

## Discussion Paper

# Community Based Monitoring and REDD+ Projects

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### Introduction

Reducing Emissions from Deforestation and Forest Degradation (REDD) is an effort to create a financial value for the carbon stored in forests, offering incentives for developing countries to reduce deforestation and degradation thereby lowering their associated carbon emissions. REDD+ has evolved from REDD and focuses on deforestation and degradation but also includes conservation, sustainable management of forests and improvement of forest carbon stocks. With 20% of global carbon emissions caused by deforestation and forest degradation, REDD+ has the capacity to fight climate change by producing real and verifiable emissions reductions, while benefiting biodiversity and people's well-being. REDD+ offers many co-benefits alongside lowering carbon emissions and improved forest management.

REDD+ projects can also offer many benefits for forest dependent communities. The incentives offered by REDD programs can help with poverty alleviation. Many REDD+ programs offer communities improved education systems and more sustainable livelihood options. This paper will explore community based monitoring in REDD+ projects including the benefits of using this method to compliment data collected remotely, an overview of the available technologies that can be used for this purpose and how community based monitoring can be applied by project developers who are developing projects under the Natural Forest Standard.

### What is community based monitoring?

Community based monitoring involves training local communities in REDD+ project areas in collecting data necessary for the success the project. In addition to satellite data, community based monitoring can be an effective and efficient way of gathering information. There can be large amounts of data needed, particularly in large project areas which are rich in biodiversity and it can also form an important part of a projects benefit distribution mechanism by providing training and

employment in data collection or surveys. It can also provide benefits for the project developer as community based monitoring utilises the experience and knowledge of local communities about their local areas to collect data in an efficient way. It is important for local people to be engaged in these initiatives, and to be empowered to undertake monitoring, to avoid conflict and promote transparency and equity in REDD+ projects.

### **What are the benefits?**

The United Nations Environment Program (2012) notes that restoring the control and management of ecosystem resources to local communities may have benefits in terms of preserving ecosystems and providing higher quality goods and services. As local people often possess detailed knowledge of the local ecosystems they are often the best equipped for effective management, including monitoring human impacts on ecosystems. Supplying local people with resources and control over their own environments, and compensating them for maintaining and restoring biodiversity can be an effective way of taking care of these valuable ecosystems. In this context, the involvement of local people, who may have diverse skills, expertise, societal roles and interests, can bring important local information on forest management to REDD+ projects (Pacha, 2015).

There are a number of advantages to incorporating community based monitoring in REDD+ projects. In practical terms, community based monitoring utilises the proximity of communities to the project area, allowing for repeated monitoring of data. Studies have shown that community-based monitoring can provide cost-effective and accurate data for REDD+ projects, which can enhance and compliment data gathered by remote sensing. For example, a 2011 study compared results of community-based and professionally undertaken monitoring in India, Tanzania, and Madagascar in order to identify how well community members can measure forest biomass. This study explored the value of community based monitoring in its findings and illustrated that data collected by community members can meet the requirements of the highest reporting standards of the Intergovernmental Panel on Climate Change (Danielson, 2011). The findings of this study also demonstrate that community based monitoring in REDD+ projects can be an effective tool in identifying changes in rates of degradation and forest enhancement. It also demonstrated that community members can collect large volumes of data at relatively low cost. Community based monitoring can also increase the speed of data collection and analysis thereby allowing decisions to be made quickly (Danielson et al., 2010).

Community based monitoring can be an important part of the benefit distribution mechanism. It can provide a structure for benefit sharing, thereby provide an incentive for engagement with REDD+ forest monitoring and management. It may also enhance the capacity of local people to take care of their own local environment by increasing awareness and knowledge regarding the importance of protecting the surrounding forest areas (Sheil & Lawrence, 2004). It can also aid the conservation of natural forests and biodiversity and the enhancement of other social and environmental benefits (Pacha, 2015).

In accordance with the NFS approved methodology NFS AM001.1a, forest area change and associated carbon stock changes from reforestation and deforestation in NFS project areas, is primarily monitored by remote sensing and national forest inventory data sets. However, local knowledge can complement this by signalling change events, when they happen, and crucially, why they happen (Pratihast, 2011). This information can be useful in developing an effective management plan and preventing or addressing leakage.

## **Technologies**

There are a number of technologies available for community based monitoring. These technologies allow for varying levels of expertise with some catering for people who have low literacy levels. They also have a variety of ways of transmitting data, with some using the internet and phone networks.

