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Araştırma Makalesi
(Research Article)

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Border of What: Ecology or Human?

Neyin Sınırı: Ekoloji mi, İnsan mı?

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ABSTRACT

Objective: The issue of human boundaries (political borders) vs. the natural boundaries (ecotones) has been controversial in recent studies. The political borders have negatively impacted the ecology and resulted in ecological and spatial fragmentation and biodiversity reduction in a country like Iran. The work aims to find a practical way to mitigate the environmental problems in the borderlands of Iran. This article evaluates the effect of creating a "Transboundary Conserved Area" or "Peace Park" in Iran with the purpose of ecological conservation.

Material and Methods: This article attempts to explain the structures and functions of ecotones and natural boundaries. To search for a feasible solution to protect the ecologically unique zones over the political borders of Iran, this article discusses whether human boundaries can act as a natural boundary and reduce its ecological effects. Therefore, five common characteristics of natural and human borders, including location and size, origination, form, function, and stability over time, are explained and compared.

Results: By analyzing the political borders of Iran, it shows that Iran needs different protected zones in most of its borderlands, and the idea of the "Transboundary Conserved Area" may not be possible due to the current complicated political matters over the borderlands.

Conclusion: The human boundaries should be flexible with the changes in their surrounding nature; they should be in tune with the current geographical structures and maintain ecological connectively and seasonal animal migrations.

ÖZ

Amaç: İnsani sınırlarını (Siyasi sınırlar) doğal sınırlarla karşılaştırılması son yıllardaki yapılan çalışmalarda tartışılan konulardan birisi olmuştur. Siyasi sınırlar ekolojiyi olumsuz yönde stkilemiştir ve İran gibi bir ülkede ekolojik ve mekansal parçalanmaya ve biyolojik çeşitliliğin azalmasına neden olmuştur. Bu çalışmada İran sınlarında çevre sorunlarının azalmasına yönelik pratik bir çözüm bulamyı hedeflenmiştir. Bu makale ekolojik koruma amacıyla İran›da "Sınır Ötesi Korunan Alanın" veya "Barış Parkın" oluşturulmasının etkisini değerlendirmiştir.

Gerekçe ve Yöntemler: Bu makale ekotonların ve doğal sınırların yapı ve işlevlerini açıklamaya çalışmıştır. İran'ın siyası bölgelerindeki eşsiz ekolojik bölgereli korumak amacıyla uygun bir çözüm bulmak için bu makalede insani sınırlarının doğal sınırlar gibi davranıp davranmadığını ve ekolojik etkilerini azaltıp azaltmayacağı tartışılmıştır. Bu nedenle, doğal ve insan sınırının ortak beş özellikleri olan yer ve boyut, köken, biçim, işlev ve zaman içindeki istikrar dahil olmak üzere açıklanmış ve karşılaştırılmıştır.

Sonuçlar: İran›ın siyasi sınırlarını analiz ederek, İran›ın sınır bölgelerinin çoğunda farklı koruma bölgelerine ihtiyaç duyduğunu ve sınır ötesi alanlardaki mevcut karmaşık siyasi meseleler nedeniyle "Sınır Ötesi Korunan Alan" fikrinin mümkün olamayabileceğini göstermektedir.

Sonuç: İnsan sınırları, çevrelerindeki değişikliklere esnek olmalıdır; mevcut coğrafi yapılara uymalı ve ekolojik olarak mevsimsel ve dönemsel hayvan göçlerinin sürdürülmesine müsaide edilmelidir.

