

Local Community Perceptions and Attitudes Towards Biodiversity Conservation: In the Case of Arjo Diga Forest Ecosystem, Western Ethiopia

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Abstract: The study looked at how residents in the Arjo Diga forest, East Wollega Zone of Western Ethiopia felt about biodiversity conservation. The Arjo Diga Forest ecosystem is home to a great variety of animals and plants; this area may be a major contributor to the country's conservation strategy. However, over the past three decades, the realm round the forest ecosystem has seen significant anthropogenic pressures. Additionally, identifying the assorted factors that influence the attitudes and perceptions of local communities about protected areas and therefore the value of biodiversity is very important for local people to support conservation efforts. Purposive sampling was employed to collect data from three kebeles, which were chosen based on their level interaction, community distribution within or near the conservation forest and forest dependency. A household survey, key informant interview, field observation and focus group discussion were used to gather data. The questionnaire study included 222 households in total. SPSS version 26 was used to analyze the data. To explore the important contributing elements for local community impression and attitude, the Chi-square test and descriptive statistics were used. According to the study, the majority of local household heads (48.6%) are unaware of the importance of biodiversity conservation. There was a significant difference in age ($\chi^2=36.216$, DF = 3 and $p<0.05$), education level ($\chi^2=73.021$, DF=3 and $p<0.05$), and annual income ($\chi^2=90.75$, DF=3 and $p<0.05$) in the view and attitude of the local residents toward the conservation values of Arjo Diga forest. As a result, it can be stated that age, education level, and income were the primary determinants of local community perspective and attitude. Furthermore, respondents report that farmland expansion (29.7%), charcoal production, and firewood production (21.6%) are intensifying, and that (55.86%) of respondents were not involved in the decision-making process, which could have a significant impact on biodiversity conservation sustainability. Soil and water conservation, as well as fencing, were among the important mitigation techniques approaches discovered in this study and used by local populations to conserve and develop the natural resource. As a result, urgent cooperation measures between biodiversity conservation management and stakeholders, as well as environmental education, should be addressed as part of a plan to protect Arjo Diga forest, taking into account these elements that influence attitudes and perceptions.

Keywords: Biodiversity Conservation, Local Community, Perception

1. Introduction

Biodiversity refers to the biological diversity of the Earth's habitats, which includes terrestrial, marine, and other aquatic environments, as well as the ecological complexes to which they belong; it includes diversity among species, across species, and within ecosystems [8, 18]. Biodiversity is beneficial to human health because it supports the proper

functioning of ecosystems, which are vital for human survival [2]. Furthermore, Biodiversity also delivers intangible benefits to humans. These administrations incorporate the arrangement of administrations, cycling and water, arrangement of soil and capacity, resistance to obtrusive species, plant dust, climate control, bother and natural contamination control. In arrange to do so, biodiversity plays imperative parts in financial, natural and

social issues and within the lives of the world's poorest individuals. It is assessed that 70 percent of the world's poorest individuals depend intensely on biodiversity and particularly biodiversity in ensured regions secures the employments of about six individuals within the world [27]. For case, in Ethiopia forest play imperative parts in guaranteeing nourishment security and economical jobs for millions of family units all through nation. Secured regions cover 15% of the nation and timberland biodiversity gives environment administrations which is contributes an evaluated 4% to the GDP and as well as they play critical parts in preservation, diversion, eco-tourism and work. In spite of the fact that coordinate and round about yearly financial values of a few ensured ranges are assessed at 1.5 billion USD [30].

Be that since it may, the combination of developing masses change, unsustainable utilization of characteristic assets (over-harvesting), deforestation, modify of characteristic vegetation to farmland, timberland fires, arrive corruption, space hardship and break is changing the planet's circumstances at an exceptional rate and scale, coming nearly in rates of biodiversity incident that posture a major danger to human well-being. Biodiversity around the world proceeds to break down, in appear abhor toward of an increment in preservation endeavors [8]. In appear hate toward of the commitment made by the Parties to the Convention on Natural Contrasting qualities (CBD) to diminish the rate of biodiversity hardship by 2010, around the world biodiversity pointers appear up proceeded reduce at unfaltering or exciting rates [28] and the decay in biodiversity is anticipated to proceed interior the 21st century [14].

