

DISTINCTIVE EFFECT OF HYDROGRAPHY ON LAND BORDERS IN ALBANIA AND POTENTIAL REGIONS OF CONTROVERSY

Atilla KARATAŞ, Hüseyin KORKMAZ

*Mustafa Kemal University, Geography Department, Hatay/TURKEY
karatasatilla@hotmail.com , hkorkmaz69@gmail.com*

Abstract

Countries have borders that identify the fields of their authority. Although the fields of influence changes according to economic, political and military powers of the countries, the elements under the actual enforcement and responsibility of the countries in terms of security and welfare only are composed of only the areas in their borders. Hence, identifying and stabilizing the international borders is substantially important for economic, political and military purposes. This study puts Albania under the microscope by identifying the current borders of Albania, some of the elements in the determination of these borders and regions along the borders which have a potential to cause problems in the future.

In the study, land borders as seen in no. 1954 map sheets of NK 35&PT.34 (1/1.000.000), NK 34-4, NK 34-5, NK 34-7 and NK 34-8 (1/250.000 and no. 2002 map of Wetlands of Albania (1/350.000) were digitalized. Following this operation, the border drawn with the help of topographic base map included in the ArcMap 10 package program data base and Google Earth was revised. River drainage network of the country was created with the help of ArcMap 10 Model Builder and ASTER GDEM Digital Elevation Model (NASA&METI) with 15m resolution and the basin borders were identified and watershed lines and thalweg (river bed) routes were determined. The country border thus drawn was categorized according to hydrographic parameters and the sections that do not have direct routes with the border lines determined according to watersheds, thalweg routes and lake divisions in terms of sectors were categorized differently.

As a result, it was determined that 65.40% of the Albanian land border was constituted according to watersheds, 10.45% to thalweg routes and 9.60% to lake sectors whereas 14.55% was developed without paying attention to these elements or is based on an obscure or variable topography. The study also focuses on the border routes that are in the position of potential controversy in terms of physical

environmental conditions and the solutions to prevent the probable problems by assessing all groups and each segment in these groups.

Keywords: *International boundaries. Hydrography. Undefined boundaries. Natural boundaries. Albania.*

Introduction

While international borders can be defined as linear lines that separate lands following different political authorities from the other parts of the world, they can also be envisioned as symbolic or real distinctions that make the enclosed space a homeland and the people of this homeland; a nation. It is believed that technological advancements in the globalized world especially the internet are bringing people closer and reducing the importance of borders in this sense (Qingguo, 2001: 32). However, this situation may present itself in various ways according to international relationships, natural ambient conditions, current policies and the preferences of political authorities. Borders, that can be symbolically determined under conditions where there are no external threats, security breaches, illegal immigration and the problems with viewpoints regarding the others at the other side of the border, are considered as defense lines under different and hostile conditions (Photo 1). This situation brings the positioning of border lines to the foreground.



- a)- U.S.A.-Canada boundary (<http://kelsocartography.com/blog/?tag=border>).
- b)- Israel-Palestine boundary (<http://www.veteranstoday.com/2012/01/13/west-bank-2011-one-year-of-humiliation-in-a-two-minutes-video/israeli-border-policemen-stands-guard-during-clashes-with-palestinian-demonstrators-in-the-west-bank-town-of-qalandia-on-march-16-2010/>).
- c)- Ancient China-Hun boundary (http://www.seven-wonders-world.com/other_wonders.htm).

d)-Western Sahara boundary
(<http://www.worldatlas.com/webimage/countrys/africa/ehnewzz>).
e)- N-S Korea boundary
(<http://msnbcmedia1.msn.com/j/MSNBC/Components/Photo/new/100524-SK-dmz-vlrg-2a.grid-4x2.jpg>).

Photo 1: Different type of boundaries around the World.

