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# Gender roles of Obu Manuvu women and leaders in the conservation of the Philippine Brown Deer *Rusa marianna* Desmarest, 1822

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## ABSTRACT

Philippine brown deer *Rusa marianna* Desmarest 1822, has been considered a conservation priority following its declaration as an endangered species by the Philippine Red List of Threatened Fauna in 2020. The research study analyzed the gender roles of women and men in the conservation of the Philippine brown deer (*R. marianna*) in the Obu Manuvu Ancestral Domain (OMAD) in Baguio District, Davao City, Philippines. Using the Harvard Analytical Framework (HAF), the study explored women's and men's (1) activity profile, (2) access to and control over resources, (3) knowledge, beliefs, and perceptions, (4) decision-making power, (5) laws, legal rights, policies, and institutions, and (6) priorities, and needs/ opportunities, and constraints. Sixteen individuals participated in the key informant interviews (KIIs), represented by chieftains, elders, and women. The results of the gender analysis conveyed that women and men are primarily involved in deer conservation. Gender gaps have been documented in education, employment, and resource management, showing that men have better access than women. However, both genders are provided access to information and training as part of the capacity-building for conservation works. In terms of employment preference, Obu Manuvu men largely dominated the farming jobs, while women worked home-based. They are also given equal rights regarding their participation in the decision-making process and property ownership. A livelihood program is considered one of the needs of the indigenous community, which includes the opportunity to economize their conservation services. Therefore, the study recommends that gender roles be integrated into formulating a conservation model. Providing equal education, employment, and livelihood opportunities for women and men is vital to the deer's sustainable conservation.

**Keywords:** conservation, gender analysis, gender roles, Harvard analytical framework

## INTRODUCTION

Conservation work has historically been dominated by men. The roles of women are often

undocumented and underrepresented, which has led to the ever-increasing need to integrate a gender lens in conservation (James 2023). Gender in conservation involves dealing with how women and men interact



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with their resources and how that impacts knowledge use, and priorities for conservation (Leisher et al. 2015). Gender is considered a social determinant of conservation success, especially when the voices of women and men are both accounted for. The inclusion of gender analysis in conservation is a novel underpinning and is underexplored across the country (Parks et al. 2015; CBD 2017).

There is an increasing demand to examine the labor responsibilities, priorities, decision-making power, and knowledge of women and men in conservation. For example, women in one of the Pacific Island countries were not consulted in coastal fisheries management because men are primarily responsible for fishing. Still, it was found that women are involved in agricultural activity, which has a downstream impact through increasing sedimentation (MacKay 2017). Gender disparity has also been observed in wildlife-dependent recreation in the United States, where women feel alienated in the male-dominated control of wildlife populations (Rizzolo et al. 2023). In Madagascar, locals at a marine conservation site also proposed that women should be involved in decision-making and management (Evans 2017). Therefore, if gender is not considered in conservation, biodiversity loss may result from mismanagement and unsustainable practices, and the gradual loss of traditional knowledge, skills, and experiences will become more evident (Leisher et al. 2015).

The Philippine brown deer *Rusa marianna* Desmarest 1822, also known as the Philippine sambar, is endemic to the islands of the Philippines, particularly Luzon, Mindanao, Samar, and Leyte. However, its population has significantly declined in the last three decades due to forest cover loss, habitat fragmentation, and human persecution (Ravenelle and Nyhus 2017). Anthropogenic pressures on natural landscapes have driven the deer to hide in the remaining forest patches (Foley et al. 2005; Villegas et al. 2022a). The most prevalent anthropogenic threat is subsistence hunting, especially among locals who lack sufficient livelihood options (Tanalgo 2017). The same scenario was observed within the Obu Manuvu Ancestral Domain (OMAD), where deer hunting remains evident despite the customary policies in place (Villegas et al. 2022a). As a consequence, the deer is now considered endangered on the Philippine Red List of Threatened Fauna (BMB-DENR 2020). Its wild population is vulnerable and rapidly declining, according to the International Union for Conservation of Nature's (IUCN) Red List of Threatened Species (MacKinnon et al. 2015).

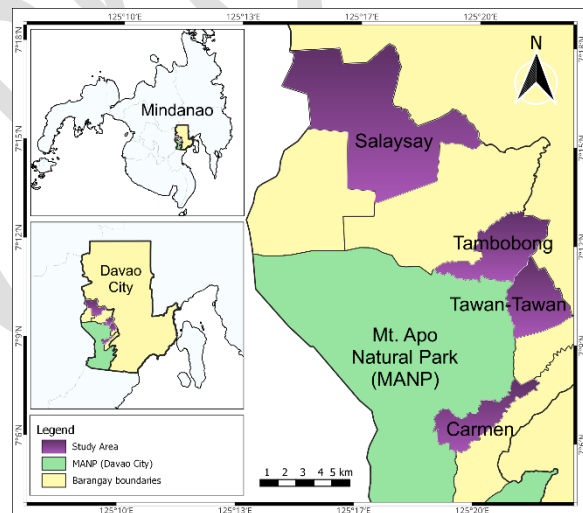
The present study aimed to analyze the gender roles of Obu Manuvu women and leaders in deer conservation in the OMAD in Baguio District, Davao City, Philippines. Specifically, the study investigated women's and leaders' (1) activity profile,

(2) access to and control over assets and resources, (3) knowledge, beliefs, and perceptions, (4) decision-making power, (5) laws, legal rights, policies, and institutions, and (6) priorities, and needs/opportunities, and constraints relative to deer conservation. The study intends to provide insights into the development of deer conservation models through the lenses of Indigenous Peoples (IPs), especially women and leaders.

