: R31, L83, Z32

INTRODUCTION

Seasonality remains one of the most persistent challenges in tourism development, particularly in small lake and summer-oriented destinations. In such places, tourism activity is highly concentrated in a short peak season, while accommodation facilities, residential buildings and local infrastructure remain underused for much of the year. This uneven rhythm creates a development paradox: destinations continue to expand their built environment in response to short-term seasonal demand, although the permanent population and year-round tourism activity often do not justify such growth.

This issue is especially visible in destinations where tourism demand is increasingly absorbed not only by hotels and formal accommodation, but also by second homes, private apartments and short-term rentals. In such contexts, residential real estate is no longer used only for permanent housing. It becomes part of the tourism economy, either

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as a second-home asset or as accommodation offered during the peak season. This transformation blurs the boundary between housing and tourism, creating a complex relationship between construction activity, demographic trends and seasonal tourism flows. As noted by Doling and Ronald (2019), this reflects the rise of "not for housing" housing, where dwellings increasingly function as investment assets rather than as homes. Similarly, Dredge and Gyimóthy (2017) argue that growing demand for tourist accommodation can contribute to rising housing prices, particularly when the formal accommodation sector does not fully respond to changing tourism patterns.

Previous research has already pointed to the need for a more careful interpretation of housing expansion in tourism destinations. Jović et al. (2022) emphasize that when a significant share of available housing units function as investment properties or short-term rental accommodation, urban planning must move toward integrated approaches that balance public and private interests and support sustainable spatial management. Perić et al. (2022) also show that residential real estate is increasingly used for short-term rental and second-home purposes, while newly constructed units may become "extra-structural" when they are added to a context that already has a substantial surplus of vacant housing. These insights are particularly important for seasonal destinations, where the apparent need for accommodation during summer may encourage overbuilding, even though the same units remain empty or weakly used during the rest of the year.

Academic literature consistently confirms that the expansion of second homes predominantly overlaps with ecologically highly vulnerable coastal, lacustrine, and mountainous destinations, where the temporal concentration of their occupancy synergistically coincides with the peak tourist season (Ericsson et al., 2022; Müller et al., 2024), emphasizing that this cumulative demand generates extreme pressure on local utility infrastructure, which remains underutilized and economically unsustainable during the off-season. Relevant studies within the specific context of the Balkans and the Mediterranean (Gallent et al., 2004; Gallent et al., 2023; Terzić et al., 2020) indicate that the temporary demography of holiday home owners can act as a significant economic buffer, preventing total off-season stagnation by supporting local service industries and preserving the vitality of rural communities. In order to leverage this potential and mitigate the gap between construction expansion and local demographic needs, contemporary spatial plans and public policies increasingly insist on the institutional transformation of these properties into registered rural tourism households. This integrative management model facilitates the transition of real estate into legal tourism flows, ensuring the controlled development of the destination without disrupting social cohesion.

Contemporary tourism development in North Macedonia is characterized by a structural transformation within the domestic tourism sphere, where domestic travel and second-home tourism have become increasingly dominant. While traditional lakeside destinations such as Ohrid and Struga have long attracted both domestic and foreign capital, the post-pandemic period has intensified spatial and economic pressures in secondary lake destinations. In this context, the municipality of Dojran, and particularly its nucleus of Star Dojran, has emerged as a paradigmatic case of development driven by second-home tourism, supported by urban middle-class investment in real estate as a hedge against inflation. As housing units, especially

apartments, are increasingly treated as investment assets with short-term rental potential (Barbić, 2024; Ryan-Collins & Murray, 2023), this pattern has become particularly evident in tourism destinations, where it acts as a powerful driver of tourism-induced gentrification.

At the national level, the seasonal nature of tourism demand is also reflected in relatively modest annual accommodation utilization, with hotels and motels operating below full capacity and recording net occupancy rates of 45.9% for rooms and only 29.6% for bed places. As a summer lake destination, Dojran experiences not only overtourism but also a seasonal influx of second-home owners who use their properties mainly during the peak season. Outside the summer period, many of these areas face high vacancy rates, effectively turning into "ghost zones". Such destinations are marked by intense pressure on local public infrastructure during the summer, combined with disturbances to the natural and cultural environment and a declining quality of residential life throughout the rest of the year (Terzić & Petrevska, 2021). This path of full tourism dependency, in which municipalities prioritize costly high-capacity infrastructure for short-term seasonal tourist use over local interests, inevitably leads to the hollowing out of local social vitality and the loss of permanent residency (Barke, 2007; Tanaka et al., 2023).