Border lines are generally determined according to the distribution of under and above ground resources, historical region borders, and human induced elements such as walls, structures etc, cartographic parameters and current features of division (Seifert, 1997: 3). The hydrographic parameters studies in the framework of this research are among the natural factors and they are noteworthy as being among the main physical geography elements used in the determination of borders with various characters in many parts of the world. In this sense, the main hydrographic elements utilized in the identification of borders are rivers, lakes and seas (Ekinci, 2008: 35). However, thalweg lines and watersheds that can be assessed as geo-morphological elements may also available be examined under different headings according to the type of assessment used. Thalweg lines and watersheds are among the geo-morphological elements when they are considered to be valley floor and ridge and they are among the hydrographic elements when they are assessed to be the deepest point of the river and basin border. In this study, thalweg lines and watersheds are considered to be among the hydrographic elements since the study employs assessment by focusing on hydrographic features. Accordingly, the border lines of Albania has been investigated based on hydrography since 85,45% of the land borders of the country are determined according to hydrographic units.

Material and Method

Border lines that the study focuses on are created in a controlled manner by using various resources and data sets so as not to have incorrect interpretations or assumptions. The country map of Albania was drawn by making use of topography maps consisting of map sheets NK 35&PT.34 (1/1.000.000), NK 34-4, NK 34-5, NK 34-7 and NK 34-8 (1/250.000) dated 1954 which was prepared by US. Army Corps of Engineers Army Map Service and Wetlands of Albania (1/350.000) map of 2002 prepared by Environmental Center for Administration and Technology and Greek Biotope/Wetland Centre. The borders drawn in this manner was later revised through coordinated efforts by using topographic base map in the data base of ArcMap 10 package program and satellite images provided by Google Earth.

The river drainage network of the country was created and basin borders were determined by using NASA and METI based ASTER GDEM Digital Elevation Model with 15 m resolution in the analysis model developed by the help of ArcMap

10 Model Builder. In this manner, watersheds and thalweg lines were determined. Lastly, passage/transit routes of the country borders were categorized based on hydrographic parameters and the border lines appointed according to watershed, thalweg lines and sectorial division of lakes were classified separately. Parts that were drawn randomly independent of all these parameters or parts that follow an indistinct or variable topography were highlighted as potential regions of controversy. Study identifies the structures and elements that can cause controversy in these regions and suggestions are provided to eliminate the probable conflicts.

Location and General Characteristics

Albania is situated in the west part of the Balkan Peninsula between the 39-42 N, and 19-21 E coordinates. Located between Dinaric-Pindus mountain zone and Adriatic Sea, it is a rectangular country with its long axis in the north-south direction (Figure 1). The country with a surface area of 28.748 km² has an unproblematic sea border with Italy which is 72 km west of the country through Ionian and Adriatic Seas (Bogdani and Selenica, 1997: 83). The country is surrounded on the south and southeast by Greece, on the east by Macedonia, on the northeast by Kosovo and on the northwest by Montenegro. The country with lower sections and coastal valleys have plateaus and slightly sloped flat lands in the mid parts and the east of the country is covered with mountainous masses arrayed in the order of North Albanian Alps (2.693 m), Korab Mountains (2.764 m) and Gramos Mountains (2.523 m) from the north to the south. These mountains are high masses composed of mostly karstic and ophiolitic units and take part in the Alpine Zone.

The country where Mediterranean and continental climate is dominant is noteworthy with its climatologically features characterized by climactic changes in short distances as a result of landforms. A West Balkan country, Albania is among the possible formal candidates of European Union along with Kosovo, Bosnia-Herzegovina and Serbia. The population of the country nearing 3.5 million represents a developing country with its economy based on agriculture, animal husbandry and tourism.