## METHODS

### Study Area

This study was conducted in the OMAD, with a total land area of 36,713.52 hectares in Baguio District, Davao City, Davao del Sur, Philippines. Specifically, the locale of this study includes four barangays: Carmen, Salaysay, Tambobong, and Tawan-Tawan (Figure 1). The ancestral domain falls within the unprotected regions of Mt. Apo Range and is a known watershed area in Davao City, Philippines (Villegas et al. 2022a).



**Figure 1.** Map of the study area in the Obu Manuvu Ancestral Domain, Davao City, Mindanao Island, Philippines. Cartographer: Ricksterlie C. Verzosa.

### Harvard Analytical Framework

The study used a qualitative research design. Through the lens of the Harvard Analytical Framework (HAF), a gender analysis of the roles of Obu Manuvu women and men in deer conservation was explored (Figure 2). The framework is usually utilized in determining and explaining the differences between women and men in terms of economic participation. A framework-based gender analysis is helpful for policymakers to understand the economic case for allocating development resources to women and men (Ochola et al. 2010). The framework is also used as a practical tool to determine the type and

amount of work women and men do in households, farms, or communities (March et al. 1999). The framework is useful for organizing information and can be adapted to many situations including biological conservation. While this framework has been widely used in agriculture, this paper introduces using the same framework in biodiversity conservation, especially concerning lands that are governed by indigenous communities. In the study area, agricultural lands and Indigenous Peoples and Community-Conserved Areas (ICCAs) are proximal and are regulated by the same customary laws and practices. The Local Government Units (LGUs) complement the biodiversity conservation initiatives by providing monetary remuneration to the forest guards and financial support for monitoring activities. Data gathered on the ground are also transmitted to them for appropriate action and coordination with relevant public and private agencies (i.e., the Department of Environment and Natural Resources and the Philippine Eagle Foundation). This study explored six components: (1) activity profile, (2) access to and control of assets and resources, (3) knowledge, beliefs, and perceptions, (4) decision-making power, (5) laws, legal rights, policies, and institutions, (6) and people’s priorities and needs, opportunities, and constraints.

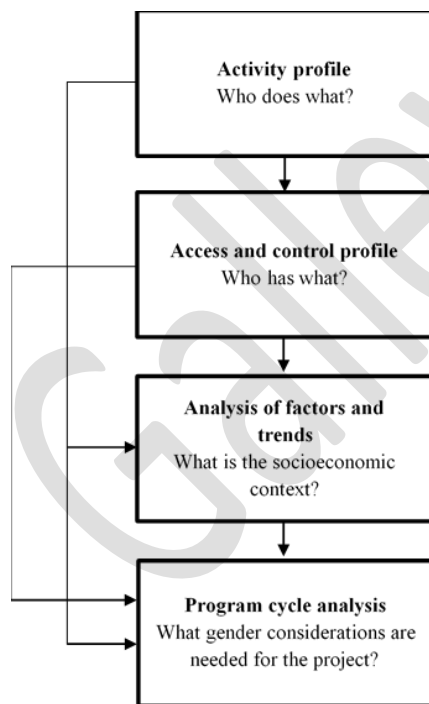


Figure 2. Gender analysis of projects using the Harvard Analytical Framework (Srinivas 2015).

**Key Informant Interview (KII)**

Sixteen participants, consisting of eight women and eight men, were interviewed in December 2020 using a semi-structured interview tool developed

by the researchers. The interview questions were formulated and based on the HAF. During the interviews, the questions were translated into Visaya, a dialect widely spoken by the indigenous people (IP) community. All participants provided free prior and informed consent (FPIC) before the interviews took place. They represented the Obu Manuvu indigenous community as chieftains, elders, and women of legal age. They were all involved in local conservation work as forest guards (Visaya: Bantay Bukid) and were *bona fide* residents of the study area. As forest guards, their primary role was to monitor wild flora and fauna within the ancestral domain, particularly the cultural keystone species (CKS) such as deer. They conducted regular foot patrols (i.e., at least once a month) to inventory the species and record conservation threats. The Obu Manuvu is a sub-tribe of the Bagobo, originating from intermarriages between Bagobo-Klata and Bagobo-Tagabawa. They inhabit three provinces in Mindanao, including northeastern Davao, northeastern Cotabato, and Bukidnon (TUOMTC 2017). All discussions were conducted on a one-on-one basis, audio-recorded and transcribed verbatim for use as a reference in data analysis.

**Thematic Analysis**

The HAF was utilized as an approach to analyze the qualitative responses of the participants. Based on the six components of the framework, a thematic analysis was employed to analyze the qualitative data collected (Creswell 2014). This technique involves analyzing qualitative data, such as transcriptions of responses obtained during key informant interviews. The analysis began with familiarization of the data, followed by data coding, including data reduction and compilation, and then clustering the codes to identify emerging themes.

