



Research Article

Community-Based Monitoring for Customary Territory Defence and Multispecies Eco-Justice: A Case Study of the Enggano Indigenous People, Bengkulu

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Abstract

Enggano Island holds high endemic biodiversity, yet pressure on its forests keeps rising. This article examines the community-based monitoring (CBM) carried out by the Enggano indigenous people together with the Enggano Monitoring Team in February and March 2025. The monitoring covered Protection Forest and Limited Production Forest areas of roughly 125 ha spread across six grids. The methods combined ground checks, line transects, bird point counts, feed-plant inventories, resident interviews, and satellite imagery and geographic information system (GIS) analysis through the QField application. The team recorded 43 animal signs, several direct encounters with endemic species such as the Enggano myna and the Enggano imperial pigeon, and a clear dominance of wildlife feed plants and other useful plants. The 2024 land cover data show that forest still covers 55.97 percent of the island. These findings position CBM not merely as a tool for collecting ecological data, but as an instrument for defending customary territory, a means of restoring the relationship between residents and their forest, and a way of preparing a local discourse on multispecies eco-justice. The authors argue that resident-generated data strengthen the bargaining position of the indigenous people in the customary forest recognition process that followed Constitutional Court Decision No. 35/PUU-X/2012, while also building an evidentiary basis for treating nonhuman beings as holders of justice claims.

Keywords

Community-based Monitoring, Indigenous People, Customary Forest, Multispecies Justice, Enggano, Biodiversity

1. Introduction

Enggano Island sits in the Indian Ocean, about 100 kilometres off the southwestern coast of Sumatra, and falls administratively under North Bengkulu Regency, Bengkulu Province. It is one of Indonesia's outermost islands, with a land area of roughly 400 square kilometres. Most of its territory remains lowland tropical forest. Geographic isolation has made Enggano one of the centres of biological endemism in western Indonesia [23].

This endemism is most visible among birds. The Enggano myna (*Gracula religiosa enganensis*), the Enggano thrush (*Geokichla leucolaema*), the Enggano scops owl (*Otus enganensis*), and the Enggano white-eye (*Zosterops salvadorii*) occur only on this island or have their own race here. The Enggano imperial pigeon (*Ducula oenothorax*) and the Enggano cuckoo-dove (*Macropygia cinnamomea*) are listed as Near Threatened (NT) on the International Union for Conservation of Nature

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(IUCN) Red List and are hunted by residents for food [7, 8]. This profile makes Enggano an endemic bird area of high conservation value and, at the same time, a vulnerable one.

Pressure on Enggano's forests comes from several directions at once. Small-scale land clearing for resident plantations, wildlife hunting, land conversion, development interests, and illegal logging all take place while supervision of the forest area remains weak [21]. Forest-dependent endemic birds are among the first to feel the effect when forest cover shrinks. On a small island, the loss of part of the habitat can suppress wildlife populations quickly because their range is limited.

The Enggano indigenous people, known locally as the people of Pulau Aru, have lived alongside the island's forests, rivers, and coast for generations. They manage natural resources through customary law and absorb newcomers through a "friend clan" system that grants equal rights [2]. Designating part of the customary territory as state forest strained the relationship between residents and their environment and set aside their standing as rights holders. The sale of customary land to outsiders, together with reported transfers of customary land by certain individuals, has added further pressure on the customary order [2].

Constitutional Court Decision No. 35/PUU-X/2012 reshaped the legal landscape for customary forest governance in Indonesia. The ruling removed the clause that placed customary forest within state forest and recognised indigenous law communities as legal subjects holding rights over their forests [4, 13, 25]. That recognition is not automatic. Indigenous communities must demonstrate their existence, their territorial boundaries, and management practices that maintain forest function and cover [5]. This is where field data matter. Without well-organised evidence, a claim over customary territory is hard to defend in the policy arena.

External monitoring of the forest area rarely runs on a regular basis in Enggano. Limited budgets, long distances, and difficult terrain make professional surveys costly and hard to sustain. The natural resource monitoring literature points to a sensible alternative, namely involving local residents in collecting and interpreting data [12, 14, 15, 20]. This approach is known as community-based monitoring. Residents hold detailed knowledge of the space and timing of their forest, so management decisions can be taken faster than under schemes run by outside scientists [16].

This article documents and analyses one round of community-based monitoring in Enggano during February and March 2025. Three questions guide the study. First, what is the state of forest cover and the biodiversity findings in the monitored area. Second, how can resident-generated monitoring data strengthen the defence of customary territory. Third, how does this practice restore the relationship between residents and the forest, and how does it prepare the ground for a discourse on multispecies eco-justice, that is, a view of justice that extends to nonhuman beings [9]. The study contributes to the discussion on customary forest management by showing that resident monitoring works on several layers at once, an ecological layer, an agrarian-political layer, and an ethical layer.