INTRODUCTION

It has been discussed how to deal with environmental chellenges including biodiversity reduction; the fragmentation of habitat spatially for endangered animals; habitat destruction through human constructions along the political borders. There is no exception that all geopolitical boundaries cut off the area in both marine and terrestrial land. Some of the political borders extend thousands of kilometers and cut across habitats of birds, insects, and fish (Jones, 2009; Cunningham, 2012). In some cases, political borders are freely crossed by animals and let them have access to their resources and needs for survival, while many international borders are bounded by fences or military obstacles which may cause fragmentation in ecosystems and landscapes. These border markers create impervious barriers to animal species and prohibit their movement and migration through a landscape (Laverty, 2007). One of the approaches to minimize environmental problems seems to remove human boundaries and create a designated corridor to facilitate animal movement and in these situations, the idea of conservation of the border areas has been suggested, which was defined by International Union for Conservation of Nature (IUCN) as Transboundary Conservation Areas (TBCA's) or transboundary peace park. These parks require cooperation among national and other geopolitical boundaries and address ecological degradation (Cunningham, 2012).

Iran is a country with various political borders over ecologically important areas. Over recent years, it has been discussing to create specific Transboundary Peace Park in some part of its political areas where the international border disturbs the natural ecosystem in Iran (https://www.irna.ir/news). The main idea of creating these parks is to remove physical, spatial, and political obstacles between two or more countries according to specific regulations and agreements in the management approach. However, to a country like Iran with a complicated political situation, forming "Peace Park" over its political borders seems infeasible and challenging. To think of a solution, this article provides an evaluation and comparison between two bordering of human and ecology to find a flexible way which is in benefit of both human and nature.

Bordering is a phenomenon which has been identified by both nature and human. In the ecological framework, a boundary is a natural zone created between two distinct ecological communities, while in some other perspectives like human policy, a boundary is a man-made line drawn around state and provinces to administratively define and secure them. Mostly, human boundaries including and territorial borders do not coincide with ecological regions and create a series of disjuncture between ecological and human bordering. The main question of the work is whether a political border can function like ecological border (ecotone) especially in borderlands covering unique natural ecosystems. Similarly, considering different identities, characteristics, and functions of both borders (human and natural borders), whether the natural boundaries can be considered as a model for human bordering. To answer these questions, this research makes an effort to analyze and compare the characteristics of natural boundaries (ecotone) with human ones particularly political boundaries.

MATERIAL AND METHOD

After World Parks Congress in 2003, an idea of Global Transboundary Protected Area was launched by International Union for Conservation of Nature (IUCN) in South Africa. IUCN defines a Transboundary Protected Area (TBPA) as: "an area of land or sea that straddles one or more borders between states, sub-national units such as provinces and regions, autonomous areas beyond the limit of national jurisdiction, whose constituent parts are especially dedicated to the protection of biodiversity, and of natural and associated cultural resources, and managed cooperatively by legal or other effective ways" (Ali, 2007). There are various examples of transboundary protected areas all around the world (mostly in Africa) that represent the concept of peace regarding the conservation of the biological values . The world first 'Transboundary Conservation Area' was implemented in 1932 as an international peace park including the Waterton Lakes National Park in Canada and the Glacier National Park in the USA (Figure 1). Transboundary Conservation Areas might be terrestrial or marine protected areas. Here, four examples of both terrestrial and Marin TBPA are characterized in Table 1.

The transboundary peace park is a category that integrates cooperative management of the resources including ecosystems and cultural resources over jurisdictional boundaries (Ali, 2007; Pouya and Özkul, 2017). They improve ecosystem integration and biological processes by harmonizing natural resources management ways and other cooperation among their governments and stakeholders (Pouya et al., 2018). In Iran, over last years, the idea of creating peace parks on its political boundries has been discussed by Environmtal Ministry of the country. However, considering the complicated Iran's political situation, the idea may not be possible in Iran.

