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Socioeconomic Impacts of Markhor (*Capra Falconeri Falconeri*) Trophy Hunting in Toshi Shasha Conservancy District Chitral Khyber Pakhtunkhwa, Pakistan

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Abstract:

Trophy hunting is the key program in contributing to distinct ecological and socioeconomic benefits at provincial and local levels. However, this program has provided some serenity that necessitates to be investigate. This study was conducted in Toshi Shasha conservancy district Chitral with the aim to examine socioeconomic impacts of markhor (*Capra falconeri Wagner 1839*) trophy hunting. Focus Group Discussions (FGDs) were conducted to collect data on trophy hunting. The results reveal that 39 markhor were hunted over 18 years. Trophy hunting on average generated US\$ 123255 annual income. Out of the gross income 80 % share of the community was invested in community development through implementation of 50 projects beside saving a balance conservation fund of Rs.61.385 Million (US\$ 385463). The remaining 20 % from the gross income contributed to the government.

Keywords: Markhor trophy hunting, Socioeconomic impacts, Toshi Shasha Conservancy, Chitral district, Khyber Pakhtunkhwa, Pakistan

1. Introduction

Implementation of suitable and scientific trophy hunting programs provides several socioeconomic and ecological benefits. However, trophy hunting has arose as an arguable hot issue with in the world due to its overwhelming socioeconomic and ecological consequences (Angula, H.N. et al. 2018). The pros and cons related with trophy hunting are changeable in diverse environmental locations (Naevdal, E. et al. 2012). There are several instances with in which trophy hunting can make income for the conservation community (Naevdal, E. et al. 2012) and benefits in some countries (Angula, H.N. et al. 2018). In certain circumstances, trophy hunting produces rare benefits for the community (Yasuda, 2011), and income made by trophy hunting is not allotted correctly to the community serving in management of trophy animals (Nordbo, I. 2017). A frequent challenge with trophy hunting is inappropriate quota for trophy hunting (Caro, T.M. 2009). There are additional barriers reported to trophy hunting, containing number of suitable permits (Lindsey, P.A. 2016), trophy size being not linked to its value (Palazy, L. 2011), and scarcity of limits on the age of trophy animals (Lindsey, P.A. et al. 2013). The significances of trophy hunting contain population sex ratio due to choosy harvesting of considerable males (Aryal et al, A. 2016), varying population dynamics (Milner, J.M. 2007) decrease of focus on trophy animals (Packer, C. 2009) loss of natural variety and inherent variations (Crosmary W.-G, 2013). Altogether of these can finally outcome in loss of the wildlife. (Rashid W. 2020). However, the principles and concept of community-based management or co-management of protected areas are recognized in different countries. The conservation of natural resources including wildlife in protected area provides economic incentives to the local communities besides preservation of landscape (Michel et al. 2015). The trophy hunting plays a significant role in conservation of endangered species and initiate income generation without affecting the growth of wildlife (Bond et al. 2004). Trophy hunting provides socioeconomic benefits to communities and reduces poaching (Ali et al. 2015; Weinberg et al. 1997). Trophy hunting creates economic incentives from different land tenures, including communal land, private land and stateland (Baldus & Cauldwell, 2004; Lindsey et al. 2006). Some conservation measures for markhor is community-based management (Hammer et al. 2008). There have been few studies on the trophy hunting in district Toshi Shasha conservancy Chitral. Therefore, the current study was conducted on socioeconomic impacts of markhor (*Capra falconeri falconeri*) trophy hunting in Toshi Shasha conservancy district Chitral. Our outcomes may enable conservation organization for effective management of trophy hunting in other related localities.

