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The Effect of natural protected areas on surrounding villages (Case study: Badr and Parishan protected areas, Songhor, Iran)

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Abstract

Many rural settlements are influenced by protected areas. The management measures along with social, and economic features of these areas can have both positive and negative effects on the surrounding villages in various forms. The present study aimed to study the effects of protected areas in Iran on surrounding villages. We focused on 8 villages in Songhor, a city in Kermanshah Province, Iran. The villages are near the protected areas of Badr and Parishan. Based on Cochran formula, 250 subjects were considered to fill out the questionnaire relating to the effect of the protected areas on villages. Also, we used a VIKOR model to investigate the effect of the protected areas on villages. We studied the relationship between the distance and the altitude of villages with regard to the protected areas using IDW method. The findings showed that the protected areas had effects on welfare, livelihood, migration, and participation in rural development and the increased inequality. Moreover, the closer the villages were to the protected areas, the more they were affected. The direct effects of altitude were also found.

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Introduction

Sustainable development was introduced as the most important issue by the United Nations in the late 20th century due to the trend seen worldwide on the environmental degradation and decreasing public living standards. Sustainable environmental development is defined as the development resulting in improved general quality of life at present and future, in which the environmental management should be considered as an important factor for sustainability. Sustainable development needs better understanding and more effective management, in which the interaction between human and the environment is well understood (Fatemi, Rezaei - Moghaddam, Wackernagel, Shennam, 2018: 53-64).

Negative environmental effects of human activities have raised a new issue, i.e. how to manage the environment by the modern societies. In this regard, the governments passed the Protected Areas Act in 1870 in order to restrict the access or development of these areas (Parra, 2010: 491-492). The protected areas are the essential means to prevent deforestation and species extinction (Joppa et al., 2008: 66-73).

The International Union for Protection of Nature has defined the protected areas as a well-defined, recognized, specialized, and

managed geographical space, through the law or other effective means, to achieve long-term protection of the nature via ecosystem-related services and cultural values (Abman, 2018: 283).

These concepts are not just limited to ecosystems and protection of biodiversity, but include protection of local people's social and economic development (Saviano et al., 2018: 2-3). However, since the use of agricultural lands and extraction of natural resources is limited in the protected areas, local people's livelihood can be negatively affected. On the other hand, the protection policies should be directed toward decreasing the negative social effects or reducing poverty. Nevertheless, there is evidence that, in developing countries, the local people living within these areas may be affected by forced migration or restricted access to natural resources or increased local tensions. This may also result in unfair distribution of resources and income among inhabitants of the areas. As a result, there are increasing concerns about conflicts between protected areas and economic development. Other evidences show that establishment of protected areas can have important role in reducing poverty and protecting local and global livelihood. According to the Convention of Biological Diversity (CBD), 1.6% of the world's population rely on biodiversity in protected areas for their livelihood and 56% of these areas provide vital services such as food products. Also, non-timber forest products (NTFP) can be considered as complementary food resource or safe networks or as a source of income to reduce poverty in these areas. Another indirect advantage is the efforts made by the government to improve the infrastructure of the protected areas and increase the quality of services in these areas. Therefore, the management and protection plans for these areas need to be designed and performed in a way that lead to poverty reduction (Estifanos et al., 2019: 1). Therefore, it must be acknowledged that the method used to manage protected areas affects local people's lives and thus we need an accurate understanding on the economic importance of environmental resources in protected areas as pertains to the local families' welfare and income (Coad et al., 2013: 1). Ideally, land use management in these areas can make successful and correct solutions that maintain ecological balance and meet human needs; that is, it is performed in a way that results in direct economic benefits (Defries et al., 2007: 1031).

Most protected areas bring a wide range of services and benefits derived from ecosystems. The spatial scale of the benefits of protected areas is simply introduced under three categories: 1) internal, 2) local, and 3) regional. Internal benefits include cultural services provided to visitors within the protected areas (PA). Local benefits are those provided near the borders of the areas around the PA. The distance here depends on the nature of the benefits but the effect size in the range of 1 to 100 km seems logical. For example, protected areas may locally contribute to improving the quantity and quality of water, production of fish, eliminating pests by predators, waste assimilation, reforestation, and making handicraft markets. Regional benefits are provided to people in farther areas through contribution to regional biophysical processes with global biophysical or wide social and economic processes on a large scale. For example, we can cite the considerable effects of tourism on the economies of the region or the national cultural importance to have a place with rare species such as rhinos. The international tourism seems to be increasingly a source of income to keep protected areas especially in the field of protection of private lands. For example, in South Africa, most of the protected areas rely on income from overnight accommodation and hunting to maintain the living conditions. In addition to highly documented benefits of protected areas, they have the potential to make a wide range of social and economic subtleties: the sense of being in the nature, swimming in the ocean, exercising in green spaces or enjoying scenic views, which are all the important elements of human's welfare. Therefore, these areas have various potentials for ecological restoration as well as contribution to human's physical and

psychological wellbeing and thus, are important for human's future (Cumming, 2016: 46-54).

The efforts made all over the world to protect biodiversity and natural habitats are greatly dependent on establishment of protected areas. However, establishment of a simple protected area does not guarantee effective protection of natural environment within its borders. The management of most protected areas around the world is inefficient (Abman, 2018: 282-289).

The main challenges in a protected area includes expulsion, removal, resettlement, deprivation of access and use of resources, costs of damages caused by wildlife to crops and livestock, threats to human life, health and property, insufficient share of revenue from protected areas, and differences in costs and benefits assigned to different groups (Vedeld et al., 2012: 22). Therefore, the countries taking part in the Convention of Biological Diversity (CBD) have not only committed to creating new protected areas across ecosystems, but also must consider the local people's needs in protecting and paying attention to local organizations related to effective protection (Tran et al., 2019: 1).

High costs of establishment and management of protected areas are imposed on indigenous people and local societies while most benefits are in national or global levels and the negative social effects on indigenous people and local societies have mostly roots in conflicts related to protection goals. Failure to meet and comply with at least a set of standards related to the local people's rights in protected areas can lead to conflicts, resistance, and lack of cooperation, finally causing negative feedback on the results of protection. In protected areas, there are different cases where conflict between local communities and protection of the areas threatens long-term sustainability of protection plans. Communicating local people's ideas and wishes is an important way to become aware of the standards in accordance with the people's rights. They can provide new solutions on how to implement various types of effective protection through linking them with the reality. Protected areas are common in developing countries, and their inhabitants depend on them for their living. It is assumed that respecting the people's rights in protected areas can reduce social costs and encourage local people to cooperate and most people have positive attitude toward living in protected areas, which allows them to use the goods and services of ecosystem due to protection laws. These areas are like other protected areas in which the inhabitants know the benefits of protection and it has been also revealed that the inhabitants' ideas are in line with those of authorities. Additionally, it has been indicated that there must be rules on what activities should be accepted, limited, or banned and what penalties should be exercised in case of breaking the rules. The rules are to be understood fairly and legally, and creation of common rules that are easily and clearly enforceable can lead to new social norms contributing to the sustainable use and protection of these areas. The studies have indicated that increased justice and legitimacy can increase cooperation towards achieving goals. It has also been revealed that there are opportunities to formulate the protection policies, which improve both social and protection outcomes. In addition, focus on local needs and priorities is a helpful way for protection strategies and targeting budget and resources for protected areas will have the greatest effect on protection. Producing accurate information on forest losses and sharing the information with residents and stakeholders can help develop a common attitude of forest status and the need for protection, and finally, evaluation of regulation quality and mutual learning is important to establish successful protection plan and reinforce rights-related approach of protection. It has been revealed that inhabitants have positive views towards protected areas, which is the result of using ecosystem products and services in accordance with the law. It has also been observed that the inhabitants' participation is possible when they have the ability to make decisions. Therefore, the consultative approach can help speed up the process by identifying inhabitants' priorities and form

opportunities to improve social and protection outcomes (Pelletier, Gelinas, Potvin, 2019: 297-304).

Due to widespread poverty, population growth, and political instability, management of protected areas in developing countries has caused deep challenges. Though globalization and neoliberal terms bring more foreign budget for protected areas in developing countries, they interfere with oil and mining activities in protected areas. These areas are identified as zones with improved social welfare, local security and protection, and social benefits on different scales. Today, protection of biodiversity is challenged with the most important goal of the United Nations Millennium Development, i.e. eradicating extreme poverty and ending hunger. Developed countries mostly assume that sustainable use of resources can take people away from poverty, provide sustainable management of resources of timber and non-timber products, fish, wildlife and other resources for rural people's living, however these rarely generate surplus income to help the poor get out of poverty. Local projects in protected areas and the surrounding areas cannot reduce poverty considerably; in reality, they are poorer due to a wider economic system that restricts their access. In the meantime, protected areas in addition to biodiversity are expected to provide economic benefits on different scales, reduce poverty, and protect cultures, and promote peace through global guidelines (Treves, Buck Holland, Brandon, 2005: 221-244).