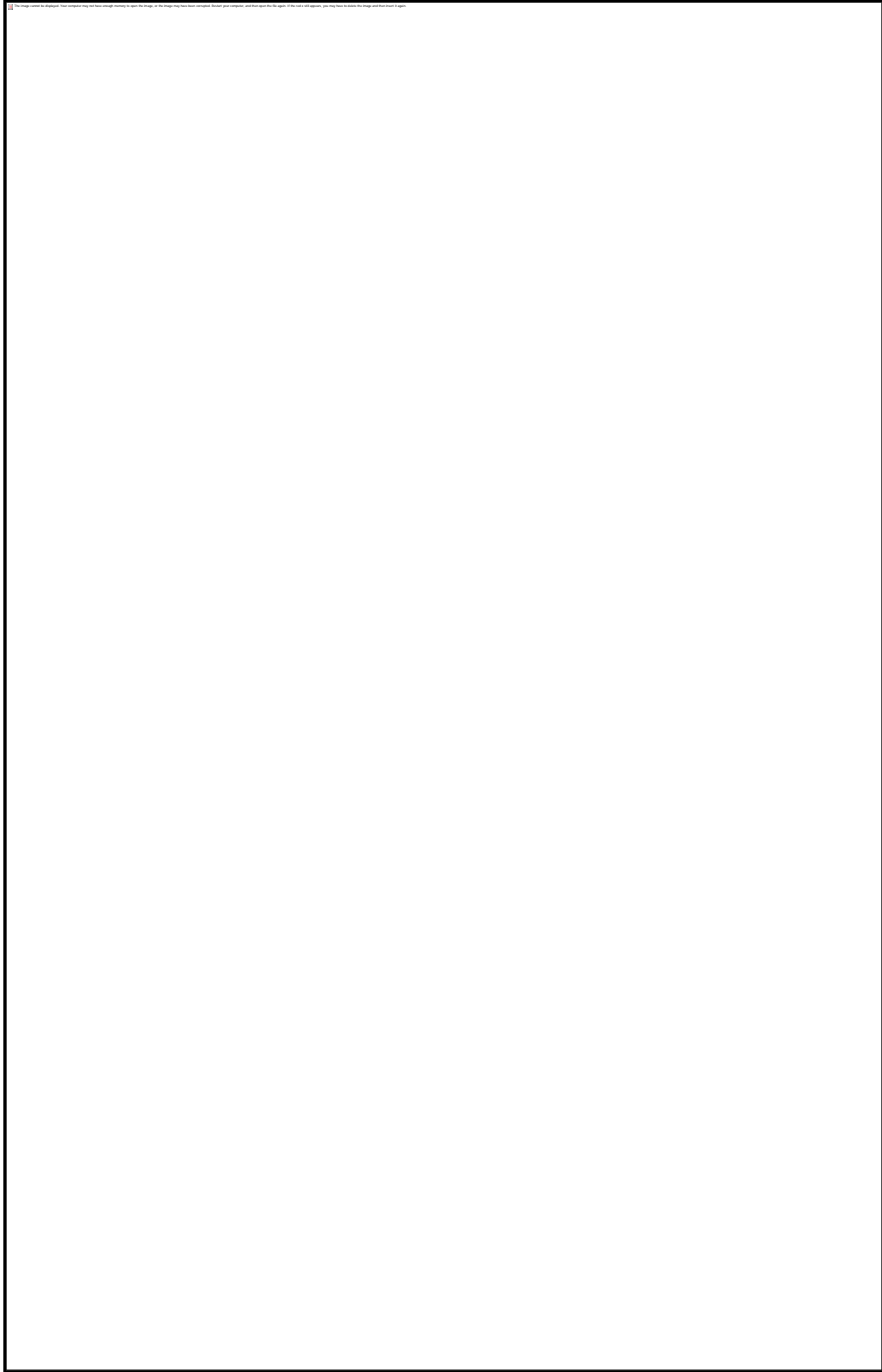


Figure 1: Topographic map of Albania.