In destinations such as Dojran, formal accommodation is supplemented during the peak season by the existing housing stock, as secondary residences and private apartments are frequently converted into short-term rental units. However, as total accommodation capacity has nearly doubled in less than a decade, the construction boom appears to have produced market oversupply and deepened the gap between housing growth, demographic change and actual tourism needs.

This paper addresses this issue by examining the mismatch between housing construction, demographic trends and tourism activity in Dojran. The analysis aims to identify whether residential expansion corresponds to local demographic needs or whether it is primarily driven by seasonal tourism demand and second-home use. By quantifying this mismatch, the paper enables a discussion of "cold beds" and gentrification risks. In doing so, the study contributes to the literature on seasonality, second-home tourism and tourism-driven real-estate expansion by proposing a more direct way to assess the relationship between construction activity and demographic-tourism dynamics. It is guided by the following research questions:

RQ1: To what extent does housing construction in Dojran correspond to demographic trends?

RQ2: How does second-home tourism contribute to vacancy, market oversupply and unsustainable tourism development in Dojran?

The remainder of the paper is structured as follows. The next section presents the methodological approach and explains the model used to assess the construction-demography mismatch. The following section presents the empirical results for Dojran. The discussion then interprets the findings in relation to seasonality and second-home tourism. Finally, the conclusion summarizes the findings, and highlights the theoretical and practical contributions of the paper.

METHODOLOGY

The empirical analysis is based on a case study of Dojran, North Macedonia (Figure 1). Many studies examine the relationship between housing and demographic change, often relying heavily on quantitative analysis (Assylbayev et al., 2024; Niiazalieva et al., 2024; Pilogallo et al., 2018). However, such studies rarely consider the role of tourism in shaping housing markets and demographic trends. The methodological framework of this study is designed to quantify the extent to which real-estate development is decoupled from demographic and tourism dynamics. More specifically, it investigates the mismatch between housing expansion, population decline, and seasonal tourism demand, incorporating the effects of seasonality based on the model proposed by Terzić et al. (2026). The analysis is carried out in three steps.

Figure 1 Location of Dojran (North Macedonia)
Source: UN Geospatial (n.d.)

Step 1 calculates the Construction-Demography Gap (CDG), both in absolute terms and as a ratio. The absolute CDG measures the supply-demand mismatch between housing stock and residential housing needs. CDG ratio, on the other hand, tracks whether housing market trajectories have decoupled from demographic trends, by comparing relative tri-annual construction rates with population growth rates (2021/2024). To adapt the measures, individuals are converted to household equivalents utilizing average household size. Results are interpreted as follows with 1.0

representing an absolute equilibrium; < 1.0 housing deficit/overcrowding; >1.0 indicating structural oversupply; <0 occurs when population is shrinking while housing stock continues to expand, revealing severe structural contradiction (Terzić et al., 2026).

Step 2 introduces the tourism-adjusted Construction-Demography Gap (TCDG), which accounts for seasonal tourism demand and the temporary use of housing units for tourism purposes. The model quantifies how effectively tourism demand mitigates or exacerbates housing oversupply. TCDG is calculated by applying corrective weights for invisible tourists, defined as visitors staying in private or informal accommodation that may not be fully recorded in official statistics (including second-homers). Two scenarios are used: 1.3 for the annual-average scenario and 1.5 for the peak-season scenario. To establish analytical equivalence, housing and tourism units are normalized at 3.0 persons per household and 2.0 persons per room, respectively. Rather than relying only on the annual average (total overnights/365), peak demand is isolated by calculating effective daily tourist demand based on absolute peak monthly visitation (Terzić et al., 2026).

Step 3 calculates three additional indicators to show how effectively the tourism economy absorbs or compounds housing oversupply— the Mismatch Index (MI) to measure directional impact of tourism on real-estate imbalances; Tourism Effect (TE) quantifies the intensity of tourism-driven market adjustments, and Oversupply Reduction (OR) provides a percentage of the resident-baseline housing surplus that is successfully alleviated by seasonal tourist demand — to better explain the tourism-related component of housing imbalance.

CASE STUDY - DOJRAN

Municipality of Dojran is located on the borderline between North Macedonia and Greece, located on the Lake Dojran, surrounded by the mountains and hills. Being the smallest and the warmest natural lake in North Macedonia, Lake Dojran offers sandy beaches, extended sunshine hours and favorable conditions for tourism development. The municipality is located 166 km south of Skopje, 38 km from Gevgelija, and 81 km from Thessaloniki in Greece. The municipality consists of 13 settlements of which Star (Old) Dojran represents the center and main tourist hub. Residents, on the other hand, are mainly concentrated within adjacent settlement of Nov (New) Dojran.