**RESULTS**

The *Rusa marianna* is a sacred species for the Obu Manuvu indigenous community, making the deer a priority for conservation. To achieve this goal, the tribe has implemented various systems and policies aimed at reducing human impact on the deer population and promoting its sustainability within the ancestral domain. One key strategy involves the establishment of a forest guarding scheme with both women and men. They both play critical roles in managing the forests and protecting the deer. While men tend to lead conservation efforts and make policy decisions, women are equally important partners who contribute by documenting and disseminating information. Both genders have unique roles to play, and their contributions are essential to ensuring a holistic approach to conservation (Table 1)

**Table 1.** Gender roles of the Obu Manuvu women and men using the Harvard Analytical Framework.

Analytical parameter	Women	Men
Activity profile	<ul style="list-style-type: none"> <li>• Perform reproductive roles such as working at home and taking care of the needs of their children</li> </ul>	<ul style="list-style-type: none"> <li>• Perform productive roles such as working in farms or private companies as laborers</li> </ul>
Access to and control over assets and resources	<ul style="list-style-type: none"> <li>• Support deer conservation efforts made by men</li> <li>• Support the information dissemination on deer conservation</li> <li>• In terms of employment services, women forest guards are assigned to clerical jobs such as encoding and bookkeeping</li> </ul>	<ul style="list-style-type: none"> <li>• Lead in deer conservation by accessing the right training programs</li> <li>• Lead in information dissemination on deer conservation</li> <li>• In terms of employment services, men forest guards are engaged in species monitoring and roving patrol jobs</li> </ul>
Knowledge, beliefs, and perceptions	<ul style="list-style-type: none"> <li>• Women work at home such as doing household chores and caring for their children and their husbands.</li> <li>• Women work overseas as domestic helpers</li> </ul>	<ul style="list-style-type: none"> <li>• Men do more strenuous labor</li> <li>• More men work on farms and in private companies as laborers</li> </ul>
Decision-making power	<ul style="list-style-type: none"> <li>• Participate in community discussions and the decision-making process</li> </ul>	<ul style="list-style-type: none"> <li>• Lead in community discussions and the decision-making process</li> </ul>
Laws, Legal Rights, Policies, and Institutions	<ul style="list-style-type: none"> <li>• Follow laws and policies in deer conservation and speak their brand of conservation</li> </ul>	<ul style="list-style-type: none"> <li>• Lead in the formulation of laws and policies that protect their ancestral domains and in deer conservation</li> </ul>
Priorities and Needs/ Opportunities and Constraints	<ul style="list-style-type: none"> <li>• Support their husbands in providing for the needs of the family</li> <li>• Seek livelihood opportunities for the family</li> </ul>	<ul style="list-style-type: none"> <li>• Provide the needs of the family</li> <li>• Seek livelihood opportunities for the family</li> </ul>

**Activity Profile**

One hundred eighty-eight forest guards are engaged in conserving the deer within the ancestral domain. Out of the 188 forest guards, 25 of them are women. None of the forest guards have completed elementary education. All of them are married and have children. While working as forest guards, both women and men are also engaged in farming as another means of livelihood. The forest guards receive a minimal monthly honorarium from the Philippine government. Both genders share the responsibility of fulfilling their duties as forest guards in their ancestral domains to protect their forests from anthropogenic dangers such as illegal logging, “kaingin” (slash and burn agriculture), and hunting wild animals. One forest guard summarized the reason behind this:

*Our main source of livelihood here in Barangay Salaysay is mainly farming but we also worked as forest guards. Our work as forest guards, involved more men than women. As forest guards and as member of the community, we really protect our ancestral domains. We even have a “datu” in our community that we respected, who has the control against anyone who would try to harm our ancestral domains. Women here in the community are working at home, while men work in their farms. (Ang among panginabuhian dinhi sa Barangay Salaysay*

*mao ang pagpanguma apan nagtrabaho usab kami isip mga guwardiya sa kalasangan. Ang among trabaho isip magbalantay sa lapsang, naglangkob ug mas daghan lalaki kaysa sa mga babaye. Isip mga guwardiya sa kalasangan ug isip miyembro sa komunidad, giprotektahan gyud nato ang atong ancestral domains. Aduna gani kami “datu” sa komunidad nga amoa ginarespeto, nga aduna control batok sa mga gusto nga maghilabot sa ancestral domanis.)* Forest guard, Barangay Salaysay, Davao City, Interview number 2

**Access to and Control Over Assets and Resources**

**Access to education.** The Obu Manuvu indigenous community has a large population of adults under 40 and above who lack the education needed to secure formal employment. Although boys and girls in the community are provided with the opportunity to attend school, poverty hinders the completion of their elementary education. Despite the Philippine government’s provision of free grade school education, the Obu Manuvu people still struggle to complete their education. This is because they must also cover expenses such as uniforms, school materials, other school fees, school allowances, and daily necessities. The lack of education for both genders is considered to be the main reason behind their low socio-economic status and the limited

availability of formal employment opportunities. The statements provided by the respondent in an interview best illustrate this, which stating that:

*Many of us here did not finish elementary because of poverty. Our parents cannot afford to send us to school back then. The same is true with our children right now. While the government provides us free education in elementary, but we also have to pay for our uniforms, schools requirements and other fees in school. We also have daily needs such as the food that we eat and other needs at home. These are some of the reasons why many of us not able to get a good job. We only get a living by farming. (Daghan sa amoa diri ang wala makahuman ug elementary tungod sa kapobrehon. Ang amoa mga ginikanan dili makakaya ng paeskwelahan mi. Mao gihapon ang sitwasyon sa amoang mga anak sa kasamtangan. Bisan pa ug ang gobyerno muhatag ug libre nga edukasyon sa elementary, kami gihapon ang magbayad sa amoa mga uniporme, requirements sa eskwelahan ug uban pang mga bayrunon. Aduna pod kami mga panginahanglan kada adlaw sama sa mga pagkaon ug ubna pa. Mao usab kini ang maong mga rason ngano maglisod mi ug kuha ug maayong trabaho. Mabuhi lang kami pinaagi sa pagpanguma.)* Forest guard, Barangay Carmen, Davao City, Interview number 5

**Access to information and training programs.** Access to correct information and training programs has supported conservation efforts made by women and men. Both genders have been equipped with the knowledge and necessary skills to understand the conservation process, especially regarding deer. As part of a long-term conservation program with the Obu Manuvu, various information dissemination programs were provided to enable forest guards to fulfill their roles. Training programs and other information dissemination initiatives are available to all community members through agencies such as local government units and non-government organizations (e.g., the Philippine Eagle Foundation). In addition, the researchers of this paper spearheaded the project titled "Population status, community values, and gender roles in the conservation of the Philippine brown deer (*R. marianna*) in the OMAD in Davao City, Philippines." This project has also provided community members with better solutions to deer conservation. The provision for training and seminars to effectively disseminate information on deer conservation highlights the opportunities that

both women and men have benefited from. One of the forest guards mentioned:

*We were given trainings and seminars in terms of deer conservation. There were non-government organizations that provided us with trainings. The government also gave us seminars. Also, the Philippine Eagle Foundation gave us inputs and other needed trainings in conserving the deer in our ancestral domains (Gitagaan kami ug mga trainings ug seminars kabahin sa pag konserba sa usa. Adunay mga non-government organizations nga naghatag ug training. Ang gobyerno naghatag ug mga seminars. Ang Philippine Eagle Foundation naghatag pod ug mga input ug uban pang mga kinahanglanon nga mga training ug seminar kabahin sa pakonserba sa mga osa sa amoang ancestral domain.)* Forest guard, Barangay Salaysay, Davao City, Interview number 2)

Another forest guard also reported:

*They have research projects conducted in the past that also helped us more fully understand our responsibilities as forest guards. For example, the research project titled "Population Status, Community Values, and Gender Roles in the Conservation of the Philippine Brown Deer (*R. marianna*) in the Obu Manuvu Ancestral Domain in Davao City, Philippines," has also provided us ideas in deer conservation. (Aduna sila research project nga gihimo kaniadto nga nakatabang kanamo aron masabtan namo ang amoang mga responsibilidad isip gwardya sa kalasangan. Pananglitan kaning proyektong gitituluhan: *Philippine Brown Deer (R. marianna) in the Obu Manuvu Ancestral Domain in Davao City, Philippines*," gitagaan pod mi ug kahibalo sa pagkonserba sa mga osa. Forest guard, Barangay Tambobong, Davao City, Interview number 4*

**Access to employment services.** Deer conservation within the OMAD has provided both women and men with access to employment as forest guards. In the course of conserving the deer, Obu Manuvu women and men were hired as forest guards with specific duties and tasks to fulfill and comply with. However, it is worth noting that a higher number of men were hired and involved in deer conservation. Despite the higher number of men, monetary benefits were equal among all employees. As forest guards, women are assigned to housekeeping and clerical jobs such as encoding and bookkeeping, while men are

engaged in monitoring and roving patrol jobs to protect the forest and wildlife sanctuary. Access to employment services is best exemplified through the statements provided by the forest guard:

*Our main job is to conserve the deer in our ancestral domains. Because of this, we were given the chance to work and be employed. As forest guards, men are assigned to monitoring and roving patrol jobs to protect the forest and wildlife sanctuary, while women worked in housekeeping and doing clerical jobs such as encoding and bookkeeping. (Ang amoa gyud panguna nga trabaho ang maong pagkonserba sa mga osa sa ancestral domain. Isip guwardiya sa kalasangan, ang mga lalaki ang gi-assign sa monitoring, ug pagpatrolya or roving arun maprotektahan ang kalasangan ug mga puluy-anan sa mga wild animals samtang ang mga babae nagatrabaho ug pambalay ug klerikal nga mga trabaho sama sa encoding ug bookkeeping.)* Forest guard, Barangay Tawantawan, Davao City, Interview number 7.