Categorization of the Borders

With a total periphery of 1.202,332 km, Albania has a total coastline of 456,977 km composed of coasts which totals to 325,235 km (61,17%) along the Adriatic Sea and 131,742 km (28,83%) along the Ionian Sea. This value that corresponds to 38% of the total periphery value does not include the coastline of the islands located in the Adriatic and Ionian Seas. The rest of the 62% of the land in the country is surrounded by land borders. Total land borders of Albania is 745,355 km and 264,660 km of this border (35,50%) is shared with Greece, 185,395 km (24,87%) is shared with Macedonia, 181,603 km (24,37%) is shared with Montenegro and 113,698 km (15,26%) is shared with Kosovo. A total of three criteria are taken into consideration while identifying the country borders and they are watershed, thalweg line and borders of the lake sectors (Figure 2). In this study, randomly drawn parts and problematic areas are considered under a fourth heading regardless of the above mentioned elements cited in the land borders section.

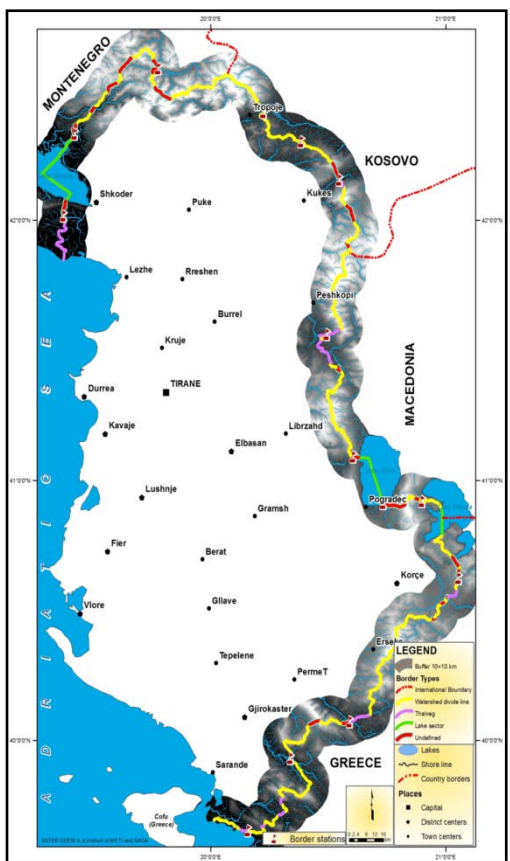


Figure 2: Boundary line and border categorization map of Albania.

Borders that Follow the Watershed

A large part of the line that consists of Albanian land border follows the masses that belong to Dinaric-Pindos zone. Hence, the biggest ratio (65, 40%) among the land borders belongs to the borders that correspond to borders composed of watershed lines on the peak sections of the mountainous areas. The lines in this group identified in 30 different regions shape the Albanian border along a line of 487,486 km (Photo 2-3).



Photo 2: Watershed line type of boundaries between Albania-Greece at southeastern Gjirokastr (Photo by: Soula SATLANI).

Photo 3: Watershed line type of boundaries between Albania-Macedonia at northeastern Peshkopi (Photo by: Pgera SIMOV).

Peak regions mostly represented with karstic regions create precise borders in areas that correspond to layer tops or sharp ridges formed as a result of severe physical disintegration. Since these types of regions require hundreds of years to change locations by erosion under normal conditions, border stability in these areas does not constitute any risks. On the other hand, since areas where ophiolite and flysch lithology is dominant create basin borders surrounded by more flat ridges, small deviations than can be neglected should be considered normal in these areas. However, borders under these lithologies can protect their positions and do not constitute any risks. Hence, the current study considers the areas that can be categorized as segments dependent on watersheds as precise borders.

Borders that Follow the Thalweg line

As we know, thalweg line is the name given to the line that connects the deepest points of the rivers (Erinç, 2000: 376; Hoşgören, 2004: 67; Selçuk Biricik, 2009: 206; Hoşgören, 2011: 274). It is not possible to claim that thalweg lines cannot be

changed because rivers have a dynamic and mobile structure. Especially in areas where topography and lithology allow rivers to have large beds and flood areas, thalweg lines show frequent and high amplitude changes. Parts that correspond to narrow valleys and canyons create somewhat more stable lines (Photo 4-5).