The province of Kermanshah in Iran has five protected areas. This province is the habitat of one fourth of mammals and endangered species in Iran. The protected areas make up about 6.7% of this province. The protected areas of Badr and Parishan are located at geographical location N35 02, E47 46 between the provinces of Kermanshah and Kurdistan. The total area of these protected areas is 43,209 hectares, and the part located in the village of Bavele close to Songhor, a city in Kermanshah has an area of 36,109 hectares and includes eights villages: Charmle Olya, Varmoghan, Darre Vazm, Hajiabad, Meykhoranat Mohammadaqa, Meykhoranant Mohammad Sadeq, Meykhoranant Sadat, and Meykhoranat Pir Ali Khan, with a total population of 1291. The purpose of selecting this subject for the present study was to take an important step towards making a peaceful coexistence between the indigenous people and sustainable protection, regarding the influence of protected areas on local people's economics, society, and culture as well as the need for paying attention to the protected areas. Therefore, the main question of this study was what the effects of the protected areas are on local societies of Badr and Parishan in the city of Songhor in Iran.

Research theoretical foundations

The International Union for Protection of Nature has defined the protected areas as a well-defined, recognized, specialized, and managed geographical space, through the law or other effective means, to achieve long-term protection of the nature via ecosystem-related services and cultural values (Abman, 2018: 283). This definition reflects a more humane view of protected areas and emphasizes their role in supporting human life and wellbeing and provision of various ecosystem services (Bragagnolo et al., 2016: 58).

The term "protected area" refers to any area of land or sea to maintain biodiversity and other natural processes through restrictions on using the land (Hansen & Defries, 2007: 974). Protected areas are spatial borders in nature. These areas with defined and justified borders are determined on maps due to special reasons in order to consist special cultural and ecological properties including endangered species, unique natural features such as waterfalls and mountains or places with archeological significance. However, these areas are multipurpose. In addition to their main role in biodiversity, they may provide important ecosystem services to the surrounding areas. Moreover, protected areas can increase the quality of life of people living outside the protected area through

providing cultural services to visitors (Cumming & Allen, 2017: 1712).

Protected areas are greatly recognized as one of the most important strategies to achieve protection and sustainable development (Du, Wiley, Penabaz, Anthony, Kinoshita, 2015: 81-52). Protected areas have been increasingly turned to a strategy to protect biodiversity, reduce deforestation, and to provide a set of ecosystem service such as fresh water, places to rest and reservoirs of wild plants and animals. The number and expansion of the protected areas is constantly changing due to changes in borders and addition or removal of areas. The definition of protected areas according to the Convention of Biological Diversity (CBD) refers to a geographically defined area that is regulated and appropriately managed towards special goals. According to the definition of protected areas proposed by IUCN, these areas are a well-defined, identified, specialized, and managed geographical space through legal methods or other effective methods to achieve long-term protection of nature via providing related ecosystem services and cultural values. The definition of CBD does not cover a wide range of various roles on protected areas in protection of biodiversity. The definition of IUCN brought about conflicts due to enforcing legal or effective methods (Soliku & Schraml, 2018: 136).

Protected areas are an appropriate tool to prevent destruction of biodiversity (Oliveira et al., 2019: 1). These areas are also the most efficient and economic methods to maintain biodiversity (Ervin, 2003: 819) and is considered as a tool to protect land cover and hence ecosystem services (Joppa & Pfaff, 2011: 1633).

Protected areas are considered as the main way to protect different goals from nature protectionto areas with limited permits for sustainable development; however, the goal is protecting all groups of protected areas (Jouzie et al., 2020: 2). Protected areas are also indicators of success in achieving the Millennium Development Goals (Chape et al., 2005: 443).

The modern concept of protected areas emerged in the 20th century with the concept of excluding areas of "wildlife" to protect biodiversity. In this regard, the local and indigenous people's living is essential for keeping the biodiversity. The initial protected areas attempt to separate human from nature; thus, they were generally banned from extracting natural resources (Grander, 2014: 3). Protected areas are located in ecosystems that are beyond the administrative borders (Defries et al., 2010: 28-71).

Approaches related to protected areas

Fence and penalty approach: according to this approach, to reach successful outcomes of protection, the local people have to be evicted from protected areas even with force (Oldekop et al., 2015: 134).

Opponents of coercion approach believe that it is morally worrying since such action mostly result in undesirable social consequences in protected areas, which ultimately lead to ineffective outcomes in long term (Oldekop et al., 2015: 134).

Approach of meeting the local people's needs: an appropriate approach confirmed to effectively protect the environment in a long term claims that protected areas has to provide the local people's needs in order to guarantee sustainable living and increase welfare. The debate between the proponents of these two approaches and the importance of considering human welfare in protecting the environment is still alive, intense, and unresolved (Oldekop et al., 2015: 134).

There is an accurate protective approach that focuses on power and aims to prevent use of resources by local people especially in developing countries. According to this approach, protection of a natural resource is achieved through strict enforcement of rules to prevent illegal activities. Attempts for protection and consequently deprivation of protected areas have lead the local people to have a contradictory perception and attitude.

Though this approach as a way to protect natural resources seems useful, introducing an area as a protected area is not sufficient to protect these resources. Therefore, the management of these areas

should be participatory in order to make balance between the use and protection of the nature. Participatory management refers to managing natural resources with full cooperation and participation of local people and engagement of real beneficiaries. Particularly, certainty about local protection of protected areas is increasingly considered as an essential element in protecting natural resources. Obviously, local people who have negative perceptions of the protected people will not support such protective measures (Alkan et al., 2009: 20).

Participatory approach is a known approach to make peace between protection of culture and biodiversity in protected areas (Izurieta et al., 2011: 2). The proponents of participatory approaches argue that they make significant promises by persuading local people to trust them and reinforcing a sense of community empowerment to ensure the legitimacy of comprehensive decision-making and ultimately improve livelihood. They conclude that the participatory approaches bring success through environmental management and economic development (Soliku & Schraml, 2018: 136).

The opponents of participatory approach argue that participatory approaches have failed to realize the promises and led to unequal distribution of power and resources, undefined economic benefits and ecology, consulting fatigue, and discouragement from long term bureaucratic processes (Soliku & Schraml, 2018: 137).

Traditional approach or the conflicts between human and wildlife: according to Connor, these conflicts are defined as those occurred when one's performance affects wild animals or vice versa. These works investigate local people's attitudes, actions, and economic losses when their livestock is killed by large carnivores such as leopards, mountain lions, etc. This traditional approach has roots in natural sciences especially biology of protection to understand the conflicts. This method was formed of very specific case studies; in other words, they are based on special experiences. The most common studies are the studies of human perceptions or those that quantify economic losses (Frapolli et al., 2018: 3).

Destruction approach: according to this updated approach, there is a time difference when the interests of two or more parties competes for certain aspects of biodiversity and at least one party assumed that its interests have been sacrificed at the expense of the other party. From this perspective, the conflicts are at least between two actors (Frapolli et al., 2018: 3).

Community-based protection approach (CBC): this approach has been criticized since it failed to achieve the protection goals. According to this approach, protected areas with community-based plans have reduced the threats more than usual protected areas (Mugisha & Jacobson, 2004: 233). Newer and more promising approaches include a combination of adaptive management, new methods of stakeholders, and the general integration of work in site with policy-making and institutional initiatives (Wells & Mcshane, 2004: 513).

The perspective of social environmental systems: it turned to a balanced and elegant approach for management of protected areas, as well as a comprehensive framework for comparison and conflicts of successes and failures of protection. The interesting and special matters in social environmental approach to understand protected areas are as follows: 1) increased attention, flexibility and sustainability of protected areas and the perspectives happening in these areas; 2) greater attention to the relationship between spatial background and scale of protected areas and ecosystem services they provide; and 3) attempts to reestablish protected areas, and their definition by people and nature (Cumming & Allen, 2017: 1710).

Top-down approach: protected areas are mostly established under a confidential top-down approach in which local communities have no interference. This approach includes processes that are missed by people with access to these areas and a wide range of powers hinder people from using these advantages (Nguyen, 2019: 89-90). Fully protected areas with top-down

approach management structures can have considerable effect on livelihood and cause conflicts between local communities and management of protected area (Clark et al., 2008: 2). This approach has been used since 1970s and disregarded local inhabitants' rights (Hummer et al., 2019: 2535).

There is a variety of changes or a combination of participation and governance between top-down and bottom-up approaches. An approach exercised in an area should be based on the social environmental system of that area (Gaymer et al., 2014: 138).