### Knowledge, Beliefs, and Perception

**Employment preferences.** Employment for women and men in the Obu Manuvu community is dominated by farming and manual labor. However, men are more commonly hired for these jobs. More men work on farms and in private companies as laborers, while women are more likely to work overseas as domestic helpers. This pattern is observed in the Obu Manuvu community, as locals believe men should do more strenuous labor than women. Furthermore, women are expected to work at home, such as doing household chores and caring for their children and husbands. This is also evident in the work women are assigned as forest guards. Women forest guards are expected to fulfill clerical roles such as recordkeeping, bookkeeping, and secretariat duties. Women often jot down the group's observations during conservation work. On the other hand, men perform productive functions such as foot patrols and species monitoring, especially in difficult terrains. A forest guard from Barangay Tawantawan, Davao City, stated:

*Aside from being a forest guard, our work here in our barangay is mainly into farming. If we don't have work in the farm, we also do manual labor. We are hired for other farms and in some in private companies to work as laborers. Women also work as domestic helpers abroad (Forest guard, Barangay Tawantawan, Davao City, Interview number 8).* This is further elaborated by a lady forest

guard from the same Barangay: *At home, we do household chores and care for our children and husbands. (Gawas sa pagkaguwardiya sa lasang, pagpanguma ang amoa gyud trabaho sa barangay. Kung wala kami pagabuhaton sa uma, nagapanghorna pod kami. Gina-hire pod kami sa laing mga uma ug sa mga pribado nga kompaniya isip laborer. Ang ubang mga babae nanarbaho pod sa laing nasod isip domestic helper.)* Forest guard, Barangay Tawantawan, Davao City, Interview number 7.

### Decision-Making Power

**Equal participation.** The entire community of the Obu Manuvu tribe is allowed to participate in the decision-making process. Women and men are organized into groups so that everyone will have the opportunity to express their concerns and participate in community discussions and decisions. They have organized a women's organization to ensure that women have equal opportunities to participate in the process. Community members are also given the chance to voice their opinions on deer conservation in their ancestral domain, allowing them to advocate for their views to higher authorities such as the local government units (LGUs), non-government organizations (NGOs), and the Pusaka Council. The following statements by a female forest guard best illustrate this:

*As members of the community, we are given the opportunity to participate in meetings and discussions. Whenever there are decisions that need to be done in the community, we are being consulted. We voice out our opinions in terms of conserving the deer. That is why our organization is being organized in the barangay (Forest guard, Barangay Carmen, Davao City, Interview number 6).* This is further elaborated by a forest guard from Barangay Tambobong, Davao City: *We also have a woman-leader. Through her, we are represented in meetings and in some discussions in the community. If we have issues and concerns, we lobby these to our leader. (Isip miyembro sa komunidad, gihatagan kami ug oportunidad nga mupartisipar sa mga meeting ug diskusyon. Kung aduna man desisyon nga pagabuhaton sa komunidad, ginakonsulta kami. Makapahayag kami sa amoa tingog kabahin sa pagkonserbar sa mga osa. Maong ang amoa grupo giila sa barangay.)* Forest guard, Barangay Tambobong, Davao City, Interview number 4.

## Laws, Legal Rights, Policies, and Institutions

**Property ownership.** The legal rights of the Obu Manuvu tribe have been defined by Philippine laws stipulated in the Indigenous People's Rights Act (IPRA) of 1997, or Republic Act No. 8371. Laws and policies that protect the rights of the members of the community and their ancestral lands are also provided by the Pusaka council/council of elders, following the policies stipulated in RA 8371. Pusaka council is a community-based association or organization of the indigenous group of Obu Manuvu. It strengthens IP protection and management of local conserved areas, enforces IP customary laws on sacred areas and policies for conservation actions, and increases local commitment through conservation initiatives. Through Pusaka, women and men in the OMAD are now allowed to speak about their brand of conservation and receive commendations from other IP groups. In performing their forest guard functions, women and men are also guided and protected by laws. Property ownership is best illustrated through the following statements:

*In our work as forest guards, law protects us all. One of the laws that protect us is the Indigenous People's Right Act (IPRA) of 1997 or Republic Act No. 8371. The Pusaka Council also governs us. This Pusaka Council is our council of elders from the Indigenous People of Obu Manuvu that also protect our rights in the community, and our ancestral lands. (Sa amoang trabaho isip gwardiya sa kalasangan, ang balaod nagaprotekta kanamo. Isa sa mga balaod nga nagaprotekta kanamo mao ang Indigenous People's Rights Act (IPRA) 1997 o gitawag nga Republic Act No. 8371. Gidumalaan pod kami sa Pusaka Council. Ang Pusaka Council ang amoang council of eleders gikan sa Indigenous People sa Obu Manuvu nga nagaprotekta sa amoang katungod sa komunidad, ug sa amoang ancestral land.)* Forest guard, Barangay Salaysay, Davao City, Interview number 1.

## People's priorities and needs/ opportunities and constraints

**Need for livelihood programs.** The livelihood program is considered one of the priorities and needs of some members of the Obu Manuvu community. Providing livelihood programs, as emphasized by community members, especially the forest guards, is seen as a way to alleviate poverty. If both women and men can benefit from these programs, it is expected that the employment rate will increase and the needs of their families will be met. Unfortunately, due to limited support for their ecosystem services or labor in forest conservation,

forest guards often have to use their own materials and funds such as bags and food allowance during conservation activities. This means that instead of earning a livelihood, some of the forest guards spend their resources for conservation work. A forest guard best expresses the need for livelihood programs:

*We would like to let you know of our concerns. Our number one problem is to get a main source of income. While our allowances as forest guards helped us with some of our needs at home, it is not enough to feed the whole family. That is why we appeal to government to provide us with livelihood programs. (Gusto namo ipahibalo ang amoa mga mulo. Ang numero uno namo nga problema mao ang makakuha ug main source of income. Samtang ang among mga allowance isip mga guwardiya sa kalasangan nakatabang kanamo sa pipila sa among mga panginahanglan sa balay, kini dili igo sa pagpakaon sa tibuok pamilya. Mao nga naghangyo kami sa gobyerno nga hatagan kami mga programa sa panginabuhi.)* Forest guard, Barangay Tambobong, Davao City, Interview number 3.