Ethiopia is home to three of the world's 34 biodiversity hotspots: the Eastern Afromontane, eastern Africa's Coastal Timberland, and the Horn of Africa [10]. As a result of biological variances and high endemism, it includes fascinating variations in geography and climate [9]. In any case, biodiversity preservation and administration have been confronting numerous social and biological issues due to the prohibition of country communities in ensured ranges from ecotourism benefits in Ethiopia brought about in ill will from the nearby individuals and negative states of mind towards natural life and preservation organizations. It is hence vital to get it the complex and variable connections between ensured zones and encompassing neighborhood communities [6]. As a result, the majority of the study conducted in the country concentrated on national parks that had previously been established and had received some funding. However, biodiversity conservation in manufactured and natural forests was not adequately explored outside of protected zones in most local locations. Some prior research in Ethiopia, for example, focused on the viewpoints of local communities on biodiversity conservation. In Ethiopia's Bale Mountains National Park, Maze National Park, Gibe Sheleko National Park, Awash National Park, and Senkele Swayne's Hartebeest Sanctuary [4-7, 16] respectively. However, research into local community perceptions and attitudes of biodiversity conservation in the country's protected forests is still needed.

The Arjo-Diga forest was declared as a biodiversity conservation incentive in 2014 and located in Diga Woreda of East Wollega, Western Ethiopia. The study region is part of a huge forest that is part of the Eastern Afromontane biodiversity hot spot area [12]. It's also in the Dhidhessa River basin, which is one of the Blue Nile's key tributaries, making it important for biodiversity and hydrology on a regional and worldwide level. However, the wider terrain around the forest ecosystem has exacerbated the deterioration of natural resources, and wildlife is facing major challenges as a result of manmade activities, which could lead to complete degradation [12]. Aside from that, identifying the various elements that influence local community attitudes and views regarding protected areas and the value of biodiversity is critical for local people to support conservation efforts. As a result, understanding these traits is crucial in many cases for improving the connection between local populations and protected areas, as well as promoting public awareness of biodiversity conservation in and around protected areas. Furthermore, no scientific investigation into the attitudes and opinions of local communities has been undertaken in the study area. As a result, it is important that we meet this need. The goal of this research was to examine into local people's attitudes and perspectives on biodiversity conservation, as well as the variables that impact these attitudes in the study area.

2. Materials and Methods

2.1. The Study Area

This study took place in Oromia National Regional State's newly constructed Arjo Diga Forest in the East Wollega Zone. In 2014, the UNDP, the Federal Government, and regional governments developed a conservation program. It is roughly 346 kilometers west of Addis Ababa and 15 kilometers west of Nekemte town. It lies between the longitudes of 9°59'00"N and 9°6'30"N, and 36°18'30"E and 36°24'30"E. (Figure 1). The area shares boundaries with West Wollega Zone is to the west, Guto Gida Woreda is to the east, Sasiga is to the south, Leka Dulecha is to the north, Illu Aba Bora (Chawaka) is to the south, and Benishangul Gumuz Regional State is to the north. The Dhidhessa River runs along the western side of Diga woreda. The size of the forest is 1268.6 hectares, with an elevation range of 1200 to 2220 meters above sea level.

The area's temporal rainfall pattern indicates a single peak around July and August, with no discernible difference between the lesser and main rain seasons, as is common in several parts of Ethiopia. The area's average annual rainfall ranges from 800mm to 2110mm, with a monomial rainfall distribution marked by high amounts of rainfall over a lengthy period of time during the summer. May through October is the rainy season, with the highest average monthly rainfall in July, June, and August [17]. The lowest temperatures ranged from 12 to 18 degrees Celsius in the course of wet, while the maximum temperatures ranged from 25 to 35 degrees Celsius during the dry season.