2. Methods

The monitoring took place in the Protection Forest and Limited Production Forest of Enggano Island, covering roughly 125 ha across six monitoring grids. Fieldwork ran in two periods, 10 February 2025 and 19 to 20 March 2025. The team consisted of members of the Enggano indigenous community and facilitators from the Enggano Monitoring Team. Local residents served not only as guides but also as recorders of findings, which places this activity in the category of participatory monitoring with high local involvement [15].

Field data collection used several complementary methods. Ground checks validated satellite imagery against the actual conditions along survey routes. Findings were entered using the QField application, the field interface of QGIS (Quantum Geographic Information System), so that every recorded point carried its coordinates. Line transects recorded wildlife and plant species along routes that followed the agreed grid. Point counts were used specifically for birds, conducted at fixed stations within a set observation radius. The feed-plant inventory recorded the species, number, and estimated age of feed trees encountered.

Spatial analysis combined remote sensing and geographic information systems. Satellite imagery from Google Earth and MapBiomas land cover data for 2024 were used to read forest cover, land change, and fragmentation. High-resolution satellite imagery from SAS Planet for 2023 served as an additional visual reference. QGIS was used to map area boundaries and arrange the recorded points. Interviews with residents complemented the field data, especially for local species names and use histories. The monitoring was designed to be periodic, with a target of monthly repetition, so that changes in condition could be read over time.

Findings were grouped into six categories: wildlife encounters, animal signs, wildlife feed plants, medicinal plants, plants of other uses, and other plants. The analysis is descriptive. The authors present a recapitulation of the number of findings per category, the frequency of animal sign types, and the composition of plant species. These results are read together with the land cover data to assess habitat condition. The main data sources for this article are the Enggano Monitoring Team report for February and March 2025, the QField output, resident interviews, MapBiomas land cover data, and SAS Planet imagery for 2023 [3].

3. Results and Discussion

3.1. Land Cover and Forest Condition

MapBiomas land cover data for 2024 show that forest remains the dominant cover on Enggano Island. Forest covers 22,291.33 ha, or 55.97 percent of the territory. Non-forest natural formation adds another 22.17 percent. Agricultural land

already covers 8,330.42 ha, or 20.92 percent of the island. Water bodies and non-vegetated areas make up the remainder. The details appear in [Table 1](#).

Table 1. Land cover of Enggano Island, 2024.

Land cover class	Area (ha)	Percentage
Forest	22,291.33	55.97%
Non-forest natural formation	8,828.90	22.17%
Agriculture	8,330.42	20.92%
Water body	281.57	0.71%
Non-vegetated area	94.63	0.24%
Total	39,826.85	100%

Source: MapBiomas Indonesia, Enggano Island land cover 2024 (AKAR Global Inisiatif, 2025). [\[3\]](#)

These figures carry two messages at once. Forest cover still above half of the island indicates that the habitat base for endemic wildlife has not collapsed. At the same time, agriculture that already reaches a fifth of the territory shows a real conversion pressure. On an island of this size, every new patch of farmland can cut a forest corridor and narrow the space available to wildlife. This pattern is consistent with the threat recorded for Enggano, where deforestation is the main pressure on biodiversity [\[23\]](#).

3.2. Animal Signs and Wildlife Encounters

In the monitored area, animal signs were the most frequently recorded category, with about 27 recorded points, followed by plants of other uses and wildlife feed plants. The recapitulation of findings per category appears in [Table 2](#).

Table 2. Recapitulation of recorded points per category, February and March 2025.

Finding category	Recorded points
Animal signs	27
Plants of other uses	17
Wildlife feed plants	13
Wildlife encounters	8
Medicinal plants	4
Other plants	1

Source: Enggano Monitoring Team report (AKAR Global Inisiatif, 2025). Figures read from the findings chart. [\[3\]](#)

Broken down by sign type, the team recorded 43 animal signs. Wild boar tracks were the most numerous at nine, plus six nests and four wallows. Racket-tailed parrot calls were recorded seven times, followed by calls of the bird locally named korea and the imperial pigeon at four each, the thrush three times, and the myna twice. Myna nests were found twice. The details appear in [Table 3](#).

Table 3. Frequency of animal sign types.

Sign type	Species	Count
Track	Wild boar	9
Nest	Wild boar	6
Willow	Wild boar	4
Nest	Myna	2
Call	Racket-tailed parrot	7
Call	Bird (korea)	4
Call	Imperial pigeon	4
Call	Thrush	3
Call	Myna	2
Call	Ground insect	2

Source: Enggano Monitoring Team report (AKAR Global Inisiatif, 2025). Bird names follow local usage. [\[3\]](#)

Animal signs indicate presence, not population density. Even so, the pattern is informative. The dominance of wild boar tracks, nests, and wallows shows that this species is active across the whole monitored area. Wild boar plays a part in forest dynamics, but it also clashes with resident farming. The Enggano community has long answered this conflict through a system of shared plots and shared-responsibility fences that hold back boar incursions into the rice fields, a form of local knowledge that remains in use today. Monitoring of animal signs gives a quantitative basis for reading wild boar pressure from year to year.

