Food and Agriculture Organization of the United Nations

IUCN

SUMMARY OF

SMART PATROLLING

A toolkit for better forest management in Bangladesh

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Food and Agriculture Organization of the United Nations (FAO)
International Union for Conservation of Nature (IUCN)
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FOREWORD

Conservation and sustainable management of natural resources is a great challenge in the modern world. The aim of sustainable forest management is to ensure that forests supply goods and services to meet both present-day and future needs and contribute to the sustainable development of communities. The Food and Agriculture Organization of the United Nations (FAO) helps countries overcome the constraints to sustainable forest management by providing information and policy advice and through institutional and technical capacity development. FAO collects, analyses and disseminates information; prepares manuals and guidelines; supports the implementation of field projects; and organizes workshops and seminars that facilitate the uptake of best practices and the exchange of experiences.

Bangladesh has a highly diversified forest ecosystem but is suffering from deforestation, forest deterioration, biodiversity loss, and destruction of ecosystems and habitats. SMART (Spatial Monitoring and Reporting Tool) is an innovative management tool designed to assist protected area and wildlife managers to better monitor, evaluate and adaptively manage patrolling activities.

The Government of Bangladesh deployed SMART patrolling in the Sundarbans – the world's largest mangrove forest – in September 2017. Although guidelines were developed, they did not cover plain land forest or hill forest monitoring in the country. In response, FAO in partnership with the Bangladesh Forest Department and the International Union for Conservation of Nature (IUCN), developed a SMART patrolling toolkit for these types of forest. The toolkit has been piloted in four protected areas of Cox's Bazar and will be used for management of hill and plain land forest across Bangladesh. This document is a summary of that toolkit.

I am thankful to the Government of Canada and the Kingdom of the Netherlands for their continued assistance and support for this project. I also want to express my gratitude to the Forest Department and IUCN for their valuable contributions. FAO extends its support to the Government of Bangladesh for the protection and restoration of forest across the country.

Robert D. Simpson

Country Representative
Food and Agriculture Organization
of the United Nations (FAO)

Bangladesh

Bangladesh has a highly diversified forest ecosystem.

INTRODUCTION

Forests harbour most of Earth's terrestrial biodiversity. The conservation of the world's biodiversity is thus utterly dependent on the way in which we interact with and use the world's forests. Yet deforestation and forest degradation continue to take place at alarming rates, contributing significantly to the ongoing loss of biodiversity. Since 1990, it is estimated that some 420 million hectares of forest have been lost through conversion to other land uses, although the rate of deforestation has decreased over the past three decades. Illegal activities and change of land use have, however, increased significantly in recent times.

Different technologies have been developed and used in the conservation field to combat deforestation, illegal logging, poaching, wildlife trade, and encroachment. Real-time monitoring and reporting mechanisms make it easier for forest rangers and management officials to take immediate action and contribute to the better management of the resources.

Bangladesh is rich in biological diversity with around 6 000 plant species and 2 600 animal species (Khan, 2008). The country has 2.56 million hectares of different types of forest land but is facing tremendous pressure from anthropogenic reasons. For better management and conservation of biological diversity, the Government of Bangladesh declared 39 protected areas.

At its core, SMART consists of a software application that enables data to be collected, stored, communicated, and evaluated in order to improve patrol efforts, patrol results, and threat levels. Geographic Information System (GIS) technology helps patrol teams to map key wildlife species and human activities. SMART has been implemented at 140 sites across 30 countries. Eight countries have adopted the system for the management of their entire protected areas.

Bangladesh was one of the first countries to pilot SMART at a World Heritage Site (WCS, 2016) – the Sundarbans. The Sundarbans are the world's largest mangrove forest and on the conservation frontline to protect species and habitats from poaching and other threats. The successful pilot created the opportunity to introduce SMART to other forest lands in the country, including hill forest and plain land forest. Considering the distinguished ecological formation, diversity of forest resources, type and causes of forest offences such as illegal felling, poaching, encroachment, wildlife trading etc., it is essential to develop separate SMART guidelines for other forest areas in Bangladesh.

Forest in Cox's Bazar, Bangladesh.

Given this context, the Food and Agriculture Organization of the United Nations (FAO) took the initiative to develop a SMART patrolling toolkit for hill and plain land forest monitoring. The Bangladesh Forest Department (BFD) conducted the pilot.

This toolkit was prepared based on the survey throughout the four protected areas named: Fashiakhali Wildlife Sanctuary, Medhakacchapia National Park, Himchari National Park, and Sheikh Jamal Inani National Park. It will guide the use on CyberTracker/Andriod phone for real-time monitoring of hill and plain land forests across the country.[1] The manual details the purpose of patrolling, responsibility of patrol team members, data management, and reporting structure, to assist forest officials to apply, impose, and monitor implementation of patrol and forest-related rules and regulations. The toolkit will be useful for law enforcement, monitoring threats, forest and wildlife monitoring, and public awareness generation.