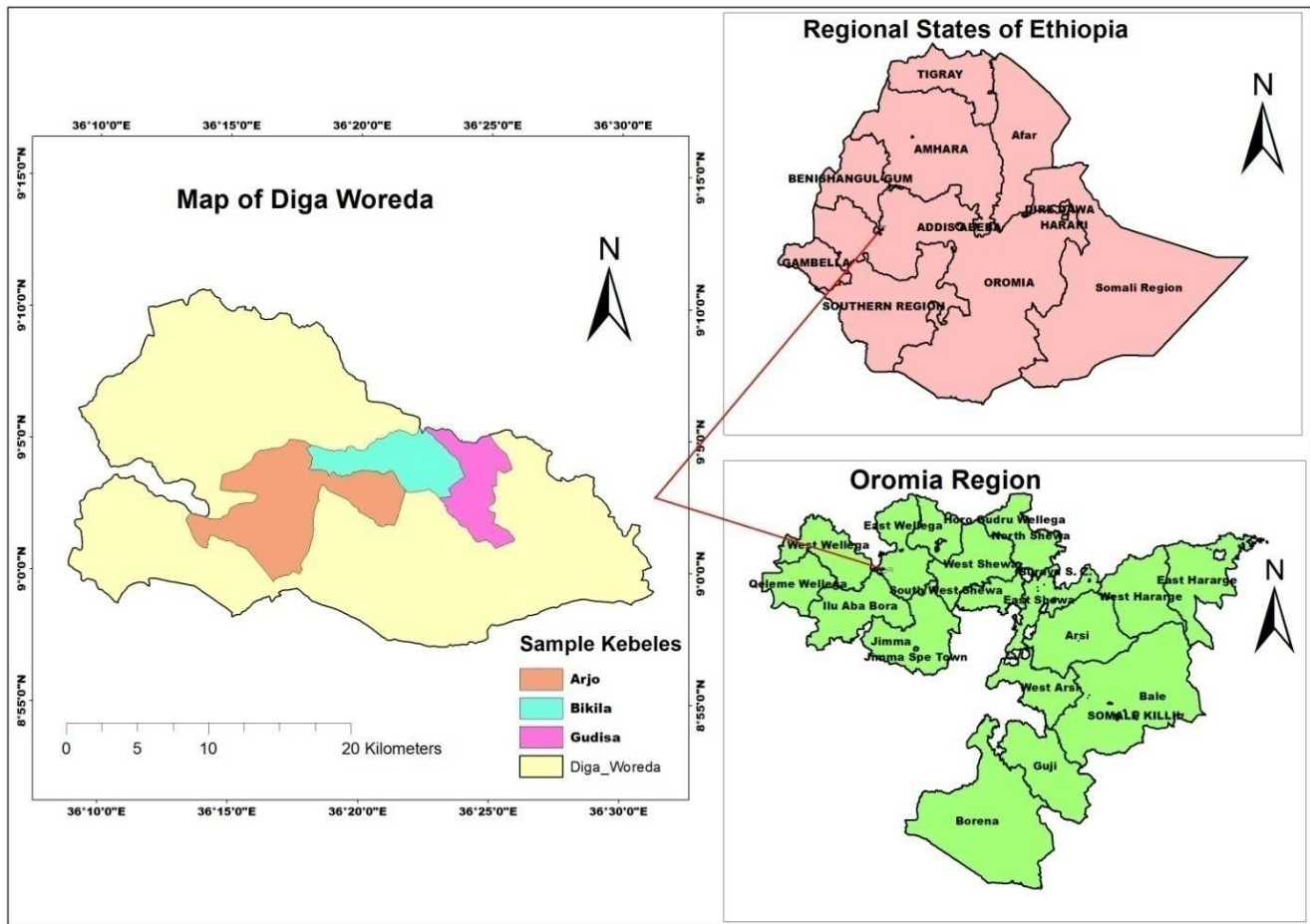


Figure 1. Location Map of the Study Area.

2.2. Methods

The primary data for this study came from a household survey, direct observation, group discussion, and key informant interviews. An important incentive for biodiversity conservation in the CRGE project office and Wereda offices is compiling a second set of recorded data. In a sample of local people, a general questionnaire, a formal questionnaire was prepared and implemented. Completely open questions and consistent answers are included in the test. The questionnaire was previously evaluated between different groups in the community who were not part of the larger sample. Eighteen households have been chosen randomly for the pilot survey; after which the critical improvements were made in the questionnaire. These pilot questions were not considered in the result analysis. The survey questionnaire used to be conducted inside zero to 4km range from the forest boundary. Allocations of the variety of sample households to every Kebeles was proportional to the variety of household head living in each selected Kebeles, for this reason 83 HH from Bikila, 75HH from Arjo and 64 HH from Gudisa were chosen based totally on the distance from the wooded area boundary and their have an impact on on the conservation region following the work of, [16]. Local Kebele people were worried in the research to facilitate the statistics collection. Questions were addressed to family heads to gather

demographic data, way of utilization or advantages of the forest resources, importants of biodiversity for us, participated on education of biodiversity problems or heard about biodiversity from media/ assembly discussion and comfortable with the installed conservation, elements that influences perception and attitudes of neighborhood communities, foremost threats and neighborhood exercise on biodiversity conservation.

Most of the questionnaires have been in my opinion administered, specifically with the head of the household, of which frequently have been male. The exception used to be the location they were absent for the duration of the household visit. In many cases, different family folks also participated to shape a collective response. Interviewees had been met at their home and roughly forty to fifty five minutes of time used to be required for an interview, relying to the respondents. If a household member 18 years of age or older was absent at some point of the survey request, that dwelling was once once skipped and the subsequent house used to be approached. The interview was carried out in the course of February 2021 to May 2021. Several secondary facts have been confirmed through key character interviews like community representatives.