## DISCUSSION

### Gender Gaps

**Access to education and employment preferences.** Gender gaps have appeared in access to education for women and men in the Obu Manuvu population. Although these gaps have narrowed over time, significant disparities still exist among indigenous peoples (Reimão and Tas 2017). Among the Obu Manuvus, the gaps are linked to poverty, as indicated by the average monthly income of the forest guards, which ranges from PHP 900.00 to PHP 11,250.00. The Obu Manuvus heavily rely on their ancestral domains, particularly forest resources like deer meat, for their food and livelihood. This is consistent with the socio-economic reliance on forest products and wildlife observed in rural areas of developing countries (Mukul et al. 2015; Garekae et al. 2017; Ali et al. 2020). The rural poor often depend on various natural resources and ecosystem services, and therefore, they are affected by its degradation (Adams et al. 2012; Matos 2022).

Both women and men in the Obu Manuvu community are involved in the conservation of Philippine brown deer. Men, in particular, have a duty to protect their ancestral domains. The Obu Manuvus derive their livelihood from farming on their traditional lands. However, due to poverty, both women and men face challenges in completing formal education. Addressing gender issues in conservation

is crucial, as it requires considering the challenges faced by women and men in terms of workload, perception, and traditional gender roles and expectations (Evans 2017).

Moreover, gender relations play an essential role in biodiversity conservation (Alvarez and Lovera 2016) partly because women and men have different roles within the farming household (Al Mubarak 2021). These roles entail additional responsibilities related to variety selection and maintenance. For example, women are often required to travel to distant areas to collect water, timber, plants, and animal products (Al Mubarak 2021). Furthermore, women and men have different perspectives on farm-related matters, contributing to a more holistic approach to farming. While it is difficult to determine who can better represent the farming system, acknowledging the significance of differentiating women's and men's needs and knowledge is crucial.

### Gender Parity

**Access to information and training programs, employment services, equal participation, and property ownership.** Women and men have equal access to information and training programs, employment services, and property ownership. Biodiversity conservation offers an opportunity for conservation practitioners and local communities to access comprehensive guidelines and training by addressing gender equality in their activities (Westerman 2021). Advances in science, technology, and social sciences provide significant opportunities for developing alternative solutions and disseminating information. This means that both genders are equally capable of engaging in conservation decisions and actions.

Moreover, biodiversity conservation initiatives provide an opportunity for local communities to engage and contribute to addressing biodiversity degradation while creating employment opportunities. In recent years, business corporations have integrated biodiversity conservation into their operational strategies (Torelli and Balluchi 2022). Working with local partners who possess knowledge of the status of regional or national ecosystems is key to identifying the long-term benefits of biodiversity and effective conservation measures. Potential partners include, but are not limited to, government agencies, local communities, conservation NGOs, and private sector actors, such as timber concessionaires.

Collaborative efforts involving various stakeholders can be facilitated by local, national, or international NGOs (Visseren-Hamakers et al. 2012; Romero-Brito et al. 2016). By adopting a “gendered approach” to conservation, organizations such as NGOs and LGUs believe can achieve environmental and social outcomes by involving women in community discussions and management (Evans 2017;

Yang et al. 2018). Similarly, it is essential to document the gender roles of Obu Manuvu women and men as a baseline for promoting equal rights, inclusive participation, and women's empowerment.

### Issues and Concerns

**Need for livelihood programs.** Although the Obu Manuvus were provided with an opportunity in terms of their access to training programs to pursue deer conservation, it was also reported that the need for livelihood programs greatly concerned them (Villegas et al. 2022a, b). Many studies have been conducted on the association between the degree of engagement of indigenous peoples in conservation programs and livelihood interventions (Bridgewater et al. 2015; Oldekop et al. 2015; Nguyen et al. 2019; Fa et al. 2020; Di Sacco et al. 2021). For conservation initiatives to be successful, it is also necessary to simultaneously enhance local livelihoods. There is a need to prioritize payment for ecosystem services to sustain local conservation efforts (Bhatta et al. 2014; Kaiser et al. 2021).

The main reason gender is considered in conservation is to protect nature for the well-being of people. When making decisions about conservation, it is important to consider that both women and men should have the right and ability to participate, as they are both users of natural resources (Evans 2017). To sustain and strengthen these efforts, it is crucial to provide adequate training and support, including capacity-building initiatives and financial remuneration for the forest guards. There is a need to ensure that the Obu Manuvu community can continue to protect and preserve this sacred species for generations to come.

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### ETHICAL CONSIDERATIONS

Before conducting this study, all necessary consents were secured according to the Indigenous Peoples Rights Act of 1997 and other related laws and regulations promulgated by the Philippine government. Foremost is the Free, Prior, and Informed Consent (FPIC) to ensure the protection of the indigenous community's economic, social, and cultural well-being. The Obu Manuvu tribal leaders and elders issued Resolution No. 1, s. 2019, approving the study conduct. Finally, all participants in this study were



asked to sign a consent form, wherein the objectives, procedures, risks, and confidentiality terms were elaborated.

