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# Identification and mapping of migration routes of transhumance communities using Geographic Information System in the Western Mediterranean Region in Turkey

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***Abstract:*** *Turkey's nomads, replaced periodically to graze their goats in the basin of the Mediterranean Region for many years. Hair goat breeding for nomads is both a production system and a cultural value symbol. Nomads who drives the immigrant life style, has come to the Turkish water front. Economy for nomads is based on animal breeding. Geographical mobility and animal breeding are two important factors affecting and shaping the nomadic life style. During these migrations, animals have to graze every day at certain times. For this reason, they cannot travel continuously. For this reason, migrants cannot travel more than 4-5 hours per day. The roads on the Taurus Mountain are generally available, but do not provide access to thousands of animals. The study site is located between 31°4'10 "and 38°27'50" northern latitudes and between 32°33'48 "and 36°3'30" east longitudes. The migratory routes of livestock farming communities from Geographical Information Systems (GIS), ArcGIS package program and Google Earth program. In addition to these, topographical maps and landscaping plans and maps of the Isparta and Antalya Forest Regional Directorates will be utilized. With multifunctional GPS, coordinate values (including x, y values) and length measurement of migration paths can be saved and uploaded as data to related programs. All the data obtained with these maps and observations were transferred to the computer with the GPSTrackMaker program and important points were determined and the migration paths were drawn with the joining of points (vector). According to the migratory patterns made by the nomads, "Small Ruminant Operation Types" were determined. These were (1) Small Scale Sheep Enterprises, (2) Large Scale Sheep Enterprises, (3) Small Local Migration Mixed Farming Enterprises, (4) Long Distance Regional Migrations Goat Enterprises.*

***Keywords.*** *Nomadic People, Goat Breeding, Migration Routes, Geographic Information System (GIS), Western Mediterranean Region, Turkey*

***Identification et cartographie des routes migratoires des communautés de transhumance à l'aide du système d'information géographique en La région de la Méditerranée occidentale en Turquie***

***Résumé.*** *Les nomades de Turquie, remplacés périodiquement pour faire paître leurs chèvres dans le bassin de la région méditerranéenne pendant de nombreuses années. L'élevage de chèvres à poils pour les nomades est à la fois un système de production et un symbole de valeur culturelle. Les nomades qui conduisent le style de vie des immigrés, sont venus sur le front de mer turc. L'économie des nomades est basée sur l'élevage. La mobilité géographique et l'élevage sont deux facteurs importants affectant et façonnant le mode de vie nomade. Lors de ces migrations, les animaux doivent paître tous les jours à certaines heures. Pour cette raison, ils ne peuvent pas voyager en continu. Pour cette raison, les migrants ne peuvent pas voyager plus de 4 à 5 heures par jour. Les routes de la montagne Taurus sont généralement disponibles, mais ne permettent pas d'accéder à des milliers d'animaux. Le site d'étude est situé entre 31°4'10" et 38°27'50" de latitude nord et entre 32°33'48" et 36°3'30" de longitude est. Les routes migratoires des communautés d'éleveurs issues des Systèmes d'Information Géographique (SIG), du progiciel ArcGIS et du programme Google Earth. En plus de ceux-ci, des cartes topographiques et des*

*plans d'aménagement paysager et des cartes des directions régionales des forêts d'Isparta et d'Antalya seront utilisés. Avec le GPS multifonctionnel, les valeurs de coordonnées (y compris les valeurs x, y) et la mesure de la longueur des chemins de migration peuvent être enregistrées et téléchargées en tant que données vers des programmes associés. Toutes les données obtenues avec ces cartes et observations ont été transférées à l'ordinateur avec le programme GPSTrackMaker et les points importants ont été déterminés et les chemins de migration ont été tracés avec la jonction des points (vecteur). Selon les schémas migratoires établis par les nomades, des « types d'exploitation des petits ruminants » ont été déterminés. Il s'agissait de (1) petites entreprises ovines, (2) grandes entreprises ovines, (3) petites entreprises agricoles mixtes à migration locale, (4) entreprises caprines à migration régionale longue distance.*

***Mots-clés.*** *Peuples nomades, élevage de chèvres, routes migratoires, système d'information géographique (SIG), région de la Méditerranée occidentale, Turquie*

## I - Introduction

Nomadism is a form of a permanent tent life without being tied to a fixed residence. One of its main features is collective harvesting of productsfrom activities such as crop and tree production as well as animal husbandry. Nomadic people migrate between plateaus, plains and steppes according to their status, they have a closed economy, homogeneous, traditional human group activities with a strong ancestry. Migration is a must for stock-breeding in the Mediterranean region. Both the climate and topography require migration because of the fact that as the summer advances, grass dries at lower altitudes and remain green only at higher altitudes.