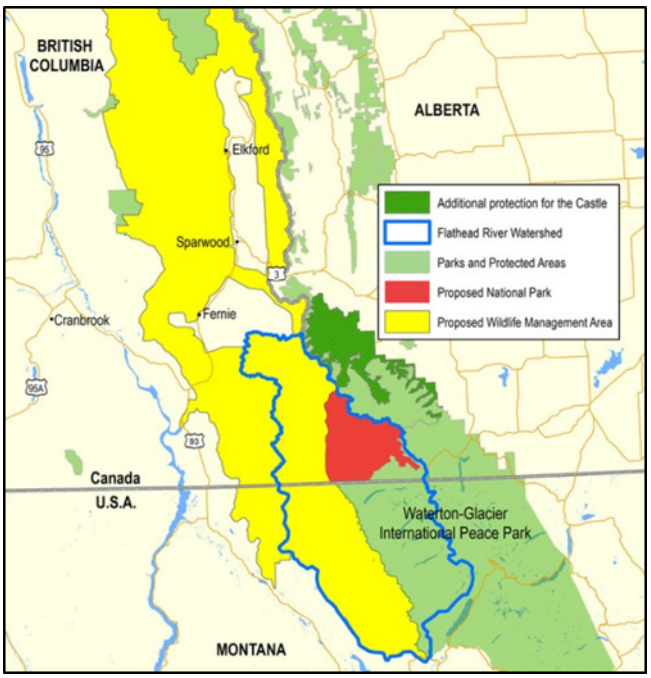
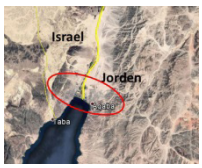


Figure 1. Conservation Plan of Waterton-Glacier International Peace Park (UNESCO World Heritage Convention)

Table 1. Some of Terrestrial and Marin Transboundary Conservation Areas

Name	Location	Year	Area	Objective	Determined Zones
Binational Red Sea Marine Peace Park		1999	11 km of shoreline	To protect two countries sharing marine resources while generating peace and coordination	-Fully Protected Marin Reserve -Marin Seascape Reserve General Red Sea Marin Peace Park
The Great Limpopo Transfrontier Park		2000	37,72 km^2	To facilitate wildlife migration; to improve tourism and eco-tourism to the area	-National Park -Conservation Area - Monument Park
Mnazi Bay-Ruvuma Estuary Marine Park		2000	650 km^2	To protect wildlife and Serve as reproductive grounds for many finfish and crustaceans.	-Coral Zone -Sand and Land Zone -Ocean Zone -Mangrove Zone -Buffer Zone
West Transborder Parks		1954	10,000 km^2	`To solve conflicts by appropriate management ; to increase numbers of plant and animal species; control bush fires, poaching, and ecotourism.	-National Park -Total Reserve -Partial Reserve -Hunting Zone

Environmental Problems over Political Boundries in Iran

Iran has 9000 km common borderline with its neighboring countries. On the east, Iran has geopolitical borders with Afghanistan, Pakistan, and Turkmenistan, on the west, with Iraq, on the north with Turkey, Armenia, and Azerbaijan, and on the south, it borders the Gulf of the Persian Gulf and Oman (Rezai, 2005). In general, among its borderline, 47 % of the total borderline is terrestrial, 20 % of it is river land, and 33% is determined sea land. There are precious ecological areas over the political borders in Iran which are under threat of damage and reduction through the political challenges and decisions between Iran and its neighboring countries. The important areas in terms of ecology, biodiversity, and environmental sources over border lines of Iran with its neighboring countries are summarized here:

- Iran and Afghanistan: The length of the borderline between Iran and Afghanistan is 10 percent of its geopolitical border. The importance of this area is due to the habitat of various types of wildlife, the possibility of fish farming, the existence of different types of birds and the provision of forage for livestock, and the use of nurseries for mattresses. More than 183 bird species have been registered in Hamoon Lake. This area suffers from illegal migration of Afghans to Iran, drought, Baloch parties, and drug smuggling(Rezai, 2005).

- Iran and Pakistan: This border is dedicated 8 percent of Iran political borderlines. Most of the areas located on this border are mountainous. The conserved area of Gando with the area of 25000 hectare in Sistan city is located over this border. Gando is a local name for a short carnivorous crocodile, which is a rare and valuable species in the area. Drought and habitat destruction are main threats of this crocodile in this area. This border is the most peaceful border over the history of Iran with no serious conflict. (Rezai, 2005)

- Iran and Turkmenistan: The conserved area of Serani in northern Khorasan city is located in this area. The protected area of Sarani has a generally mountainous climate, with steep slopes and deep valleys and highlands, forming part of the mountain range and has beautiful scenery. This area was declared Protected Area due to its natural features such as Ares Trees and the habitat of the ram of Oryol.