Direct encounters complement the sign data. The team encountered wild boar, the myna, the Enggano myna, the imperial pigeon, the local yarobu snail, and the Enggano river prawn. Two of the bird species carry high conservation value. The Enggano myna refers to *Gracula religiosa enganensis*, and the imperial pigeon to *Ducula oenothorax*, which is listed as Near Threatened [\[7\]](#). Direct records of species like these matter because they strengthen the evidence that the habitat in the monitored area still supports endemic wildlife. The snail and the river prawn add records of freshwater fauna that are rarely documented on this island [\[18\]](#).

3.3. Wildlife Feed Plants

Wildlife feed plants were one of the dominant finding groups, with 13 recorded points. The species recorded include kayu beringin kaber, pohon EN, pohon umis, wild salak, kayu en, banyan, pohon ehei, and pohon kupit. Banyan appeared repeatedly, both as kayu beringin kaber and as a banyan tree, which is consistent with the role of banyan as an important food source for fruit-eating birds such as the myna and the imperial pigeon.

An even spread of feed plants across the monitored area indicates that the food base for wildlife remains sufficient. In a forest ecosystem, food availability is a key factor that keeps wildlife within its habitat. This group of plants is, however, vulnerable. Encroachment, clearing for farmland, and illegal logging can lower the number and diversity of feed trees. When feed trees disappear, the wildlife that depends on them comes under pressure. For this reason, periodic monitoring of feed plants provides an early warning of changes in habitat quality.

3.4. Medicinal Plants and Plants of Other Uses

The team recorded three medicinal plant species, namely akar dookber, akar kuning, and pohon pripok, each at three recorded points. The group of plants of other uses was the most diverse, with species such as nibung palm, kayu nehek, forest fern, wild banana, pohon kupik keh, small rattan, rumpun silet, kayu bayur, pohon apua Enggano, pohon bayur kuning, pohon metoa Enggano, wild salak, and melinjo. Many of the names recorded are local Enggano names rather than common trade names.

These records hold a value beyond ecological data. Local names such as akar dookber, pohon ehei, or pohon metoa Enggano carry inherited knowledge about the function and use of plants. This kind of knowledge is bound to the language and practice of residents, and it will fade if the forest is degraded or if younger generations stop entering the forest. Documenting local names through monitoring keeps that knowledge alive and tied to real locations in the field [1, 6].

3.5. Resident Monitoring as Evidence and Territorial Defence

The data residents collect serve a double function. At the first layer, the data describe the condition of the forest and its wildlife. At the second layer, the data become evidence. The typology of natural resource monitoring places an activity like the one in Enggano in the category of high local participation, where residents collect and help interpret the data [15]. This category yields management decisions that are faster and closer to residents' needs [16].

This evidentiary function is directly relevant to the customary forest recognition process. After Constitutional Court Decision No. 35/PUU-X/2012, indigenous communities can obtain a

customary forest designation, but they must show their existence, boundaries, and management practices that maintain forest function [5]. Recorded points with coordinates, land cover maps, and wildlife records are precisely the kind of evidence this process requires. Experience elsewhere shows a similar pattern. Resident-based forest monitoring in Loreto, Peru, reduced deforestation in measurable terms compared with communities without a comparable programme, and at the same time strengthened resident organisations in defending their rights [16]. Data held by the community itself strengthens their bargaining position before the state and corporations.

Natural resource management by indigenous communities often proves effective, fair, and sustainable compared with management by the state alone [2]. Cross-context studies also show that formal community involvement in forest governance can support carbon, biodiversity, and livelihood benefits together [17]. Within that frame, community-based monitoring in Enggano is not a stand-alone technical exercise. It is part of an effort to re-establish resident control over their customary territory.

3.6. Restoring the Relationship Between Residents and the Forest

Designating part of the customary territory as state forest is not only a matter of legal status. It also strained the relationship between residents and their environment [2]. When access and control shifted to the state, the frequency with which residents entered the forest to hunt, gather forest products, and maintain knowledge declined as well. That decline is dangerous, because local ecological knowledge lives through practice rather than through archives.

Monitoring activity reverses that direction. Walking the grids, recording local plant names, and reading animal signs are ways for residents to return to their forest on a regular basis. This work becomes a space for intergenerational knowledge transfer, where older residents name species and explain their functions to younger ones. Traditional knowledge is not replaced by science, but combined with it to build a strong argument for environmental care [24]. This is the dimension that technical accounts of monitoring often miss. Beyond producing data, this activity restores residents' relationship, identity, and sense of ownership over their forest.