Protected area related theories

The theory of conflict claims that the protection policies at national and local levels cause conflicts between the interests of local governments and rural communities since these policies restrict the access to land and other vital resources for local communities. The main conflicts in protected areas include excavation, relocation, resettlement, deprivation of access and use of resources, costs incurred to crops and livestock by wildlife, threat to human life, threat to human welfare, difference in costs and benefits to rural communities (Vedeld et al., 2012: 22).

In developing countries, pressures on natural resources are increasing in proportion with the growth of human population. Increasingly, the establishment of protected areas is adopted as the most practical strategy to reduce the adverse effects of such pressures (Duan & Wen, 2017: 168).

Theory of participation declares that the main condition for success in protection and development is the ability to provide local participation. The local people's understanding and attitude towards these resources is important to attract their participation. If the existing resolutions restrict the right of local people to these resources, their perception and attitude will be negative. Another important factor in forming positive attitudes is providing the opportunities to train the local people, i.e. increasing the level of knowledge and information on protected areas (Alkan et al., 2009: 22). Various studies have revealed the effectiveness of participatory methods in planning and managing development in protected areas (Portillo et al., 2019: 2). Moreover, the studies have indicated that failure to obtain support of the society is associated with failure in achieving successful outcomes in international case studies conducted in developing and developed countries (Heagney et al., 2015: 1648).

In protected areas where humans coexist with animal and biological species, animal and plant species are often damaged due to human pressure on nature. Possible consequences of such views in protection related decision-making can be loss of biodiversity through human pressure on protected areas (Abukari & Mwalyosi, 2020: 1-2).

Regarding increased pressure on the earth resources, an effective system of protected area is a promising hope for the protection of living areas, representative of natural ecosystems and their species. Therefore, the protected areas are a valid and measurable indicator for success in conserving or slowing down the world's remaining biodiversity (Chape et al., 2005: 450). Protected areas are the most important protection form and their function in protecting biodiversity and ecosystem services is widely identified (Duan & Wen, 2017: 168).

According to Mace, we are now in a paradigm of people and nature or social-environmental system, which is gradually replaced for the previous view of nature for people. Therefore, the modern protection views protect the protected areas as complex, compatible, social-ecological systems that are directed and conserved through dynamism of human and ecological elements and the interaction between these elements. The paradigm of change in protection has not complete displaced the previous ideas. Elements of the previous paradigms remain as a part of the current one (Cumming, 2016: 48).

Protected areas can affect the environmental outcomes such as species richness, species frequency, and ecosystem services level, but the main mechanism through which protected areas can affect the

environmental outcomes is applying them in human decision-making when using resources (Ferraro & Hanauer, 2016: 7).

Livelihood and welfare of rural poor people especially in developing countries is at risk from protected areas because their living mostly depend on agriculture and existing natural resources in these areas. Benefits and costs the local people experience due to establishment of protected areas can affect the positive or negative attitudes towards protection activities (Abachebsa, 2017: 8-11). Protected areas reduce access to resources that bring welfare for human (Ferrano & Hanauer, 2016: 8). Therefore, they have negative and unfair effect on social and economic welfare of the surrounding communities (Ferrano, 2008: 2).

On the other hand, protected areas reinforce ecosystem services, which results in human increased welfare (Ferrano & Hanauer, 2016: 8). The benefits and advantages of protected areas are undoubtedly recognized in changing the climate, loss of habitats and biodiversity (Leung, 2012: 349). Protected areas can protect the ecosystem services on which the local communities depend and create more sources of income, e.g. through tourism (Braber et al., 2018: 1).

Intensive use of ecosystem can reduce the advantages provided by ecosystems, and thus non-linear risks, poverty and inequality are more likely to happen (Canteiro et al., 2018: 220). In this regard, according to international standards, a method is appropriate that simultaneously includes socio-economic and environmental outcomes (Heagney et al., 2015: 1648).

Most protectionists believe that strictly protected areas are the only way to preserve the natural landscape remained from human encroachment and deforestation. However, these areas cause social costs incurred by rural poor inhabitants in an unbalanced way in developing countries (Persha et al., 2010: 1).

Despite increase in number of protected areas over the last two decades, they were not completely effective; therefore, mere reliance on protected areas to sustain biodiversity is not enough (Jiang & Yu, 2019: 2). The environmentalists claim that development without proper management of natural resources and the environment is not sustainable for the current and future generations. On the other hand, poor nations and people cannot understand the need to save resources unless there be promises and immediate realization of economic development (Brechin & West, 2015: 77).

Inequality in protected areas can exacerbate the local people's negative attitudes towards these areas while justice can be a condition for effectiveness of these areas (Dawson et al., 2018: 1). Decision to protect or exploit a natural resource is highly dependent on social and economic values from which the society is or may be formed. Ecosystem Services (ES) are provided through structures, systems, or ecological functions, which directly or indirectly contribute to human's welfare. Ecosystem services are defined based on human's needs and validated by humans; therefore, they are effectively produced by people and nature (Vos et al., 2016: 2).

Economic requirement of protected areas for the local population and lack of appropriate alternatives for them have resulted in more incompatibilities in these areas; thus, establishment of protected areas can bring about considerable economic costs at the family level because these areas restrict some traditional resources (Lu et al., 2007: 409-410).

Research background

Protected areas (PA) play an important role in providing ecosystem services, economic resources, and consequently human welfare. This argument indicates that protected areas can improve human welfare and local livelihood. Protected areas have positive effects on local people's living and the families living within or around these areas have more income than those living in the surrounding areas. In this sense, there is a positive and significant relationship between establishment of protected areas and improved economic conditions. Protected areas have an important role in rural families' living through attracting tourists (ecotourism, swimming in the

ocean, sport tourism), development of infrastructures, more access to non-timber forest products (NTFP), hunting, and livestock grazing (Estifanos et al., 2019; Ristic et al., 2019; Jiao et al., 2019; Saviano et al., 2018; Cumming, 2016; Bacarreza, Hanauer, 2012; Nlom, 2011; Sims, 2010).

On the other hand, other analyses have indicated that there is no relationship between poverty indicators and exploitation of protected areas; in other words, if there is poverty in rural protected areas, it is due to the inhabitants' isolation not the restrictions imposed by protected areas (Foerster et al., 2011). Nevertheless the role of protected areas in conserving biodiversity and local sustainable livelihood causes many problems for the local people in many protected areas. In these areas, conservative plans restrict local activities and the local people are forced to migrate. They also have negative effects on the local people's traditional life. Protection and local sustainable living are interdependent. The local poor people whose living depend on protected areas lose access and exploitation of natural resources such as fresh water and foods. In this context, the studies have indicated that protected areas have no positive effect on local economies and users' living (Chen, 2019; Nguyen, 2019; Nolte et al., 2013; Mukul et al., 2010; Treves et al., 2005). Regarding the relationship between tourism in protected areas, which can be one of reasons for economic value of these areas, and poverty in these areas, it has been revealed that introducing these areas as areas that attract tourists increases competition over natural resources and leads to conflict in using these resources, destruction of the environment and thus increased poverty. In addition, establishment of ecotourism resorts has led local communities to lose their access to parts of their lands. That is, the development of economic and tourism enterprises has prevented the local communities from access to pastures for grazing livestock and has even reduced its available land for grazing (Wishitemi et al., 2015).

Developing ecotourism in protected areas, as a strategy for economic independence, is considered as a guarantee to protect and facilitate local management; however, improper exploitation and illogical use of natural resources in protected areas cause a variety of problems for the local people (Bazmara Baleshti et al., 2017).

Nevertheless, protected areas both impose costs (displacement that in turn causes landlessness, unemployment, homelessness, marginalization, food insecurity, social chaos, inter-ethnic conflict, conflict between human and wildlife, and damage to livestock and land) and have advantages (support and regulation services such as production and maintenance of soil, raw materials, hydrological cycle stability, runoff control, soil erosion prevention, wood extraction, herbal plants, non-timber forest products, and ecotourism) for local communities living in these areas (Coad et al., 2008).

Regarding the economic and social effects of protected areas, it has been revealed that improper and ineffective policies can impose costs to local people. The access to natural resources may be restricted, local power structures as well as social-traditional values and behaviors may be changed. Fully protected areas with top-down management structures have major effects on people's living and cause conflict between local communities and management of protected areas. Therefore, it has been indicated that the top-down approach for managing protected areas, as used before the 1970s, not only unjustly ignored inhabitants, but also did not even provide appropriate protection for these areas; as a result, the comprehensive, participatory, and sustainable down-top management method has been used since then (Mach et al., 2020; Hummal et al., 2019; Clark et al., 2008; Coad et al., 2008; White, 1993). Also, protected areas are also more effective in countries with less corruption and democratic government that protects the property rights and institutions (Abman, 2018).

