A Darwin Initiative Project

Participatory Resource Monitoring in Community Use Zones of Crocker Range Park

1 August 2007 to 31 July 2009

December 2007

Global Diversity Foundation, Sabah Parks, PACOS and the local communities of Buayan-Kionop

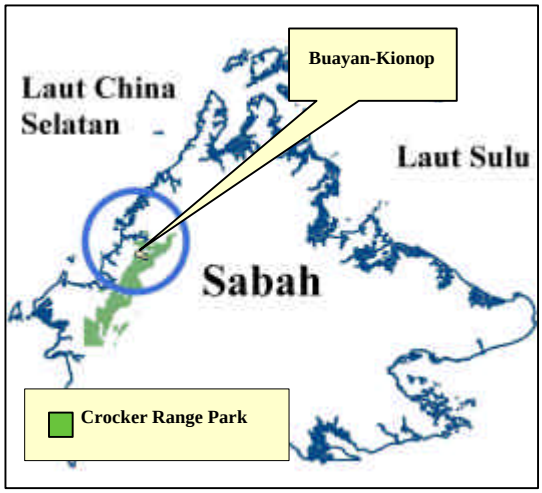
1. Overview

Project particulars

The project is titled "Participatory Resource Monitoring in Community Use Zones of Crocker Range Park". The project timeframe is from 1 August 2007 to 31 July 2009.

Project site

The project site is located in the Buayan-Kionop area of the Crocker Range Park, focussing on areas inside and outside the Park.



Project partners

Funded by the Darwin Initiative, this project is carried out by the Global Diversity Foundation in partnership with Sabah Parks, Partners of Community Organisations (PACOS) and the local community in Buayan-Kionop represented through the Buayan *Jawatankuasa Keselamatan dan Kemajuan Kampung* (JKKK; Village Safety and Development Committee).

Project components

The project comprises four main components: field research, training, dissemination, monitoring and evaluation.

- **Component One: Field research**, comprises three stages:
  - Formation of the Resource Catchment Assessment Team
  - Planning, design and implementation of participatory resource monitoring techniques
  - Integration of Participatory GIS and Participatory 3-D Modelling into resource monitoring

- **Component Two: Training**, comprises two stages:
  - Two training courses in January 2008 and April 2008.
  - Two community exchanges in 2009 to Ulu Senagang and Semporna

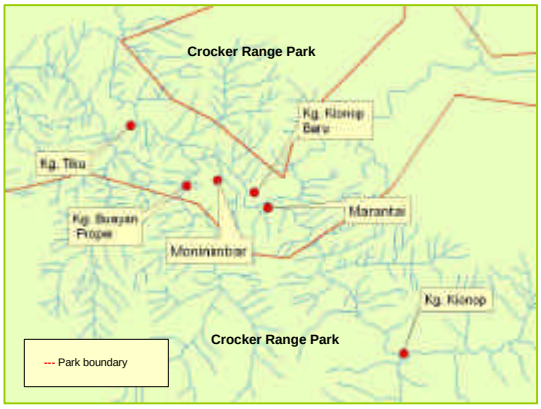
- **Component Three: Dissemination,** comprises:
  - Three Community Use Zone Management Workshops where project progress and results are presented and reviewed by project partners and relevant agencies
  - Sharing knowledge through community exchanges to similar sites in Sabah
  - Production of methods manuals that describes the monitoring techniques implemented and lessons learned.

- **Component Four: Monitoring and evaluation,** comprises:
  - Four participatory evaluations are scheduled, comprising three interim and one final evaluation. Evaluations coincide with Community Use Zone Management Workshops
  - Evaluation results, combined with progress reviews during Workshops, feed into the reflexive design of field research activities.

2. Background

From 2004 to 2007, the Darwin Initiative project "Ethnobiology of Proposed Community Use Zones of Crocker Range Park" documented community resource use and access in Buayan-Kionop. Carried out by the Global Diversity Foundation, Sabah Parks and Universiti Malaysia Sabah, the project applied a selection of ethnobiological methods to investigate the key resources and landscapes important for subsistence livelihoods in Buayan-Kionop.

Buayan-Kionop is an area located in the Upper Papar River in the Crocker Range, Sabah. About 30 indigenous Dusun people live in Buayan-Kionop in several small hamlets inside the Crocker Range Park, and in adajcent areas outside the Park. With no road access and far from markets, they rely on the natural resources and landscapes around them to fulfil their subsistence needs.