Photo 4: Thalweg line type of boundaries between Albania-Greece at southeastern Sarande (Photo by: Mladen ANTIC).

Photo 5: Watershed line type of boundaries between Albania-Greece at southeastern Permet (Photo by: Bles KOVIKU).

Thalweg based borders identified in 11 different regions in Albania constitute 10.45% of the land border with 77,866 km. Valleys with thalweg lines on the southeast of Sarande which forms some parts of Albanian-Greek border are comparatively narrow and deep and highly stabile. Flood bed with a width more than 100 m and a few meters length on the south and northeast of Erseke and on the southwest of Scutari has the potential of serious fluctuations as a result of flow changes that can be observed in the river (Figure 3-4).

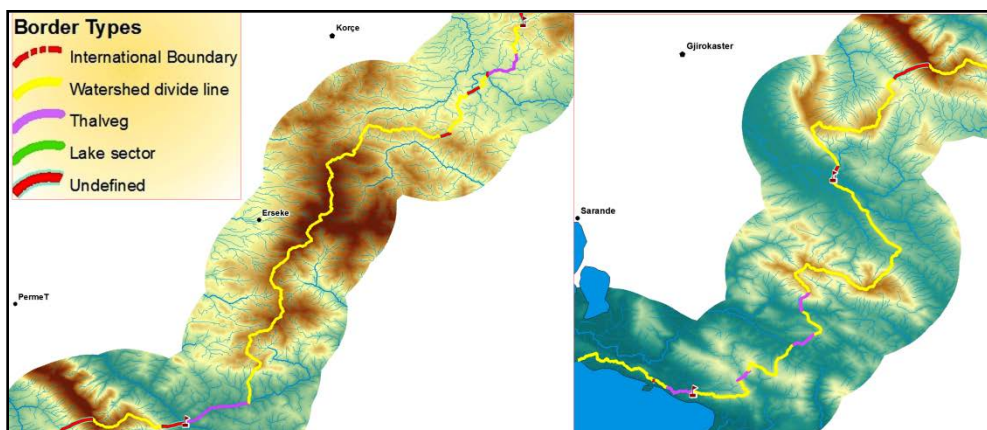


Figure 3: Thalweg and watershed line type of boundaries between Albania-Greece near Erseke.

Figure 4: Watershed line type of boundaries and instable surfaces between Albania-Greece near Gjiokaster.

Taking the border line as a zone and allowing collective use of the river in parts where the flood bed does not exceed an identified width will reduce the conflicts in the area. In flood beds that cover larger areas, milestones/benchmarks should be identified in predetermined intervals starting with the stabile areas at the two ends of the specific river bed in order to create an average border line agreed by both parties. Also under favorable political, economic and physical conditions, reservoirs may be built to allow drawing of borders based on management partnership. Otherwise, deviances in the river routes, borders and use of private areas will cause many problems.

Borders Determined According to Lake Sectors

In fact, it is a topic of discussion with different interpretations whether lakes are separated according to border lines or whether country borders are drawn according to rules that specify the terms of use for lakes in countries. This situation develops as a parallel to the issues related to sharing. Lake borders shaped according to factors such as shore length, distribution of the sources that feed the lake and rights received as a historical heritage are determined with two main methods: designation of a mid-point and regions of use (Boggs, 1937: 445). Albania with three separate border lines shaped according to the lake sectors on Scutari, Ohrid and Prespa lakes prescribes borders based regions of use for the countries (Photo 6-7).