Yörüks are among the Turkish peoples who have traditionally chosen the nomadic lifestyle, which is alsocustomary for the Turkmen tribes (obas) who live a highland-winter life in Anatolia. They constitute a very important majority of the population of Anatolian people. Migration bears a special importance for the Yörüks (Ozden and Atmis, 2006), who have been raising hair goats in the upper basins of the Mediterranean Region for centuries. Goat breeding is a symbol of cultural value for the nomads, besides a production system (Tolunay et al. 2018). Nomadic stock-breeding has always been an activity with both economic and cultural aspects for the Yörük and Turkmen tribes living in the mountainous areas of the Mediterranean region of Anatolia from the initial immigration of Turkish populations to date. Yörüks who spread to many mountainous areas in Turkey have their own original culture (Ozden and Atmis, 2006). While on the move, Yörüks usually stay in one place for a day or two and then continue moving (Dulkadir, 1991), however, occasionally, they spend several months in one place in their tents as well (Aksoy, 2009; Aktas 2019). Living in tents and moving around during the year, Yörüks have developed climate-friendly practices to survive. Climate-specific thinking is reflected in their living habits and artefacts. As a nomadic community Yörüks have been living in felted tents for centuries and mainly generating their livelihood through natural resources (Aktas 2019). In this study, the migration routes of some nomadic communities dealing with animal husbandry in the Western Mediterranean Region were investigated by means of geographic information system (GIS).

## II - Material and Method

The study area is the Western Mediterranean Region of Turkey – one of the seven geographical regions of thew country - which consists of the provinces of Isparta, Antalya and Burdur (Figure 1). This region is among the prominent places in our country in terms of forest cover. The Region has lands and vegetation suitable for small cattle breeding, as it is quite mountainous and bumpy. As a culture, it is known that nomadic communities have been breeding sheep and