Sabah Parks is currently establishing a Buayan-Kionop Community Use Zone, as outlined in the Crocker Range Park Management Plan. Formely restricted to delimitation according to cultivation sites, the Buayan-Kionop Community Use Zone will now be delimited to accommodate community subsistence needs, ranging from hill and wet rice agriculture, subsistence hunting and freshwater fishing, and the gathering of key forest products. A Buayan-Kionop Community Use Zone Management Agreement, negotiated between Sabah Parks and the local community, will act as the central mechanism for governing the Community Use Zone.

From 2007 to 2009, the Global Diversity Foundation, Sabah Parks, Partners of Community Organisations (PACOS) and the Buayan-Kionop community are partnered in the Darwin project, "Participatory Resource Monitoring in Community Use Zones of Crocker Range Park". Following on from the preceeding Darwin project, this project implements participatory resource monitoring of key subsistence activities inside the Community Use Zone.

3. Objectives

The overall objective of this project is to implement a participatory resource monitoring programme that enables local institutional partners to conduct long-term assessments of subsistence activities in the Community Use Zones (CUZs) of Crocker Range Park.

The focus site is the Buayan-Kionop area, where a selection of quantitative and qualitative monitoring techniques will be employed to collect cumulative data about key subsistence activities both inside and outside the Park. This is a logical and crucial step towards implementing the collaborative management approach recently embraced by Sabah Parks. Both the process and monitoring results will feed into the development, and strengthen the adaptiveness, of the Buayan-Kionop CUZ Management Agreement.

The specific objectives are to:

1. Create a local Resource Catchment Assessment (RCA) Team and build its expertise in community resource monitoring, advanced ethnobiological techniques and participatory GIS;

2. Establish and implement community-based monitoring protocols to assess the continuing impact of subsistence agriculture, hunting, fishing and NTFP gathering in the Buayan-Kionop CUZ;

3. Design a participatory GIS approach and local language field guides for the Buayan-Kionop CUZ for use in collaborative management of Crocker Range Park; and

4. Share lessons learned with colleagues working in other CUZs in the Crocker Range Park and other sites in Sabah.

4. Activities

The project is structured in three phases conducted over two years from August 2007 to July 2009, flowing on directly from the conclusion of the preceding Darwin project in July 2007.

- Phase One (August 2007 to March 2008) concentrates on the design and field testing of participatory resource monitoring techniques for critical subsistence activities.

- Phase Two (April 2008 to March 2009) focusses on developing a Participatory GIS approach for monitoring CUZs, which combines the field testing of monitoring techniques with GIS mapping and Participatory 3-D Modelling.

- Phase Three (April 2009 to July 2009) focusses on cross-visits with similar sites in Sabah to share knowledge and encourage replication.

The two-year implementation timetable is attached in Annex 1. Each phase comprises the four components:

Component One

The Resource Catchment Assessment Team and field research

The primary thrust of the project is to form a Resource Catchment Assessment Team comprising representatives from the Global Diversity Foundation, Buayan-Kionop Community Research Assistants, Sabah Parks, PACOS, and other community members from the Ulu Papar area.

A team of 10 Community Research Assistants from Buayan-Kionop form the core of the Resource Catchment Assessment Team. The Community Research Assistants play a crucial role in the ongoing community-based monitoring of subsistence activities, both inside the Buayan-Kionop CUZ and in adjacent areas outside the Park.

Sabah Parks will assign 6 staff from the Crocker Range Park and the Research and Education Division to be members of the Resource Catchment Assessment Team, while PACOS will assign 2 staff members to the Team. Global Diversity Foundation will assign 3 staff members to the Team.

Field Research

The Resource Catchment Assessment Team will be trained to plan, design and implement participatory resource monitoring of key subsistence activities in the Buayan-Kionop CUZ (see Component Two). These include – as part of the general community resource monitoring – the opening of new agricultural fields, hunting of specific animals including bearded pig and various deer species and the gathering of non-timber forest products such as rattans.

Working closely with partners, the project will design monitoring protocols that build upon the extensive information already collected during the previous Darwin project (see Annex 2). The focus will be on tried and tested techniques that can be adopted by park staff and community members, which may include village group discussions, repeated fixed-point photography, assessment of the presence/absence of species, simple dedicated transects of wildlife and human resource use to collect quantitative data on changes over time, and filling out observation sheets on key species, habitats and the extent of resource use detected during patrols.

