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Local People's View Towards Wildlife Conservation and the Misuse of Natural Resources in Jorgo-Wato Protected Forest, Western Ethiopia

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Abstract: The study investigated the attitudes of local people towards wildlife conservation in Jorgo-Wato Protected Forest. Data were mainly collected using questionnaire in the form of interview from households (n=282) located at a distance of five kilometers from the forest, group discussion and direct observation. The study revealed that the local people had inadequate awareness about the diverse significance of wildlife beyond its domestic use. The attitudes of households towards wildlife conservation varied between gender and residency periods, but not varied between occupation and educational levels. The majority of respondents mentioned that fuelwood (95.6%), livestock grazing (86.0%) and construction materials (81.4%) were commonly used from the forest. Unrestricted access into the forest and resource extraction, debarking trees for beehive construction and to reduce shade over the coffee plantation had extremely threatened the forest. Hence, local community's understanding should be improved on wildlife conservation and natural resource use patterns in Jorgo-Wato Protected Forest.

Key words: Attitude · Conservation · Natural Resource · Protected Area · Wildlife

INTRODUCTION

Most protected areas are threatened by anthropogenic pressures [1, 2]. Wildlife species gradually decline or vanish as wildlife habitat is cleared by anthropogenic activities [3]. Moreover, human activities affect the survival of wildlife by altering their behavioural activities, abundance, distribution and ranging patterns [4]. Animals ranging from invertebrates to larger mammals cause conflict with humans. In protected areas, however, larger animals move out of protected areas and cause conflicts with the local people compared to small mammals. The negative impacts of these animals on the livelihoods of the local community gradually create hostility against wildlife conservation [5]. Crop raiding is one of the most important factors that trigger conflict between wildlife and humans in sub-Saharan Africa [5, 6]. This has reduced the contributions of the local people in conservation activities in protected areas [7].

Human–wildlife interactions and perceptions have vital roles in the conservation and management of protected areas [8]. Perceptions are important because they reflect local people's typical way of life, feelings and their common practices in the community [9]. Knowledge of people's attitudes toward wildlife is important to evaluate the success of wildlife conservation policies. The local people's view has an important role in conservation activities and processes because it helps to design sustainable conservation strategies between local residents and protected area managements [10]. Knowledge of people's attitude also helps to predict the way people cooperate and impact conservation activities [11]. Human attitudes and values toward conservation and management of wildlife vary among and within different societies [12]. It was assumed that educational levels, gender [13], socioeconomic status [14], exposure to law enforcement [15], age [16] and residency periods [17] are known to affect attitudes of people towards wildlife conservation. Human–wildlife conflicts have also negatively affected people's attitudes in developing countries [18]. Knowledge of local people's attitude towards protected areas is very important to design conservation and management policies that involve the local people in the future. Therefore, studies that focused

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on the feelings and opinions of the local community towards the conservation and protection of wildlife will balance human-wildlife interaction and secure the sustainability of wildlife in the area. In order to involve local communities in wildlife conservation, it is necessary to know and understand their opinions and feelings towards protected areas [19]. Researches about the attitudes of local people towards conservation of protected areas has been well documented [20-22]. However, studies addressing on local people's view towards wildlife conservation and the misuse of natural resources in Jorgo-Wato Protected are forest lacking. This study tests the following two hypotheses: (1) local people's view towards wildlife conservation varies with gender, occupation, educational levels and residency period around Jorgo-Wato Protected Forest; (2) natural resources used from Jorgo-Wato Protected Forest are similar between adjacent Peasant Associations. Moreover, the study has documented the different ways of resource misuse patterns in the area.