However, in cases where the establishment of such areas is performed under strict regulations, livelihood and consequently economic welfare, health, and social life of local communities are at risk. Therefore, studies have indicated that strict approach in protected areas not only

prevent illegal use of natural resources by local people, but intensify exploitation of these areas. Therefore, an approach should be adopted that support people (Oldekop et al., 2015; Karko, 2013; ALkan et al., 2009).

Moreover, specifying an area as a protected area does not lead to effective protection but protected areas are effective only when not only protect these areas but also help the local people to use their environmental, social, and economic advantages (Garcia et al., 2019; Kolahi et al., 2013; Rodriguez, Vega, 2012). The incentives provided in protected areas have improved livelihood of some families, which depends on local people's access to resources, the characteristics of the incentives, and proper interaction between people and the government (Karki, 2013; Liu et al., 2012). Ignoring the local people's rights in protected areas can lead them to resists and oppose. This can result in negative outcomes in protecting the areas, which threatens the protection plans in long run. Therefore, communicating local people's ideas and focus on local needs ad priorities is an important way to get aware of people's rights in protected areas (Pelletier et al., 2019). A participatory approach between authorities and local people can contribute to speeding up the protection of protected areas through identifying inhabitants' priorities, and provide opportunities to improve social and protection outcomes (Pelletier et al., 2019; Oldekop et al., 2015; Izurieta et al., 2011; Hayes, 2006).

In addition, local people should not be forced to move from their lands because it leads to adverse economic, social, and cultural effects. Thus, when the local people are forced to move from protected areas, it leads to the conflicts between local communities, authorities, and officers of the protected areas (Bhardwaj, Kumar, 2018; Soltau, Brockington, 200; Colchester, 2004). On the other hand, protection in these areas is achievable when it is under no official mechanism, and local communities take the responsibility for protection through local management (Ellis, Porter-Bolland, 2008). According to what was discussed, it can be concluded that 5 variables of inequality, livelihood, welfare, participation, and migration are effective on the villages of protected areas. These variables are greatly influenced by altitude and distance of the village from the protected area. In this sense, the conceptual model of the study is presented:

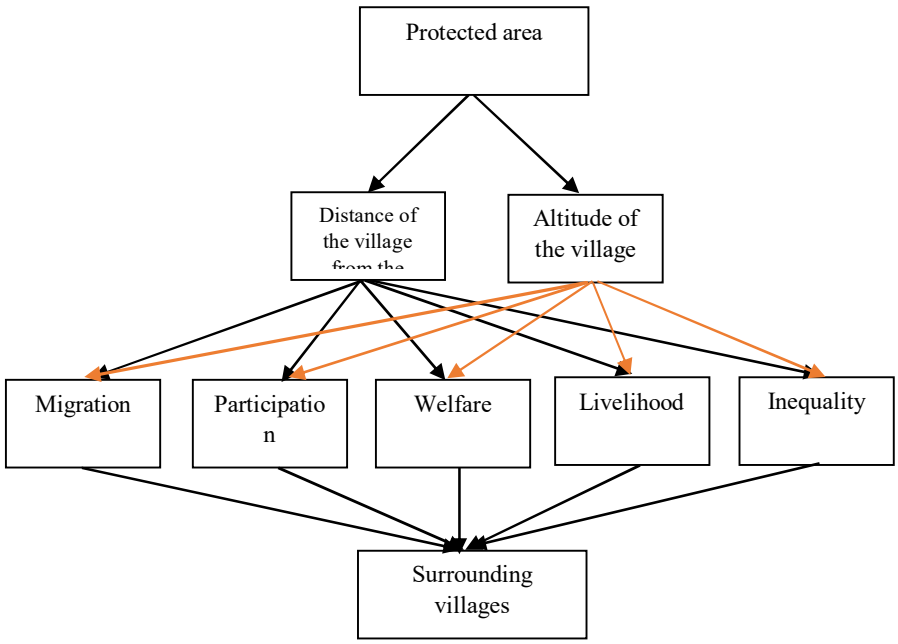

Figure 1. The conceptual model of the study

Methodology

The method used in this study was descriptive-analytical. It was practical in terms of purpose and was conducted as a survey. The protected areas of Badr and Parishan encompass parts of two provinces of Kermanshah and Kurdistan. The focus of this study was on the rural district of Baveleh in the city of Songhor, Kermanshah. This rural district includes 38 villages, of which 8 are located within the protected areas. All 8 villages were investigated in this study. The total population of these villages is 1291 people (353 families).

Since all members of the population had equal chance to be selected, random sampling method (simple random) was used in this study. The Cochran formula was used to calculate the sample size that obtained as 183.90. However, to round it up and cover possible errors and considering the members of Islamic councils, villagers, local trustees and local officials, the number was upgraded to 250 people (Table 1).

Table 1. The area under study

Village	Population	Family	Sample size
Charmle Olya	361	98	68
Varmoghan	46	12	9
Hajiabad	111	33	23
Meykhoran Mohammadaqa	207	58	40
Meykhoran Mohammad Sadeq	188	58	40
Meykhoran Sadat	31	8	8
Meykhoran Pir Ali Khan	208	47	34
Total		254	

The reliability of this study was 0.704. The validity of the study was confirmed by the geography and environmental experts. Figure 1 shows the area under study.

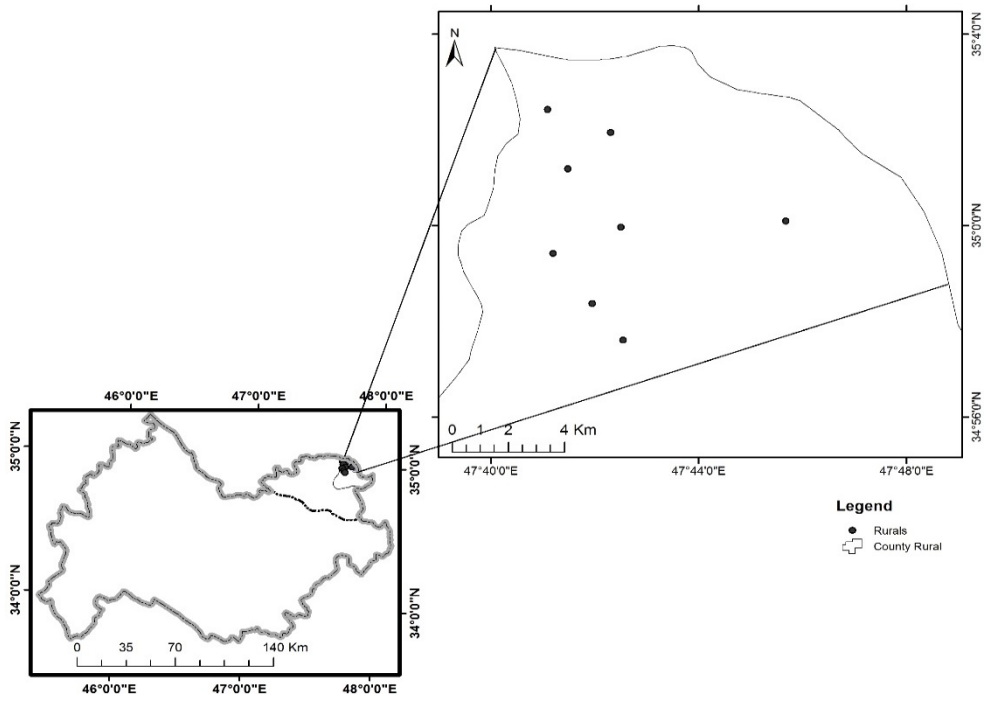

Figure 1. The area under study

According to Table 2, 99 (39%) villagers at the age range of 31-40 years old comprised most of the sample size. A number of 20 (7.9%) villagers were 51

years old and above, who consisted the smallest age group. In addition, 50 (19.7%) respondents were at the age range of 20-30 years old and 63 (24.8%) were at the age range of 41-50 years old.

Table 2. Respondents' age frequency distribution

Age	Frequency	Frequency percentage
Below 20 years old	22	8.7
20-30 years old	50	19.7
31-40 years old	99	39
41-50 years old	63	24.8
51-60 and above	20	7.9
Total	254	100

Gender is one of the nominal scales. Therefore, the table of frequency can provide general information about this variable. As seen in Tables 3 and 4, 160 (out of 254) (63%) respondents living in villages of protected areas, whose data are available, were male and 94 (37%) were female (Table 3).

Table 3. Frequency distribution of the respondents' gender

Gender	Frequency	Percentage
Male	160	63
Female	94	37
Total	254	100

Source: research findings, 2020

According to Table 4, the number of villagers living in the protected areas with diploma and under diploma degrees was 196 (2.77%) people. They included the largest sample size. The minimum sample size was related to the villagers with master's degree (4 respondents (1.4%)). Also, the people with associate degree (34 people (13.4%)) and bachelor (20 people (7.9%)) constituted the total sample.