Data accumulated from monitoring activities will be periodically uploaded to the Resource Catchment Area GIS database. Using Participatory GIS and Participatory 3-D modelling approaches, the project will pursue the development of the Resource Catchment Area GIS into a versatile monitoring tool that is accessible to both conservationists and community members alike.

A total of 20 months of field research is envisaged for the project, and will be caried out by members of the Resource Catchment Assessment Team, in collaboration with other local agencies where relevant. Each Phase involves intensive fieldwork periods:

Progress will be evaluated at regular intervals, and monitoring results will be presented at Community Use Zone Management Workshops attended by all project partners and relevant stakeholders (see Component Four).

Component Two

Training courses and community workshops

Two training courses are planned for the project. Phase One and Phase Two will be launched with a two-week intensive training module that will be attended by the Resource Catchment Assessment Team, along with other local professionals and researchers. The aim of the training course is to train the Resource Catchment Assessment Team in participatory resource monitoring, Participatory GIS and Participatory 3-D Modelling approaches.

The training courses are hosted by Sabah Parks and comprise a one-week taught course followed by a one-week practical module held at the Crocker Range Park Headquarters and Substations. Selected local experts, including some who contributed to the training modules in the preceeding Darwin project, will present key issues and methods of participatory resource monitoring, including Participatory GIS and Participatory 3-D Modelling. Practical modules will provide the on-the-ground framework for field-testing the participatory resource monitoring techniques.

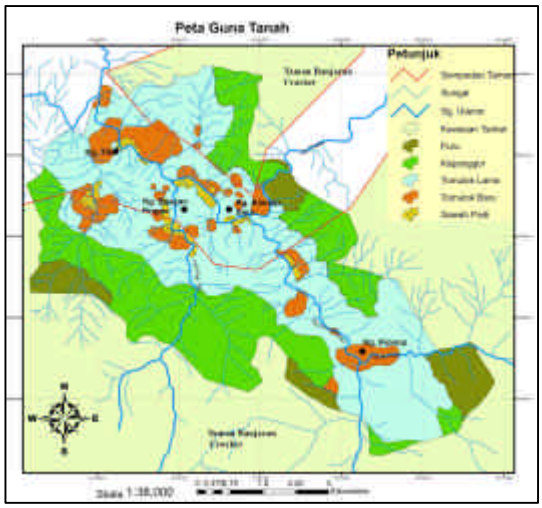
Following on from the training modules, the Resource Catchment Assessment Team will conduct community workshops to discuss and implement the participatory resource monitoring techniques with the wider community.

Phase Three training takes the form of community exchanges to share expertise through cross-visits to similar sites in Sabah, such as Ulu Senagang and the Tun Sakaran Marine Park in Semporna.

Component Three

Dissemination

Project progress and results will be presented at Community Use Zone Management Workshops. Each Phase will culminate with a two-day Community Use Zone Management Workshop that brings together all project participants, and other relevant parties, to review and evaluate the monitoring activities and the results to date. Each Workshop will be followed by a one-day meeting between Sabah Parks and community members to explore concrete measures for the long-term monitoring of the Buayan-Kionop CUZ.



Information about the project will also be disseminated through cross-visits between Buayan-Kionop and other sites in Sabah that are addressing parallel issues. Structured as community exchanges, these visits will be effective in sharing lessons learned from our experience of combining community resource monitoring, participatory GIS, sustainable resource use and biodiversity conservation.

By the project's end, we will publish a methods manual that outlines the participatory monitoring techniques we have implemented, and the lessons learned. These publications will be made available to professionals, researchers and community representatives who are working on similar issues in Southeast Asia.

Component Four

Monitoring and evaluation

Four participatory evaluations are scheduled for the project. Three interim evaluations will be conducted every six months in Phases One and Two, with a final evaluation at the end of Phase Three. Evaluations are designed to coincide with the Community Use Zone Management Workshops so that a joint review of project progress and results is integrated within the evaluation framework (see Component Three).

Evaluation results contribute to the reflexive design and implementation of field research.

5. Expected Impacts

The participatory resource monitoring programme is an essential part of the adaptive management strategy envisioned in the Crocker Range Park Management Plan. It will provide local communities with the opportunity to balance resource use with conservation while sharing enforcement responsibility with park staff, in particular, to reduce poaching and logging by people from outside the community.