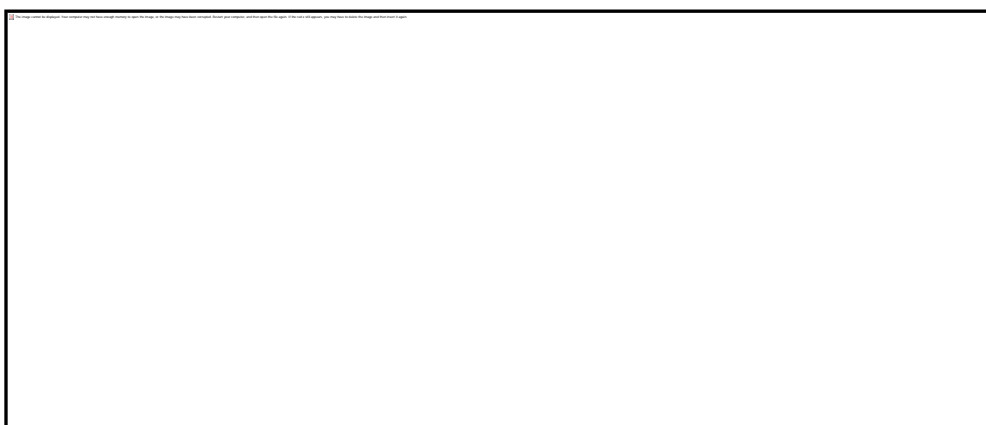


Photo 6: Thalweg and lake sector lines Photo 7: Lake Sector type of

may change during floods, southwestern Shkoder (Photo by: Fraskanjel DELO).

boundaries between Albania-Montenegro in Lake Shkoder (Photo by: Alexander KOZAK).

The country has a 71,590 km (9.60% of the total borders) border line that follows the lake sectors with Scutari Lake (37,188 km) as longest lake border in the country which constitutes 51.95 % of total lake borders. The lake is shared between Albania and Montenegro. On the other hand, the line which constitutes 32.52% of the lake sector based border with a length of 23.280 km in Ohrid Lake identifies the sections that can be used by Albania and Macedonia. Prespa Lake is shared by three different countries (Albania, Macedonia and Greece). This line in the lake that constitutes 15.54% of the total lake sector based border of Albania is 11.122 km, with 6,747 km on the South is shared by Albania and Greece and 4,375 km on the north is shared by Albania and Macedonia.

Borders drawn according to lake sectors can be regarded as stabile borders with a possibility of small changes from time to time. The fact that small deviations in the lake border lines do not cause notable operational results makes these types of borders low risk borders.

Borders that do not constitute precise lines

These types of borders identified in 23 separate regions consist of 14.55% of total Albanian land borders with their 108,413 km length. Although some of these borders are based on distinctive elements such as watershed lines or thalweg lines; the ambiguous nature of the topography that characterizes the said elements leads to a dynamic/mobile border line. Ridge-valley topography which is frequent and highly developed can be given as an example for this type (Figure 5-6).

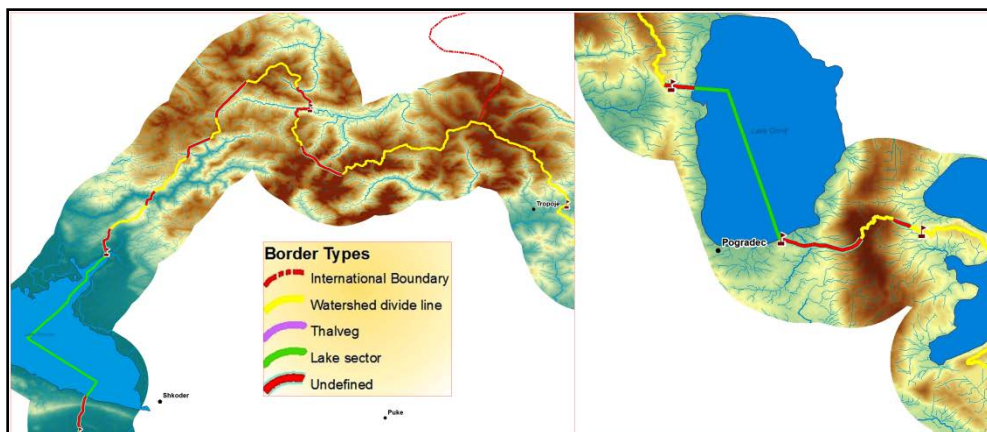


Figure 5: Intensive valley and ridge topography based undefined boundaries at North Albania.