According to available population estimates, Dojran had approximately 3,084 inhabitants in 2021. By 2024, the population was estimated to have declined to 3,001 persons (-2.7%), mainly due to natural decrease and, to a much lesser extent, migration. The average household size is 2.9 persons, slightly below the national average of 3.04. Dojran's population is highly homogeneous, as 83% of residents are ethnic Macedonians, with smaller shares of Turkish (7.2%) and Serbian population (5%). The municipality has 926 households and 3,147 dwellings, of which 997 are occupied. This indicates that vacant dwellings strongly prevail, accounting for 68.3% of the total housing stock. By comparison, the 2002 census recorded 3,426 inhabitants in Star Dojran, living in 1,021 households, with a total of 2,116 dwellings, of which 51.7% were vacant. Most of these vacant units are second homes that remain empty for much

of the year. Therefore, Dojran can be understood as a municipality that is demographically shrinking while spatially expanding.

Table 1. Spatial distribution of population, households and dwellings in Dojran

Settlement	Population	Households	Dwellings	% Vacant
Durugli	4	2	11	81.8
Gopcheli	116	33	45	26.7
Kurtamzali	42	13	41	68.3
Nikolikj	520	145	187	22.5
Nov Dojran	997	371	703	47.2
Star Dojran	413	148	764	80.6
Sretenovo	344	135	1,095	87.7
Furka	459	159	221	28.1
Tsrnichani	189	60	74	18.9

Source: State Statistical Office of the Republic of North Macedonia. (n.d.),

Despite ongoing population decline, housing construction in Dojran is thriving. Over the last three years, up to 2024, an additional 359 residential dwellings with a total floor area of 20,536 m² were built (State Statistical Office of the Republic of North Macedonia, n.d.). This represents the highest housing construction growth rate in the country, even surpassing the construction boom in the capital city, Skopje. Given the declining resident population, housing construction in the municipality appears to be largely tourism-led and highly speculative.

According to the Census of Catering Capacities in the Republic of Macedonia (State Statistical Office of the Republic of North Macedonia, 2016), which remains the latest official source, Dojran had 46 accommodation establishments with 725 rooms and 2,079 beds, employing 145 persons. The municipal website lists 40 accommodation facilities, including hotels and resorts, four commercial hotels, several modern casinos, and more than 600 weekend homes (Municipality of Dojran, n.d.). Over the last decade, however, accommodation capacity has almost doubled. Large apartment buildings have been constructed particularly in the attractive areas of Sretenovo and Star Dojran, especially north of St. Ilija's Church, creating a new development corridor towards Nov Dojran. Given the current demographic situation, these new units are likely to become part of the short-term rental market, including Airbnb-type apartments. While they may help absorb peak-season tourist demand, they also intensify competition in the rental and real-estate market.

Tourism development

According to Dimitrov et al. (2016), the development of tourism and hospitality in Star Dojran and around Lake Dojran can be divided into two broad stages: the pre-tourism stage, covering the period from the 19th century to 1912 and again from 1934 to 1941, and the tourism stage, which includes the periods 1953–1960, 1961–1988, stagnation from 1989 to 2004, and revitalization since 2005. In the early stages, Dojran had three hotels and 14 restaurants along the lakeshore during the 1920s and functioned mainly as a transit destination to and from Greece. By the 1930s, several villas had been built, although these were still insufficient to stimulate more intensive tourism development.

Tourism began to develop more substantially after the Second World War. In 1954, sixteen old villa houses in Old Dojran were transformed into a resort with 75 beds, while the first modern hotel, Polin, was built in 1961. Soon afterwards, by 1964, accommodation capacity reached a total of 1,040 beds. In 1975, Dojran had eight hotels, 21 social resorts, and an auto-camp bungalow resort, with a combined capacity of 960 rooms and 2,500 beds. This capacity was later expanded by the tourist resort Mrdaja, with an additional 1,500 beds, and the Achik resort, with the same capacity (Dimitrov et al., 2016).

Tourism development around Lake Dojran reached its peak in the 1980s. At that time, the destination had eight hotels, one motel, two auto-camps, four children's resorts, 40 workers' resorts, 800 holiday homes, 150 rental studios, and additional private accommodation, providing a total of 12,730 beds. However, uncontrolled tourism development, combined with excessive use of water from Lake Dojran, contributed to an environmental disaster and a prolonged decline in tourism. A solution was introduced in 2002 through the construction of an artificial hydrosystem, which enabled the gradual redevelopment of tourism from 2010 onwards (Dimitrov et al., 2016). According to Dimitrov (2017), the progressive development of the destination began in 2005 through a combination of mass-tourism life-cycle dynamics, consolidation, and post-Fordist tourism extension, linked to the democratization of tourism and the culmination of domestic tourism demand in North Macedonia.