Table 4. Frequency distribution of the respondents' level of education

Level of education	Frequency	Percentage
Under diploma and diploma	196	77.2
Associate	34	13.4
Bachelor	20	7.9
Master	4	1.6
Total	254	100

Source: research findings, 2020

Table 5 shows the employment status in the protected areas. According to this table, the largest sample size was related to occupations irrelevant to the protected areas (153 people (60.2%)). Also, unemployed people in the selected sample constituted 38.2% (97 people) of the total population. The people working in professions related to the protected areas were 4 (1.6%).

Table 5. Frequency distribution of employment status

Employment	Frequency	Percentage
Professions related to the protected areas	4	1.6
Irrelevant professions	153	60.2
Unemployed	97	38.2
Total	254	100

Source: research findings, 2020

As seen in this table, the income less than 1 million Toumans with 157 people (61.8%) constituted the largest sample size and the income over 5 million Toumans

with 4 people (1.6%) was the minimum size. Also, the incomes between 1-3 million Toumans and 3-5 million Toumans constituted 26.8% (68 people) and 9.8% (25 people) of the total samples size, respectively.

Table 6. Frequency distribution of the respondents' income

Income	Frequency	Percentage
Less than 1 million Toumans	157	61.8
1-3 million Toumans	68	26.8
3-5 million Toumans	25	9.8
Over 5 million Toumans	4	1.6
Total	254	100

Source: research findings, 2020

Analytical findings

As shown in Table 7, villagers have no appropriate access to basic goods and equipment for life, house and road. They also have no appropriate access to medications but are satisfied with their health. They have positive attitudes towards social communication and empathy with other villagers. They claimed the establishment of the protected areas has had little damage on their kinship. On the other hand, villagers have received little trainings about the protected areas. In general, they were not satisfied with living in the protected areas (Table 8).

Table 7. Welfare in the protected areas

No.	Items	Very high	High	Low	Very low	Mean	Attitude
1	Are you generally satisfied with basic goods and services (such as food, living conditions, and transportation) accessible for you and your family?	11.8	36.2	40.2	11.8	2.5197	Low
2	How satisfied are you with living in the protected areas?	4.7	46.9	40.6	7.9	2.5157	Low
3	Is access and purchase of the basic goods for your daily life in the protected areas convenient and affordable?	7.6	23.6	46.1	23.6	2.8661	Low
4	Can your family have access to essential facilities (such as health center and electricity) and services (such as transportation and education) in the protected areas?	3.1	26.8	52.8	17.3	2.8425	Low
5	Can your family have enough food to be healthy?	14.2	48.4	31.9	5.5	2.2874	High
6	Are you satisfied with your housing status in the protected areas (size and quality)?	13.0	47.2	32.7	7.1	2.3386	High
7	In terms of health issues, is access to basic goods and services such as food, water, and medicine safe in the protected areas?	3.1	27.2	50.0	19.7	2.8622	Low
8	Are you generally satisfied with your family's health status?	15.0	54.3	26.8	3.9	2.1969	High
9	Are you satisfied with your family's happiness and healthy mindset?	12.6	58.3	22.4	6.7	2.2323	High
10	How often can your family members do free time activities?	18.9	49.6	27.6	3.9	2.1654	High
11	Are you generally satisfied with your freedom of choice and actions in the protected areas?	9.4	46.5	34.3	9.8	2.4449	High

No.	Items	Very high	High	Low	Very low	Mean	Attitude
12	Are your family members treated equally in the protected areas, regardless of gender, tribe, race, language, religion, political beliefs, socioeconomic status, or other factors?	5.9	40.6	42.1	11.4	2.5906	Low
13	Do you have optional access to affordable health care services in the protected areas?	2.4	14.2	47.6	35.8	3.1693	Low
14	Do you like to have access to affordable education in the protected areas?	26.8	36.6	22.0	14.6	2.2441	High
15	How knowledgeable are you about the protected areas?	4.3	24.4	48.8	22.4	2.8937	Low
16	How many training sessions have you received about the protected areas?	2.8	2.0	50.4	44.9	3.3740	Low
17	Do you have optional access to high quality affordable housing in the protected areas?	3.1	22.4	55.1	19.3	2.9055	Low
18	How satisfied are you with the quality of facilities and infrastructures in the protected areas?	3.9	16.5	55.1	24.4	3.0000	Low
19	How satisfied are you with the quality of roads and transportation network in the protected areas?	2.8	14.2	57.5	25.6	3.0591	Low
20	Due to restricted socioeconomic or physical conditions in the protected areas, how often do you feel you want to help others but you cannot?	24.0	41.3	25.2	9.4	2.2008	High
21	Are you generally satisfied with your family's social communication with others in the protected areas?	30.7	51.2	13.8	4.3	1.9173	High
22	Do your family members participate actively in social activities of the village?	16.5	36.6	36.6	10.2	2.4055	High
23	Are others willing to help others in case of an unpleasant event?	33.9	45.3	12.6	8.3	1.9528	High
24	Has the protected areas caused problems in kinship systems?	7.5	20.9	52.0	19.7	2.8386	Low

Source: research findings, 2020

protected areas have created no occupational and income opportunities for them while their villages offer many tourism potentials. They showed interests in creating jobs related to the protected areas; however, the establishment of protected areas has had little impact on villagers' livelihood.

According to Table 8, the establishment of the protected areas has deprived local people from access to land, water, and pasturelands. While, a large part of villagers' living depends on hunting, grass, herbal and food plants. It also shows that losing such rights can reduce local people's interest in protecting these areas. On the other hand, it Villagers claimed that

Table 8. Livelihood in the protected areas

No.	Items	Very high	High	Low	Very low	Mean	Attitude
1	To what extent, is living in the protected areas at risk?	13.4	39.8	36.6	10.2	2.4370	High
2	What effect have the protected areas had on your quality of life?	13.4	25.2	45.7	15.7	2.6378	Low
3	To what extent, has the establishment of the protected areas caused the loss of land ownership?	18.5	35.4	31.1	15.0	2.4252	High
4	To what extent, has the establishment of the protected areas interfered with access to seasonal water points in your village?	11.0	3.0	40.9	11.0	2.5197	Low
5	To what extent, has the establishment of the protected areas deprived the local people from access to water and pasturelands in dry seasons?	12.6	40.9	40.9	5.5	2.3937	high
6	Has anyone attacked the wildlife in the protected area where you live?	7.5	18.9	57.9	15.7	2.8189	Low
7	Have the protected areas caused loss of assets without compensation?	11.4	22.8	48.4	17.3	2.7165	Low
8	Have the protected areas caused conflict between human and wildlife, and damage to livestock and land?	11.4	1.7	52.0	18.9	2.7835	Low
9	Is destruction of the environment severe in your village?	9.8	22.0	47.6	20.5	2.7874	Low
10	Is there alienation from decision-making in your village?	15.0	39.8	34.6	10.6	2.4094	High
11	Is hunting of minor importance for living?	7.1	19.3	30.3	43.3	3.0984	Low
12	Is collecting food plants of minor importance for living?	8.7	16.5	43.7	30.7	1.9684	High
13	Are grazing and collecting grass of major importance as an income source?	42.1	37.4	18.5	2.0	1.8031	High
14	Can the use of herbal resources be potentially important?	40.2	33.5	20.1	6.3	1.9252	High
15	Is removing food of minor importance for living?	4.7	27.2	43.3	24.8	2.8819	Low
16	To what extent, has the protected area hindered your economic activities?	7.1	20.9	55.9	16.1	2.8110	Low
17	In areas where people's living depends on natural resources, do the protected areas' effect on restriction of natural resources have negative effects on human's health?	1	22.4	53.1	11.4	2.6299	Low
18	Can losing traditional rights reduce people's interest in long-term supervision of these lands?	16.1	42.1	34.3	7.5	2.3307	High
19	Have the incentives granted in the protected areas improved living of some families?	2.4	25.2	51.2	21.3	2.9134	Low
20	Has the protection of areas deprived people of using some natural resources such as fresh water and foods?	10.6	34.6	44.5	10.2	2.5433	Low
21	Has the establishment of protected areas restricted local activities?	8.7	33.9	45.7	11.8	2.6063	Low
22	To what extent, has the protected areas have negative effects on animal husbandry?	12.6	31.5	40.9	15.0	2.5827	Low