- Iran and Azerbaijan: Conserved areas of Arasbaran, Merakan, and Kiamaki wildlife conserved area are located on this border. Conserved area of Arasbaran has 1000 plant species and 300 animal species due to the presence of green mountains, beautiful forests, rich meadows and rivers, the diversity of plant and animal species has specifically ecological and national importance. Political Tensions growing in two countries relationship are the main threat for conserving these areas.

- Iran and Armenia: it is the shortest geopolitical borderline of Iran. Armenia as green country shares its most important river (Aras river) with Iran. Aras River is one of the most important rivers in Iran, which, in addition to the special tourist attraction and the positive effects of ecosystems, is important for catchable fish (Hendi and Danekar, 2012) Aras River is threatened by the pollution from the countries of Turkey, Iran, Azerbaijan, the Republic of Nakhchivan and Armenia. So, a principled consensus between Iran and Armenia took place so that the two countries jointly monitor and evaluate the Aras River. Kiamaki wildlife Refuge and Marakan Protected area are located on the river beach and the border (Hendi and Danekar, 2012).

- Iran and Iraq: Border with Iraq included 17% of Iran borderline. There are various rivers crossing in this area. One of the important areas under threat of destruction is Hawizeh–Azim marshes (117000 hectares). Hawizeh–Azim marshes sustain the highest quality in the larger al Ahwar ecosystem complex. They are fed by the Tigris River and by the Karkheh River (Ali, 2007). This wetland is located on the border between Iran and Iraq and about one-third of this wetland is in Iran. The lagoon is rich in plant and animal resources, and these resources are going to dry because of the wrong management regimes of the two counties over the borderland. Qarawiz with unique species of deer is another protected area between Iran and Iraq in Kermanshah province.

- Iran and Turkey: It includes 6 % of the whole borderlines of Iran. Rivers of Garasu and Nazlo flow in this part and their various height of mountains including small Ararat (Hendi and Danekar, 2012). The conserved wildlife areas of Aghol with the area of 90.000 hectares are over this border that was considered as one of the valuable habitats of various species of native and migratory birds. Hunting is forbidden in one part of the areas.

Considering the overview of political boundries in Iran, they are recognized atleast 6 borderlands (Figure 2) which need to be protected from military obstacles

in Iran including : the conserved area of Sarani, on the border of Turkmenistan; the Hamoon Reserve Area on the border of Afganistan, the conserved area of Hawizeh-Azim on the border of Iraq, the Garawiz conserved area on the border of Iraq, Kiamaki conserved area on the border of Armenia, Arasbaran conserved area on the border of Azerbaijan.

Figure 2. Protected areas on the boderland of Iran: 1.The conserved area of Sarani, 2.The Hamoon Reserve Area 3.The conserved area of Hawizeh-Azim 4.The Garawiz conserved area 5.Kiamaki conserved area, 6.Arasbaran conserved area

Over the last years, in order to mitigate the environmental issues over borderlands in Iran, the creation of international peace parks have been discussed by the Environment Department and other related institutions (https://doe.ir/Portal/Home/default.aspx). While, creating these parks need serious negotiations and agreements among Iran and its neighboring countries to obtain cooperative resource management (Ali, 2007), which takes times and in most of the cases it won't be feasible due to various political conflicts. Trying to find a middle way instead of totally ignoring political borders through peace parks, this article evaluates the characteristics of natural borders (ecotone). Comparing two borders of human and nature, and analyzing their differences and similarities may help the artificial borders with acting like an ecotone. Considering the ecotone as a model in forming the political border can be a possible way to solve ecological issues in borderlands of Iran having more than six conserved zones located on the political boundaries.