MATERIALS AND METHODS

Study Area: The study was conducted in six Peasant Associations around Jorgo-Wato Protected Forest (JWPF) located between west Wollega and Bune Bedele Administrative Zones (Fig. 1). The Peasant Associations were selected because they shared large boundary with JWPF. The forest is situated between 8° 40' 20'' to 8° 48' 06'' N latitude and 35° 48' 01'' to 35° 56' 40'' E longitude. Elevation in JWPF ranges from 1, 780 to 2, 584 m asl. The study area comprises many undulating steep slopes, riparian gorges, rugged mountains and hills. Some of the large mountain peaks in the area includes Jorgo, Dalo, Dichiyi, Abuxo, Orio and Aba Cirri. JWPF is one of the moist evergreen Afromontane forests located in the western parts of Ethiopia. It mostly comprises natural and plantation forests. Jorgo-Wato Protected Forest is home for more than 20 medium and large sized mammals. JWPF is surrounded by six large Peasant Associations. The majority of ethnic tribes around JWPF were Oromo who are agro-pastoralists and lead their life through livestock farming such as cattle, sheep, goats, donkeys, poultry and crops such as teff, maize, wheat, sorghum, bean and pea.

Methods: Households located within approximate distance of 5 km from the forest were selected for questionnaire survey, assuming that they have easy access, increased activity and more information about resources used from the forest than distantly located residents [24]. All respondents were informed about the objectives of the interview. Household respondents involved were from six Peasant Associations: Harbu Abba Gada (*n*=56), Siba Selassie (*n*=33), Siba Kobi (*n*=27), Siba Dalo (*n*=65), Asgori Sora (*n*=38) and the Wato Golbe (*n*=63). Data were collected from household heads or any other individual older than 18 years. Peoples' views towards wildlife conservation in JWPF was collected through questionnaire in the forms of interview.

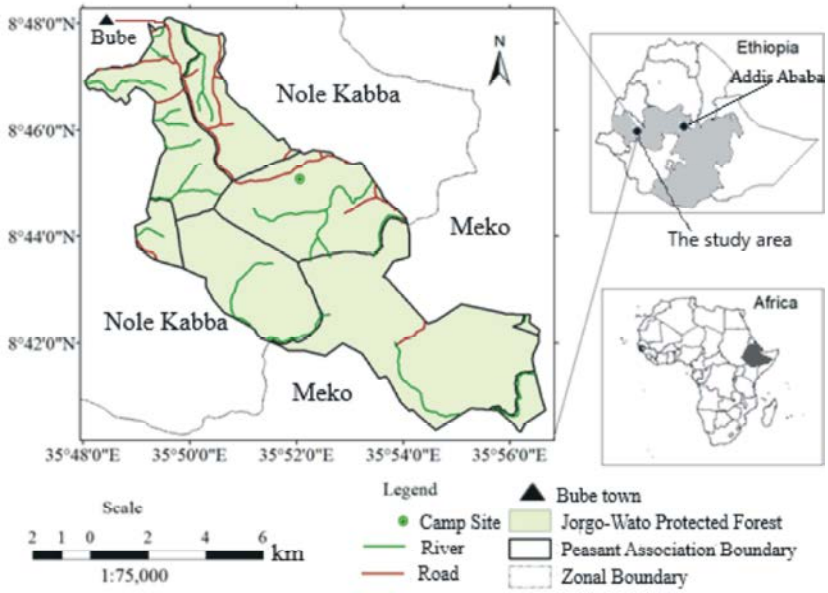

Fig. 1: Location map of JWPF, Source [23]