2. Materials and Methods

2.1. Study Area

The study area, Toshi Shasha conservancy is situated in district Chitral (fig- 1). Toshi Shasha conservancy is recognized for markhor trophy hunting. Toshi Shasha is located at a distance of 16 kilometers from Chitral town. The area

is located within 35° 57' 13" N and 31° 48' 51.70" E. The conservancy has borderlines with ridge between Shoghor in the north, in the west with Chitral Gol National Park, in the east with watershed line between Lotkoh River and Mastuj River and in the south with Lotkoh and Chitral. The area was declared as a game reserve with an area of 1045 hectares in 1979 but due to rich biodiversity of the adjacent areas on December 16, 1998 the area was re-designated as community game reserve with an area of 20,000 hectares (Aliet al.2015). The area is dry temperate and support species such as *Artimisia brevifolia*, *Quercus ilex*, *Ephedra gerardiana*, *Indigofera* species., *Prunus amygdalus*, *Pisticia integerrima*, *Abies pindrow* (*Picea smithiana*, *Cedrus deodarafound* in the area (Ali and Qaiser 2009, Khan et al.2002 and Ashraf et al. 2014).

2.2. Methods

The methodology used by Moser and Kalton 1971, Shackleton, 2001 was used during March 2, 2015 to September 15, 2015 for collection of data. There are wildlife conservation community organizations in the study area. Each organization comprises of an executive body designated by members. The members are selected by means of one member per household. There are 12 community organizations with executive body members 164 (10%) of the community members 1691 (table-2) representing total population of the study area. In this context a total of 16 respondents (10 %) of the executive body were interviewed. (Table-2). We used Focus Group Discussions (FGDs) and household interviews for data collection with well-developed questionnaires. FGD is frequently adopted as a tool to gather scientific data from communities and individuals about a particular theme (Nyumba, T.O et al, 2018; Chakraborty and Gasparatos2019) and is also used in conservation sciences. FGD is typically used for assessment of organizational interventions or strategies which are previously in place (Mukherjee, N. 2018). Therefore, FGD tool was preferred for this study due to the causes including; FGD gives the diverse stakeholders (local community, field staff) a chance to deliberate the conservation concerns in a non- informative way. FGD is accommodative in admitting the dialogue to advance slowly, thus encouraging disclosing of facts and viewpoints and can remark comprehensive data about markhor trophy hunting.FGD can improve the data gained from household question and answer session and special records (trophy hunting data) with extra data which is supplementary representative of the base condition. Consequently, a total of four FGDs were accomplished: one with Toshi Shasha conservancy community staff (community watchers); another with the conservancy officials (Ranger, Deputy Rangers, watchers); the third and fourth with the community (executive body members)that were organized in the main villages of Toshi (table-2).For the community FGDs, a total of 18 community members were selected from 12 main community organizations. The, FGD along the conservancy officials and community staff of the conservancy was managed to judge their insight about trophy hunting and its evolving challenges in conservancy. Furthermore, records of trophy hunting in the past 18 years incorporating number of markhor hunted and revenue created (table-3), projects implemented (table-4) community fund (table-5), were received from conservancy executive bodies of the conservation organizations.

3. Results

3.1. Conservation Impact of Trophy Hunting

The FGDs showed the opinions of the local community members pertaining to trophy hunting. Trophy hunting has altered the outlook of the local community to wildlife conservation in an incompatible way.

3.2. Opinions Concerning Increase in Markhor Trophy

The community FGDs which make 45% of all the FGDs participants approved that the number of markhor should increase in the study area (Table 1). They look at the financial advantages from the trophy hunting because among the main reason for the encouraging approach in the community (table-1).

3.3. Opinion about Number of Trophy Hunting

The community FGDs and the conservancy officials FGDs which constitute 70 % of the FGDs participants exposed that the permits should increase. This might be due to the increase in markhor population and they are optimistic about economic benefits from the trophy hunting (table-1).

3.4. Opinions about Continuity of Trophy Hunting

All the participants in the conservancy officials and community FGDs (70% of all FGDs) reveal that trophy hunting had created financial benefits for the community and improved community livelihood besides protection of biodiversity should be continue as a whole (table-1).

3.5. Opinions about Benefits of Trophy Hunting

All the participants (100%) in all the FGDs agreed that the trophy hunting had supported the community in terms of livelihood improvement, jobs opportunities and protection of the biodiversity (table-1).

