

# Citizens, Technology & effective ecosystem monitoring

Enhancing the protection and governance of key biodiversity areas in the Philippines.

March 2022





# Key Points

Ecosystems in the Philippines host rich biodiversity with globally important species of birds, mammals and plants. But these environments face growing threats from forest loss and mining, to land conversion and degradation.

In response, Haribon Foundation (BirdLife Partner in Philippines) is working closely with state and non-state actors - at different levels of governance in the country - to identify sustainable solutions to the conservation challenges these environments face.

- Citizens are vital actors in ecosystem monitoring for recording and cross-referencing data at site level.
- In-field monitoring with app-enabled technology helps substantiate policy and advocacy efforts.
- Visual and user-friendly apps serve to engage and empower indigenous peoples and local communities.
- Technology enabled ecosystem monitoring by citizens is a cost-effective conservation method for environmental insights.

This report draws attention to Haribon Foundation's process for establishing citizen ecosystem monitoring and the subsequent impacts for people, species and landscapes.

228

KBAs / IBAs in  
the Philippines

209

Species of  
mammal

46%

Decline in forest cover  
in last 100 yrs

# Background

The Philippines is one of the 17 megadiverse countries in the world and considered as a biodiversity hotspot due to its high species diversity and high rates of endemism. Over 57% of plants and animals in the country are endemic and found nowhere else in the world. More than 7,000 islands boast high species diversity with at least 209 species of mammals, 641 species of birds, 246 species of reptiles, and more than 15,000 plants.

The country has 228 Key Biodiversity Areas (KBAs), which support native and endemic species, and migratory species both in marine and terrestrial ecosystems. However, only 93 out of the 228 KBAs are within protected areas (PAs).

For 50 years, the Haribon Foundation has been committed to protecting and conserving sites and species in the Philippines. Haribon does this by engaging and empowering people to ensure sustainable resource use. Unfortunately, the Philippines has one of the highest rates of tropical forest loss in the world, from 70% to less than 24% forest cover in the last 100 years.

The main causes of forest loss include logging, mining, and land conversion due to the high incidence of poverty and limited livelihood options in terrestrial KBAs. This is perceived as one of the main drivers of species extinctions.

About 20% of the country's species listed in the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species, are considered as threatened. In addition, weak

"the Philippines has one of the highest rates of tropical deforestation loss in the world."

enforcement and continuous habitat destruction, will ultimately lead to the Philippines losing its rich biodiversity.

Haribon Foundation has been working in the KBAs of [Mounts Irid-Angilo](#) and [Binuang in Luzon](#), [Mount Siburan in Mindoro](#), and [Mount Hilong-hilong](#) in Mindanao in the past twelve years. These host endemic and threatened species (see next page).

These KBAs experience different levels of conservation challenges including weak enforcement of environmental laws, unregulated collection of timber and non-timber forest products, wildlife hunting for food and pet trade, slash and burn agriculture, mining, construction of large-scale dams and road networks, and the lack of political will by concerned Local Government Units (LGUs) and forest-dependent communities.

Although there are policies in place to reduce these threats, forest monitoring and reporting of the actual forest conditions and trends are far more challenging due to the limited capacity of key stakeholders to report and enforce these laws.



1



2



3



4



5



6

## Key Species

- 1 Philippine Eagle, *Pithecophaga jefferyi*
- 2 Northern Rufous Hornbills, *Buceros hydrocorax*
- 3 Southern Silvery Kingfisher, *Ceyx argentatus*
- 4 Golden-crowned Flying Fox *Acerodon jubatus*
- 5 Mount Irid-Angilo, Luzon, the Philippines
- 6 Philippine Pangolin, *Manis culionensis*



# Engaging citizens

As a step towards addressing the conservation challenges these sites face, Haribon has engaged non-state actors including indigenous peoples and local communities, academia, church, relevant government agencies, LGUs, youth groups and community-based forest protection volunteer groups known as bantay gubat or forest guardians.

Haribon supports these key stakeholders to be more vigilant and active in forest protection and conservation. This involves capacity building, network and alliance building, conservation planning, and information sharing to develop a real-time monitoring system i.e., Citizen's Action for Monitoring Ecosystems (CAME).

