Keeping it legal

An ITTO project improves the detection and prevention of illegal logging in Guyana

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Scanned: GFC official checks legality at log pond *Photo: P. Bholanath/GFC*

With over 13 300 000 hectares of State Forest Estate in a largely pristine state and a forest sector supporting over 20 000 employees and many forest based communities, legality has been a priority for Guyana's forest sector. Almost 50% of the State Forest Estate of Guyana remains unallocated in terms of commercial production use, while the remaining 50% is under sustainable management and is largely intact. While the extent of illegal logging in Guyana is thought to be generally low, the impacts of illegal activities can have significant impacts on Guyana's relatively small and developing economy as well as having environmental and socio-cultural consequences, if prevention and detection is not appropriately done. As such, forest law enforcement in countries with low rates of illegal logging and trade, like Guyana, is still of utmost importance for the continued sustainable development of the forest sector.

Over the past nine years, several activities have been implemented in Guyana to allow for detection and prevention of illegal logging and illegality in trade of wood products. In 2000, a log tagging and tracking system was developed and implemented nationally in 2001. This provided a comprehensive mechanism for verification of legality of origin of forest produce, and also provides one important requirement for a chain of custody or legal verification/assurance system for operators. Additionally, the forest management planning requirements and system of document control provides a further mechanism to allow for legality to be maintained. This focus is reflected in the work plan of the GFC, specifically in the work plan of the Planning, Forest Resources Management and Forest Monitoring divisions. An important part of the work plan of the Forest Monitoring Division focuses on environmental and general monitoring of forest activities in and around forest concessions, throughout the chain of custody of forest produce. This includes managing the log tracking system and associated documentation systems involved in forest activities.

Following an assessment of these systems by the GFC, it was identified that there were areas for improvement in detection and prevention of illegal logging and trade of wood products in Guyana. The conclusion of this assessment indicated that improvement in the prevention and detection of illegal logging and illegality in the shipment and trade of wood products can be enhanced by improving detection, reporting and recording of illegal acts, national level routine assessments, and an institutional arrangement within the GFC that allowed for a dedicated, permanent programme that addresses legality.

These key areas formed the main outputs of project PD 440/07 Rev.1 (M) which was submitted to ITTO in 2007. The project outputs were: dedicated geographic information system (including satellite image analysis and legality database); barcode timber-tracking system; central monitoring and detections database; wide-area computer network (WAN) and report dissemination procedure; and Legality and Monitoring Extension unit of the GFC. Implementation began in February of 2008 and activities were completed in late 2009.

Remote sensing of illegality

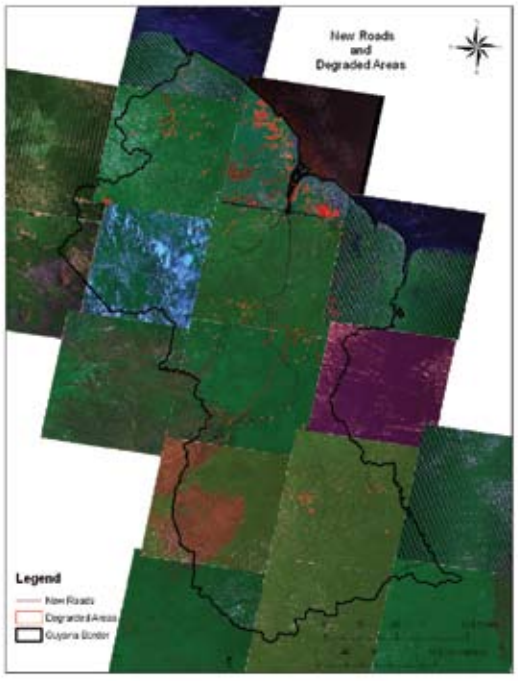
One aspect of the project involved improving detection of illegal logging through satellite imagery analysis. The value of satellite systems in monitoring logging activities, especially in the tropics, is widely appreciated. Two time periods were assessed, based on indicators of illegality which were developed, and with reference to the legislative and regulatory guidelines for legality in the forest sector of Guyana. These periods were 2005-2007 and 2008-2009, for which the indicators of illegality were used to identify areas of possible illegality. This layer of assessment was done using Landsat images at medium

resolution (30m). More detailed detection involved monitoring "hot spots", selected areas in Guyana exposed to known drivers of forest cover change: forestry activities, mining, and other land uses. For this layer of monitoring, which also allowed for cost effectiveness in data coverage, high resolution data for selected areas were obtained from the ASTER radar satellite at 15 m resolution and CERS (20 m).