The data was analysed by using Statistical package deal for Social Science (SPSS) model 26. Descriptive information was used to compute suggest values, percentages, frequencies and other vital information. Chi-square take a

look at was performed to check the relationship between chosen qualitative variables and one way analysis of variance (ANOVA) was once run to take a look at if there used to be a enormous distinction between the suggest attitudinal rankings and the chosen variables.

3. Results and Discussion

3.1. Results

3.1.1. Socio-economic and Demographic Characteristics

During the present study, data of local community perception towards biodiversity conservation was collected by questioner, direct observation and with the use of conducting interviews with appropriate respondents. Accordingly, the analysis of respondent background indicated that about (59.5%) of the respondents were males and (40.5%) were females. Farmers who took part in the questionnaire survey were of legal age, had experience in agricultural activities, and had lived in the research area for a long time. From the finding the most of the respondents were above 41yrs were (51.8%). While (21.6%) were between 18-30 years. Taking into consideration the marital statuses of the respondent, (81.1%) were married. While (3.2%) and (10.4%) were widowed and single respectively.

Of the respondents (21.6%) were illiterate, While (27.9%) and (18.5%) obtained secondary school and college respectively. Respondents (36%) had 1-3 family size. While (29.3%) and (17.1) were 4-6 and 7-10 family size respectively. Taking the respondent's annual income into account, (20.7%) had a yearly income of 10000 birr. While (31.1%) of those polled have a net worth of greater than 21000 birr (table 1).

Table 1. Socioeconomic and Demographic characteristics of respondents.

Back ground		No of respondents	%
Sex	Male	132	59.5
	Female	90	40.5
Age	18-30	48	21.6
	31-40	59	26.6
	41-50	62	27.9
	>51	53	23.9
	Married	180	81.1
Martial status	Single	23	10.4
	Divorced	12	5.4
	Widowed	7	3.2
Educaton level	Illterate	48	21.6
	Primary	71	32.0
	Secondary	62	27.9
	College and above	41	18.5
Family size	1-3	80	36.0
	4-6	65	29.3
	7-10	38	17.1
	above 10	39	17.6
	10000 birr	46	20.7
Income per year	11000-15000 birr	49	22.1
	16000-20000 birr	58	26.1
	21000 birr and above	69	31.1

Most of the respondent (75.2%) crop farming and livestock rearing were the main sources of income for local communities of in and around of Arjo Diga forest. From the finding the majority of the respondents (54.5%) were landholding size was less than 1 ha. While (49%) were 4 -5 ha. There was a significant difference in the size of landholding among study Kebeles ($X^2 = 65.36$, $DF = 3$, $P < 0.05$). Many of the respondents from Arjo (54.5%) and Gudisa (18.2%) held a landholding less than 1ha, while many of the respondents from Bikila (49%) and from Gudisa (33.3%) own a land size 4-5 ha (Figure 2).