No.	Items	Very high	High	Low	Very low	Mean	Attitude
23	Have the protected areas caused severe pressure on natural resources outside of these areas?	2.4	25.6	57.1	15.0	2.8464	Low
24	To what extent, are agricultural uses affected by the protected areas?	5.9	30.7	51.2	12.2	2.6969	Low
25	Is agriculture in the protected areas of minor importance?	9.4	19.7	43.3	27.6	2.8898	Low
26	To what extent, is land use change in the area you live?	7.9	31.5	37.4	23.2	2.7598	Low
27	Have the protected areas created job opportunities?	1.6	5.1	43.3	50.0	3.4173	Low
28	How difficult is finding a satisfactory job or doing livelihood activities in the protected areas?	26.8	37.8	16.1	19.3	2.2795	High
29	To what extent,, have the protected areas brought income for you?	1.6	6.7	35.8	55.9	3.4606	Low
30	To what extent, is your job related to the protected areas?	1.6	5.1	29.5	63.8	3.5551	Low
31	To what extent, have the profiteers harmed you?	1.6	21.3	53.1	24.0	2.9961	Low
32	To what extent, has the presence of non-native people harmed you?	8	10.2	61.4	27.4	3.1575	Low
33	Are you interested to create a business related to the use of natural resources in the protected areas?	16.5	33.5	33.9	16.1	2.4961	High
34	To what extent, does the protected area have the potentials for tourism businesses?	13.0	52.0	23.6	11.4	2.3346	High
35	To what extent, have the protection rules had negative effects on your life?	5.1	33.9	51.6	9.4	2.6535	Low
36	Has the establishment of the protected areas illegalized local people's most activities such as hunting?	16.1	35.8	35.4	12.6	2.4449	High
37	Has the establishment of the protected areas caused disturbance in conventional systems of environmental management?	5.1	11.0	65.4	18.5	2.9724	Low
38	Has the establishment of the protected areas caused social unrest, resistance, arson, social conflicts and the subsequent repression?	4.3	13.4	54.3	28.0	3.0591	Low

Source: Research findings, 2020

As seen in Table 9, the establishment of the protected areas forced some villagers living within the areas to move, resulting in consequences such as restricted access to resources, unemployment, poverty, the ineffectiveness of the principle of protection, and to some extent the marginalization of the villagers.

According to Table 10, the local people's opinions and experiences were not used in the management of the protected areas, while villagers believed that they are the best protectors, and ignoring their demands can result in their unwillingness to cooperate, and resist; therefore, it is believed that a participatory management needs to be performed. This is what has been ignored by the authorities.

Table 9. The dimension of displacement in the protected areas

No.	Items	Very high	High	Low	Very low	Mean	Attitude
1	To what extent, has the establishment of the protected areas caused displacement of rural communities from their ancestral lands?	9.4	18.5	59.8	12.2	2.7480	Low
2	Has the displacement caused restrictions in access to natural resources?	13.8	34.3	40.9	11.0	2.4921	High
3	Has the displacement of people from the protected areas led to impoverishment of the affected people?	19.7	29.5	43.7	7.1	2.3819	High
4	Does forced displacement from the protected areas lead to ineffective outcomes in long run?	23.2	37.8	29.1	9.8	2.2559	High
5	Has displacement led to marginalization?	11.0	36.2	42.9	9.8	2.5157	Low
6	Has displacement led to unemployment?	20.9	40.2	33.1	5.9	2.2402	High

Source: research findings, 2020

Table 10. The dimension of participation in the protected areas

No.	Items	Very high	High	Low	Very low	Mean	Attitude
1	To what extent, have the local people been involved in the management of the areas?	4.7	20.1	52.0	23.2	2.9370	Low
2	To what extent, have the local people been involved in the protected areas?	4.0	13.4	54.7	31.5	3.1732	Low
3	Can the local people be considered as the best protectors of these areas?	24.8	44.5	25.2	5.1	2.1850	High
4	Does the negligence of the local people's rights result in resistance and lack of cooperation?	26.4	39.4	26.4	7.9	2.1575	High
5	To make a balance between the use and protection of nature, should these areas be managed under a participatory method?	27.6	47.6	20.1	4.7	2.0197	High
6	Do local communities have a vital role in management and development of the environment due to their knowledge and traditional methods?	22.8	52.0	20.5	4.7	2.0709	High

Source: research findings, 2020

As seen in Table 11, the villagers' attitudes indicate that the benefits of the protected areas have been distributed unequally.

Table 11. The dimension of inequality in the protected areas

No.	Item	Very high	High	Low	Very low	Mean	Attitude
1	Have the benefits of the protected areas distributed unequally?	13.4	40.2	39.0	7.5	2.4055	High

Source: research findings, 2020

Table 12 shows the correlation between the variables of the research. This table indicates that the protected areas bring welfare, livelihood, displacement, participation, and inequality in rural areas.

Table 12. The correlation between the influential variables

Dependent variable	Independent variable	Correlation coefficient	Sig
Satisfaction of life in the protected areas	Welfare	**0.486	0.000
	Livelihood	0.001	0.992
	Displacement	*-0.153	0.015
	Participation	**0.233	0.000
	Inequality	*-0.141	0.025

The value of the regression coefficient was 0.516, indicating that this regression model can explain 0.516% of the variance. Beta coefficient shows the relative importance of the variables; that is, it shows which coefficient is of greater importance. In other words, the variable with greater beta value is more important and the variable with minimum beta is less important. According to this table, welfare is of greater importance and displacement is of minimum importance. Livelihood is in the second rank, and participation and, in the lower rank, inequality are less important than displacement (Table 13).

Table 13. Regression equation of the protected areas

	B	Beta
Constant value	0.485	
Welfare	1.043	0.473
Livelihood	0.021	0.012
Displacement	-0.207	-0.148
Participation	-0.005	-0.004
Inequality	-0.074	-0.085

Y=0.485+1.043x1+0.021x2-0.207x3-0.005x4-0.74x5

Satisfaction of life in the protected areas had a significant relationship with welfare; in other words, the more the welfare in the protected areas, the higher satisfaction of life will be in these areas. It also means that living in the protected areas can by itself increase the villagers' welfare. On the other hand, less satisfied are the villagers living within the protected areas, displacement or migration from the areas increases since it has direct effect on villagers. Decreased satisfaction of life in the protected areas can cause inequality and the sense of injustice in access to advantages or disadvantages of these areas. However, villagers will be more satisfied with their lives if they are more involved in the areas. In other words, it can be said that more satisfied are people with their lives, their sense of responsibility and participation will increase (Table 14).

Table 14. Comparing the means of the villagers in the effects of the protected areas

Variable	Chi square	Sig
Welfare	5.324	0.620
Livelihood	25.648	0.001
Displacement	13.668	0.057
Participation	11.247	0.128
Inequality	15.944	0.026

At this stage, the villages were ranked according to the VIKOR model. Table 15 shows that total effects of variables were calculated according to 5 variables of inequality, livelihood, migration, and participation (Table 15).

Table 15. The research variables in villages and their sum

Village	Inequality	Welfare	Livelihood	Migration	Participation	Total
Charmle	2.4877	2.3015	2.5145	2.5835	2.6176	12.5048
Varmoghan	2.2963	2.4444	2.5098	2.4489	2.1111	11.8105
Hajiabad	2.413	2.7101	2.7417	2.5843	2.087	12.5361
Meykhoran Mohammad aqa	2.3577	2.435	2.7461	2.5678	2.2439	12.3505
Meykhoran Mohammad Sadeq	2.4872	2.5251	2.6878	2.5726	2.4701	12.7428
Meykhoran Sadat	2.875	2.725	2.725	2.2917	2.6042	12.0768
Meykhoran Pi Ali Khan	2.5	2.5376	2.4637	2.4853	2.2549	12.2415

In the next stage, the values of usefulness (S), regret (r), and VIKOR index (q) were calculated (Table 16):

$S^{-}= 3.916658$

$S^{+}= 1.61024$

$R^{-}= 1$

$R^{+}=0.670124$

Table 16. Calculation of usefulness, regret, and VIKOR index

Village	Inequality	Welfare	Livelihood	Migration	Participation	S	R	Q
Charmle	0.7669258	1	0.820113314	0.002734108	0	2.649210	1	0.30882345
Varmoghan	0.8656989	0.285100354	0.936614731	0.44429255	0.899581606	3.935861	0.936615	0.21704923
Darre Vazm	1	0.66257379	0.836756374	0.0462747779	0.1954579721	3.891665	1	0
Hajiabad	0.1798341	0.935818299	0.0015580727	0	1	1.584910	1	0.4482174
Meykhoran Mohammad aqa	0.1893900	0.668476977	0	0.056390977	0.704297022	2.833935	0.8939	0.150275437
Meykhoran Mohammad Sadeq	0.7670122	0.47201889	0.206444759	0.1039986329	0.277987184	1.66657	0.1670123	0.898779067
Mekhoran Sadat	0	0	0.1584985836	1	0.025254429	1.61024	1	0.5
Meykhoran Pir Ali Khan	0.1648004	0.244250295	1	0.338345865	0.683565775	3.911241	1	0.817434808

Table 18 shows the VIKOR index ranking that indicates the status of the villages:

Table 18. The ranking of the villages

Village	Q	Ranking	Village	Q	Ranking
Charmle	0.30882345	4	Meykhoran Mohammad Aqa	0.502754371	7
Varmoghan	0.21704923	3	Meykhoran Mohammad Sadeq	0.987790678	8
Darre Vazm	0	1	Meykhoran Sadat	0.5	6
Hajiabad	0.4482174	5	Meykhoran Pir Ali Khan	0.174348088	2

Figures 2 and 3 are used to more effectively indicate the status of the villages according to usefulness (s), regret (r), and VIKOR index (q).