Table 2. Seasonality indicators

Indicator	2001	2011	2019	2024
Total population	3,426	3,324	3,182	3,001
Total tourists	3,527	22,785	92,978	68,360
Foreign tourists %	13.0	5.7	28.1	6.8
Total overnights	14,568	105,067	353,219	267,127
Maximum monthly attendance (% of annual)	57.9	71.2	67.1	52.1
Peak season attendance (bi-monthly) % of annual	69.4	95.7	90.6	79.9

Source: State Statistical Office of the Republic of North Macedonia. (n.d.).

In 2025, the municipality recorded 62,678 tourists, of whom only 8.9% were foreign visitors, while almost half of all tourist arrivals (47.4%) were recorded in August (Figure 2).

Similar patterns were observed in 2024, when Dojran received 68,360 tourists, of whom 6.8% were foreign visitors. These tourists generated 267,129 overnight stays, with foreign visitors accounting for only 3% of the total. In the same year, 52.1% of tourist arrivals and 54.9% of overnight stays were concentrated in a single month, August, while around 80% of total tourist flows occurred over just two months. These figures indicate an alarming degree of seasonal concentration. During August, the officially recorded tourist population, further supplemented by unregistered second-home owners and visitors, substantially exceeds the permanent resident population, intensifying pressure on local housing and contributing to the gradual displacement of residents.

Figure 2. Seasonal distribution of tourists in Dojran municipality
Source: Authors using Google Gemini, based on data from the State Statistical Office of the Republic of North Macedonia. (n.d.).

The summarized results presented in Table 3 indicate a clear and strong imbalance between demographic change, housing construction and tourism-related housing demand in Dojran.

Table 3. Summarized results

Indicator	Result
Population change[1] (%)	-2.7
Vacancy rate (%)[2]	68.3
Housing growth (%)[1]	12.7
CDG ratio[1]	-14.0
CDG absolute[3]	3.4
TCDG max	0.9
TCDG avg	2.9
MI	0.5
TE	0.8
OR max (%)	103.3
OR avg (%)	22.2

Source: Authors
Note: [1]Data for period 2021-2024; [2]Data for 2021; [3]Data for 2024.

RESULTS AND DISCUSSION

Dojran, and particularly Star Dojran, serves as a case study of domestic tourism gentrification and second-home syndrome. Although the scale of housing construction far exceeds resident demand, the strong seasonal influx of tourists absorbs part of this structural oversupply. However, this absorption is temporary and highly seasonal, meaning that it does not justify the extreme pace of development. It can therefore be

argued that excessive construction in Dojran is directly stimulated by tourism, while its intensity remains disproportionate to the municipality's demographic and residential needs. In discussing overtourism concerns, Perles-Ribes et al. (2025) identify phases of explosive tourism demand growth as an early warning signal of potentially unsustainable development trajectories.

With regard to RQ_1, the findings show that housing development does not correspond to demographic trends. During the period 2021–2024, the population declined by 2.69%, while the housing stock increased by 12.7%. This divergence is substantial, particularly because housing growth was far above the national average of approximately 3%. Such a contrast indicates that recent construction cannot be explained by permanent residential demand, but is fully tourism driven. This mismatch is further confirmed by the CDG indicators. The negative CDG ratio (-14.01) shows that the construction rate expanded despite demographic decline, following the path of "growing shrinking cities" (Fernandez and Hartt, 2022) and raising concerns about unsustainable growth-oriented urban policies. The absolute CDG value of 3.4 additionally confirms an extreme overbuilding pattern, as the volume of available housing exceeds realistic resident needs more than threefold.

As Dojran traditionally functions as a summer and weekend destination for urban dwellers from Skopje, it has gradually transitioned from hotel/resort to apartment-rental accommodation, with a pattern of second-home ownership. The high vacancy rate provides additional evidence of this imbalance. With 68% of housing units vacant or seasonally used, Dojran shows signs of an overbuilt destination where a large share of the housing stock does not serve residential needs. This situation produces the so-called "cold beds" effect, where housing exists physically but remains inactive for most of the year. Under normal market conditions, such excessive construction combined with population decline would be expected to reduce housing prices. Yet, in Dojran, despite demographic decline and high vacancy, real-estate prices have increased sharply, while housing has increasingly become both a speculative asset and a second-home. This transformation has intensified gentrification pressures, especially in the most attractive lakeside areas, where residents increasingly face stronger competition from seasonal owners and investors.

