

User Guide and Manual

Forest Disturbance Alert Platform



Produced by Open Development Cambodia (ODC)

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Acronyms and Abbreviations

ADPC	Asian Disaster Preparedness Center
AOI	Areas of Interest
CBO	Community-Based Organization
CF	Community Forestry
CPA	Community Protected Area
CSO	Civil Society Organization
FGI	Forest Governance Initiative
GFW	Global Forest Watch
IPs	Indigenous Peoples
JICA	Japan International Cooperation Agency
JJ-FAST	JICA-JAXA Forest Early Warning System in the Tropics
NPA	Natural Protected Area
ODC	Open Development Cambodia
SERVIR-SEA	SERVIR Southeast Asia
WMS	Web Map Service

Introduction

Remote sensing is essential for monitoring forests because it provides near-real-time and comprehensive data on forest health, extent, and dynamics. It helps detect forest disturbance and deforestation, assess climate change impacts, manage resources, and enable early wildfire and disease outbreak warnings. This technology is crucial for biodiversity conservation and overall forest ecosystem preservation. Japan International Cooperation Agency (JICA) has developed a tool to watch deforestation, which is called “JICA-JAXA Forest Early Warning System in the Tropics (JJ-FAST)” under the Forest Governance Initiative (FGI). The tool aims to promote capacity development and the spread of good forest conservation practices to contribute to the fight against deforestation in developing countries and global climate change. SERVIR-Southeast Asia (SERVIR-SEA), a geospatial data-for-development program that addresses the needs of Southeast Asian countries, has created tools for detecting forest alerts while also providing data on forest cover and land cover. Global Forest Watch (GFW) forest alert data refers to near-real-time information on where forests are being disturbed or lost, based mainly on satellite imagery.

Even though the importance of remote sensing and stakeholders has been identified, the product itself is very technical for users, particularly Civil Society Organizations (CSOs), Community-Based Organizations (CBOs), Community Forestry (CF), Community-Protected Areas (CPAs), Indigenous Peoples (IPs), and local governments. As a result, a practical and user-friendly approach is suggested. Open Development Cambodia (ODC) develops a Forest Disturbance Alert Platform that will automatically send notifications to users or subscribers through Telegram Channels, so it could support them in detecting and protecting the forest in time.

Target Audience

The pilot initiative involving several organizations and communities potentially delivers significant benefits to various stakeholders, including individual community members and society. The target beneficiaries of this effort can be categorized into two primary groups: civil society organizations (CSOs) and local communities. CSOs actively engaged in natural resource and environmental protection represent the core beneficiaries, as the initiative will enhance their capacity to achieve their objectives. Additionally, local communities stand to benefit by safeguarding their land and effectively managing their forests in a timely and sustainable manner.

Application Purpose

The Forest Disturbance Alert Platform aims to provide accessible, user-friendly alerts and notifications in both Khmer and English via Telegram channels, catering specifically to non-technical users, including local communities. By delivering near-real-time notifications on detected forest disturbances, the platform empowers stakeholders to take timely and informed actions to safeguard forest resources.

Key Features

The Forest Disturbance Alert Platform delivers near-real-time alerts for forest monitoring, delivered through a user-friendly Telegram channel customized to users' or subscribers' Areas of Interest (AOI). The platform provides near-real-time information by integrating data from SERVIR-SEA, JJ-FAST, and GFW overlaid with Forest Land 2021. This initiative enhances access to cutting-edge forest monitoring technologies, promotes transparency through open data, and supports collective efforts to protect and preserve our forests.

Platform Approach

The Forest Disturbance Alert Platform was developed by aggregating the forest alert data from GFW, JJ-FAST, and SERVIR-SEA. A database server has been established to store data related to forest disturbance, such as areas of detection, Natural Protected Areas (NPAs), provinces, and Area of Interest (AOI). This server ensures that the data is securely stored, organized, and accessible for further processing or analysis. A web server has been set up to host GeoServer, an open-source software that allows users to publish, share, and manage geospatial data online. Then, forest alert data from GFW, JJ-FAST, and SERVIR-SEA were integrated. The data was also published as a Geo-Webservice, and the integrated data is shared via GeoServer using standards like Web Map Service (WMS).

The detection boundaries are overlaid with selected forest-related categories from the 2021 Land Cover¹ Data produced by SERVIR-SEA. These categories include evergreen, semi-evergreen, deciduous, flooded forests, and mangroves.

The Forest Disturbance Alert Platform utilizes a Python script to develop an auto-generated notification system, or Telegram Bot, for delivering updates to selected Telegram channels. Notifications are dynamically generated based on predefined message templates in Khmer and English, generated when forest disturbances are detected within the specified AOI.