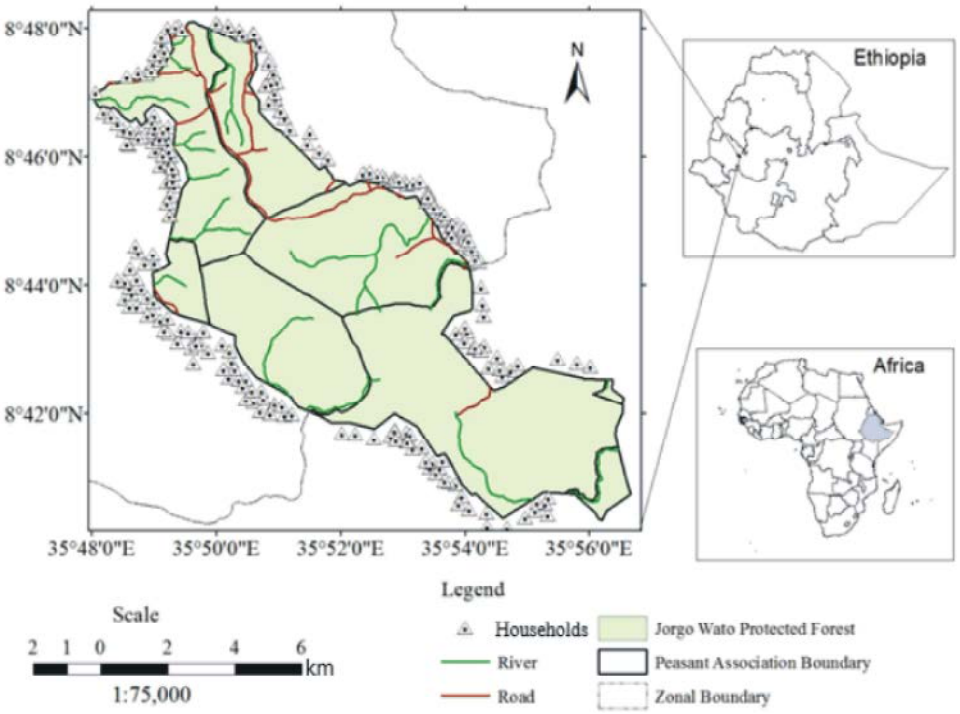

Fig. 2: Map of JWPF showing the locations of surveyed households

The interview was entirely conducted in *Afan Oromo*, native language of the local people. The locations of surveyed households were recorded and marked on the map of the study area (Fig. 2). The survey focused on the types of resources used from forest, their involvement in conservation activities, their awareness about wildlife laws and reasons for misuse of resources in the area. Similar questions were also presented for group discussant or elders who have been living around JWPF throughout their life to triangulate information from various sources. Furthermore, incidences of illegal resource uses were collected during field work and used to confirm the reality of data collected through questionnaire survey. Perceptions of respondents about resource use and wildlife conservation activities of JWPF were analysed by Chi-square test, descriptive statistic and text analyses.

RESULTS

The study revealed that respondents have inadequate knowledge about wildlife conservation laws and resource utilization from protected areas. Respondents stated that they support and cooperate in wildlife conservation with the little knowledge they had as far as their right to use resources from JWPF is insured. The attitudes of households towards wildlife conservation differed significantly between gender and residency periods, but insignificant between occupation and educational levels (Table 1).

Significantly, large number of respondents were aware about the importance of JWPF in their livelihood activities such as fuelwood, beehive materials, construction materials, farming tools, sources of wild coffee, spices and an area for livestock grazing (Table 2). Consequently, the majority (95.6%) of the respondents mentioned that fuelwood was the most important resource used, followed by livestock grazing (86.0%), construction materials (81.4%), farming tools (76.6%) and beehive materials (75.4%). The least collected resource was *Aframomum corrorima* (24.4%). Resources used by less than 5% were lumped and represented as "others". These accounted for 36.6% of the total resources used, which include materials for fence (crop and house), domestic animal pen, wild edible fruits, medicinal plants and fibre for various purposes. The use of various resources among respondents of the six Peasant Associations was not significant ($P > 0.05$). Most respondents mentioned that they were legally prohibited from collecting resources from the forest except dried and fallen trees. However, various incidences of illegal activities were recorded during field surveys in JWPF (Fig. 3).

Table 1: Factors influencing people's attitudes towards wildlife conservation in JWPF (n=number of respondents)

		Attitudes towards wildlife conservation (%)					
Variables	N	Positive	Negative	Mediocre	χ^2	df	P-value
Gender							
Male	170	47.16	9.22	3.90	53.65	2	< 0.05
Female	112	13.83	19.15	6.74			
Occupation							
Farming	196	35.1	5.7	28.7			
Farming and trading	41	6.7	2.5	5.3	7.38	4	= 0.117
Students	45	6.0	3.2	6.7			
Educational level							
Uneducated	115	19.5	5.0	16.3			
Non-formal	56	9.2	3.2	7.4			
Primary	79	12.4	3.2	12.4	3.14	6	=0.791
Secondary	32	5.0	2.5	3.9			
Residency period							
<5years	29	3.90	4.61	1.77			
6-10 years	39	5.67	4.96	3.190			
11-15 years	44	8.16	2.48	4.96	51.11	8	< 0.05
16-25 years	59	12.06	4.61	4.26			
>25 years	111	29.43	4.26	5.67			