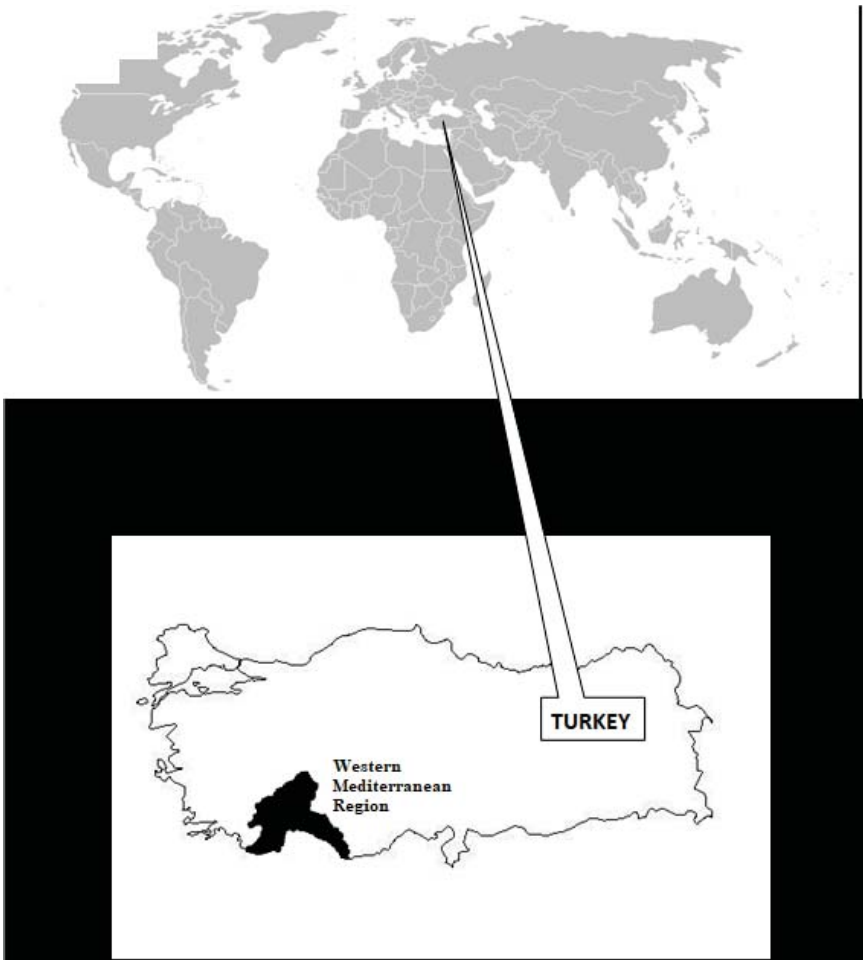


**Figure 1.** Western Mediterranean Region, Antalya, Isparta and Burdur Provinces

goats in these lands for centuries. The Taurus Mountains determine the main lines of the landforms of the region.

The Western Taurus Mountains, appearing in the west, extend to the Taşeli Plateau. The study site is located between 31°4'10 "and 38°27'50" northern latitudes and between 32°33'48 "and 36°3'30" east longitudes. The migratory routes of livestock farming communities were derived from Geographical Information Systems (GIS), ArcGIS package program and Google Earth program. In addition to these, topographical maps and landscaping plans and maps of the Isparta and Antalya Forest Regional Directorates were utilized. With multifunctional GPS, coordinate values (including x, y values) and length measurement of migration paths can be saved and uploaded as data to related programs. All the data obtained with these maps and observations were transferred to the computer with the GPSTrackMaker program and important points were determined and the migration paths were drawn with the joining of points (vector).

## III - Results

The migration movement is basically evaluated into two parts. The migration for a specific purpose and the other one without a specific purpose that is only for shifting. In Turkish history, when the migration movements are examined, Turks stand out as a community that migrates to different places in summer and winter. In this context, the life styles of the Turks before they settled down were "nomadic". In the researches, it is seen that the migration of the communities

settled down were "nomadic". In the researches, it is seen that the migration of the communities has two types. The first one is the migration unfolding seasonally and voluntarily and other one that is compulsory because of the geographical conditions and economic factors. All people migrating are called nomadic. In the emergence of transhumance activities, especially in the Mediterranean countries, climate and altitude play important role for nomads choosing the place to migrate. The existence of the economic environment has been effective. While the sub-zone housing units that make up the main environment was used for agriculture, the upper zone where lush grasslands grow was used to livestock activities. Indeed, due to its climatic characteristics of herbaceous vegetation is developed of different time periods according to the altitude. Images of migrations, tents and living places of nomadic societies are shown Figure 2, 3 and 4.

**Figure 2**. Photos from the migration of nomads (Photographer: M. Yılmaz)

This triple combination between climate-vegetation-livestock made it compulsory to relocate within the region from the beginning of spring. Undoubtedly all these are related to the human environment of the Relief Shapes and the climatic events taking place on that relief demonstrates.

**Figure 3.** Tent made of goat hair used as shelter by nomadic societies (Photographer: M. Yılmaz)

Nomads in Turkey have used hair goats in the upper basins of the Mediterranean Region for centuries. Hair goat breeding is a cultural activity for the nomads besides a production system. Yörüks, who continue the nomadic lifestyle, are composed of Turkish tribes.

The economic life of the nomads is based on animal husbandry. geographic mobility and animal husbandry is two important factors that affect and shape the lifestyle of the nomads. During migrations, animals have to graze at certain times every day. For this reason, they cannot travel continuously and travel more than 4-5 hours a day.

**Figure 4**. Living area kitchen adjacent to the bristle tent (Photographer: M. Yılmaz)

Figure 5 indicates migration routes of nomadic societies in Antalya. The nomads living in Akseki, Gündoğmuş, Serik, Manavgat and Gazipaşa districts of Antalya Province migrate to pastures in the southern part of the Taurus Mountains. While the nomads living in Korkuteli go to the Yazir plateau, the nomads living in the Elmalı region migrate to the Baranda plateau. Nomadic migrations, which are generally made by vehicles, can also be on foot with the herd to reach some plateaus.