CAME is a simple monitoring and reporting system initiated to crowdsource biodiversity data that can be used to monitor and assess the status and trends of KBAs. It is spearheaded by both state and non-state actors with focus on KBAs not covered by PAs. CAME is modelled on BirdLife International's Important Bird and Biodiversity Area Monitoring System (IBAMS).

In 2018, prospective bantay gubat members from three priority KBAs i.e., Mounts Irid-Angilo and Binuang, Mount Siburan and Mount Hilong-hilong, were identified and underwent a capacity building program through the Strengthening Non-state Actor Involvement in Forest Governance Project implemented by BirdLife International, jointly with the Centre for International Development and Training (CIDT) and funded by the European Union.



Image: Haribon Foundation - Women Bantay Gubat in Sablayan Occidental Mindoro using CAME tool

A series of foundational trainings were initiated by the project covering: environmental concepts, conservation strategies and technical know-how on forest monitoring and reporting for the bantay gubat groups.

These community-based forest protection volunteers were equipped with the necessary skills and knowledge for them to qualify as Deputized community Environment and Natural Resource Officers (DENROs). This enabled the volunteers to receive coaching and mentoring and play a role in developing local conservation legislation.



# 50

Years Haribon Foundation has  
been conserving nature

# 7,000

Islands that make up the Philippines

“

“The bantay gubat are invaluable partners in monitoring and reporting forest activities. Their speedy reports to the Municipal Environment and Natural Resources Office (MENRO) and local elected officials, ensure that there is an immediate response. They are also influential within the community because of the trainings they went through in forest conservation.”

- Joel Astoveza, Bantay Gubat

”

NDATION

Image: Haribon Foundation, Mount Siburan  
KBA bantay gubat volunteers documenting  
illegal forest activities using the KaPatrol App



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FOUNDATION



# Developing the monitoring system

Since 2019, the CAME system has undergone several stages of development that has included workshops and consultations, and field trials with selected stakeholders in the priority KBAs before its actual implementation.

Stakeholder mapping and analysis were conducted to identify key actors' interest and involvement in natural resource management of the KBAs and defining their respective roles and responsibilities in the implementation of CAME.

A Participatory Situation Analysis (PSA) was conducted to determine the biophysical and socio-economic characteristics of the KBAs through focus group discussions. Included was mapping and the identification of monitoring sites to determine the trigger species to be regularly monitored.

The CAME team was formed per priority KBAs from various stakeholders including the bantay gubat, government agencies and other non-state actors. A CAME action plan was developed for each team. The team is divided into three core groups:

- **Data Gatherers** are trained and deputized local forests guards (bantay gubat) and other volunteers.
- **Data Analysts and managers** analyse and process the reports submitted by data gatherers.
- **Decision Makers** decide corresponding conservation actions needed based on the specific reports submitted.

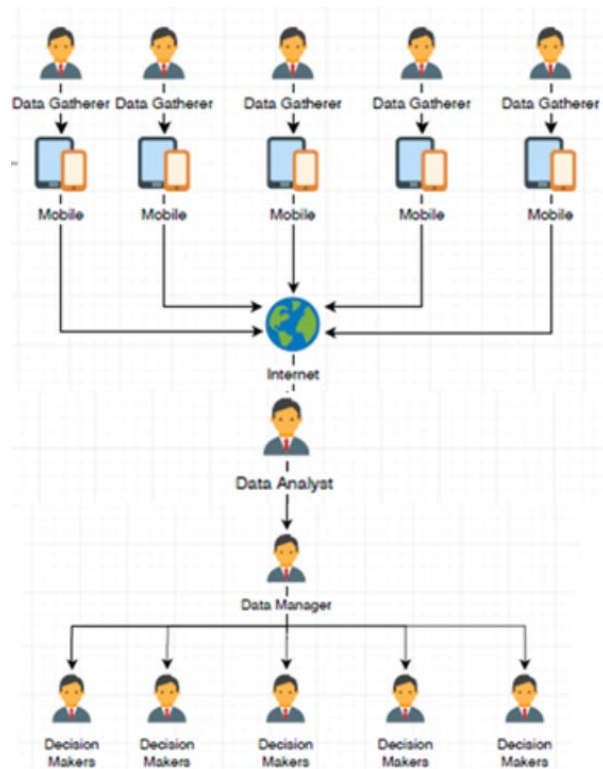


Image: Haribon Foundation, Diagram of CAME system roles of each member



# Integrate Technology

In 2020, Haribon started the development of the Kalikasan Patrol or “KaPatrol” app which is an Android mobile application designed to assist local forest communities and local governments in monitoring and reporting forest activities.