- **C7-LDFN**

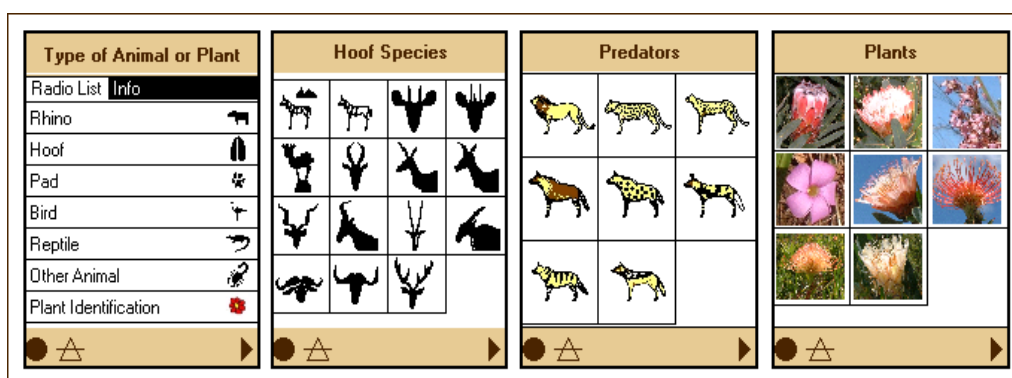
The system C7-LDFN, is an application that can be used to survey native forests. The app is readily available to download and enables the recording of native species, projects and surveys for forestry inventory and natural regeneration. It is, however, limited to data for forest inventories and cannot be used to collect additional biodiversity or social information (Global Canopy Program, 2014).

The app is designed to be user friendly and does not require programming knowledge, making it suitable for people with a moderate level of expertise. The data from the app can be saved to a Comma Separated Values file, which can then be read in any text editor, Excel or other software data processing interface for forests (Laboratório de Geomática , 2014).

- **CyberTracker**

CyberTracker is an application for the data collection, which is georeferenced. This app is suitable for users with low levels of literacy and can be used on a Smartphone or handheld computer and is not limited in terms of the data that can be recorded i.e. it can be used to record any type of observation and can be customized for the specific requirements of the user.

Cyber Tracker uses icons for the input of data. This enables people with little or no literacy to use the app but it also allows for faster data collection and reduces input errors (CyberTracker, 2013).



Source: CyberTracker (2013)

CyberTracker allows user to view data in tables, maps and graphs. Map views include Microsoft Virtual Earth, Google Earth, ESRI Shape File map layers or Image maps. Photos can also be attached to data entries.

CyberTracker supports remote synchronization allowing CyberTracker desktops, Smartphones and handheld computers to send data over the internet to a central server. Data can also be exported to Microsoft Excel, Comma Separated Values, XML or HTML formats (Global Canopy Program, 2014).

- **iNaturalist**

iNaturalist is a smartphone application and website that allows a community of users to record biodiversity observations; and crowd source species identifications. The smartphone app is used for data collection while the iNaturalist website allows data to be entered and species identification to be verified.

This app is useful for community based monitoring in REDD+ projects as it allows community members with smartphones to set up surveys, record data offline, and analyse data online. The iNaturalist website uses crowdsourcing for species identification; therefore, data that is recorded is

publicly available. While this allows for transparent data collection it can also reveal information on rare and endangered species.

The app can be downloaded and internet access is needed to consolidate data, even though data observations can be collected in the field offline. iNaturalist currently only supports the English and Spanish languages and while the app is suitable for people with low expertise it is unsuitable for those who have low literacy levels (Global Canopy Program, 2014).

- **Open Data Kit**

Open Data Kit an open-source set of tools which is available free of charge and can help organisations design and manage mobile data collection. Open Data Kit can be useful in community based monitoring as it allows users to build a data collection form or survey, collect the data on a mobile device and send it to a server. The data which is collected on the server can then be consolidated and extracted into other formats.

Open Data Kit has many uses such as, socio-economic and health surveys and it allows users to include GPS locations and images and to build multimedia-rich nature mapping tools (Global Canopy Program, 2014). It is supported by a growing community of developers, implementers and users as well and its development is supported by ongoing research at the University of Washington's Department of Computer Science & Engineering (Open Data Kit, n.d.).

- **Smap**

Smap is a software program designed for data management and visualisation. Like Open Data Kit It is open source, and can be downloaded from the Smap Consulting website. Smap can be used in conjunction with Open Data Kit to create, upload and download forms for forest monitoring (Global Canopy Program, 2014).

Data can be collected using surveys on Android phones or in web browsers. Smap allows people to create and upload surveys which can later be downloaded to phones, tablets or in web browsers.

Smmap allows users to monitor, evaluate and report on programs of work, rapidly assess the situations and information and facilitates project management through data collection (Smmap Consulting, n.d.).

The data collected can be displayed in graph, map, or tabular formats on the Smap Server. Data can then be exported as spreadsheets, Smap reports, Facebook or other systems as a map. It also allows for tasks can be assigned to users to complete additional surveys (Global Canopy Program, 2014).

- **Sapelli**

Sapelli is an open-source of data collection software program which has been developed to enable illiterate indigenous people or those with low levels of literacy to monitor their local forest and empower them to take action to protect their local environment and way of life (Global Canopy Program, 2014).

Although the software is currently under development the platform provides a number of unique features and currently allows for basic data collection and transmission. Planned features include a Web-interface for survey design, project management, and querying, analysis and visualisation of data (UCL, 2014).