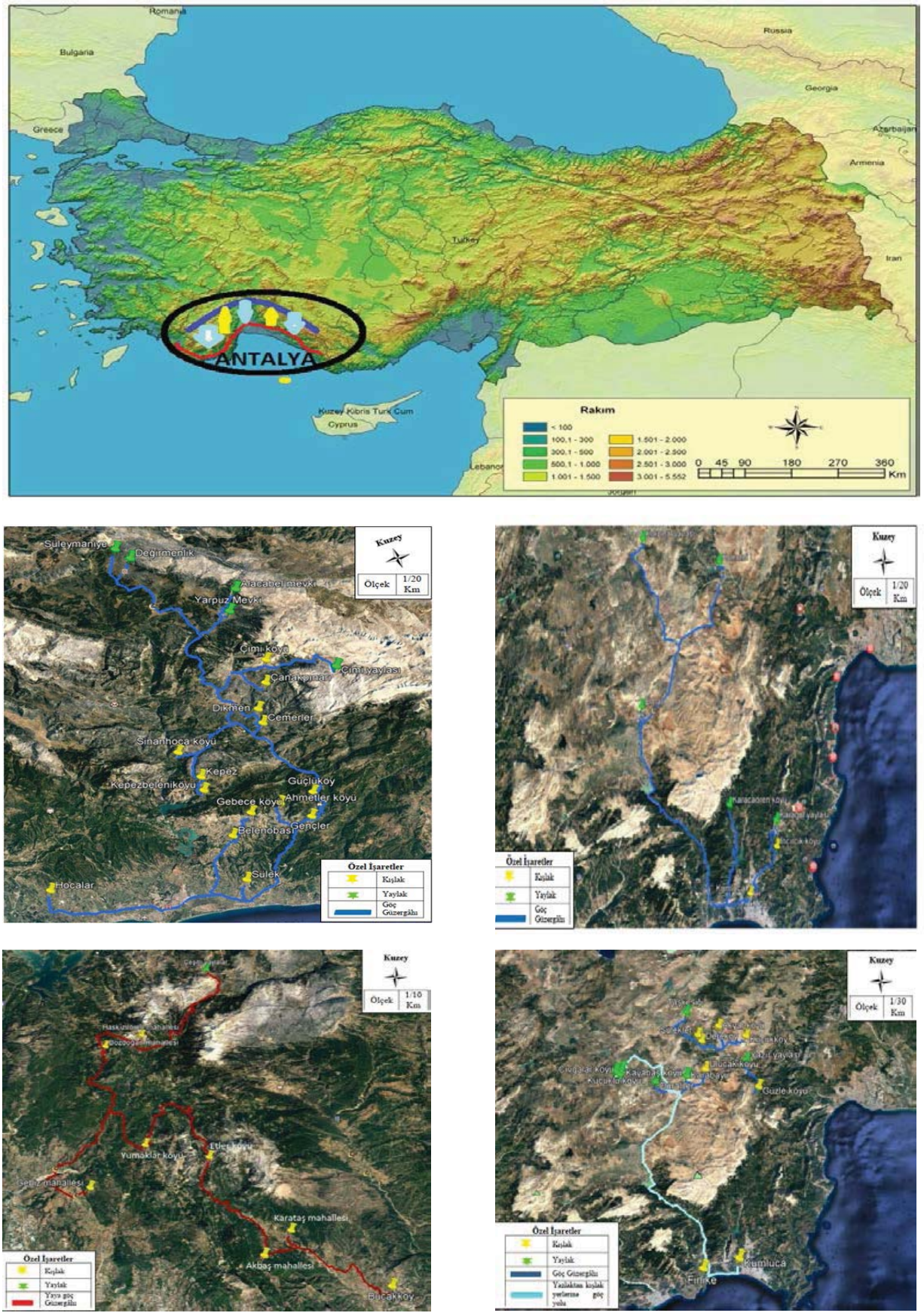


**Figure 5**. Migration routes of nomadic societies in Antalya

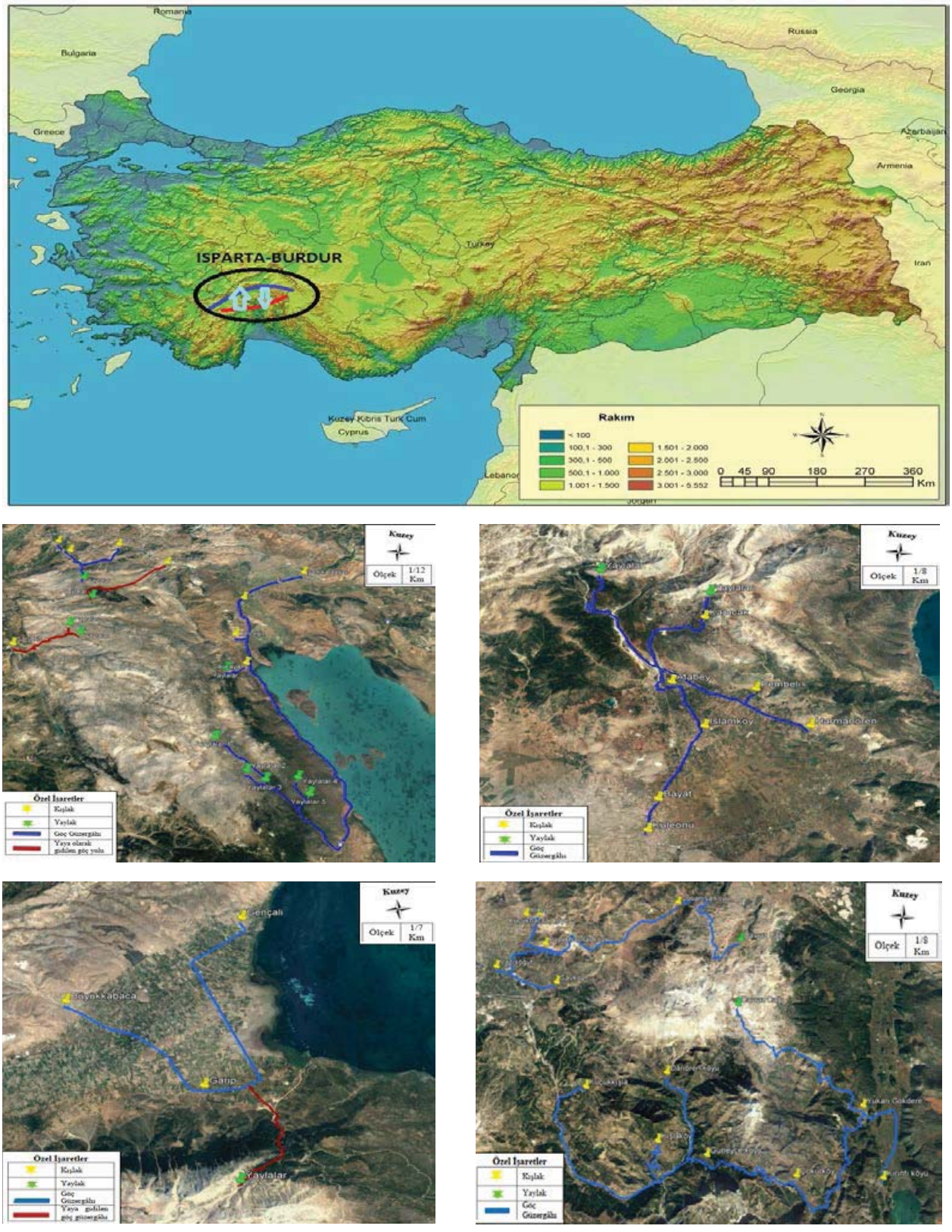


**Figure 6**. Migration routes of nomadic societies in Isparta/Burdur

Figure 6 demonstrates Migration routes of nomadic societies in Isparta/Burdur Provinces. Anamas, Kapıcak, Barla, Davraz Mountains are the important highland centers of Burdur Province. Especially Davraz Mountain is an important highland place for nomadic societies for

settlement. The nomads living in the villages around Isparta moved to the settlements of these mountains during the summer months. Nomads, who spend the winter in Bağören Village and Barla Town, It ascends to Barla Mountain.