Table 2: Percentage of resources used by the local people around JWPF (Sum of % exceeds 100 due to multiple responses, n = number of respondents)

	Peasant associations						
Resources used (%)	HAG n=56	SS n=33	SD n=65	AS n=38	SK n=27	WG n=63	Mean
Livestock grazing	92.2	81.5	89.5	94.1	75.0	83.6	86.0
Beehive materials	76.5	74.1	80.7	70.6	79.2	71.0	75.4
Rhamnus prinoides	51.0	48.1	42.1	35.3	37.5	40.0	42.3
Wild coffee (seed and seedlings)	41.2	40.7	54.4	55.9	29.2	21.8	40.5
Fuelwood	98.0	96.3	98.2	97.1	87.5	96.4	95.6
Aframomum corrorima	31.4	33.3	21.1	23.5	20.8	16.4	24.4
Construction materials	82.4	88.9	84.2	58.8	83.3	91.0	81.4
Farming tools	72.5	77.8	82.5	79.4	58.3	89.1	76.6
Others[1]	29.4	37.0	31.6	29.4	25.0	67.3	36.6

[1]Resources reported to be used by less than 5% were lumped and represented as "others" which includes fence (for crop and house), wild edible fruits, pen, coffee plantation, medicinal plants and fibre

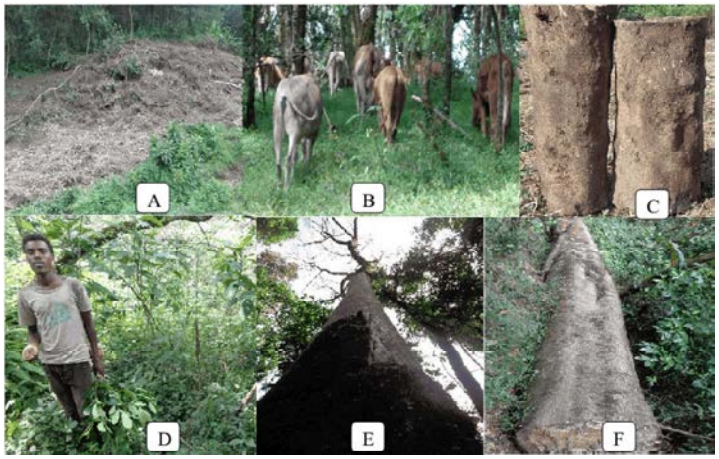

Fig. 3: Illegal human activities and misuse of resources recorded in the JWPF (A=Deforestation, B =Illegal livestock grazing, C=Beehive prepared from the bark of *Olea welwitschii,* D=Illegal coffee plantation, E=Debarked *Olea welwitschii* dried, F=*Pouteria adolfi-friedericii* cut for timber)

DISCUSSION

The majority of respondents have positive attitude towards wildlife conservation in JWPF, which is consistent with the view reported by Mir *et al*. [8]. Positive attitudes recorded in the area could be attributed to the ecological, economical and other livelihood benefits of JWPF. As noted by Shibia [16], benefits and costs encountered around protected areas strongly influence the attitude of local people. Costs such as crop loss and livestock depredations negatively influence people's attitudes, while benefits acquired could develop positive attitudes [8]. Moreover, respondents blame the government and conservationists because none of them have regulated vermin animals that have been increasing in the area over a long period of time. As noted by Roque de Pinho [25], conservationists and government are more concerned about wildlife than human well-being in Amboseli National Park, Kenya. In the present study, about 10.64% of respondents have a mediocre view towards wildlife conservation. These respondents have positive attitude toward the existence of forest, but negative attitude towards some of the vermin animals because of their notorious effects on humans, livestock and crops. Similar finding was reported by Gandiwa *et al*. [26] from Gonarezhou, Zimbabwe, in which the community has mixed perceptions towards wildlife conservation.