3.6. Opinions about Disadvantages of Trophy Hunting

The conservancy official FGD (30% of FGDs) mentioned that the trophy hunting program had resulted to an increase in markhor population which might have negative impacts on plant abundance and density (table-1).

3.7. Opinions Disputes with in Community Organization

The participants in the conservancy officials FGD and conservancy community staff FGD which constitutes 55% of all FGDs participants pointed out that disputes within the community organizations occur on gaining power for managing the resource. This may hamper the community development (table-1).

3.8. Opinions about Grazing of Markhor in Agricultural Fields

The participants (70% of all FGDs) in the conservancy community FGD and community FGD approved that Markhor graze in agriculture fields during winter when there is scarcity of food with in the habitat(table-1).

3.9. Opinion about Compensation for Agricultural Crops from Community Fund

All the participants (100%) in all FGDS agreed that the community obtain compensation from community fund generated from the revenue of the markhor trophy hunting. They reveal that the community receive compensation on case to case basis among damages occurred due to grazing of markhor in agriculture (table-1).

3.10. Opinions about Projects from Community Fund

All the participants (100%) in FGDs agreed that the projects are funded from the community. The community implement project and the conservancy officials monitor the quality, quantity and outcomes. These projects are designed for the welfare of the community and conservation of wildlife(table-1).

3.11. Revenues from Markhor Trophy Hunting Program

Trophy hunting of markhor was introduced into Toshi Shasha conservancy in 1998. The trophy hunting season in Toshi Shasha conservancy starts out at the beginning of December and finishes in late March. A total of 39 markhor were lawfully hunted being trophies in the past 18 years. The highest number of 4 markhor hunted per year during the year 2003-4, 3 hunts per year during 1998-99 and 2002-3 while 2 hunts carried out each year during 1999-2000 and 2004-5 to 2014-15. However, a single markhor was hunted each year during 2001-2 and 2015-16 (table-3). Trophy hunting of markhor had produced an overall revenue of US\$!The Formula Not In Table in the past 18years. Share of the community was recorded as US\$!The Formula Not In Table (80%) and the share of the government was found US\$!The Formula Not In Table (20%). The total earnings were divided as 20 % government and community 80 %. (table-3) Thefee for hunting a single markhor was dissimilar during the past 18 years. Initially, the fee per hunt was low, but it mostly increased in the coming years. The higher rate per hunt US\$ 98000 was recorded during 2014-15 followed by US\$ 97500 during 2013-14 and US\$ 95500 during 2014-15. In the remaining years it ranged between US\$ 15000-92000 (table-3).

3.12. Community Projects

We studied community projects in Toshi Shasha conservancy completed in the duration of 1998-99 to 2015-16 (table-4) There are 50 projects designed for community livelihood and conservation. The cost of the projects was met with in the revenue from markhor trophy hunting. The top priority of the community among the projects was on sanitation and drinking water. The 2nd priority was construction of girls' and boys' schools and the 3rd priority was hydel power stations, electricity and electricity transformers while the remaining projects include hiring of wildlife watchers and construction of suspension bridges.

3.13. Community Balance Conservation Fund

We also studied the remaining fund of markhor trophy hunting among the community bank accounts during 2015-16 (table-5). A gross amount of Rs.61.385 Million (US\$ 385463) was recorded from the 12 community bank accounts. We found the highest amount Rs. 11.926 Million was recorded with VCC Seen, followed VCC Koju Payeen (Rs. 8.294 Million) and VCC Bulyough (Rs. 7.96 Million) while the amount with the remaining VCCs was found ranged between Rs. 1.352 Million to Rs. 4.783 Million.