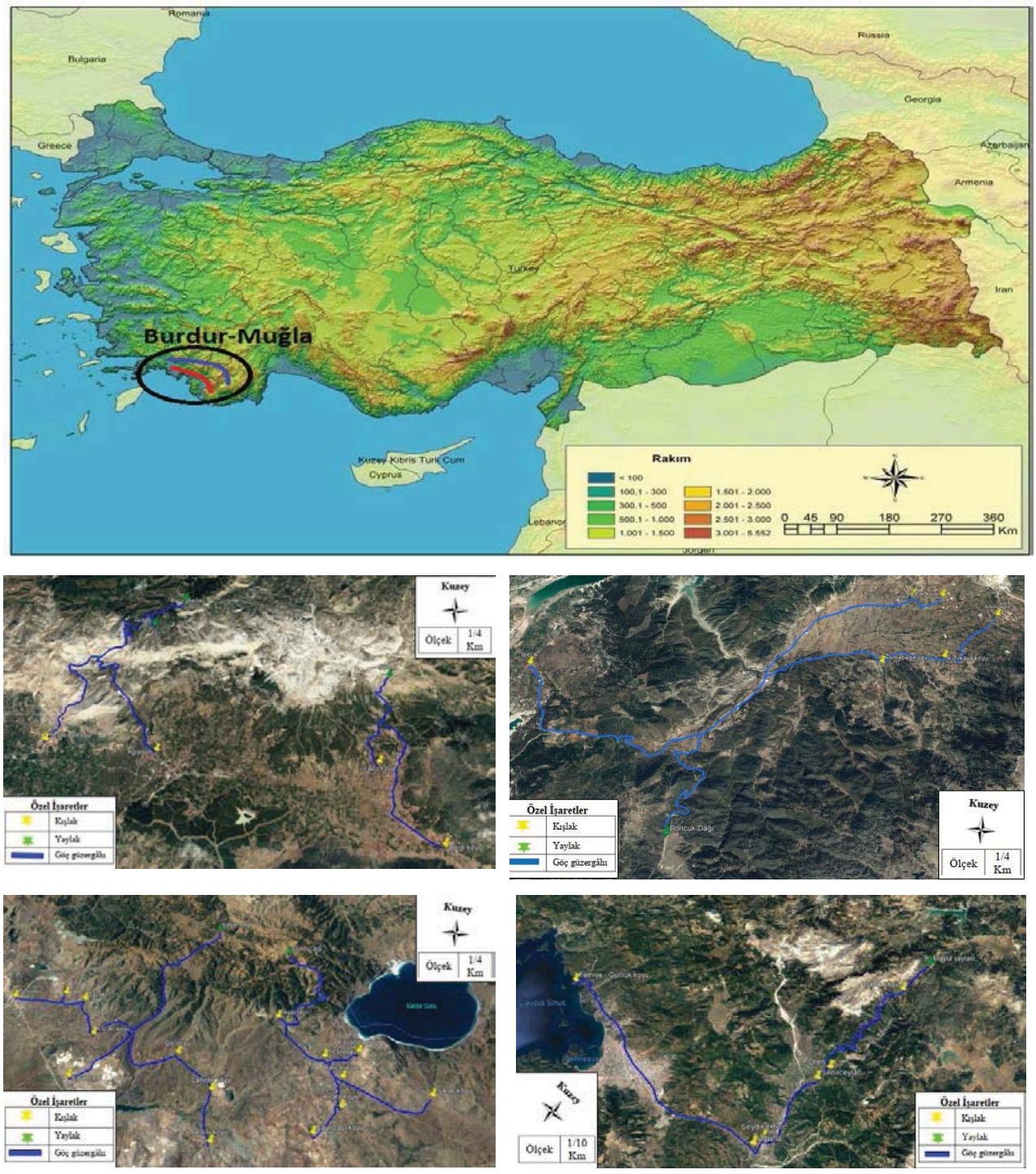


**Figure 7**. Migration routes of nomadic societies in Burdur/Muğla

Migration routes of nomadic societies in Burdur/Muğla Provinces are shown Figure 7. Kestel, Rahat, Söğüt, Eşeler Mountains are the important highland centers of Burdur Province. The nomads living in Tefenni and Karamanli districts migrate here. The nomads living in İbecik

Village of Golhisar District migrate to Boncuk Mountain. The migration route starting from Uğurlu Village of Seydikemer District in Muğla Provience, reaches the village of Ballık, following the Ören and Sahilceylan villages, Muşta plateau is reached as the last point.