In relation to RQ_2, the results show that second-home tourism plays a central role in explaining vacancy, market oversupply and unsustainable tourism development in Dojran. The tourism-adjusted indicators confirm the presence of a housing gap. The TCDG max value of 0.9, calculated with the peak-season weight of 1.5, and the TCDG average value of 2.9, calculated with the annual-average tourism correction, show that tourism demand absorbs a significant part of the apparent housing surplus. This means that the housing imbalance should not be interpreted only as empty or unused construction. A significant part of the housing stock is temporarily activated during the summer season through second-home use, apartment rentals and informal accommodation. However, this tourism absorption is highly seasonal and therefore does not eliminate the structural problems. The MI index (0.5) indicates a strong divergence between residential and tourist housing needs, while TE (0.8) confirms that tourism has a substantial influence on the apparent oversupply.

Tourism demand substantially absorbs housing oversupply, particularly during the peak season, indicating a full shift towards a visitor-oriented local economy. It is

estimated that more than 80% of the existing housing surplus is utilized during the peak season, mainly in July and August, when tourist demand may even generate modest shortages in available accommodation. Outside the peak season, however, only 22% of the housing surplus can be justified by tourism demand. In other words, second-home tourism explains part of the construction surplus, but it does not justify the overall scale of housing expansion.

Given Dojran's relatively small permanent population, the built environment increasingly appears to be designed for tourists rather than residents. During the peak season, tourists in Star Dojran may outnumber local residents by more than ten to one.

Furthermore, the local housing market is largely shaped by investment from the domestic urban middle class, which acts as a catalyst for local real-estate inflation. This trajectory aligns with broader trends identified by Balkoski et al. (2023), including significant migration outflows, high rates of illegal construction, and a general lack of environmental awareness. Although the South-East region recorded a 34.7% decline in the number of construction permits issued in 2024, the lakeside zone of Dojran remains a highly active sub-market.

The price structure in Dojran is increasingly polarized. In the administrative center, Nov Dojran, housing prices remain closer to regional averages, at around €800/m². By contrast, in the tourist core of Star Dojran, real-estate listings in 2025 show houses ranging from €105,000 to €200,000, while renovated villas now reach €1,200–€1,800/m². Under these conditions, premium lakeside real estate is increasingly privatized by seasonal owners, while the permanent local population is gradually pushed towards peripheral, non-tourist zones. As a result, under the process of tourism-led gentrification, Star Dojran has become a high-value enclave of intermittent residency, while Nov Dojran remains a more stagnant zone for the permanent labour force.

Taken together, the results show that Dojran's housing imbalance is not simply the result of excessive construction, but of a seasonal tourism model that temporarily absorbs surplus housing while leaving the structural problems unresolved. The destination therefore operates through a dual housing logic: high seasonal activation during the summer peak and prolonged vacancy during the rest of the year. This confirms that second-home tourism partly explains the market dynamics, but also reinforces vacancy, gentrification and spatial inequality.

CONCLUSION

The paper examined whether housing construction in Dojran reflects actual demographic needs or whether it is increasingly driven by seasonal tourism and second-home demand. The findings point to a clear separation between demographic change and real-estate development. Instead of following population growth, construction has continued in a context of demographic decline, creating a housing market increasingly shaped by temporary use, investment interests and seasonal consumption.

This imbalance becomes even more visible when tourism demand is taken into account. Second-home tourism helps absorb part of the housing surplus during the summer peak, but it does not solve the deeper structural problem. Rather, it creates a

dual housing pattern: short-term activation during the high season, followed by long periods of vacancy and underuse. In this sense, "cold beds" are not simply an accommodation issue, but a sign of wider unsustainability in the local housing and tourism system.

The case of Dojran also speaks to broader debates on urban shrinkage. It shows how tourism-led construction can create an impression of growth and vitality, even when the resident population is declining and local livability is weakening. This is particularly relevant for small seasonal destinations, where speculative housing demand may increase pressure on urban space, worsen affordability and shift development away from community needs.

To address this problem, the paper proposed a model that links construction growth, demographic change and tourism-related housing demand. The model offers a practical way to assess whether housing expansion reflects real local needs or is mainly supported by seasonal and investment-driven demand. It can therefore be useful for other tourism destinations facing similar tensions between real-estate expansion, population decline and temporary use.

Future development in Dojran should therefore not be assessed only through new construction or seasonal arrivals, but also through its effects on residents, housing affordability, land use and environmental quality.

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