OBJECTIVES

- Ensure the conservation area through the enforcement of acts, rules, policies, orders, and ordinances.
- Monitoring threats to assess the success of forest law enforcement patrols.
- Monitoring forests and wildlife to evaluate the success of patrolling efforts in reducing deforestation, poaching, and other sources of human-caused mortality.
- Raising awareness among people and communities who use forests as a natural resource.

SCOPE

- **SMART National Coordination Committee.** Based on experience from the Sundarbans, it is important to have a Forest Department committee for supervision, guidance, and planning.
- **Patrol area.** This SMART patrolling toolkit has been prepared for hilly region and plain land forests and piloted in four protected areas of Cox's Bazar:
    - Cox's Bazar North Forest Division
        - Fashiakhali Wildlife Sanctuary (FWS)
        - Medhakacchapia National Park (MNP)
    - Cox's Bazar South Forest Division
        - Himchari National Park (HNP)
        - Sheikh Jamal Inani National Park (SJINP)

[1] CyberTracker is a device mostly used for installing the smart software and data collection.

SMART patrolling in the field.

GENERAL PATROLLING PROCEDURES

IMPORTANT CONSIDERATIONS

- **Approval of patrol plan.** The patrol team leader should complete a SMART patrol plan that needs to be approved by the respective Division Forest Officer (DFO) prior to the start of a patrol.
- **Frequency of patrolling.** The prescheduling for the patrolling should be ready at the beginning of each month. However, a particular routine might mean that offenders can guess when patrols will be conducted, allowing them to avoid detection.
- **Patrolling locations.** Patrols should cover all entry and exit points and possible routes that offenders use.

SIZE AND COMPOSITION OF PATROL TEAMS

SMART patrol teams should consist of 4-5 members. Members may be included from community patrol groups (CPGs).

- Team leader (navigator and law enforcement officer).
- One deputy team leader (monitoring officer).
- One SMART data recorder.
- Two armed security guards.

RESPONSIBILITIES OF THE PATROL TEAM MEMBERS

TEAM LEADER	DEPUTY TEAM LEADER	SMART DATA RECORDER	SECURITY GUARDS
Discuss plan details with the team. Complete a SMART Patrol Approval Form. Range officer will sign and keep. Double-check equipment before going on patrol. Build community awareness, keeping people updated on laws, rules, and regulations. Record waypoints, monitor threats, violation of laws and rules and sighting of priority wildlife. Ensure data recording in both manual and digital entry. Ensure respect to treat public and professionalism in conducting patrols. Decide on arrest or verbal warning. Ensure proper uniform of all team members.	Search for priority wildlife. Search for conservation threats and evidence of wildlife and forest crime and pollution sources. Notify team leader and data collector to record observations. Assist team leader in raising awareness among resource users on relevant acts, rules, ordinance, etc. Ensure proper care of instruments before and after the patrols and maintain check book and log-sheet for instruments. Ensure proper body search of an arrested offender or any intruder.	Search for wildlife, forest violations. Record data on all required observations of threats. Collecting SMART data using CyberTracker.	Maintain safety protocols. Assist in searching for threats, human activities, and wildlife. Assist to ensure all safety equipment maintenance. Carefully maintain the arms number and ammunition quantity.

SAFETY

- To ensure the safety of all team members, make sure to follow the patrol plan.
- In case of deviation from the patrol plan, the patrol team should immediately contact the range officer.
- Patrol camp areas should have mobile phone communication facilities.
- During a storm, the patrol team should take shelter in the safe zone.
- When walking in areas of high wildlife risk or following an elephant movement, the team should stay together. Armed security guards should be in the front and back carrying flares.
- If illegal activities are found, the team leader should assess the situation and risk. If there is any significant risk, the team leader will record the GPS location, contact the range officer or divisional forest officer, and wait at a safe distance for reinforcements from the Reserve Team, Rapid Action Battalion (RAB) or Border Guard Bangladesh (BGB).

Elephant walking track.

NAVIGATION AND COMMUNICATION

- GPS should be used for navigation during patrols though CyberTracker-enabled SMART mobile devices. The GPS trackback function should be used to follow uploaded tracks.
- Make sure that mobile phones and other communication instruments are fully charged before starting a patrol. Have the numbers of officials from the patrol range office or camp as well as emergency numbers for communicating with the range officer and other necessary persons.