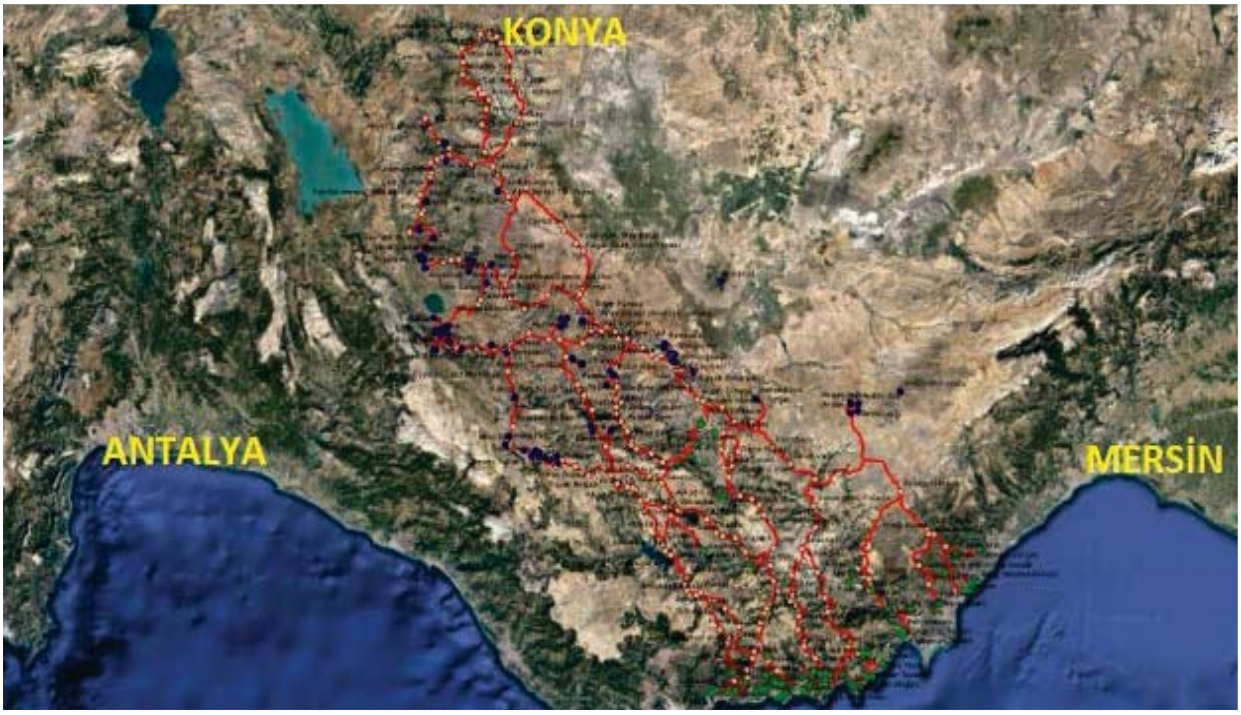


**Figure 8**. Migration routes of Sarıkeçili Yörüks in Mersin and Konya Provinces

The migration routes of Sarıkeçili Yörüks indicate Figure 8. The nomadic societies of Sarıkeçili live in bristle tents, make a living from animal husbandry, and in summer they go to the plateau on foot. In summer, they go to the plateau with their animals and live in tents. They live in the districts of Karaman and Konya provinces in summer. In winter, they migrate to Erdemli, Silifke, Gülnar, Aydıncık and Bozyazı districts of Mersin province. Sarıkeçili Yörüks are real nomadic in Turkey. Semi-nomads spend the winter in a fixed dwelling instead of a tent.

## IV - Conclusion

Although there are legal regulations about pasture, the most important factor determining the migration routes is the region's ecological conditions for affecting transportation to the highlands and wetlands. These ecological conditions determined the way of life of nomadic societies and revealed human communities living in harmony with nature. The nomads change their location and place as summer and winter quarters, in their own opinion, "homeland". The areas they call “place of land” are mostly forest and treasury lands. Presence of agricultural lands on migration routes or by the forest administration afforestation, rehabilitation, pasture improvement and reforestation due to this reason, difficulties are encountered during migration. The areas include migration routes are surrounded by wire mesh so that water sources are also kept inside. Nomads who cannot use their routes migrate over longer distances and alternatively, have to use highways. The nomads sometimes cannot use forest roads, which are neglected due to the lack of maintenance. Agricultural irrigation or mining of water resources on migration routes being transported by plastic pipes to be used for their own needs affects the flocks' access to water.

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