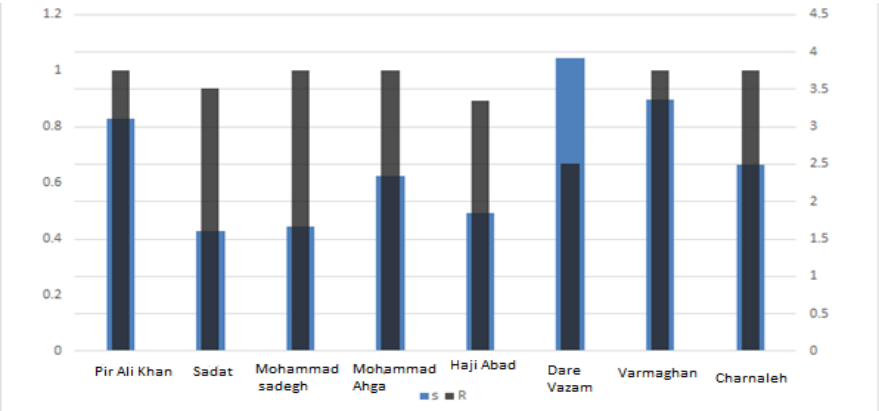

Figure 2. Usefulness and regret values

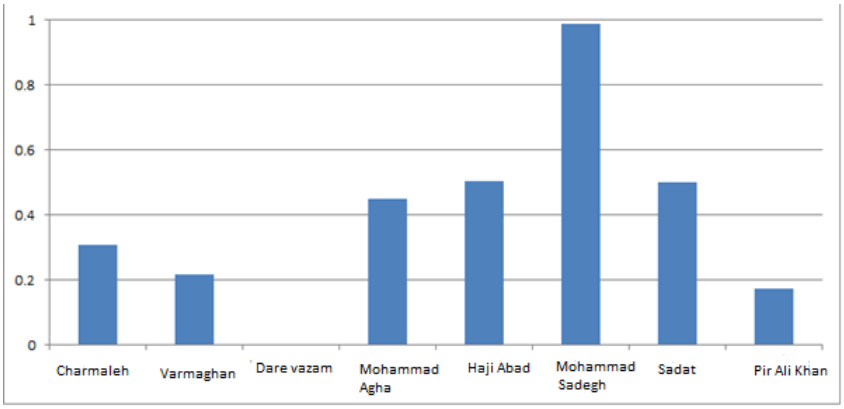

Figure 3. VIKOR index value

Considering the two variables of altitude and distance in the next stage, it was revealed that these two variables had a significant relationship with the effect of the protected areas on villages. In other words, the closer the village was to the protected areas, the more influenced it was. Also, the villages with higher altitude were more influenced by the protected areas. Table 18 shows the variables under study with regression equation.

Table 18. The relationship between altitude, distance, and social and economic variables of the study

Village	Reverse Q	Q	Distance (km)	Altitude (m)
Charmle	1	0	1.25	2144
Varmoghan	0.8	0.21705	0.5	2098
Darre Vazm	0.8	0.17435	2.38	2053
Hajiabad	0.	0.30882	1.29	2198
Meykhoran Mohammad Aqa	0.5	0.5	2.74	2021
Meykhoran Mohammad Sadeq	0.5	0.50275	4.55	1997
Meykhoran Sadat	0.6	0.44822	6.26	1951
Meykhoran Pir Ali Khan	0	0.98799	7.43	2000

Figure 4 shows the regression equation and the relationship between altitude and Q. Figure 5 shows the effect of distance on increased influence of the protected areas on the villages under study.

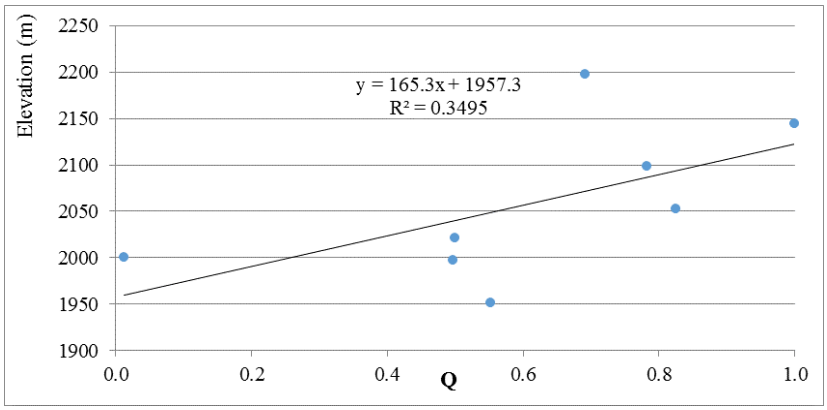

Figure 4. The effect of altitude on the research variabilities

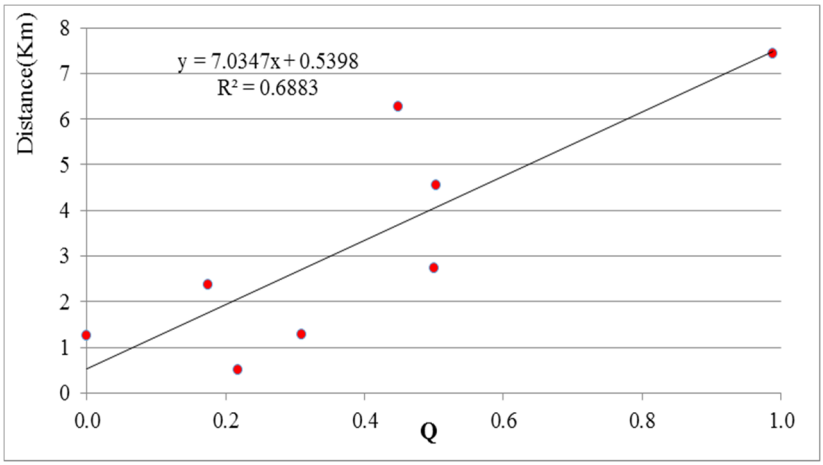

Figure 5. The effect of distance on the research variabilities in the protected areas

Figure 4 shows that the effect of altitude on the research variables in the protected areas is about 0.35, which has a direct relationship with increased altitude. Figure 5 indicates that the effect of distance on the research variables in the protected areas is about 0.69 with a direct relationship with increased distance. Since the farther villages are less influenced by the protected areas, the IDW method was used to interpolate Q values. To more effectively determine the effect of the protected areas, the data are presented in Figure 6 as follows.

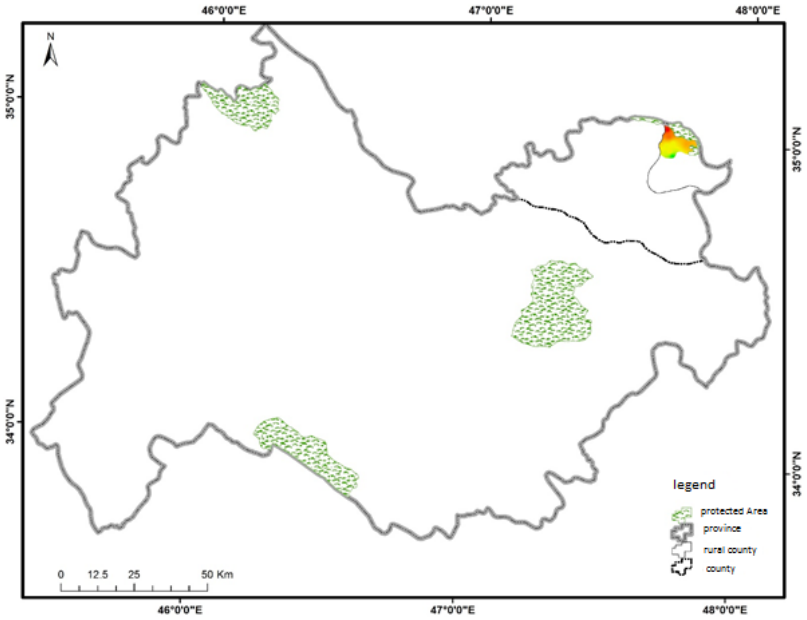

Figure 6. The protected area in the province of Kermanshah

Figure 7 shows that the closer and higher the villages are, the more effects the protected areas have on the surrounding villages.