Comparison of the borders

To the human, borders are defined two kinds of boundaries; natural boundaries and artificial boundaries. Physical (natural) Boundaries are geographical elements as natural obstacles to communication and transport including rivers, mountain ranges, oceans, and deserts (Figure 3). Usually, political boundaries are formed along physical boundaries (Agnew 2008). Boundaries act not just as physical lines, but as social symbols which are used to mark social and cultural distinctions and separate power containers in the state (Passi, 2009) .

In some cases, a wall is constructed as political borders between countries with the goals of national security increase on the borderland, smuggling control, and illegal migration decrease (Figure 4). However, these structures break wildlife habitats and wilderness regions and cut water basins ecosystem and the national forests.

***Figure 3**. Aras River acts as a natural border between Iran and Armenia (source: http://www.irna.ir)*

***Figure 4.** the geopolitical border between Turkey and Iran (http://www.irna.ir)*

Landscapes also have borders that are being identified by nature called ecotone. Ecotone is an area where two different plant communities mark the transition between two ecosystems by creating a determinate interface (Kark, 2013). Natural edges or ecotones are usually less sharp and abrupt than human-made boundaries. They show a gradual transition from one ecosystem to another. These natural borders do not clearly represent an edge or a boundary. In fact, the concept of an ecotone supposes the existence of the active interaction between two or more ecosystems, which have different qualities of their neighbor ecosystems (Kark and van Rensburg, 2006). In some cases, borders of nature may also be considered as human borders like when a wide river or huge mountain range are marked as political borders among countries. Here, these two borders are compared in terms of five main factors including:

- Location and size
- Origination and creation factors
- Structure and form
- Function
- Stability over time

Location and size

Human boundaries are created for diverse purposes in various positions. Boundaries that separate the communal living areas into divers spatial scales are political ones. The International border is a real or artificial line that separates geographic areas. They are related to various human settlements, culture and language and separate countries, states, provinces, cities, and towns, giving expression to power relations. Political boundaries are created on all spatial scales, from local or administrative units to province and regions arrangements.

Ecotones appear in both terrestrial and marine systems and include various spatial scales, from huge continental-scale ecotone, where biomes meet (van Rensburg et al. 2004), to local-scale transitions, where small microhabitats and plant communities coincide including mountain tree lines.

Origination and creation factors

All artificial boundaries are generated by human beings. They define the area that a particular government controls it. So, it is the man and not nature that determines the position of geopolitical boundaries (Hartshorne, 1938). Geometric borders are made by arcs or lines of latitude or longitude with no regard to the physical and cultural properties of the area (Paasi, 2009). Since territorial political areas have been the production of social and political activities, there is nothing inherently natural or credible about the political boundaries (Kapil, 1966). In terms of selection, all political borders are the results of negotiation and reflect the power relations of the state.

Ecotones occur across ecological gradients (Figure 5). Those gradients are generated as a result of spatial changes in environmental factors such as elevation and topography, climate, soil. Ecotones commonly associated with areas of sharp climatic change along environmental gradients. The sharpest ecotones are often created by anthropogenic operations, but there are also numerous natural instances (Kamel, 2003). According to Risser (1995), ecological boundaries may be created by sharp gradients in areas with environmental variables or may be caused by the slow nonlinear reaction to gradual environmental changes (Kark, 2013).

Figure 5. Khanmirza Agricultural Plain, Iran; An instance of ecotone (between oak forests and agricultural land) (Taken from Shahabeddin Taghipour Javi, 2015).

Structure and form

Making human boundaries has a process which starts with claims and negotiates, and then through delimitation step, the border is put on the map. Finally, during the demarcation process, actual signs are put on the ground by means of barriers, fences, walls, or other markers to show boundaries. However, various events may lead to bordering of the states and make different spatial forms such as geometric forms with straight lines or arcs. According to Hartshorne's classification (1938), there are four categories of boundaries with different structures explaining in Table 2.