A prototype decision support flowchart (decision tree) was developed to guide the process of assessment and a number of illegality indicators that were developed and used to assist GFC in determining the nature and type of forest clearance. The flowchart provided a tool to support decisions regarding appropriate response(s) by GFC to detection of changes in forest cover determined from medium resolution satellite images. At this scale, change can be categorized as linear or polygon features – equating to roads and canopy gaps (approximately 1 ha or greater), respectively. The location of change was one of the main determinants of whether it was considered likely to be illegal activity related to logging. Some of these areas were verified by ground truthing and aerial surveys. Reference to proposed operations presented in Annual Operations Plans (AOPs) was necessary to support a decision on the probable legality of any activity detected.

The result of the satellite interpretation was a national base layer comprising harvested areas, road networks, and areas subject to clearance by mining, agriculture and other activities. In some cases, images had to be used in combination with forest and other land use allocation information to make a definitive determination (see map). This approach was effective in allowing for national level coverage of the forest at minimal cost, scoping of areas that are both accessible and inaccessible, and for a comprehensive assessment by custom developed indicators of illegality.

We see you: Remote sensing and GIS allow production of monitoring maps like this



Timber tracking

The second aspect of the system developed under the project involved the improvement of Guyana's log tracking system. In 2001, the national log tracking system was implemented using manual means of verification. Under this system, cut logs and stumps are identified using a plastic barcode tag that is attached immediately after logging or when logs are converted into pieces at timber collection points. The manual implementation of this system, however, did not allow for the full benefits of traceability and verification of origin to be realized. The project aimed at helping prevent illegal logging and trade in illegally harvested timber by expanding the timber tracking system to the harvesting of tropical forests, shipment and exporting stages.

The timber tracking system was based on a barcode system utilizing wide area computer networks. By connecting to a central database, this system enables distribution systems to be managed from the origin of the timber that was harvested through to the point where it is distributed, processed and exported. The system developed collects several key pieces of information including: concession identification (name and number), type of produce being removed, timber species, tag number, date of expiry, and block number identifying the specific approved location in the case of large concessions. The information collected by GFC's field offices is linked via a wide area network to a central database at GFC's head office. Both the WAN and the central database have been developed as part of the ITTO project.

The improved national log tracking system allows for an overall enhancement of detection and prevention of illegal logging and illegality in trade of wood products by using an existing national system and filling gaps in its operation. Additionally, the necessary database infrastructure, networking and communication linkages were also created to allow for a comprehensive effort to be made in detection and prevention, in a timely, coordinated and effective manner.

Challenges and lessons learned

The project design allowed the development objective to be met via the full integration of all steps in the production to export chain (production, transportation, declaration, processing, export); this was then used in enhancing the level of legality in the forest sector from the production level, through to processing and then to export. The project built on existing systems, capacities and infrastructure in place at the GFC and in so doing, allowed for smooth implementation and overall effective transition from the systems currently in place, to those designed through the project. This approach also allowed for the sustainability of the initiative to be maintained as cost and human resources at the GFC are appropriate and adequate to allow for continuity of the initiatives. Further, the approach taken was to build local capacity to conduct the project activities. This also lent to local resources being used primarily for continued implementation of systems designed.

From an operational perspective, having the national agency that is responsible for managing legality in the forest sector of Guyana (GFC) as the main executing agency for the project resulted in a coherent and systematic approach being taken that allowed for continuity and sustainability of the initiatives. Additionally, the availability of resources at the GFC, especially in terms of infrastructure and human resources in areas such as geographic information systems allowed for existing capacity to be utilized and built on instead of starting anew. The new ITTO online project monitoring system also enabled more systematic tracking of activity progress which resulted in careful attention being placed toward ensuring that activities remained on track as planned and that inputs from ITTO were received in a timely fashion.