The primary impacts of this project will be:

1. Sustained monitoring of critical subsistence activities by community members and park staff in CUZs

2. Increased technical capacity among key stakeholders to use GIS, ethnobiological research methods and local language field guides to document and assess CRP biological resources and landscape mosaics.

We hope that the Buayan-Kionop CUZ model will inspire similar approaches to maintaining local livelihoods in other protected areas of Sabah.

Annex 1: Implementation Timetable, 2007 to 2009

Date	Key milestones
Phase 1	**Establishment of the Resource Catchment Assessment Team participatory resource monitoring of agriculture, hunting and gathering**
Aug 2007	Project set-up: (1) Purchase of equipment and establishment of Local Operations Centre; (2) final planning with Sabah Parks, PACOS, local community and other project participants, including formalisation of institutional partnerships and community Research Agreement; (3) Recruitment of Resource Catchment Assessment Team
Sept 2007 (rescheduled for Jan 2008)	One-week taught module on key issues in participatory resource monitoring of critical subsistence activities in CUZs held at the CRP HQ in Keningau, followed by one-week practical module on participatory techniques for monitoring agriculture, hunting and gathering held in Buayan-Kionop with 15 participants
Oct 2007 (rescheduled for Jan 2008)	Three-day community workshop for 40 participants held in Buayan-Kionop to explore key issues in community-based resource monitoring of agriculture, hunting and gathering
Oct 2007	Half-year Progress Report submitted
Oct 2007 – Mar 2008	Six-month fieldwork to implement the Resource Catchment Assessment Team participatory resource monitoring techniques for agriculture, hunting and gathering in Buayan-Kionop
Mar 2008	Two-day CUZ Management workshop held at CRP HQ in Keningau for 30 participants to disseminate fieldwork progress and results, followed by one-day consultation meeting between park personnel and community members to explore collaborative management options for agriculture, hunting and gathering in CUZs
Mar 2008	One host country press release to announce the results of the CUZ Management workshop
Mar 2008	Interim evaluation of the Resource Catchment Assessment Team and participatory resource monitoring of agriculture, hunting and gathering
Apr 2008	First Annual Progress Report submitted
Phase Two	**Establishment of Resource Catchment Assessment Team participatory GIS approach for monitoring agriculture, hunting and gathering**
Apr 2008	One-week taught module on participatory GIS approaches for tropical forests held at the CRP HQ in Keningau, followed by one-week practical module on participatory GIS techniques for monitoring agriculture, hunting and gathering held in Buayan-Kionop with 15 participants
May 2008	Three-day community workshop for 40 participants held in Buayan-Kionop to explore community-based GIS techniques for monitoring agriculture, hunting and gathering
May – Oct 2008	Six-month fieldwork to implement the Resource Catchment Assessment Team participatory GIS techniques, integrated with monitoring of agriculture, hunting and gathering in Buayan-Kionop
Oct 2008	Interim evaluation of the Resource Catchment Assessment Team and participatory GIS approaches for monitoring agriculture, hunting and gathering
Oct 2008	Half-year Progress Report submitted
Nov 2008	Manuscript prepared on participatory GIS and resource monitoring for submission to peer reviewed journal
Nov 2008 – Mar 2009	Five-month fieldwork to continue the implementation of participatory resource monitoring of agriculture, hunting and gathering with GIS in Buayan-Kionop

Date	Key milestones
Mar 2009	Two-day CUZ Management workshop held at CRP HQ in Keningau for 30 participants to disseminate fieldwork progress and results, followed by one-day consultation meeting between park personnel and community members to explore participatory GIS approaches in monitoring CUZs
Mar 2009	One host country press release to announce the results of the CUZ Management workshop
Mar 2009	Interim evaluation of the Resource Catchment Assessment Team and participatory GIS approaches for monitoring agriculture, hunting and gathering
Mar 2009	Integration of materials for a draft local language field guide and lessons learned manual on participatory GIS approaches for monitoring critical subsistence activities in CUZs
Apr 2009	Second Annual Report submitted
Phase Three	**Magnification and dissemination of participatory resource monitoring to other CUZs and sites in Sabah**
Apr 2009	One-week cross visit by Resource Catchment Assessment Team to Ulu Senagang CUZ in Crocker Range Park with 15 participants
May 2009	One-week cross visit by Resource Catchment Assessment Team to Tun Sakaran Marine Park CUZs with 10 participants
Apr – June 2009	Three-month fieldwork to finalise the Resource Catchment Assessment participatory GIS monitoring programme
June 2009	Two-day state-level CUZ Management workshop held at CRP HQ in Keningau for 50 participants to disseminate fieldwork progress and results, followed by one-day consultation meeting between park personnel and community members to explore options for resource monitoring in CUZs
June 2009	One host country press release to announce the results of the CUZ Management workshop
June 2009	Final evaluation of the Resource Catchment Assessment Team and participatory resource monitoring and participatory GIS programme
June 2009	Manuscript prepared on participatory resource monitoring of Community Use Zones for submission to peer reviewed journal
June 2009	Final draft local language field guide and lessons learned manual on participatory resource monitoring, participatory GIS produced
July 2009	Official handing-over of Resource Catchment Assessment GIS and participatory resource monitoring programme to Sabah Parks and PACOS
July 2009	Preparation of Final Report and submission of local language field guide and lessons learned manual on Participatory Resource Monitoring of Community Use Zones for publication