Figure 6: Ohrid and Prespa Lake sectorial division and pure topography based undefined boundaries nearby.

On the other hand, river sections scarped by borders, borders that follow an indeterminate topography and sections drawn without considering physical elements are regarded as problematic borders and accepted as potential risk areas. In these regions, the area between the two ends of the line can be drawn with a line that connects the reference points identified in regions with precise borders in order to create unproblematic borders.

Results

Albania has hopes and plans for the future with its developing economy and social structure. It is imperative that problems should not be experienced in terms of border violation and safety so that the country does not undergo conflicts with the surrounding neighbors. The method to present a confident stance in the fragile and variable Balkan political structure is related to border safety as well. Hence, identification and management of physical elements that form the borders of the country will eliminate possible problems in that arena.

Although land borders in Albania largely based on fixed physical elements create a safe line, sections on the contrary and probable risk areas are also existent. Measures to form more precise borders in such regions will necessitate different methods and implementations in each region. Border arrangement implementations based on careful analysis of the physical structure and geographical character of the land will have a better chance to eliminate potential conflicts and be successful in the long run.

References

- Bogdani, M. and Selenica, A., 1997. Catastrophic Floods and Their "Risk" in The Rivers of Albania. Destructive Water: Water-Caused Natural Disasters, Their Abatement and Control (Proceedings of the Conference Held at Anaheim, California, June 1996). IAHS Publ. no. 239, pp. 83-85.
- Boggs, S. W., 1937. Problems of Water-Boundary Definition: Median Lines and International Boundaries through Territorial Waters. Geographical Review, Vol. 27, No. 3 (Jul., 1937), pp. 445-456.
- Ekinci, D., 2008. Physical Geography's Role and Impact Stage on Determining of Political Units Boundary, First International Conference on Balkans Studies;

Integration of the Western Balkans into Euro-Atlantic Structures Future Challenges, 07-08 November 2008, Tirana, Albania, pp.24-43.

Erinç, S., 2000. *Jeomorfoloji I*. Güncelleştirilmiş 5. Basım, Güncelleştirilenler: Ahmet Ertek, Cem Güneysu. Der Yayınları, İstanbul.

Hoşgören, Y., 2004. *Hidroğrafya'nın Ana Çizgileri I Yeraltı Suları-Kaynaklar-Akarsular* (5. Baskı). Çantay Kitabevi, İstanbul.

Hoşgören, Y., 2011. *Jeomorfoloji Terimleri Sözlüğü*. Çantay Kitabevi, İstanbul.

Qingguo, J., 2001. Our Global Willage: Prospects for Globalization and National Borders. Feature: Globalization, Winter-2001, pp. 32-35.

Seifert, D. J., 1997. *National Register Bulletin Defining Boundaries For National Register Properties*. U.S. Department of the Interior National Park Service National Register of Historic Places 1995.

Selçuk Biricik, A., 2009. *Fiziki Coğrafya-Jeomorfoloji ile Hidroloji'nin Temel Prensipleri ve Araştırma Yöntemleri* Cild-I. Gonca Yayınevi, İstanbul.

Internet Resources

http://msnbcmedia1.msn.com/j/MSNBC/Components/Photo/_new/100524-SK-dmz-vlrg-2a.grid-4x2.jpg.

<http://www.worldatlas.com/webimage/countrys/africa/ehnewzz>.

http://www.seven-wonders-world.com/other_wonders.htm.

<http://kelsocartography.com/blog/?tag=border>.

<http://www.veteranstoday.com/2012/01/13/west-bank-2011-one-year-of-humiliation-in-a-two-minutes-video/israeli-border-policemen-stands-guard-during-clashes-with-palestinian-demonstrators-in-the-west-bank-town-of-qalandia-on-march-16-2010/>.