The local people around JWPF had no enough knowledge about wildlife laws and values of wildlife beyond domestic use. They were only certain about the general consequences of illegal resource use from protected areas such as appearing in courts, which might put them in prison and or paying fine or both. Lack of clear knowledge of wildlife laws and ways to use resources from JWPF was attributed to the low awareness creation and community education and poor commitment of professionals in realizing conservation policies. As reported by Gandiwa *et al*. [26] improving park-community relationships, enhancing education and awareness programmes and law enforcement have significantly increased the level of people's understanding. Though people have little knowledge about principles of conservation, they were reluctant to respect. Poor penal system and implementation of the laws has made protected areas an open access to natural resources [28].

Supports and cooperation of local people on wildlife conservation around JWPF could be linked to the immediate benefits received from JWPF. For the local people, domestic use of the forest outweighs the benefits that the government and conservationists promised them to payoff for their cooperation in wildlife conservation. This is because the life of the locals is entirely linked to protected areas since the historic periods. Similar finding was reported by Newmark *et al*. [28] in five protected areas in Tanzania in which benefits and services obtained at individual level affected people's attitude toward wildlife conservation. People's appreciation and involvement in the management of protected areas increase when they realize that the benefits exceed costs [29, 30]. As noted by Kruger [31] and Allendorf [32], people's attitudes toward wildlife were positively correlated with the benefits acquired from protected areas. Prohibiting people from accessing and using resources from protected areas develops a negative attitude in people and increases activities that are detrimental to conservation [33]. However, benefits alone do not necessarily lead to the development of positive attitudes [34] because vermin animals are not seen positively even if they have benefits for humans [35].

Socioeconomic characteristics, the extent of law enforcement, beliefs and ecological concerns affect people's attitudes towards wildlife conservation [36]. Demographic variables such as education, gender, age, religion and ethnicity can also influence people's attitudes toward wildlife [37]. However, factors that influence people's attitudes are site-specific and inconsistent [38]. In the present study, gender and the number of years that respondents lived around JWPF were known to influence people's attitudes toward wildlife. However, other factors had not shown significant role in influencing people's attitude. Gender influenced attitudes of respondents towards wildlife in JWPF, a finding that is consistent with Mir *et al*. [8]. Females showed significantly more negative attitude towards wildlife than males. This might be due to the fact that females are more emotional, less tolerant and fear for the attack of wild animals such as carnivores than males. In contrast, Kideghesho *et al*. [39] reported that gender has no significant effect on community perceptions towards wildlife conservation in the Western Serengeti. Variation in the attitudes of gender in different areas could be attributed to variation in the adaptation of people towards wildlife interaction, which may develop through life long experiences. The length of residency periods affects people's perception towards wildlife conservation because they accustomed to the area more than late settlers or recent settlers [17, 38]. This study also revealed that indigenous residents have more positive attitudes toward wildlife than those who lived a few years around JWPF. This could be ascribed to the best knowledge and perceptions developed based on the evaluation of long

life experiences, interactions and values of wildlife in the area [26, 40]. However, the result of this study contradicts with the findings of King [41], where new residents had developed more positive perceptions towards wildlife conservation in South Africa, even though they were less dependent on the forest.

Educational level had not shown significant role in influencing people's attitude towards wildlife conservation around JWPF as revealed by Gadd [21]. Education increases knowledge of people on wildlife and their conservation significance, but less likely changed dependence of local people and exploitation of resources from protected areas [42]. The development of positive or negative attitudes is directly linked to the benefits acquired and the degrees of costs for being adjacent to protected areas [8]. As reported by Lindsey *et al*. [43], scouts hunt illegally to compensate low salary in areas where they are employed to protect wildlife. In addition, government employees are known to buy bushmeat from illegal hunters [44] and timber for construction. In Central Africa, government officials pay poachers to hunt elephants for ivory [45]. However, individuals who are at the higher levels of education have more positive attitude towards protected areas and wildlife conservation than those with lower levels of education [13, 39].