Annex 2: Participatory Resource Monitoring Matrix

Summary framework for the types of data collected through participatory resource monitoring of critical subsistence activities in the Buayan-Kionop Community Use Zone, from 2007 to 2009. Please refer to fact sheets in the following pages for further details.

Subsistence activity	Species-level data fields	Landscape-level data fields	Resource user data fields
Agriculture	• Species and varieties planted • Presence of protected species in and around areas cleared for cultivation	• Spatial reference • Size of areas opened • Land/forest type in area opened • Length of rotation/fallow period • Type of site (e.g. *tumo, gopu, ranahon* etc.)	• Identity of farmers and associated demographic data • Frequency and intensity of management and labour at all stages
Hunting	• Identity and number of species caught, with demographic and behavioural data • Location/s of captures • Presence and location/s of protected species	• Forest types and locations of capture sites/hunting grounds • Access frequency to hunting grounds • Habitat alterations to hunting grounds	• Identity of hunters and assessment of overall number of active hunters • Frequencies, locations and duration of hunting trips • Hunting techniques and technologies used
Freshwater Fishing	• Identity and number of species caught • Capture location/s • Capture records of any protected species	• Locations of principal fishing spots • Local knowledge of spawning sites • Land/forest types in these areas, and alterations to habitats in fishing/spawning sites and upriver	• Identity of key fishers and assessment of overall number • Frequencies and locations of fishing trips • Techniques and technologies used
NTFP Gathering	• Identity of gathered products and their uses • Locations and intensity of gathering • Identity and offtake of protected species	• Locations and land/forest types in principal gathering sites • Alterations to these habitats	• Identity of gatherers and assessment of overall number • Frequencies and locations of gathering trips

Population

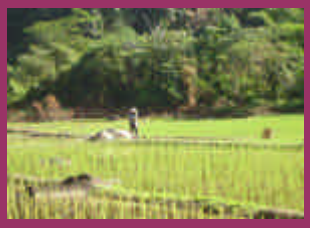
From 2007 to 2009, monitoring of the Buayan-Kionop population includes the following:

- Updating the existing demographic database compiled during the initial Darwin project (2004-2007) to incorporate:
  - Births and deaths.
  - Migration of current residents to locations outside of Buayan-Kionop.
  - Migration of new residents from outside Buayan-Kionop to the area.
  - Migration of current residents within Buayan-Kionop (between villages in Buayan-Kionop).
  - Changes in marital status and occupation.

What we know about Buayan-Kionop:

- The Buayan-Kionop area comprises the four main villages of Buayan, Kionop, Tiku and Timpayasa. Of these villages, only Kionop is located inside the Crocker Range Park.
- The villages of Buayan-Kionop are administered under one Village Safety and Development Committee, which is centred in Buayan.
- Buayan-Kionop is home to approximately 310 indigenous Dusun people in about 55 households.
- Very few residents have a monetary income; instead, income is measured in sacks of rice produced per year. The average household produces 30 sacks of rice per year.
- Most adults are involved in agriculture, fishing and gathering of forest products, and many adult men hunt at least occasionally.
- A government primary school is located in Buayan, as well as an indigenous community pre-school.

Agriculture


From 2007 to 2009, participatory resource monitoring of agricultural activities includes the following:

- Recording the location and size of fallows opened each year for hill rice; along with the identity of the owner, the successional stage of the forest cleared and the identity of any secondary crops planted.
- Monitoring the timing and manpower involved in the stages of cultivation, including clearing, burning, planting, maintenance and harvesting.
- Documenting local management practices used in agriculture, and decision-making in the opening of fallow areas for swiddens.
- Incorporating the locations of agricultural sites into a GIS map of local resource use and a 3-dimensional model of the area.
- Inventorying of plants maintained in local homegardens (including species identity and uses), and examining homegarden species diversity.