In 2021, both the CAME system and KaPatrol application were launched to the public to build a broader network of community-based forest protection and law enforcement groups. This was also done to replicate the formation of CAME teams in other KBAs and popularize the use of the monitoring and reporting tool.

With the KaPatrol app, data gatherers can submit their monitoring reports quickly even from remote areas. Information can easily be accessed by data analysts and managers to be processed and reported to the decision makers.

These can then be used to help to identify proper conservation actions such as the requirement for increased patrolling of a particular area or the establishment of a local conservation area.

The data collected through the KaPatrol app can be validated, analysed, and interpreted with the CAME stakeholders, and will ultimately help formulate enabling policies, and initiate site conservation action programs and strategies in priority KBAs.

"CAME is designed to complement the existing biodiversity monitoring tools employed by the government and highlight the important role of civil society organizations in forest monitoring and reporting."



Image: Haribon Foundation - Bantay Gubat receiving a tutorial on the KaPatrol App.



# Defined Impacts

## Improved understanding, knowledge and innovation

- Majority of the stakeholders invited during the national and KBA-wide launch of the CAME System and Ka Patrol App were very interested to adopt the system and influence the use of the system in their respective KBA, including the World Wildlife Fund (WWF).
- The local governments of Lanuza and Infanta formally stated their support for CAME as their standard forest monitoring and reporting tool.
- The Cantilan Water District in Mount Hilong-hilong KBA recognised the importance of recruiting additional bantay gubat members and gain familiarization of the KaPatrol app.

## Practical policy development and knowledge

- Local government have appreciated the use of Community-based Monitoring and Reporting (CBM&R) framework in generating information to inform policy, advocacy, decision-making and awareness raising strategies.
- Forest monitoring and reporting results submitted by the bantay gubat groups and data gatherers to the CAME team, have provided real-time condition reports that following the SPR (state, pressure, response) model of IBAMs. This will lead to the formulation of local conservation plans in the future that take into account forest conditions and trends.

## Capacity development and active local engagement within KBAs

- Approximately 140 bantay gubat were trained in CAME and KaPatrol app.
- Strong ownership and support of local partners was achieved.
- CAME members have appreciated the use of technology and community-based approach in forest monitoring and reporting.
- Increased recognition of people's organization and community stakeholders' role in forest management with local government units and government agencies in forest management.
- The use of CAME complements existing biodiversity monitoring tools used by the government.
- Institutionalization and mainstreaming of the CAME system both at national and local government agencies benefits broader reporting and monitoring of forest loss.

# Summary

The landscapes and key sites in the Philippines play host to rich biodiversity and endemic species, whilst facing a wide range of threats. To effectively respond with sustainable and comprehensive solutions, stakeholders of all kinds must be engaged and empowered. Technology is a key asset in this process. With investment and clear strategies, citizens can become critical actors in gathering field data that directly supports the development of policies that offers hope for these environments into the future.



Image: Getty Images

## Lessons Learnt

Multi-stakeholders' consultation builds consensus on the tools, parameters and indicators to be used in forest monitoring and reporting.

Information on forest and biodiversity can easily be collected, processed, and accessed by key stakeholders to address forest management issues and challenges.

Using the Ka Patrol App, regular forest monitoring and reporting can be done by the non-state actors to substantiate government reports of the actual forest condition of the KBAs.

A user-friendly application like CAME/ Ka Patrol App, which can be easily understood and used by the indigenous peoples and local communities helps increase community-based involvement in collectively strengthening forest conservation efforts.





## Acknowledgements

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To find out more from Haribon Foundation on their experience developing CAME tool, please contact: Gregorio E. de la Rosa Jr, Department manager at [research@haribon.org.ph](mailto:research@haribon.org.ph) or Josiah David G. Quimpo, Conservation Specialist at [iba@haribon.org.ph](mailto:iba@haribon.org.ph) of the Conservation Science and Research Department.

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