Ecotones as transition zones are characterized by a series of deep changes in the structure and composition of plant and animal communities (horizontally and vertically). The physical transition may be abrupt as a sharp boundary line; gradual as a slow transition of the

two communities across a broad area or even appear via a set of intermediate habitats (Forman, 1995). Examples include shorelines occurring when sea and land meet, savannas as transitional zones between hardwood forests and long prairie grasslands, or between pasture and woodlot (Dramstad et al., 1996) (Figure 6). Ecotones has a three-dimensional structure which is defined by the width, verticality, and form. The quantity, variability, and types of the plants and animals in the spatial arrangement, internal changes, and surface forms increase structural heterogeneity (Hansen and di Castri, 1992). Forms of ecotone are curvilinearity, as well as special forms such as concave, lobe, straight, and so on. Forms and number of coves and lobes in a smooth boundary segment affect the function of the ecotone (Milne et al., 1988). A strait form of the border let the movement of species along the border and patches, however, coves and lobes let more integration and movement across the ecotone. The width dimension refers to the edge portion of a landscape unite, where environmental status differ considerably from the interior part of the unite (the edge effect) (Forman and Godro, 1986). The vertical dimension refers to the total stratification and height of the structural elements, generally vegetation (Hansen and di Castri, 1992).

Table 2. Four categories of different political boundaries according to Hartshorne's classification (1938).

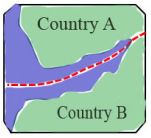
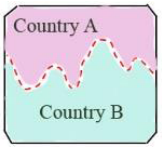
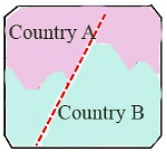
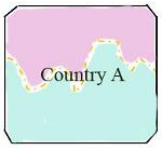
Antecedent Boundaries	existed before the cultural landscapes and human settlements formally appeared and remained in a place while people left the place to occupy the surroundings; Such as Himalayan Mountains Between China and India.	
Subsequent Boundaries	Coincide with cultural, social, economic, or linguistic disjunctions and follows cultural lines; like Germany and Poland.	
Superimposed Boundaries	Imposed by an outside force (like a treaty), but regardless of possible cultural boundaries; such as North and South Korea.	
Relict Boundaries	They no longer have any political function, but they can still be seen in the cultural landscape; such as the Great Wall of China and Berlin Wall.	

Figure 6. A transition zone between the lake and pine forest, Isohiekka, Talvilampi/Finland (Taken from Alireza Moradpour, 2016)

Function

Functions of the human boundaries are understood in relation to their categories such as region, state, province, nation, and territory (Paasi, 2009). There are two common imaginations of the human boundary; it can act as a barrier that limits activities and end authorities, or it can function as a bridge that lets relation between individuals from many civilizations and backgrounds. In general, the functions of the political boundaries and the international borders in particular are:

- To define and generate relations and interaction among neighboring states, which also characterize how the countries permit their citizens to travel across the border.

- To do legitimate and executive functions, which can be positive or negative, friendly and unfriendly.
- To interstate commerce and trade to make sure that revenues are gathered in forms of customs duty and commodities are not smuggled across the border.
- To create, protect and administrate for military scopes and security.
- To except area from other communities and authorities unless they have the permission of controlling authority.

However, the combination of form, width, and verticality determine functions of each ecotone and landscape boundary. Forman and Moore (1992) explained the functioning of ecotone in terms of filters, barriers, conduits, sources, sinks, and habitats (Bider, 1968). Strayer et al. (2003) determine the borders functions through some concepts used in physics which consists of transmission (partial), transformation, absorption, reflection, amplification, and neutral. In general, two aspects of the structure may impact on all functions of ecological boundaries; one is contrast and the other is porosity. Contrast is determined by the sharpness of the boundaries and it lets the adjacent ecosystems combine with different degree of abruptness. Porosity is the density of pores in the boundary which has the influence on the movements and permeability of the objects, energy, materials, and species across and along the boundary (Hansen and di Castri, 1992).