4. Discussion

Markhor trophy hunting in Toshi Shasha conservancy has made a total revenue of US\$!The Formula Not In Table from 1998 to 2016, which on average is equal to yearly income of US\$ 123255. The local community gained on average 80% of the revenue with US\$ 98604 per year. This appears to be considerable earnings for the local community, assumed the conversation rate. The community has acknowledged trophy hunting due to the financial advantages it delivers. Numerous researchers conducted similar studies on trophy hunting. Trophy hunting is carried out in 23 countries of Africa (Lindsey, P.A. et al. 2007). South Africa boasts the well-built hunting industry by making US \$ 100 million income due to the trophy hunting every year and Namibia creates US \$ 28.5 million each year (PHASA, 2006) keep on by Zimbabwe and Botswana and produces US \$ 16 and US \$ 20 million per year, respectively (Chardonnet, 2002). Humavindu and Jonathan (2003) studied trophy hunting in Namibia and reported number of trophy animals hunted, income generated, %age of trophy hunting in tourism, payments to the poor and retained by the government. Trophy hunting is yet related in wildlife conservation and development of rural communities particularly in creating income where conservation funding is not enough due to financial restrictions (Muposhi, V. K. et al. 2016). David, H. et al. 2018 reported perception of the local community members on trophy hunting benefits. The essential aim of the trophy hunting programs in Pakistan is to safeguard large mammals and their habitats involving caprine, and to deliver sustainable benefits to the community for their participation in conservation actions, the program is emerging and successful but requirements necessities encouragement for sustainable conservation (Shackleton 2001).

5. Conclusions

The markhor (*Capra falconeri falconeri* Wagner) trophy hunting is important economically. The trophy hunting creates US\$ **The Formula Not In Table** in total production. Trophy hunting add 80% of the entire revenue to community. Trophy hunting also makes payment to the government as 20 % of the total income made. Trophy hunting also plays a key role as a producer of revenue and sponsor to development, and it delivers monetary incentives for financings in wildlife conservation. This study may be important for other similar areas in Pakistan. On the other hand, additional comprehensive study on the financial features of trophy hunting is desirable. Specifically, information on the economic properties of demand for hunting experiences would offer imperative indicators for planning and policy.

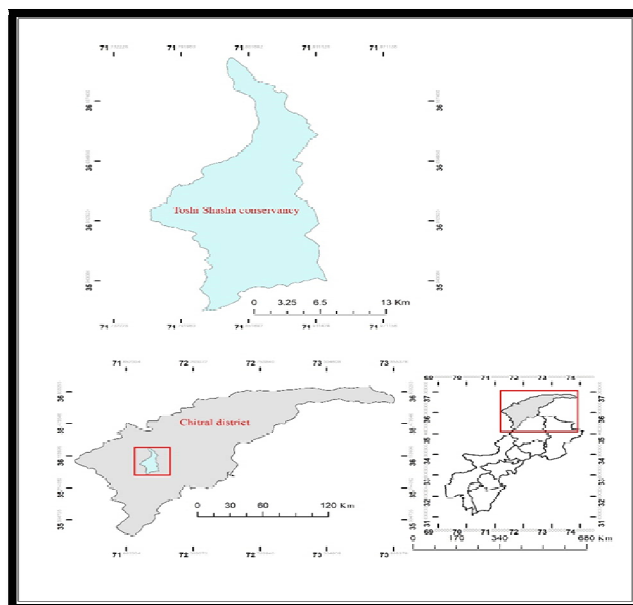


Figure 1: Location of the Study Area Toshi Shasha Conservancy Chitral

Category	Conservancy officials FGD 1	Conservancy community staff FGD 2	Local community		Sub-Total (FGD 3 & FGD 4)	Total	% age out of 40 participants
			FGD 3	FGD 4			
No. of participants	12	10	10	8	18	40	-
Age range (years)	30 to 55	22 to 45	25-50	30-65	-	-	-
Location of FGDs	Toshi	Toshi	Toshi	Toshi	-	-	-
Gender	All Males	All Males	All Males	All males	-	-	-
Number of Markhor should increase	0/12	0/10	10/10	8/8	18/18	18/40	45
Number of trophy hunting permits should increase	10/12	0/10	10/10	8/8	18/18	28/40	70
The trophy hunting should continue	10/10	0/10	10/10	8/8	18/18	28/40	70
Benefits of trophy hunting	12/12	10/10	10/10	8/8	18/18	40/40	100
Disadvantages of trophy hunting	12/12	0/10	0/10	0/8	0/18	12/40	30
Disputes with in the community	12/12	10/10	0/10	0/8	0/18	22/40	55