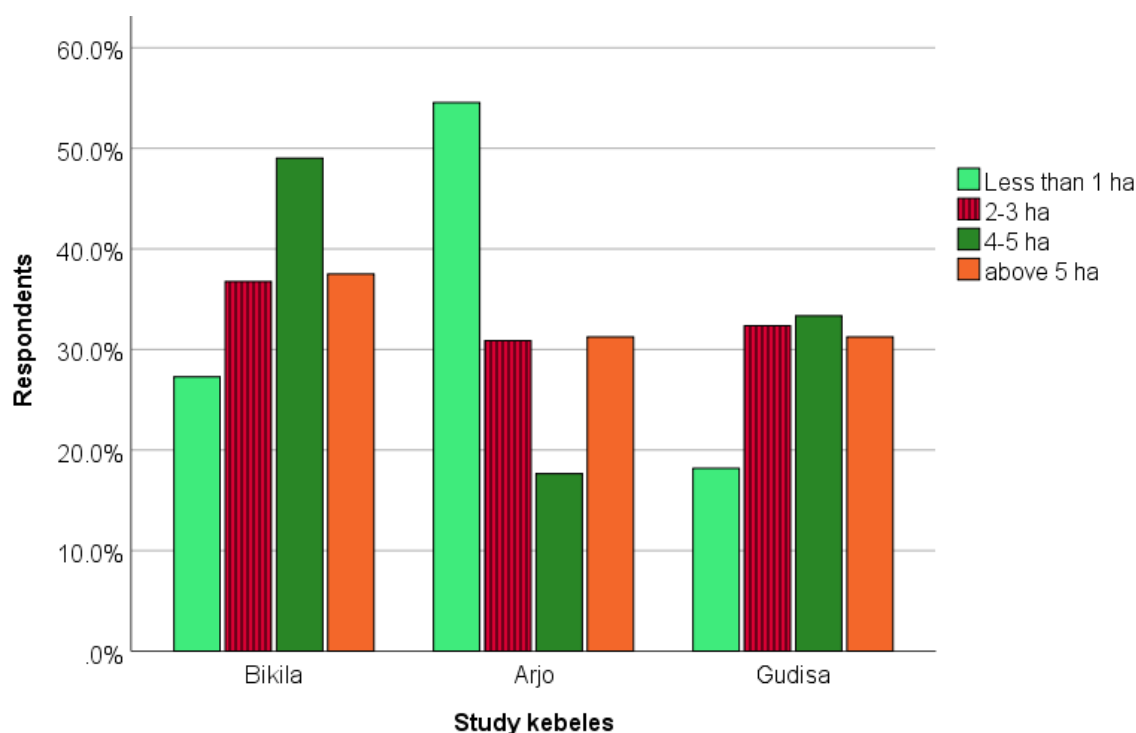


Figure 2. Landholding size of respondents across study kebeles.

3.1.2. Local Communities' Perception on Biodiversity Conservation of Arjo Diga Forest

The environmental awareness surveys conducted aiming to examine the perception of communities towards biodiversity conservation in general and of the Arjo-Diga Forests conservation specifically given in (table 2). Based on data analysis showed that, 72% of the local community benefits fuel wood from forest, while, 9% of local people benefits aesthetic. Only 24.8% of the target population in and around Arjo-Diga protected forest had participated in the training dealing about biodiversity conservation. Among the community members participated in focal group discussion, 78.4% of local people did not hear about biodiversity from radios, televisions and from meetings held both at woreda and kebele levels. The reasons that the informants rise were, lack of radios and televisions, being busy with agricultural activities to support

their family. According to the result of survey, 48.6% of local people did not know the importance of biodiversity for us, in contrast to 37.4% understood it as everything on earth such as soil, plants, water, animals, and microbes. While, 14% of local people think biodiversity means river, forest and mountains.

According to the data collected and evaluated to determine the community's understanding of natural resource conservation, 74.3% of local residents believe that natural resource conservation is highly important for their livelihood, while 25.7% believe that they are unaware of its relevance. Sixty-five percent of the target community said they were satisfied with the Arjo-Diga forest's existing conservation efforts. In contrast, because of illiteracy and poverty, 20.97% of the population is uneasy about developing conservation (table 2).

Table 2. Local people's reliance on natural resources and their attitudes towards conservation of biodiversity in the study area in Arjo Diga Forest.

Question	Number respondent	(%)
What benefit do you derive from the forest?		
Grass/ fodder	65	29.3
Timber	27	12.2
Fuel wood	72	32.4
Medicinal plant	16	7.2
Water	33	14.9
Aesthetic	9	4.1
Is the conservation of forest or plant and animals is good things?		
Yes	165	74.3
No	57	25.7
Do you think that biodiversity important for us?		
Yes	83	37.4
No	108	48.6
Do not Know	31	14.0
Have you participated on training of biodiversity issues?		
Yes	55	24.8
No	167	75.2
Have you heard about biodiversity from media/ meeting discussion?		
Yes	48	21.6
No	174	78.4
Do you know the main objective of the Arjo Diga forest?		
Yes	155	69.8
No	67	30.2
Is there any change in natural environments from usual?		
Yes	166	74.8
No	56	25.2
Are you comfortable with the established conservation efforts of Arjo-Diga forest?		
Yes	145	65.3
No	77	34.7

3.1.3. Factors That Influence the Community Perception on Biodiversity Conservation

There were great discrepancies in age, education, and income among the basic socioeconomic categories. This suggests that they have a high relationship with local community attitudes toward biodiversity protection in terms of age, Education level and annual income. According to the analysis of respondent age, young to medium stage

respondents have a positive attitude toward the establishment of Arjo Diga forest biodiversity protection. While, Participants that had a negative perception of biodiversity conservation was in their adult years. There used to be once a huge difference in the age with biodiversity conservation ($X^2=36.216$, $DF = 3$ and $p<0.05$) (table 3). On the different hand, Participants with a higher education stage and a wonderful point of view of the Arjo Diga forest's institution tended to have extra fine attitudes regarding biodiversity

protection. While, Participants who had a terrible influence of biodiversity conservation have been greater illiterate also Participants with a higher annual income have a greater tremendous outlook on the advent of the Arjo Diga forest biodiversity protection. While, Participants who had a bad

attitude toward biodiversity safety had decrease annual income. There was a significant difference in the education level and annual income with biodiversity conservation ($\chi^2=73.021$, $DF=3$ and $p=0.009$ and ($\chi^2=90.75$, $DF=3$ and $p=0.026$) (table 3) respectively.

Table 3. Attitude of respondents on biodiversity conservation in the study area.