Stability over time

Geopolitical boundaries are varying over time through wars, agreements, and commerce. For instance, after World War II, the map of Europe was mostly changed and redrawn. Alteration of the artificial boundaries are not limited to the change of borders' position, but the creation and fall of states, changes of geographical names, as well as some unforeseen destructive natural disasters. Sometimes the residents living in one area take over another region through conflict, war, and violence. Other times, the land is sold and traded peacefully. Usually, the land is divided after a war through international agreements.

While, an ecotone is an area with rather rapid changes and transition. Both the characteristics and the location of a boundary may vary over time. Several spatial factors may change: boundaries may become sharper or more spread; conduits may appear or disappear. For example, vegetation growth along the boundaries of a tropical forest may separate and isolate the interior part of the forest patches from its surrounding matrix or make the boundaries less previous over time. According to existent changes; there are two kinds of changes; the abrupt change or sudden change corresponds to an unpredictably environmental disturbance and is determined by chaotic and nonlinear behavior, and the gradual change that refers to the true gradients (van der Maarel, 1976). Therefore, ecotones may emerge, shift in location, differ in terms of structure and species present, or disappear because of species migrations over a period of major environmental change.

FINDINGS

The idea of transboundary peace parks provides a collection of areas with various degrees of conservation. What is performed as the solution in the transboundary peace parks has been to remove international boundaries in pursuit of ecological conservation (Figure 7). In Iran with having various ecological zones over the borderlands, ignoring political borders and military infrastructures in the borderlands seems impossible. However, the form, structure, function of the human borders could be modified considering the ecological needs of the region. They can act as a transitional cordial for ecosystem and animals and in some cases, their forms can be based on the ecological existing forms.

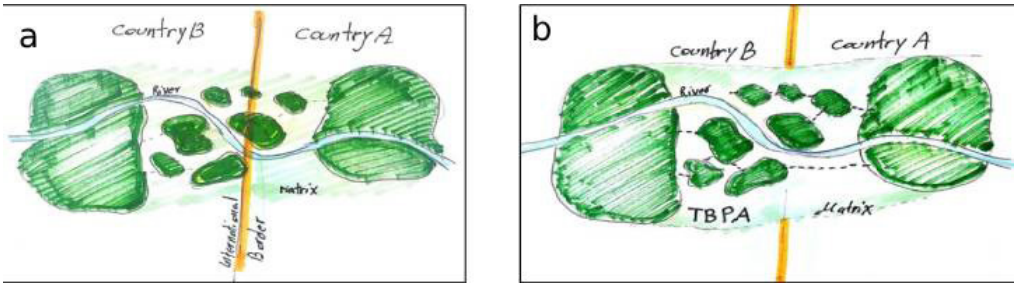


Figure 7. a: shows fragmentations caused by the political border, b; shows border removed in the areas defined as Transboundary Peace Parks to conserve the ecological systems.

Table 3. Comparison of the two boundaries; ecological and artificial boundaries.

Common Indexes	Ecological Boundaries	Artificial Boundaries
Location and Size	Large or small between two or more ecological communities	Among countries, states, provinces, cities, towns, and regions
Origin Factors	Often occurred naturally and sometimes in result of human activates	made by human with political negotiations and administrative goals
Form and Structure	-Simple (strait) or convoluted -interactive or noninteractive -abruptness or steepness -geometric shape or tortuous	Strait lines that might be spatial or physical confirmed by fences and structures and other military obstacles.
Functions	-Transitional function -Corridor function as pathways for energy, organisms, and chemical elements -The flow and accumulation of materials and energy -The increase of disturbances -The diversity and abundance of species	- Determination space on a map or by a physical fence - Land and source sovereignty -Administration and management of territories of adjacent countries -Defense and inclusion of political territories - Individual movement control and migration limitation -Act as social symbols and institutions that mark social distinctions in societies
Stability	Stability of the plant community composition, while the location is dynamic and gradually changes through disturbance.	Change over time through war, disaster, treaty, and trade.