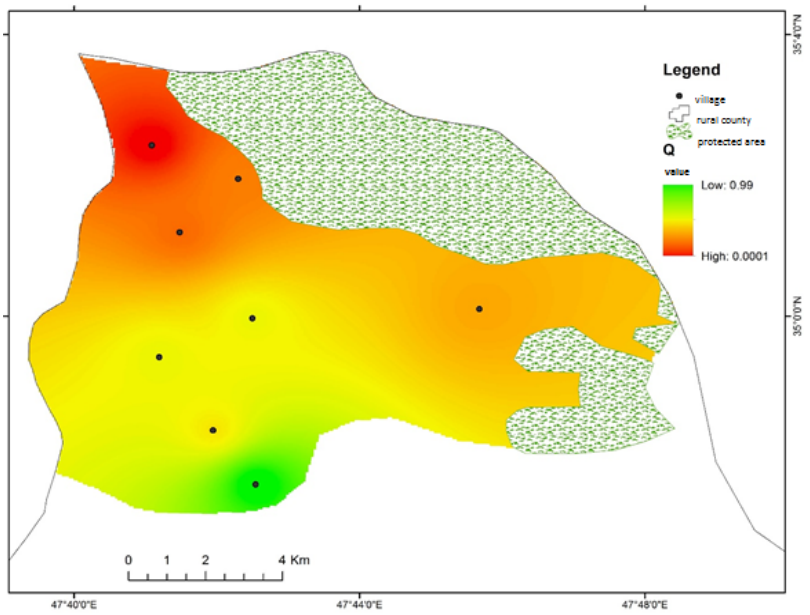

Figure 7. The effect range of the protected areas in terms of altitude and distance

Figure 8 is the final map depicting the effects of all variables.

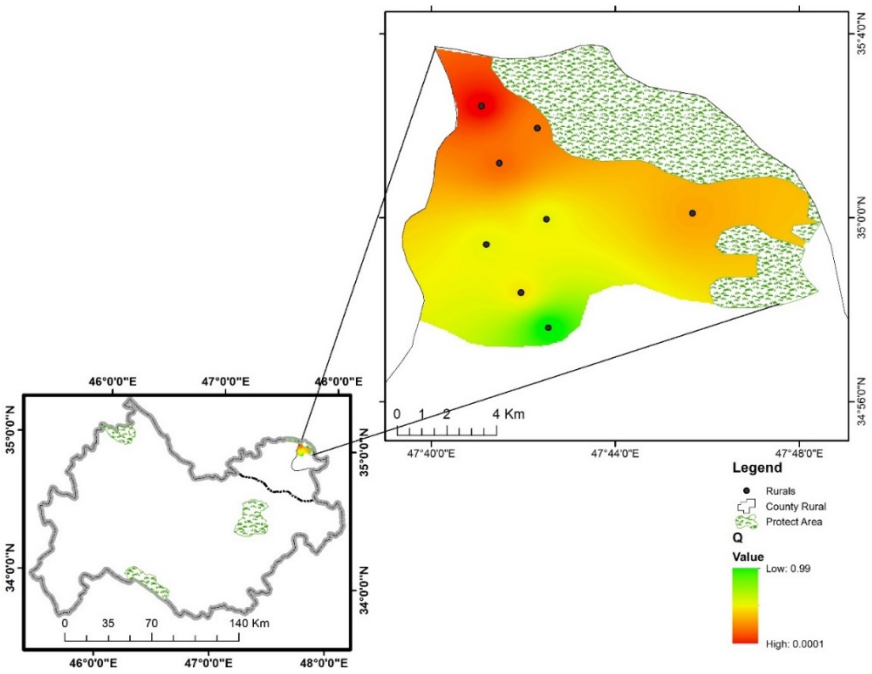

Figure 8. The final map of the influenced villages in terms of altitude and distance

Discussion

In line with the results of studies such as Jiao et al (2019), Ristic et al (2019), Estifanos et al (2019), Nlom (2011), Bacarreza & Hanauer (2012), Cumming (2016), Saviano et al (2018), and Sims (2010), the present study showed that the protected areas (PA) improve economics and, consequently, increases human welfare. Also, this study indicated that the protected areas can improve human welfare and local livelihood. Protected areas have positive effects on local people's livelihood, and the families living within or adjacent to

the protected areas have more total income than those living in the surrounding areas. Therefore, there is a positive and significant relationship between the establishment of these areas and development of economic conditions. The protected areas have an important role in rural families' living through attracting tourists (ecotourism, swimming in the ocean, sport tourism), development of infrastructure, better access to non-timber forest products (NTFP), hunting, and livestock grazing.

However, consistent with the results found in studies such as Nolte et al (2013), Nguyen (2019), Chen (2019), Treves et al (2005), and Mukul et al (2010), the present study showed that protected areas can cause problems for local people. The protection plans restrict local activities, force local people to migrate, and have negative effects on their living. Protection and local sustainable living are interdependent. The local poor people whose life depends on the protected areas lose their access to natural resources such as fresh water and foods due to protection. Therefore, it has been indicated that the protected areas have no positive effects on local economies and users' livelihood.

The present study had similar results to those found by Coad et al (2008) who believed that the protected areas impose costs (displacement that in turn causes landlessness, unemployment, homelessness, marginalization, food insecurity, social chaos, inter-ethnic conflict, conflict between human and wildlife, and damage to livestock and land) and have advantages (support and regulation services such as production and maintenance of soil, raw materials, hydrological cycle stability, runoff control, soil erosion prevention, wood extraction, herbal plants, non-timber forest products, and ecotourism) for local communities living in these areas.

In line with studies such as Clark et al (2008), Coad et al (2008), White (1993), Hummal et al (2019), and Mach et al (2020), this study found that improper and inappropriate policies can lead to various losses for local people. Access to natural resources may be restricted, local power structure and social-traditional values and behaviors may be changed. Fully protected areas with top-down management structures have major effects on people's living and cause conflicts between local communities and management of the protected areas.

This study, like Izurieta et al (2011), Hayes (2006), Oldekop et al (2015), and pelletier et al (2019), showed that the participatory approach between authorities and local people can facilitate the protection process of the protected areas and provide opportunities to improve social results and protection through identifying the inhabitants' priorities.

Another concern in protected areas is migration of the inhabitants. Like studies such as Colchester (2004), Soltai & Brockington (2007), and Bhardwaj & Kumar (2018), this study showed that local people should not be displaced due to protection of the protected areas because it can lead to many adverse economic, social, and cultural consequences.

Conclusion

This study indicated that the villagers' access to essential goods and equipment, appropriate housing, and road is not satisfactory. They also do not have proper access to medicine but are satisfied with their health status and have positive attitudes towards good social communications and felt sympathy with others. However, they expressed dissatisfaction from living in the protected areas.

The establishment of the protected areas has relatively deprived them from access to land, fresh water, and pasture, while they are mostly dependent on hunting, grass, herbal and food plants. It was also revealed that loss of such rights can reduce the people's interest in protecting these areas. On the other hand, it was noted that the establishment of the protected areas provided no job opportunity and income source for the villagers, while the villages have many potentials for tourism. The villagers would like to create businesses in these areas. In general, the establishment of the protected areas has had little effects on the villagers' livelihood.

The establishment of the protected areas has restricted some of the villagers living in the villages surrounding these areas, leading to restricted access to resources, poverty, the ineffectiveness of the protection and, to some extent, marginalization.

This study indicated that the local people have not been involved in the management of these areas, while the villagers claimed that they are the best protectors. Thus, disregarding their demands can lead them to resist and fail to cooperate. Therefore, it is believed that these areas need to be managed under a participatory approach, which has been ignored by the authorities.

Moreover, the findings showed that the benefits of the protected areas have been distributed unequally. In general, this study revealed that the protected areas resulted in welfare, livelihood, displacement, participation, and inequality in rural areas. According to the findings, among the variables of the study, i.e. inequality, welfare, livelihood, participation and migration, welfare attained the first rank of priority and displacement was ranked as the last one. Livelihood was in the second rank and inequality and participation were placed after displacement factor.

Satisfaction of life in the protected areas had significant relationship with welfare; in other words, the more the welfare in the protected areas, the higher the satisfaction of life. It also means that living in the protected areas can in turn increase the villagers' welfare. On the other hand, less satisfaction of life can increase migration or displacement since it has direct effect on the villagers. In addition, reduced satisfaction of life can be a reason for inequality and injustice in access to advantages and disadvantages of the protected areas. When people are more involved in managing these areas, they would be more satisfied of life; therefore, the more satisfied the people are with living in the protected areas, the higher their levels of responsibility and participation would be.

This study also showed that the two variables of altitude (about 0.35) and distance (about 0.69) had bearing on the impact of the 5 variables under study. In other words, the closer the villages were to the protected areas, the more effective they the variables would be. Similarly, the villages that were located at higher altitudes were more influenced by the 5 variables under study.

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