Notification within the Telegram Channels:

- Date: [DD/MM/YEAR]
- Location: [Areas of Interest]
- Coordinate system: GPS - WGS 84 / UTM Zone 48N (EPSG:32648) (X [Number] and Y [Number])
- View map on Google (Hyperlink)
- View map on the platform (Hyperlink)
- Download KML (Hyperlink)
- Feedback (Hyperlink)



Figure 1. Notification on the Telegram Channel

¹ Based on the European Union Deforestation Regulation (EUDR) regulation, companies will only be allowed to sell products in the EU if the supplier of the product has issued a so-called “due diligence” statement confirming that the product does not come from deforested land or has led to forest degradation, including of irreplaceable primary forests, after 31st December 2020. Therefore, ODC decided to use the forest cover data in 2021, this could be used to monitor the deforestation which aligns with the EUDR policy.

Steps to access the Forest Disturbance Platform

This section provides users with detailed instructions on how to navigate the platform and effectively access forest disturbance data and notifications.

Landing Page

To start the platform, the users will first see the Landing Page, where they can see some features, including:

- Home: Introduction to the platform
- Flags: Change the language to Khmer-English
- Explore map or Map: Go directly to the dataset and map
- User Guide: Detail the user guide and manual



Figure 2. Landing page

Explore map

The platform's overall interface and front-end design are depicted in the figure below, with the following key components:

Dashboard Control

The platform enables users to monitor and explore forest disturbances within selected areas, including countries, provinces, natural protected areas (NPAs), and custom-defined Areas of Interest (AOIs). Through the Dashboard Control, users can configure both the geographic area and period for targeted monitoring. On the Dashboard Control panel, users can perform the following actions:

- **Define Area of Interest (AOI):** Users can specify areas for data analysis across all components of the platform. This is achieved by selecting administrative boundaries, such as country, province, NPA, or AOI, and further refining the selection by choosing a specific location name. Custom AOIs can also be defined to tailor the monitoring scope.
- **Define Time-Series:** Users can specify a period for data visualization and analysis. This involves selecting a start and end date to track changes or trends over time. Time-series data enhances the ability to observe historical patterns and analyze recent disturbances.
- **Apply Filter:** Users can apply the filter they have.

- **Reset Filter:** Users can reset the filter or map based on their interest.
- **Shared Map:** Users can share the map with other people.



Figure4. Forest disturbance information

Map Display

This panel functions as the primary interface, displaying map layers corresponding to the selected AOI and specified period. Users can interact with the map using features such as zoom in & zoom out, locate their current position, and switch to full-screen mode for enhanced visualization.

Legend

The legend provides a clear representation of the dataset, aiding in the interpretation of map layers. There are three data source categories available: GFW, SERVIR-SEA, and JJ-FAST. Users can choose their preferred data source for visualization. It is important to note that JJ-FAST and SERVIR-SEA data are limited to historical records.

QR Code for Telegram Channel

The QR code links to a Telegram channel specifically generated for the selected Area of Interest (AOI). Users can join this channel to receive real-time notifications and updates regarding forest disturbances. Additionally, the channel allows users to provide feedback on alerts, fostering better engagement and responsiveness.

Forest Disturbance Monitoring: Request Guidelines

The Forest Disturbance Alert Platform is open to interested stakeholders, including civil society organizations, community groups, government agencies, and others, to request monitoring or specify an Area of Interest (AOI) such as community forestry (CF), community protected areas (CPA), indigenous communities, and other areas related to forest conservation and patrol.

To ensure the request is significant, informative, and actionable, requesters are required to submit the following information:

Information requirements for AOI requests

Category	Details required
Requester information	Name, position, and organization
Organization details	Organization name, address, and main sector
Reason for request	Justification for monitoring the AOI
AOI Detail	Name (Khmer and English) and size of the AOI
	Type of AOI (E.g., community forestry, community protected area, etc.)
	Date of registration (If applicable)
	Supporting documents (If any)
	Coordinate system or map layer
Intended use of data	How the monitoring data will be utilized
Duration of monitoring	The time frame for monitoring the AOI
Challenges in AOI	Threats or issues in the requested AOI
Contact information	Phone number, Telegram, and Email

Process of Submission and Review

1. Submit the completed request form with the required details outlined above.
2. The technical team will review the submitted information and evaluate the request based on its significance and feasibility.
3. A notification of the decision will be sent to the requester via the contact information provided within 14 working days.

How to Submit a Request

To request an AOI, please fill out the form using the link: [Request Form](#)

For any additional inquiries, feel free to reach out to the technical team through the contact information provided on the [Open Development Cambodia Website](#).

Disclaimer

Open Development Cambodia (ODC) aggregates and displays forest alert data sourced from third-party providers, including GFW, SERVIR-SEA, and JJ-FAST. ODC does not generate, verify, or independently validate this data. The information provided is for informational purposes only and should be verified with the original data sources before being used for important decisions.