## DECLARATION OF COMPETING INTEREST

The authors declare no competing interests.

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## REFERENCES

- Adams WM. 2012. Conservation in the Anthropocene: Biodiversity, Poverty and Sustainability. In: Roe D, Elliott J, Sandbrook C and Matt Walpole (eds). Biodiversity Conservation and Poverty Alleviation: Exploring the Evidence for a Link. John Wiley and Sons, Ltd., pp. 304-315.
- Al Mubarak R. 2021. Why women have an essential role in biodiversity conservation. Climate Champions. <https://climatechampions.unfccc.int/why-women-have-an-essential-role-in-biodiversity-conservation/>. Accessed on 24 June 2022.
- Ali N, Hu X and Hussain J. 2020. The dependency of rural livelihood on forest resources in northern Pakistan's Chaprote Valley. Global Ecology and Conservation, 22: e01001. <https://doi.org/10.1016/j.gecco.2020.e01001>
- Alvarez I and Lovera S. 2016. New times for women and gender issues in biodiversity conservation and climate justice. Development, 59: 263–265. <https://doi.org/10.1057/s41301-017-0111-z>
- Bhatta LD, Van Oort BE, Rucevska I and Baral H. 2014. Payment for ecosystem services: Possible instrument for managing ecosystem services in Nepal. International Journal of Biodiversity Science, Ecosystem Services and Management, 10(4): 289-299. <https://doi.org/10.1080/21513732.2014.973908>
- BMB-DENR (Biodiversity Management Bureau – Department of Environment and Natural Resources). 2020. Philippine Red List of threatened wild fauna. 120pp. <https://www.biodiversity.ph/wp-content/uploads/2020/08/PRLC-Book-vertebrates.pdf>. Accessed on 24 June 2022.
- Bridgewater P, Régnier M and García RC. 2015. Implementing SDG 15: Can large-scale public programs help deliver biodiversity conservation, restoration and management, while assisting human development? Natural Resources Forum, 39(3-4): 214-223. <https://doi.org/10.1111/1477-8947.12084>
- CBD (Convention on Biological Diversity). 2017. What is gender and biodiversity? <https://www.cbd.int/gender/biodiversity>. Accessed on 21 January 2023.
- Creswell J. 2014. Research Design (4th ed.). California, United States of America: SAGE Publications, Inc. 42pp.
- Di Sacco A, Hardwick KA, Blakesley D, Brancalion PHS, Breman E, Rebola LC, Chomba S, Dixon K, Elliott S and Ruyonga G et al. 2021. Global Change Biology, 27(7): 1328-1348. <https://doi.org/10.1111/gcb.15498>
- Evans R. 2017. Why gender matters in conservation. Mongabay. <https://news.mongabay.com/2017/05/qa-with-a-champion-of-the-gendered-approach-to-conservation/#>. Accessed on 24 June 2022.
- Fa JE, Watson JE, Leiper I, Potapov P, Evans TD, Burgess ND, Molnár Z, Fernández-Llamazares A, Duncan T and Wang S et al. 2020. Importance of Indigenous Peoples' lands for the conservation of intact forest landscapes. Frontiers in Ecology and the Environment, 18(3): 135-140. <https://doi.org/10.1002/fee.2148>
- Foley JA, DeFries R, Asner GP, Barford C, Bonan G, Carpenter SR, Chapin S, Coe MT, Daily GC, Gibbs HK, et al. 2005. Global Consequences of Land Use. Science, 309: 570-574. <http://dx.doi.org/10.1126/science.1111772>
- Garekae H, Thakadu OT and Lepetu J. 2017. Socio-economic factors influencing household forest dependency in Chobe enclave, Botswana. Ecological Processes, 6: 40. <https://doi.org/10.1186/s13717-017-0107-3>
- James R. 2023. Breaking the bias: How to deliver gender equity in conservation. Nature. <https://doi.org/10.1038/d41586-023-00779-7>
- Kaiser J, Haase D and Krueger T. 2021. Payments for ecosystem services: A review of definitions, the role of spatial scales, and critique. Ecology and Society, 26(2): 12. <https://doi.org/10.5751/es-12307-260212>
- Leisher C, Temsah G, Booker F, Day M, Agarwal B, Matthews E, Roe D, Russell D, Samberg L and Sunderland T et al. 2015. Does the gender composition of forest and fishery management groups affect resource governance and conservation outcomes: A systematic map protocol. Environmental Evidence, 4: 13. <https://doi.org/10.1186/s13750-015-0039-2>
- MacKay F. 2017. Indigenous Peoples' rights and conservation: Recent developments in human rights jurisprudence. Forest Peoples Programme. <https://www.forestpeoples.org/en/rights-based-conservation/news-article/2017/indigenous-peoples-rights-and-conservation-recent>. Accessed on 24 June 2022.
- MacKinnon JR, Ong P and Gonzales J. 2015. *Rusa marianna*. The IUCN Red List of Threatened Species 2015: e.T4274A22168586. <https://dx.doi.org/10.2305/IUCN.UK.2015-2.RLTS.T4274A22168586.en>. Accessed on 24 June 2022.
- March C, Smyth I and Mukhopadhyay M. 1999. A Guide to Gender-Analysis Frameworks. Oxfam. Retrieved from Oxford. [www.ndi.org/files/Guide%20to%20Gender%20Analysis%20Frameworks.pdf](http://www.ndi.org/files/Guide%20to%20Gender%20Analysis%20Frameworks.pdf). Accessed 15 December 2023.
- Matos A. 2022. Poverty alleviation, ecotourism, and biodiversity protection in Principe Island. In: Information Resources Management Association (ed). Research Anthology on Ecosystem Conservation and Preserving Biodiversity. IGI Global, Hershey, pp. 1640-1656. <https://doi.org/10.4018/978-1-6684-5678-1.ch079>
- Mukul SA, Rashid AZ, Uddin MB and Khan NA. 2015. Role of non-timber forest products in sustaining forest-based livelihoods and rural households' resilience capacity in and around protected area: A Bangladesh study. Journal of