Variable	Attitudes of respondents on the biodiversity conservation (%)			χ^2	df	P-value
	n	Postive attitudes	Negative attitudes			
Age				36.22	3	0.000
18-30	48	22.5	3.2			
31-40	59	19.8	6.8			
41-50	62	14.9	9.0			
>51	53	8.1	15.8			
Education level				73.02	3	0.009
Illterate	48	5.0	16.7			
Primary	71	18.0	13.5			
Secondary	62	20.3	3.2			
College and above	41	22.1	1.4			
Income per year				90.75	3	0.026
10000 birr	46	8.3	44.2			
11000-15000 birr	49	12.4	40.2			
16000-20000 birr	58	35.2	9.1			
21000 birr and above	69	44.1	6.5			
Livestock				72.30	3	0.000
1-10	78	48.3	10.4			
11-20	65	34.5	19.5			
21-30	44	13.8	31.2			
31 and above	35	3.4	39			

3.1.4. The Main Threats and Community Practice in Conservation Biodiversity

Respondents have been also polled on their thoughts on the foremost risks to biodiversity conservation at some point of the contemporary study. The best dangerous agent of biodiversity, according to those who spoke back (29.7%), is the extension of farmed land, which is the study area's largest concern. Another causal agent of biodiversity, in accordance to the respondents (21.6%), is charcoal manufacturing and collecting of fire. Whereas, (6.3%) of

the respondents felt that quarry operation and poaching (Figures 4 and 5).

Findings about the region were once described as a dense local cover, which enhances biodiversity and soil structure. Deforestation was often seen everywhere as a result of local intrusion into the forested areas. The majority of respondents (52.70%) participated in soil management and water management practices, according to the study (Table 3). To maintain and improve natural resources, the conservation of soil and water structures must be simplified and improved.

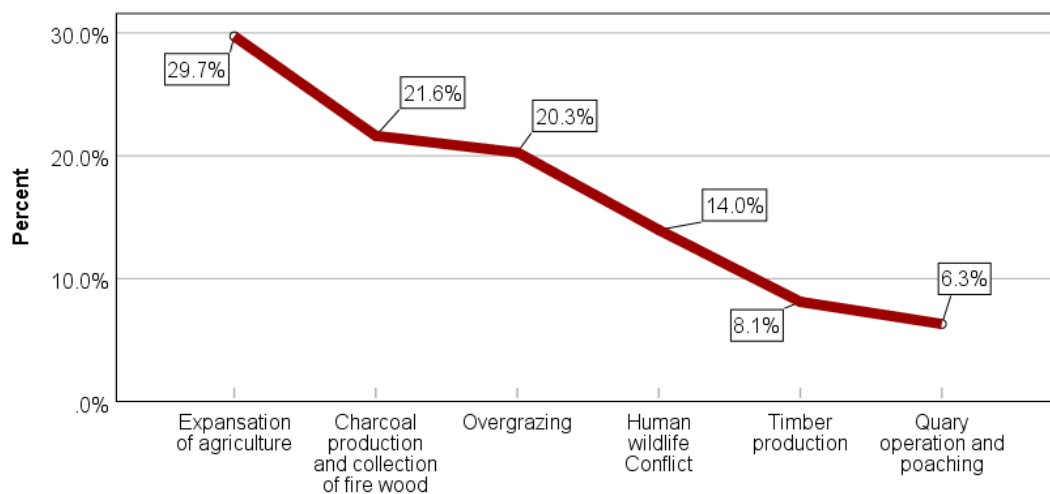


Figure 3. Threats of biodiversity conservation in the study area Arjo Diga forest.