According to the information caught by the two boundaries' analyses and comparison in terms of common factors (location and size, origination, form and structure, functions, and stability), each of boundaries has been formed to serve the specific functions and porpuses. Table 3 provides a brief of the comparison.

Comparing human borders (artificial border) and natural borders, the natural ones are seen in various forms and functions rather than the artificial ones which mostly act as a barrier to define, limit, and control national assets and lands. Even though the form of the artificial borders can be various, the strait and geometric line is the most known form as a political border. However, these man-made structures can be considered and constructed in more flexible forms considering the ecological functions of the land. As it depicts in Figure 8, human borders can be defined in various forms rather than a straight line, which can act in favor of ecological systems as well.

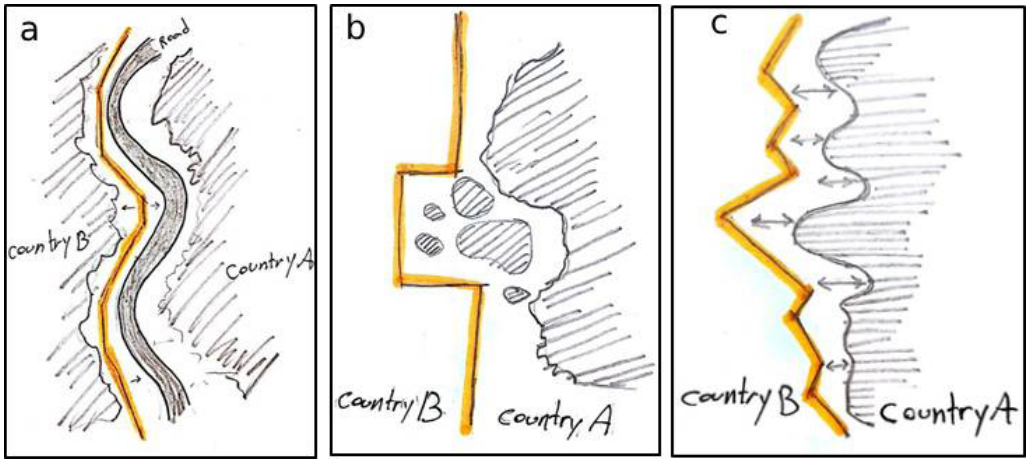


Figure 8. Bordering regarding the ecological functions; a: a road or river can define the form of the human border which leads to less fragmentation, b & c; bordering according to the condition of the ecological patches to maintain the connectivity and reduce its negative effects on the ecosystem.

The main goals of the artificial borders are to stop exchange, movements between two countries and block the flows. In the contrary, the natural boundaries, or edges are the places highly dynamic, open to the exchange of materials, species, energy, nutrients and so on. However, in some cases, the natural edges block the possible negative impacts of their surrounding environments and act as a buffer that protects the interior habitat. Natural boundaries act to respond to the ecological needs of two neighboring communities and are more flexible in form, size, and location. While, human borders are mostly straight lines in order to outline, define, limit, or and protect the human territories. Even though human corridors have had a transitional function (trade, tourism, and so on), their primary role seems to enclose the human communities. Natural boundaries provide a great flow of energy, materials, vegetation and keep pace with environmental changes like climate changes; however human borders can be drawn everywhere based on political negotiations disregard with the ecological relations. Human borders can be stable for hundreds of years without any changes or can be relocated during an event like war and political agreements.

CONCLUSION

According to the different identity of natural and human communities, the incompatibility and conflict around two human and natural boundaries seem inevitable. Bordering of human is occurring in various scales from the family garden to national areas and in most cases bordering means drawing a strict line of ownership regardless of any ecological interactions. It is time to redefine strategies as to human border development which can be more harmonious with nature such as;

-Human boundaries should be flexible with the changes in their surrounding nature; for example, the location of the human boundaries may be changed with changes of the river direction over the borderland.

-They should be drawn and established in tune with the current geographical forms and structures on the ground.

-Human borders should enable connectively of the ecosystems and let seasonal animal migrations to mitigate ecological effects.

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