EQUIPMENT

Check the following equipment and supplies before leaving on a patrol:

HANDBOOK, LOGBOOKS, FORMS, AND OTHER DOCUMENTS:

- ○ Handbook for SMART patrols
- ○ Offenders and seized items handover form
- ○ Emergency contact numbers
- ○ Educational outreach materials
- ○ Detailed map of patrolling range
- ○ Equipment handover form
- ○ Contour map of the whole area

SAFETY EQUIPMENT:

- ○ First-aid kit
- ○ Powerful handheld torchlight with spare batteries
- ○ Rain jackets for all team members
- ○ Guns with ammunition
- ○ Handcuffs
- ○ Lighter
- ○ Rubber boots
- ○ Compass
- ○ Flares
- ○ Waterproof bag for equipment

DATA RECORDING EQUIPMENT:

- ○ CyberTracker equipped handheld device with SIM card and charging cable
- ○ Power bank or battery
- ○ Binoculars
- ○ Camera, memory cards, and spare batter
- ○ GoPro body-worn video camera with spare batteries

STATIONERY AND SUPPLIES:

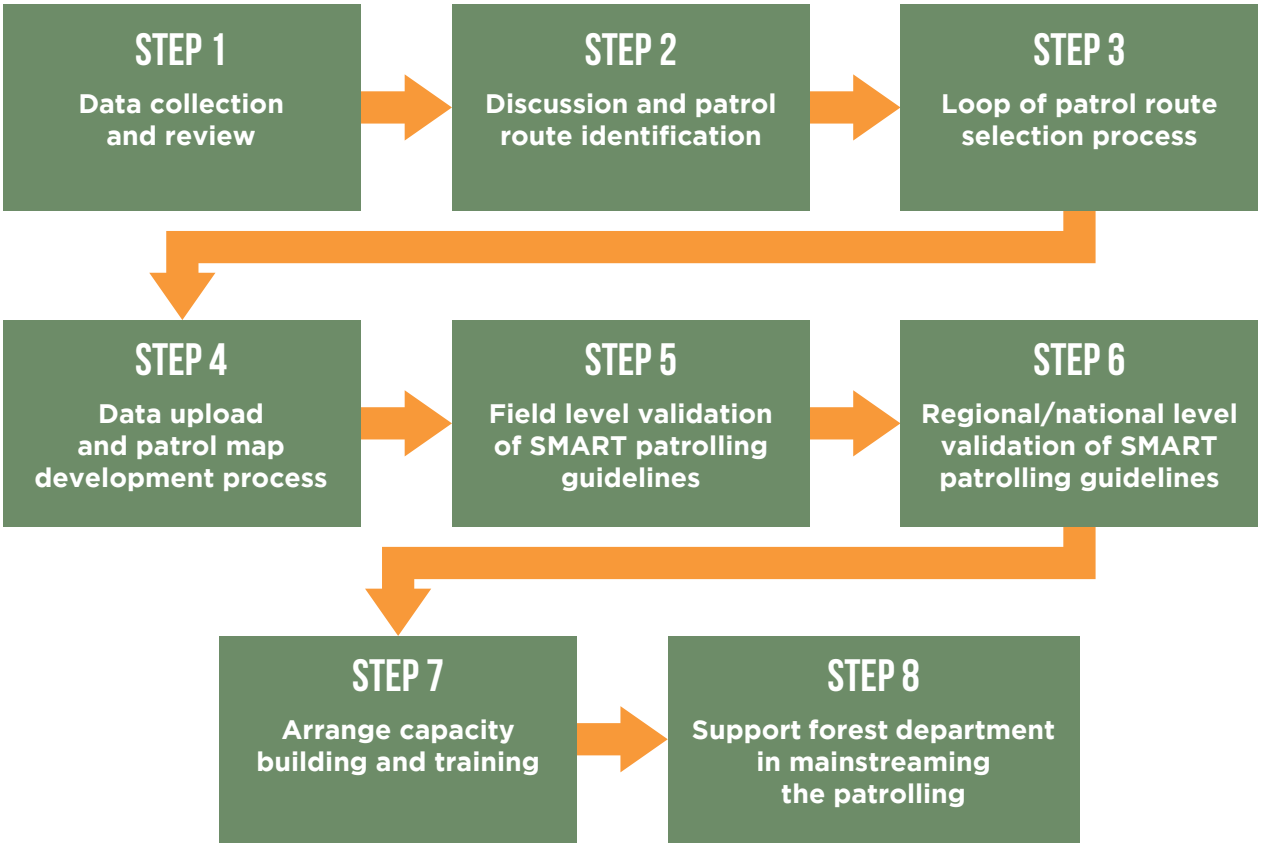
- ○ Pens
- ○ Waterproof markers
- ○ Seal of patrol team leader
- ○ Stamp pad
- ○ Measuring tape
- ○ Weight measuring scale
- ○ Knife

SAMPLE COLLECTION KITS:

- ○ Wildlife mortality kits and plastic jars with lids and gloves
- ○ Zip-lock polythene bags along with the tag
- ○ Polythene bags without zip-lock
- ○ Ice box
- ○ Jars and formalin
- ○ Walkie-talkie

FORMULATION PROCESS OF SMART PATROLLING

SMART Patrolling formulation took several steps during the development process.[2]



[2] For detailed process- FAO and IUCN, 2021. *SMART Patrolling: A Toolkit for Hill and Plain Land Forest Monitoring.*

Patrolling team.