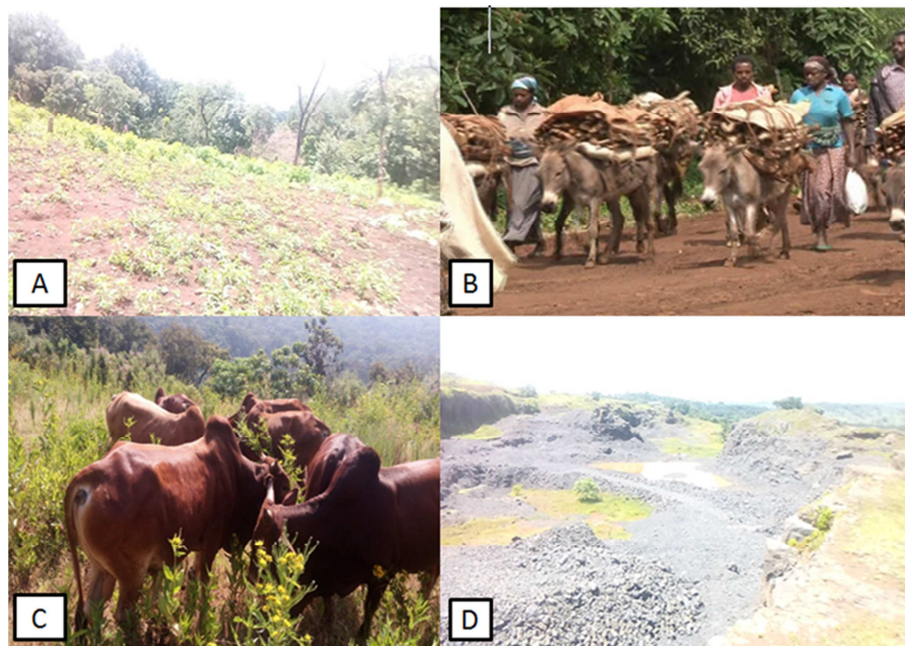


Figure 4. Threats of biodiversity observed in the study area (A) Expansion of farmland, (B) Deforestation, (C) Overgrazing and (D) Quarry operation (Photo: Girma. G, 2021).

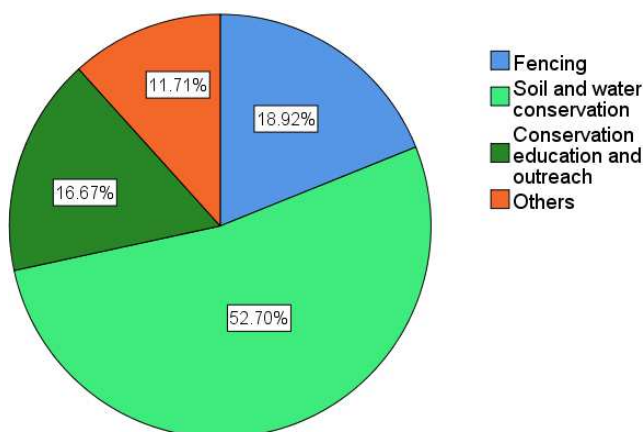


Figure 5. Management practices in the Arjo Diga forest protected area.

3.2. Discussion

3.2.1. Forest Benefits and Local Communities' Perception

All respondents from the study villages considered the surrounding forests as a source of livelihood, such as firewood, fodder, non-wood forest products, water, medicinal plants, and aesthetic values. [27] Point out that the conservation of forest resources has many advantages for the local population, since they make an important contribution to the family economy and, above all, serve as a way of life for terrible household. Firewood is the most frequently harvested forest product as it is a cheap and readily available source of energy for cooking and heating. These findings are consistent with previous research [20] in Kenya's Embobut forest and [11] in Botswana's Chobe enclave, which both identify firewood as the most gathered forest product. Grass/fodder was the second most commonly gathered forest product, according to all respondents' sources of livelihood

dependency. Different protected sites in Ethiopia and overseas have reported similar results [1, 3, 5, 22].

The results, on the other hand, revealed that the majority of respondents were unaware of local conservation awareness initiatives, had not heard about biodiversity from training or other sources, and had no idea how important biodiversity is to us. While some respondents are dissatisfied with the implementation of conservation efforts, others are optimistic. The reasons for the informants' rise are that they are busy with agricultural activities to support their families, that they have not been involved in decision-making processes, that they have lost land, that they are illiterate, that they are poor, and that they have previous experience of human-wildlife conflicts as a result of the establishment of the conservation has an impact on them who are dependent on resources such as fuel wood and grazing. The findings corroborate previous research on the sanctuary and parks [5, 21, 26]. Linearly, Local communities in Kenya's Marsabit National Reserve saw protected area creation as a waste of land if they were not included in the conservation area's management and decision-making process [21].

3.2.2. Factors That Influences the Community Perception and Attitude

People's positive attitudes of biodiversity protection were highly influenced by their age, educational level, and income, according to the findings. Young to medium stage respondents in the study region had a favourable attitude toward the establishment of Arjo Diga forest biodiversity conservation, according to their age. Participants who exhibited a poor attitude toward biodiversity protection were in their adult years at the time. This indicated that the respondents' age was related to the length of experience with biodiversity benefits and their associated costs, with older

respondents being more likely than younger respondents to have been negatively affected by wildlife damages and restrictions in their use as a result of the conservation establishment. This finding is comparable to those found by, [21] in Marsabit National Reserve (Kenya) and [29] Pendjari National Park in Benin respectively. As a result, the local residents' views and impressions of the protected area have been strongly influenced by age.