organization							
Grazing of Markhor in agricultural fields	0/12	10/10	10/10	8/8	18/18	28/40	70
Compensation for damage of agricultural crops	12/12	12/10	10/10	8/8	18/8	40/40	100
Projects implemented	12/12	10/12	10/12	8/8	18/18	40/40	100

Table 1: Structure and Opinions of the Focus Group Discussions (Fgds) Participants

S. No	Name of community organization	Members per house holds	Community organizations executive body members
1.	Pursan	250	18
2.	Bukthuli	72	12
3.	Oghder	81	8
4.	Kasat	25	10
5.	Bulyogh	53	15
6.	Kohra Lust Shali	20	8
7.	Seen	300	32
8.	Alburhan	20	5
9.	Kuju Payeen	100	14
10.	Shoghur	70	10
11.	Siwakth	150	18
12.	Madashil Karim Abad	550	14
Total		1691	164

Table 2: Vccs/Villages, Households and Vccs Executive Members in Toshi Shasha Conservancy Chitral

Year	No. of hunts	Fee US \$ Per hunt	Fee Realized in US\$	20% Govt: share in US\$	80% Community share in US\$
1998-99	3	15000	45,000	9000	36000
1999-2000	2	22150	44,300	8860	35440
2000-01	3	27000	81,000	16200	64800
2001-02	1	28000	28,000	5600	22400
2002-03	3	30500	91,500	18300	73200
2003-04	4	33000	132,000	26400	105600
2004-05	2	45000	90,000	18000	72000
2005-06	2	52500	105,000	21000	84000
2006-07	2	57000	114,000	22800	91200
2007-08	2	79000	158,000	31600	126400
2008-09	2	81150	162,300	32460	129840
2009-10	2	77500	155,000	31000	124000
2010-11	2	80500	161,000	32200	128800
2011-12	2	92500	185,000	37000	148000
2012-13	2	90000	180,000	36000	144000
2013-14	2	97500	195,000	39000	156000
2014-15	2	98000	196,000	39200	156800
2015-16	1	95500	95500	19100	76400
Total	39	-	2,218,600	443720	1774880

Table 3: Revenue Generated from Markhor Trophy Hunt during 1998-99 to 2015-16 in Toshi Shasha Conservancy Chitral

S. N	Project title	No. of projects
1.	Sanitation	04
2.	Drinking water supply	07
3.	Construction of girl's school	03
4.	Boys schools	03
5.	Hydel power stations	05
6.	Electricity meters	04
7.	Electricity transformers	01
8.	Hiring of wildlife watchers	04
9.	Hiring of school teachers	01
10.	Flood protection walls	01
11.	Suspension bridges	04
12.	Link roads	02
13.	Maintenance of jeep able road	01
14.	LPG Agency	01
15.	Loan to students	01
16.	irrigation channels	02
17.	Mosques	02
18.	Provision of compensation for agricultural crops	03
19.	Community halls	01
	Total	50

Table 4: Projects Implemented Out of the 80% Community Share in Toshi Shasha Conservancy Chitral during 1998-99 to 2015-16

S. N	Name of community organization	2015-16(Million Rs.)
1	Madashil Karim Abad	4.147
2	Siwakth	4.338
3	Seen	11.926
4	Al-Burhan	5.008
5	Bokhtuli	4.008
6	Bulyough	7.96
7	Kasat	3.383
8	Shoghore	4.021
9	Koju Payeen	8.294
10	Parsun	1.352
11	Oughderh	2.165
12	Khoralasht	4.783
	Total	61.385

Table 5: Community Balance Conservation Fund in Toshi Shasha Conservancy Chitral During 2015-16

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