SMART CYBERTRACKER CONFIGURATION AND DATABASE STRUCTURE

SMART includes field data collection and computer-based management. From installation of the data collection to management and reporting, all the steps are illustrated in the extended version of the diagram 'SMART Patrolling: A toolkit for better forest management'. A SMART desktop database would ideally be located where decisions made about deploying resources for patrolling and monitoring are made. Data collected by field teams should have inherent value for the management of the conservation area.

The mobile data collection component of SMART uses CyberTracker, a third-party platform created to simplify the collection. SMART mobile data collection leverages the functionality of CyberTracker to eliminate the need for field observations to be recorded separately from GPS data. CyberTracker uses a GPS-enabled mobile device (e.g., smartphone or personal digital assistant) to collect both observations (text or icon-based data entry and digital images) and GPS data in a single unit. After a patrol returns to the office, observations and GPS data are transferred directly into the SMART database in a semi-automated process.

Herd of Asian elephants in the forests of Cox's Bazar.

UPLOADING PA INFORMATION IN SMART APPLICATION

Before initiation of this application, it is essential to download the SMART application from the website (http://smartconservationtools.org/download/) and follow the detailed guidelines. SMART can manage multiple conservation areas (or protected areas) within a single database. It is good to start with an empty database and create a new conservation area. The conservation area properties include names and description assigned to a specific conservation area. These properties help users of SMART software to manage multiple conservation areas. It is mandatory to create an account by filling the mandatory fields for the primary administrator. The primary administrators can make any changes within the newly defined conservation area.

MANAGING FIELD DATA

The SMART software mostly use for field data collection related to the management of the forest areas. To customise the data model it is essential to define it and provide inputs. The default data model reflects a wide range of human activities that can be recorded by the Forest Range Officers. The user can configure the model as necessary. SMART users and employees working within a conservation area may belong to a particular agency, and they may have a rank within that agency. As part of the initial setup of a conservation area, the list of agencies and their associated ranks can be accessed through the menu tab as 'Conservation Area > Agency and Rank List'. The personal data and affiliations of employees involved in data collection and management need to be entered. As staff begin and end their terms

of employment, dates of hiring and termination are added to individual records. Assigned employees in SMART-related tasks (data entry, analysis, manager, and administrator). In order to add a new SMART user to the employee list page by clicking on 'Create New' and enter the details of the new employee. Another part of the initialization process is defining the list of stations that are used by employees to start their patrols: enter the station information.

PATROLLING, SUMMARISING AND REPORTING

It is essential to define patrol types that indicates the mode of transportation used for the patrols. The administrator will define patrol mandates and state the general objective of a patrol. Patrol teams are assigned for each patrol categorizing them according to their specialty or team name. Specify a period (in days) for how long after a patrol was entered using "Managing Patrol" options. The SMART application allows the user to explore options within the patrol perspective. Patrol exports/imports allow multiple computers to be used to enter the patrol information while allowing one or more computers to function as the central computer that imports all the patrols. Queries and summaries are the tools used to extract patrol and observation information from the database. SMART allows simple or complex queries and summaries that need to be developed and exported. SMART query and summary filters include Date, Patrol, Data Model and Area. SMART reports are highly configurable and allow for a wide range of standardised reporting. After creating the report, SMART will display the report list screen and toolbars. An image adding option is available for the reports.

RECOMMENDATIONS

Garjan forest.

The following recommendations will aid successful implementation of the SMART approach to conserve protected areas in Bangladesh:

- Identify system-wide weaknesses and develop a targeted programme to strengthen these areas.
- Identify and classify the most well-known risks and threats for individual protected areas and take necessary actions to enhance management practices.
- Long-term monitoring and cross conservation area analysis might be useful.
- Review existing budget priorities and reallocate expenditure according to the degree of threat and the conservation priority of each protected area.
- Greater public involvement in decision-making is crucial, building ownership and diversity of views.
- Involve more members of the local and indigenous communities in the SMART patrolling and conservation process of the protected areas.
- Arrange bi-annual refresher courses for frontline staff.
- Provide proper equipment to the SMART team such as torches, umbrellas, jungle boots, raincoats, and suitable vehicles for road patrolling.
- The assistant conservator of forests should be the SMART coordinator of a division. Bridging the SMART team and the divisional forest officer can support better data management and reporting. The SMART coordinator should participate in the SMART planning session.

Elephants in the forests of Cox's Bazar.

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