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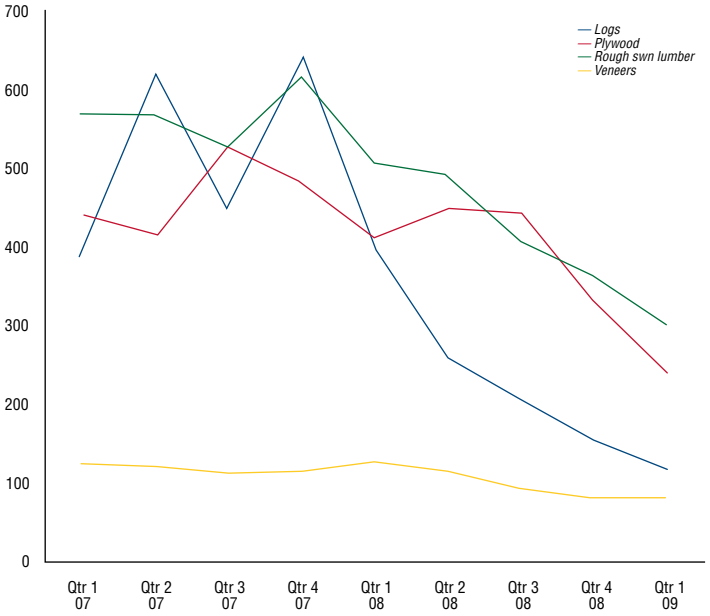
European buyers were not active in forward buying going into the last quarter of 2009 and little evidence was seen that orders would improve. European buyers were placing few orders even for popular species such as light red and dark red meranti, for which reduced production levels in Southeast Asia had until recently caused problems for European shippers.

There was little hope that production levels of tropical timber products would return to normal or expand in late 2009/early 2010. Japanese South Sea plywood mills have reduced their production levels by about 20-30% and it was doubtful production would return to normal even with slight increases in demand. The scaling back of production and layoffs in West Africa also continued through the first half of the year, a trend that was not expected to reverse itself given the low demand from the European market. This trend was also observed in Malaysia and Indonesia, which had faced massive layoffs in the timber sector in late 2008 and early 2009 (see *TFU* 18/4). Nevertheless, there were some reports of short supplies of plywood in Japan, which experts hoped was a sign of a turnaround in the market which would eventually boost imports and/or domestic production levels.

Editor's note: Lauren Flejzor has left ITTO after a successful tenure as MIS Coordinator. We wish her well in her new position with the FAO Forestry Department. ITTO's bi-weekly Market Information Service newsletter continues to be produced under acting Coordinator Mike Adams (mis@itto.int).

Spot the trend: EU 25 quarterly imports of hardwoods from developing countries by main product group (1000 m^3)



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The main challenge faced by this project was the difficulty in securing high quality satellite images for Guyana. For several months, poor quality images were the only ones available from both high and medium resolution providers. The solution to this is to plan for high resolution images to be sourced over a longer time frame. However, this has implications for both financial and time inputs. Remotely sensed optical images at medium resolution used in this project (Landsat) only allowed for clearings of approximately 1 hectare and greater to be monitored. This is characteristic of almost all medium resolution images. Only the use of finer resolution (and thus more expensive) images can detect the smaller clearings which are often the initial indicator of illegal logging.

What next?

The establishment of the Legality Monitoring and Extension unit within the GFC provides the mechanism to allow this initiative to be sustained into the future thereby enabling the outputs of this project to continue to improve the prevention and detection of illegal activities in logging, transporting and shipment. The work that has been done under this project in forest assessment using remote sensing has already fed into Guyana's submission to the World Bank's Forest Carbon Partnership Facility where an assessment of drivers of forest area change was required.

The availability of satellite images to continually conduct national level assessment of illegal logging incidences will also determine the success of future efforts. The tropics are prone to heavy cloud cover and this can often be prohibitive to conducting remote sensing imagery analyses using optical images. New developments in satellite and remote sensing technology may overcome this problem (see, e.g., *TFU* 18-1 for a description of cloud penetrating radar satellites being pioneered by Japan), but cost of images will remain a prime consideration.

The situation that is prevailing after the project completion is generally an environment where illegal logging can be detected and prevented through a more integrated, national level system. The project has allowed for a variety of technologies to be integrated and has increased capacity of the GFC to conduct such work. Local communities, exporters, other forest sector stakeholders and the nation as a whole will benefit from the resulting higher level of legality in the sector.

The full completion report of this project is available from eimi@itto.int.