3.7. Preparing the Ground for a Multispecies Eco-justice Discourse

The monitoring carries a third purpose that reaches beyond ecology and tenure. It prepares the ground for a discourse on multispecies eco-justice. Multispecies justice is a theory of justice that includes the interests not only of all humans but also of nonhuman beings, such as animals, plants, forests, and rivers, and treats those interests as justice claims rather than as matters of convenience or charity [9, 10]. It rejects the view of the human as separate from and superior to the more-than-

human world, and it places ecological relations at the centre of moral and political decisions.

Enggano data speak to this frame in a concrete way. Each recorded point logs a nonhuman being on its own terms, that is, where a wild boar wallows, where a myna nests, where an imperial pigeon feeds, and where a banyan stands. By documenting the presence, behaviour, and feeding grounds of endemic species such as *Gracula religiosa enganensis* and *Ducula oenothorax*, the monitoring builds an evidentiary basis for treating these beings as subjects whose functioning and flourishing deserve protection. The records of the yarobu snail and the Enggano river prawn extend this attention to small and often overlooked freshwater fauna. In multispecies justice terms, attending to the rare, the abundant, and the uncared-for alike is part of the point [9].

This frame fits the Enggano context rather than being imposed on it. Indigenous philosophies have long viewed the human and nonhuman world as relational and agential, and scholars of multispecies justice credit those philosophies as a major root of the field [11]. The Enggano customary order already treats the forest, the rivers, and their beings as part of one living web rather than as a stock of resources. The monitoring puts that worldview into a documented form. It converts a relational ethic into records, maps, and counts that decision makers can read.

Framing the work this way also names the injustices at stake. Social, environmental, and multispecies injustices often arise from the same processes, where land conversion and weak protection harm both residents and the beings they live with [19, 22]. When customary territory is cleared, the Enggano people lose access and identity, and endemic species lose habitat and food. A multispecies eco-justice reading does not erase the tensions inside the community, such as the hunting of imperial pigeons for food or the conflict between wild boar and rice farming. It offers a frame for negotiating those tensions while keeping the flourishing of nonhuman beings inside the circle of concern. Recognition of customary forest under Decision No. 35/PUU-X/2012 can then become more than a tenure instrument. It can become an institutional vehicle through which the interests of nonhuman beings enter local decisions about land and forest.

4. Limitations

This study has several limitations that need to be stated openly. The monitoring period covered only two months, so it cannot yet describe seasonal dynamics. The monitored area was about 125 ha across six grids, small relative to the size of the island, so the findings do not yet represent all of Enggano. Animal signs indicate presence rather than population density, so estimates of individual numbers cannot be drawn. Some species names remain local names that require taxonomic verification. Several finding figures were read from charts rather than from a raw database. The multispecies eco-justice argument here is a conceptual opening rather than a completed analysis, and it needs deeper ethnographic and legal work to

mature. Continued periodic monitoring with a longer time series would address these limitations.

5. Conclusion

Community-based monitoring in Enggano during February and March 2025 produced a useful initial picture. Forest still covers 55.97 percent of the island, but agriculture already reaches a fifth of its area. The team recorded 43 animal signs, direct encounters with endemic wildlife including the Enggano myna and imperial pigeon, and a dominance of feed plants and other useful plants. These findings indicate that the habitat in the monitored area still supports endemic wildlife, while also signalling a real pressure from land conversion.

Beyond ecological data, this work operates on three layers. At the ecological layer, it offers an early warning of changes in forest condition. At the agrarian-political layer, it produces evidence that strengthens the position of the indigenous people in the customary forest recognition process that followed Constitutional Court Decision No. 35/PUU-X/2012. At the ethical layer, it prepares a local discourse on multispecies eco-justice, where nonhuman beings enter the circle of justice claims and customary recognition becomes a route for taking their flourishing seriously. The activity also restores the relationship between residents and the forest and keeps local knowledge alive. The authors recommend that monitoring continue on a regular basis with a longer time series, a clean and open database, and the integration of resident data into customary forest recognition proposals. Support from local government through a regional regulation recognising the indigenous community would strengthen the entire process.

Abbreviations

CBM	Community-Based Monitoring
GIS	Geographic Information System
IUCN	International Union for Conservation of Nature
NT	Near Threatened
QGIS	Quantum Geographic Information System

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Author Contributions

Erwin Basrin: Conceptualization, Methodology, Supervision, Writing – original draft

Pramasty Ayukusdinar: Data curation, Formal analysis, Investigation, Writing – review & editing

Bdikar Anumtiko Ling Kricas: Investigation, Resources, Validation, Visualization

Conflicts of Interest

The authors declare no conflicts of interest.

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