- Environmental Planning and Management, 59(4): 628-642. <https://doi.org/10.1080/09640568.2015.1035774>
- Nguyen T, Lawler S, Goldoftas B and Le C. 2019. Biodiversity conservation or Indigenous People's welfare: A dilemma for forest management in Vietnam's BU Gia Map National Park. *Community Development*, 50(4): 406-421. <https://doi.org/10.1080/15575330.2019.1642927>
- Ochola WO, Sanginga PC and Bekalo I. 2010. *Managing Natural Resources for Development in Africa: A Resource Book*. International Development Research Centre. Ontario, pp. 212-214.
- Oldekop JA, Holmes G, Harris WE and Evans KL. 2015. A global assessment of the social and conservation outcomes of protected areas. *Conservation Biology*, 30: 133-141. <https://doi.org/10.1111/cobi.12568>
- Parks MH, Christie ME and Bagares I. 2015. Gender and conservation agriculture: constraints and opportunities in the Philippines. *Geography Journal*, 80: 61–77. <https://doi.org/10.1007/s10708-014-9523-4>
- Ravenelle J and Nyhus PJ. 2017. Global patterns and trends in human-wildlife conflict compensation. *Conservation Biology*, 31(6): 1247-1256. <https://doi.org/10.1111/cobi.12948>
- Reimão ME and Taş EO. 2017. Gender education gaps among Indigenous and Non-Indigenous groups in Bolivia. *Development and Change*, 48(2): 228-262. <https://doi.org/10.1111/dech.12292>
- Rizzolo JB, Delie J, Carlson SC and Dietsch AM. 2023. Gender differences in wildlife-dependent recreation on public lands. *Frontiers in Conservation Science*, 4. <https://doi.org/10.3389/fcosc.2023.1006150>
- Romero-Brito TP, Buckley RC and Byrne J. 2016. NGO partnerships in using ecotourism for conservation: Systematic review and meta-analysis. *PLOS ONE*, 11(11): e0166919. <https://doi.org/10.1371/journal.pone.0166919>
- Srinivas H. 2015. The GDRC Framework on Gender and Development. The Global Development Research Center. <https://www.gdrc.org/gender/gdrc-genderframework.html>. Accessed on 22 February 2024.
- Tanalgo KC. 2017. Wildlife hunting by indigenous people in a Philippine protected area: A perspective from Mt. Apo National Park, Mindanao Island. *Journal of Threatened Taxa*, 9(6): 10307-10313. <https://doi.org/10.11609/jott.2967.9.6.10307-10313>
- TUOMTC (The Unified Obu Manuvu Tribal Council). 2017. *Caring for Pusaka: A Primer*. Obu Manuvu of Davao City, Philippines. 5pp.
- Torelli R and Balluchi F. 2022. Biodiversity management approaches in small and innovative businesses: insights from a systems thinking perspective. *Social Responsibility Journal*, 19(7): 1297-1319. <https://doi.org/10.1108/SRJ-03-2022-0113>
- Visseren-Hamakers JJ, Leroy P and Glasbergen P. 2012. Conservation partnerships and biodiversity governance: Fulfilling governance functions through interaction. *Sustainable Development*, 20(4): 264-275. <https://doi.org/10.1002/sd.482>
- Villegas JP, Ibañez JC and Cabrido CKT. 2022a. Abundance and distribution of the Philippine Brown Deer (*Rusa marianna* Desmarest, 1822) in the Obu Manuvu Ancestral Domain, Mindanao Island, Philippines. *Acta Biologica Universitatis Daugavpiliensis*, 22(1): 68-89.
- Villegas JP, Ibañez JC and Rosales JR. 2022b. Conservation and population status of the Philippine warty pig (*Sus philippensis*) within the Obu Manuvu Ancestral Domain in Davao City, Mindanao Island, Philippines. *Sylvatrop*, 32(1): 1-14.
- Westerman K. 2021. Unpacking the perceived benefits and costs of integrating gender into conservation projects: Voices of conservation field practitioners. *Oryx*, 55(6): 853-859. <https://doi.org/10.1017/s0030605320001295>
- Yang YE, Passarelli S, Lovell RJ and Ringler C. 2018. Gendered perspectives of ecosystem services: A systematic review. *Ecosystem Services*, 31: 58-67. <https://doi.org/10.1016/j.ecoser.2018.03.015>
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