People living adjacent to protected areas highly rely on forest and non-timber forest products to fulfill their basic needs and to generate money to purchase locally unavailable resources. The high level of direct reliance on forest and non-timber forest products to sustain life leads to misuse and overuse of resources around protected areas. Previously, the cultural belief system that was worshiped around Mount Jorgo prohibits cutting trees in the forest. Cutting trees in and around the areas of cultural worship have been considered as breaking the customs of the belief system. However, the expansion of Christian Missionaries over the area has gradually weakened the traditional community's customs developed for centuries as reported from Nigeria by Obioha *et al*. [46]. Currently, the local people have no fear to cut trees and relied on forest products. Fuelwood, beehive and construction materials, farming tools, wild coffee and livestock grazing land were some among the many resources used from JWPF. Several studies have reported the substantial use of firewood, grazing land and other forest products by local residents around protected areas [31, 47-50]. Firewood was the most common resource used in JWPF as it is a cheap source of energy mainly for cooking and for light. Firewood was also collected and transported, by restaurant owners, to the nearby district town, Bube. In developing countries, many people depend on firewood as a source of energy for cooking and heating [51]. This gradually escalates the loss of wildlife habitats and threatens wildlife in protected areas [4].

During the dry season, when forage declines in open pasture, the peripheral parts of JWPF was used for livestock grazing because shade tolerant and perennial grasses were moist throughout the year. As reported by Tewodros Kumssa and Afework Bekele [22], livestock grazing in Abijata-Shalla Lakes National Park has increased during the dry season as settlers look for better forage in the park. Similar findings from the Old Oyo National Park, Nigeria, revealed that illegal livestock grazing has threatened the Park [3]. Resources such as fibre, coffee seedling, *A. corrorima, R. prinoides,* beehive construction materials and timber were supplied to the market for commercial purposes. Selective logging, selective debarking and mass debarking of large-sized trees were the most awful human activities widely practiced in JWPF. *Pouteria adolfi-friedericii* and *C. africana* were selectively logged for timber, whereas *O. welwitschii* and *C. macrostachyus* were selectively debarked for traditional beehive construction. In addition, mass debarking of large trees and *Eucalyptus* species were underway to minimize shading over illegally planted coffee plantations in JWPF. Selective debarking of trees would gradually lead to the reduction of the species diversity, instead replacing it with coffee farm. The conservation and management status of JWPF have been gradually loosening since 1991. Since then, the area of the forest has collapsed from 19, 875 ha to 8, 503.49 ha due to human pressure. The area of the forest has been declining mainly due to human pressure from adjacent lands and illegal coffee plantation in the forest. Illegal human activities and resource use were unrestricted in the forest. Poaching signs such as gin traps removed, dogs, gunshots, poachers tracking and carcasses of animals were observed in the forest. However, none of these activities were addressed by all the local, district, zone and regional conservation authorities for remedial action. For sustainable conservation of Jorgo-Wato Protected Forest and wildlife of the area, anthropogenic activities such as illegal coffee plantation, shifting cultivation and unlimited access and harvest of resources from the forest should be stopped. Involving community in conservation activities and decision making process, environmental education and increasing people's knowledge about wildlife laws and resource use patterns should be realized to curb the erosion of wildlife resources from JWPF.

CONCLUSION

Prohibition of people from exploiting resources in protected areas is challenging as it rejects the traditional rights of local communities to use resources from protected areas. Sustainable use of natural resources has paramount significance for effective management and conservation of biodiversity. To realize this, communities adjacent to protected areas should be well informed about the values of protected areas and conservation of biodiversity. This study showed that local people have inadequate knowledge about wildlife conservation laws and resource utilization patterns beyond domestic use but have positive attitudes towards JWPF. The positive attitudes of the local people were linked to the immediate benefits obtained from JWPF rather than the long term diverse benefits obtained from the forest. People have unlimited access into the forest and extract resource in order to fulfil livelihood needs. Though the local people have little knowledge about wildlife laws and resource use patterns from protected areas, they were not concerned about the sustainable use of resources from JWPF. Resource use patterns such as debarking trees for beehive construction and debarking trees to minimize shading over illegally planted coffee plantation were some among the many awful activities that threatened JWPF. Debarking trees to minimize shading over illegally planted coffee plantation would gradually convert the forest into coffee plantations. Therefore, enforcement of wildlife and protected area laws should be practiced to curb the current misuse, unlimited access and extractive resource use patterns in JWPF.

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