What we know about Buayan-Kionop:

- Currently, there are 55 farming households in Buayan-Kionop.
- Swidden and wet rice agriculture provide the bulk of the food resources consumed in the community.
- Many species and varieties of secondary crops are grown together with rice. Among the most highly valued of these are tapioca, yams and corn.
- The swidden cycle usually involves long fallow periods, which creates a mosaic of forest at various successional stages. Each type of forest stage sustains a broad range of biodiversity.
- Villagers also grow hundreds of plant species in homegardens, principally as additional sources of food and medicines.
- Farmers recognise more than 25 distinct soil types, and hold detailed knowledge regarding the properties and fertility of different soils.

Hunting

From 2007 to 2009, participatory resource monitoring of hunting activities includes the following:

- Monitoring of hunting activities by interviewing hunters at regular intervals and by using standardised monitoring data sheets.
- Data recorded includes the date, duration and location of hunts, the identities of animals captured, sex and estimated weight of captures, forest or land type in the capture location, and distribution of meat.
- Regular patrols along selected hunting trails, recording sightings, tracks, signs or calls of hunted species.
- Incorporation of georeferenced data on hunting grounds and frequency of access into GIS maps of local resource use.
- Education on State legislation governing protected animal species, and development of an agreement to stop the hunting of protected and/or endangered species.

What we know about Buayan-Kionop:

- Hunted meat is the main source of protein in the community. Meat is eaten fresh, smoked or preserved using the ground seed of the *pangi* plant.
- A wide variety of animals are hunted in the forest. Knowledgeable hunters can name more than 100 distinct species, although most of these are hunted only rarely.
- The majority of hunting offtake is made up of mammal species, though birds and reptiles are also caught.
- The most commonly hunted species are the bearded pig (*Sus barbatus*), the small-toothed palm civet (*Arctogalidia trivirgata*), the mousedeer (*Tragalus javanicus* and *T. napu*) and the barking deer (*Muntiacus muntjac*).
- Hunting trips are conducted day and night in both secondary and primary forests. Hunters may travel large distances to reach suitable hunting grounds.

Freshwater Fishing



From 2007 to 2009, participatory resource monitoring of freshwater fishing activities includes the following:

- Regular interviewing of a sample of community members who regularly engage in fishing.
- Information will be gathered on fishing locations, species and numbers of individuals caught, and fishing techniques used.
- Incorporation of georeferenced data on principle fishing grounds into GIS maps of local resource use.
- Interviewing community members to document local knowledge of spawning sites.
- Assistance and participation in the development of community-based initiatives to manage fish stocks.

What we know about Buayan-Kionop:

- Fishing provides a very important source of protein in the community. Either fresh or preserved fish often accompany meals.
- A variety of techniques are used in fishing, including the use of seine and throw nets, rod and line, and capture by hand.
- Many species of fish are caught. Some of the most highly valued species are the river carp (*Tor douronensis*), the marbled eel (*Anguilla marmorata*) and the jungle perch (*Hampala macrolepidota*).
- Other aquatic species sometimes caught include river turtles and frogs.

NTFP Gathering



From 2007 to 2009, participatory resource monitoring of NTFP gathering activities includes the following:

- Regular monitoring of NTFP gathering using standardised data sheets.
- Data recorded includes location/s of gathering activities, the land/forest type in that location, and plant species gathered (including their uses).
- Patrolling of forest trails to identify and mark locally-used plants, and any plants protected under State legislation or of conservation importance. Subsequent patrols will monitor any habitat changes or disturbance to these plants.
- Incorporation of georeferenced data on NTFP gathering into GIS maps on local resource use.

What we know about Buayan-Kionop:

- Plant knowledge in this community is very high. In freelisting exercises, community members identified 693 types of plants.
- Many community members engage in the gathering of forest products, and many have an intricate knowledge of wild plants and their uses.
- Hundreds of plant species in the surrounding forests are gathered for a wide variety of uses, such as sources of food, medicines, construction materials, basketry materials, and preservatives.
- Among the most highly valued forest products are rattans, often used in construction and the making of baskets and other handicrafts. In freelisting exercises villagers named more than 35 distinct types of rattan.