One of the variables that influence people's perceptions of biodiversity protection in the research area is their educational level. All of the individuals who are opposed to biodiversity conservation had a low degree of formal education. These findings are consistent with those reported in Marsabit National Reserve in Kenya, Pendjari National Park in Benin, in Maze and Gibe Sheleko National Park in Southwestern Ethiopia [6, 21, 25, 29] respectively who found that as education levels rise, so does positive attitude toward conservation areas. The key reason for this condition in this study is that people with a high degree of formal education may have more awareness about conservation-related issues as a result of high levels of interaction at learning or educational institutions and media exposure. Further positive shift can be attributed to educated people having a better chance of benefiting from the conservation through non-agricultural jobs because they are less likely to be living on the edge.

The creation of the Arjo Diga forest biodiversity protection has a more positive view among households with a higher annual income. Participants with a negative attitude toward biodiversity conservation, on the other hand, had lower annual income. The findings support those of [13] in the Kipini Division of Kenya's Tana Delta District, and [19] who found that household income is strongly linked to local people's attitudes toward biodiversity protection. As a result, low-income respondents in the research area were more concerned with meeting their families' fundamental needs than mitigating negative environmental impacts because their households rely heavily on environmental revenue such as fuelwood, charcoal, and lumber.

3.2.3. The Main Threats and Community Practice in Conservation Biodiversity

Agriculture expansion, charcoal production and firewood, overgrazing, human-wildlife conflict, timber, quarry operations, and poaching are all major threats to Arjo Diga forest conservation, according to the current study. The bulk of the local people, on the other hand, had not been involved in the decision-making process, which they saw as a problem. The findings agree with, [23] in Nechdar National Park, Ethiopia. With this rapid rate of deforestation and other threats, the environment will reach a point where it will no longer be able to support the community and will have a severe impact on the intended biodiversity protection. Similarly, [24] found that insufficient communications and a lack of active participation among stakeholders in the Royal Natal Park Authority in KwaZulu-Natal had resulted in misunderstandings amongst stakeholders, negatively affecting local views toward conservation. The majority of

respondents, on the other hand, took part in soil and water conservation management in order to promote biodiversity restoration and conservation. Participants in the focus group demonstrated that preventive delivers environmental services such as microclimatic control and soil conservation in addition to specific economic benefits.

These findings are similar to those of [15] who reported in the Ada'a wereda East Shewa Zone of Oromia Region, Ethiopia, that establishing isolated zones in degraded environments is an appropriate strategy of biodiversity conservation and subsistence survival.

4. Conclusions and Recommendations

The purpose of this study was to see how well people understand the need of biodiversity conservation and how they feel about forest conservation. People who are younger to middle-aged, more educated, and have a higher annual income had better compliance than those who did not have any of these traits, according to the statistics. Most household heads are unaware of the importance of biodiversity conservation, are not involved in decision-making, and do not attend forest conservation meetings held by local leaders and environmental organizations, therefore these conclusions are likely. Furthermore, anthropogenic activities are intensifying, which might have a significant impact on ecosystem resilience in general and biodiversity conservation sustainability in particular. Therefore, depending on the bases of this information, the following recommendations are proposed for urgent consideration of all stakeholders:

- 1) To reduce the number of people who do not support forest biodiversity conservation, negotiations and information exchange should be enhanced.
- 2) The minority who objected to the conservation were particularly upset by management tactics that restrict neighboring people's access to land for agriculture and the lack of a portion of earnings returned to the community.
- 3) The development of less extensive farming systems and the promotion of some other income-generating activities can help to reduce people's demand for greater land for farming operations.
- 4) In terms of adults, environmental education should build on people's existing good opinions and seek to mitigate negative perceptions where possible. This could be accomplished by using non-formal educational methods. Education could be a powerful tool for motivating individuals to adopt or reinforce favorable attitudes toward conservation of biodiversity.
- 5) Urgent cooperation measures between biodiversity conservation management and all stakeholders should be considered as a plan to conserve Arjo Diga forest and associated resources in a sustainable manner.

Consent to Participate (Ethics)

The study was conducted after getting the ethical clearance

from Institutional East Wollega Zone, Environment Authority, and Nekemte, Ethiopia. Written consent was obtained from each study subject. Participants were informed the objectives of the study and their right to refuse filling the questionnaire at any time they want. Participants were informed that their answers would remain anonymous and confidential.

Author Contributions

The author devised the survey procedure, carried out fieldwork, and analyzed the data. Presenting research and teaching outcomes for Jimma University College of Agriculture and Veterinary Medicine's Department of Natural Resource Management, and then taking commites for possible evaluation. Additionally, compose the manuscript and revise the entire document, edit the manuscript, and revise the final version of the primary document for possible review.

Conflict of Interests

The authors declare that they have no competing interests.

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