Annex 1: Information about data use in the platform

Forest Alerts from GFW

- **Overview:** The Global Forest Watch integrated disturbance alerts dataset combines five satellite-based systems (GLAD-L, GLAD-S2, RADD, DIST-ALERT, and Integrated Disturbance Alerts) into a single layer to detect forest loss faster and more consistently. It assigns confidence levels based on repeated detections or agreement across multiple systems, with higher confidence indicating more reliable alerts.
This platform uses only the highest-confidence alerts from the Global Forest Watch integrated disturbance dataset.
- **Resolution:** GLAD-L (30m), GLAD-S2 (10m), RADD (10m Sentinel-1 radar data), DIST-ALERT (30m, combines Landsat and Sentinel-2 data to cover disturbances), and Integrated

Disturbance Alerts (10m). The 10-meter spatial resolution of RADD and GLAD-S2 alerts enables the detection of smaller-scale forest disturbances compared with 30-meter products. This enhanced resolution is especially useful for identifying small canopy gaps resulting from logging activities.

- **Geographic coverage:** GLAD-L (Tropics), GLAD-S2 (Amazon basin), RADD (Humid tropics), and DIST-ALERT (Global), and Integrated Disturbance Alerts (Global)
- **Frequency update:** 1-12 days and upon source systems' updates
- **Alert confidence used by current platform:** Highest-confidence (detected by more than one alert system)
- **Link to Global integrated disturbance alerts:**
<https://www.globalforestwatch.org/blog/data-and-tools/integrated-deforestation-alerts/>

Forest Alerts from SERVIR-SEA

- **Overview:** The forest alert layer leverages the University of Maryland (UMD) GLAD Alert product, defining “forest” as areas with trees over 5 meters tall and a canopy closure above 30%. Alerts are triggered when canopy loss exceeds 50% per Landsat pixel. This system complements the annual global forest cover loss product, first developed using Landsat-7 data (2000–2019) and updated annually.
- **Resolution:** 30m
- **Geographic coverage:** Cambodia
- **Frequency update:** 16 days
- **Link to the Biophysical M&E Dashboard:** <https://cambodia-me-servir.adpc.net/mapviewer>

Forest Alerts from JJ-FAST

- **Overview:** Japan International Cooperation Agency (JICA) has developed a tool to watch deforestation called the JICA-JAXA Forest Early Warning System in the Tropics (JJ-FAST) under the Forest Governance Initiative (FGI). JJ-FAST uses Synthetic Aperture Radar PALSAR-2 onboard ALOS-2 with 50m resolution data. Its detection frequency is 45 days, with reliable monitoring features not affected by cloud cover, and it can detect deforestation with more than 2 hectares.
- **Resolution:** 50m
- **Geographic coverage:** Global
Note: For Cambodia, JJ-FAST data is historical only (last updated March 2024) and is no longer actively updated. Users should treat this layer as reference data only.
- **Frequency update:** 45 days
- **Link to JJ-FAST Dashboard:** https://www.eorc.jaxa.jp/jjfast/jj_mapmonitor_phase1.html

Detected Boundary – Land cover

- **Published by:** SERVIR-SEA
- **Overview:** Detection boundaries are overlaid with selected natural forest categories from the 2021 land cover dataset produced by SERVIR-Southeast Asia (SERVIR-SEA), including evergreen, semi-evergreen, deciduous, flooded forests, and mangroves. These forest classes were converted from raster to vector format and simplified for alert-generation purposes. As a result, minor spatial inaccuracies may occur due to the polygon simplification process.
- **Resolution:** 30m
- **Data source:** <https://cambodia-me-servir.adpc.net/mapviewer>

Natural Protected Areas (NPAs)

- **Published by:** Open Development Cambodia (ODC)
- **Overview:** This dataset contains boundary data of the natural protected areas that were digitized from the Royal Gazette from the Government of Cambodia, Royal Decree, Sub-decree, Prakas, Report 1992-2020, and Protected Planet 2011.
- **Data source:** <https://data.opendatacambodia.net/en/dataset/protectedareas>

Area of Interest (AOI)

- **Overview:** The areas of interest are identified based on requests from users seeking to detect or monitor specific locations and receive notifications and alerts. These areas may include community forestry, community-protected areas, or regions significant to indigenous communities.

Country and Provincial Boundary

- **Published by:** Open Development Cambodia (ODC)
- **Overview:** The datasets were obtained from the Department of Geography of the Ministry of Land Management, Urban Planning and Construction (MLMUPC) in 2008 and then unofficially updated in 2014 by referring to Sub-decrees on administrative modifications. A new province was added (Tbong Khmum).
- **Data source:** <https://data.opendatacambodia.net/en/dataset/administrative-boundaries-of-cambodia-2014>