A Sapelli app is available to download from the Google Play store and utilises icon-driven interfaces. It also allows for the interface images to be changed and data can be transmitted through by binary, compressed SMS messages or by HTTP over mobile or Wi-Fi networks.

### **Conclusion - Community Based monitoring and the NFS**

The Natural Forest Standard aims to conserve and restore natural forests through actions that benefit local communities and indigenous people. It is essential that projects do not have negative impacts on people living within project areas or on those that have land use rights, and that the needs, rights and interests of these people are recognised by the project developments.

The NFS requires projects to implement a benefit distribution mechanism which is relevant, effective and efficient. While the standard is flexible in allowing project developers to develop this mechanism as appropriate, depending on the individual project, community based monitoring may offer project developers many benefits, as described above.

As with all NFS project activities, the development of the benefit distribution mechanism should be guided by the principles of free, prior, and informed consent. Implementing community based monitoring can be particularly useful as it ensures that the mechanism will be equitable and transparent. Community based monitoring can also encourage local communities to engage with the

project through employment opportunities and increased awareness of the local environment and the importance of preserving natural forests and the ecosystems within them.

As the Natural Forest Standard offers a holistic approach to forest conservation by protecting the carbon, social and biodiversity values within them, community based monitoring can allow projects to protect the rights of local people while utilising their skills and knowledge to protect natural forests. Community based monitoring can be particularly useful for Natural Forest Standard projects in conducting their biodiversity assessment. It can be useful for the identification of ecosystem intactness and documenting the presence of endangered species within project areas.

While remote sensing techniques are the primary method for the detection of deforestation in NFS project areas, community based monitoring can provide valuable additional data to aid analysis of deforestation and degradation events. Community based monitoring can also signal new changes and events and help verify remote sensing findings.

Involving the local communities and stakeholders in monitoring can provide benefits for communities and project developers while improving data reliability. Community based monitoring offers NFS projects a valuable tool in meeting the requirements of the Standard and providing transparent and appropriate benefits to communities.

## References

CyberTracker, 2013. *Software Introduction*. [Online]  
Available at: <http://www.cybertracker.org/software/introduction>  
[Accessed 5 March 2015].

Danielson, F. e. a., 2011. At the heart of REDD+: a role for local people. *Conservation Letters*, pp. 1-10.

Danielsen, F., Burgess N.D., Jensen P.M., Pirhofer-Walzl K. (2010) Environmental monitoring: the scale and speed of implementation varies according to the degree of peoples involvement. *J Appl Ecol*, **47**, 1166–1168.

Global Canopy Program, 2014. *Forest Compass: Digital Technologies*. [Online]  
Available at: <http://forestcompass.org/how/digital-technologies/c7-ldfn>  
[Accessed 5 March 2015].

GOFC-GOLD, 2013, A sourcebook of methods and procedures for monitoring and reporting anthropogenic greenhouse gas emissions and removals associated with deforestation, gains and losses of carbon stocks in forests remaining forests, and forestation. GOFC-GOLD Report version COP19-2, (GOFC-GOLD Land Cover Project Office, Wageningen University, The Netherlands). Available at: [http://www.gofcgold.wur.nl/redd/sourcebook/GOFC-GOLD\\_Sourcebook.pdf](http://www.gofcgold.wur.nl/redd/sourcebook/GOFC-GOLD_Sourcebook.pdf)

Laboratório de Geomática , 2014. *C7-LDFN*. [Online]

Available at:

<https://play.google.com/store/apps/details?id=com.crcampeiro.florestal.n&hl=en>

[Accessed 6 March 2015].

Open Data Kit, n.d. *Home*. [Online]

Available at: <https://opendatakit.org/>

[Accessed 4 March 2015].

Pacha, M. J., 2015. *Community-Based Monitoring, Reporting and Verification Know How-Sharing Knowledge from Practice*, s.l.: WWF.

Pratihast, A. a. H. M., 2011. *Community Based Monitoring and potential links with National REDD+ MRV*. [Online]

Available at: [http://redd.ciga.unam.mx/files/inputpapers/input\\_paper1.pdf](http://redd.ciga.unam.mx/files/inputpapers/input_paper1.pdf)

[Accessed 6 March 2015].

Sheil, D., Lawrence A. (2004) Tropical biologists, local people and conservation: new opportunities for collaboration. *Trends Ecol Evo***19**, 634–638.

Smapp Consulting, n.d. *Applications*. [Online]

Available at: <http://www.smapp.com.au/>

[Accessed 5 March 2015].

UCL, 2014. *Sapelli*. [Online]

Available at: <http://www.ucl.ac.uk/excites/software/sapelli>

[Accessed 6 March 2015].

United Nations Environment Program, 2012. Valuation of Ecological Services and Natural Capital. [online] Available at:

<http://www.unep.or.jp/letc/Publications/Freshwater/FMS7/11.asp>