Data sharing in community-based forest monitoring: lessons from Guyana

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Key Lessons

- Data sharing, rather than being an automatic or simple process, requires serious attention within community-based forest monitoring initiatives.

- Data sharing protocols are important governance instruments for community-based forest monitoring models; as such they should reflect the socio-political context in which data is collected.

- Data sharing requires clear processes, agreements, roles and local data management capacity to ensure that communities retain control over data, while also enabling data to be shared effectively. This avoids trade-offs between respect for community-rights and efficient data transfer.

- Building consensus on how to classify different data outputs is an important, albeit lengthy, process, especially for data on sensitive issues. This process needs to happen prior and/or parallel to data collection and should focus on creating an understanding of the risks, value and relevance of the data collected and information generated.

- Basing data sharing frameworks and standards on the principles of free, prior and informed consent is key to enabling effective and equitable data sharing that respects the data ownership rights of local people.

- Data sharing protocols need to be updated and revised periodically as data sensitivities, classifications and relevance change over time.

Figure 1. Community monitoring in North Rupununi, Guyana

Introduction

Data sharing is an often overlooked issue in community-based forest monitoring initiatives. It will require more attention as forest communities increasingly participate in monitoring conservation efforts (see forestcompass.org). The growth of participatory monitoring and the increasing use of technology can empower local people and inform external policy interventions; equally, it can generate risks to communities if clear data sharing protocols are not established and agreed. Addressing data sharing and its different challenges is essential to facilitate the flow of critical information for decision-makers, while guaranteeing respect for local rights.

This article draws on the experience of developing a data sharing protocol as part of a community-based forest monitoring initiative using digital technology in Guyana (see Box 1). It discusses key considerations for establishing effective, locally appropriate data sharing processes.

Box 1. Community-based monitoring in Guyana

The Community Monitoring, Reporting and Verification (C-MRV) project in North Rupununi, Guyana, piloted the use of smartphone technology and cloud-based data storage as part of a system for monitoring different aspects of mixed forest/savannah landscapes. This area is home to the Makushi indigenous people. A monitoring framework was developed through a series of participatory workshops, with the intention of balancing the distinct monitoring interests, needs and priorities of communities and external actors (i.e. government, and facilitating organisations – GCP and Iwokrama).

Such an approach was fundamental to increase synergies among actors and support local and external decision-making for resource management and emerging REDD+ interventions in Guyana.

The monitoring team consisted of 32 members from 16 villages spread across the region, supported by a local management team. They used electronic questionnaires on an application called Open Data Kit (www.opendatakit.org) to collect a variety of socio-environmental data sets through interviews and field visits. Developing a data sharing protocol was essential, given the project's collaborative nature and the sensitivities around data, particularly on wellbeing and natural resources (for example, locations of sacred sites and hunting grounds). This protocol provides the guidelines for using and sharing data; it covers storage, classification, ownership, and access to data and information. However, a clear and functional data sharing process also depends on strong community management capacity and the data sharing standards and practices of external partners. All these issues would need to be considered if this initiative were to be replicated or scaled up.

This project adopted a 'rights-based approach to data sharing'. This is based on principles of free, prior and informed consent (FPIC), and prioritises the protection of the rights of those who generated the data, and/or those potentially affected by data-sharing. There is more information on the project in this case study.

Data sharing in community-based forest monitoring

Monitoring and understanding the dynamics of tropical forests depends on generating and analysing a huge amount of data. The emergence of policy interventions like REDD+[1] have added to the need for data - on carbon stocks and flows, biodiversity and socioeconomic aspects of forest landscapes.[2] Within this context, community-based forest monitoring is increasingly seen as a viable approach for generating data on the ground, to complement remote sensing and fill knowledge gaps; for example, on local drivers of deforestation and forest degradation, biodiversity and social wellbeing. This is necessary to develop comprehensive national forest monitoring and REDD+ safeguard information systems.

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1 Reducing emissions from deforestation and forest degradation, with conservation, sustainable forest management and the enhancement of forest carbon stocks.
2 See: Korhonen-Kurki, K. *et al*, 2013

Beyond supporting national and international undertakings, such as REDD+, CBD and FLEGT, community-based forest monitoring models can also deliver local livelihood and forest conservation benefits related to improved community decision-making on natural resource management, informed participation in conservation interventions, and employment and capacity building opportunities, among others (Danielsen, F. *et al*, 2011).

While community-based forest monitoring initiatives vary in terms of the level of local participation and involvement of external actors (Danielsen, F. *et al*, 2007) and the themes or purpose of monitoring (i.e. data can be collected for different end users), communities should be involved in deciding how and with whom data is shared. Further attention is needed to how community-generated data is appropriated and used at the community level and beyond.

The integration and use of community generated data both locally and as part of external monitoring frameworks will depend largely on the relevance and accuracy of the data, and how regularly and effectively it is transferred and shared. The compatibility of the community-generated data with wider knowledge management systems is also a key issue. In many cases the transfer of data across these scales can be limited by a lack of political will, institutional capacity or mandates for assimilating locally-generated data. At the local level, external data sharing can be hindered by the need to consider local ownership and rights over data.

Community-based forest monitoring initiatives are embedded within local socio-political contexts and power dynamics, and communities have stakes and claims on the data they generate.[3] This means that data sharing under community-based monitoring regimes can be rife with interwoven political and social sensitivities, which should be addressed using appropriate participatory and rights-based approaches. The increasing use of digital technologies within community-based forest monitoring models adds another layer of complexity for accessing and sharing data from community-based initiatives.

Considerations for developing data sharing protocols

1. Data management and infrastructure

Figure 2. Local project management team in North Rupununi, Guyana.

Creating and managing a data sharing protocol depends on effective systems to store, access and manage the data.

In the community-based forest monitoring project in Guyana, the monitoring data sets were managed locally (by communities) and externally (by facilitators). All data collected (in GIS, Excel or Smap) was stored in the cloud (Dropbox) and in hard drives (e.g. computer discs) for external and local access. An audit log of all data was created and continuously updated to keep track of information flows and storage, in order for communities to be aware of where the data was. A local project management team led the whole process, after taking part in a two-year technical capacity building course.

Although the use of cloud-storage was very useful for data sharing and data management, it was dependent on internet connectivity, and more importantly, it was a new concept for local project members. This created challenges for fostering community ownership and empowerment. Therefore, key elements of the training and capacity-building were understanding each tool, and using and accessing the system without external support.

Lesson

❖ Local capacity needs to be built so that data is managed in a way that ensures that communities retain control of their knowledge and data.

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3 Information is a source of perceived or real power, therefore retaining this information at the local level is paramount.

2. Data classification

Community-based forest monitoring collects vast amounts of data, much of which is sensitive. Categorising this data is therefore a necessary first step to identify these sensitivities and ensure measures are taken to protect this data.

Figure 3. The data classification traffic light system

Green	**Amber**	**Red**
Data that can be shared, because it has already received approval through community consultations. Terms and conditions will apply (e.g. copyright, citations).	Data that is still is not clear or its status is not yet fixed and requires some further consultations to clarify its status and terms under which it can be used.	Data that is sensitive and that may only be used in limited ways. Requires 2/3 majority vote approval by the community before it can be shared.

In the community-based forest monitoring project in Guyana, the communities decided to classify data using a "traffic light" system (red, amber and green). Even though there are no traffic lights on roads in North Rupununi, all participants were happy with this system and knew what it meant.

The communities and facilitators made some key decisions on data sharing. They decided that the classification of data would be agreed by communities, without any coercion from external parties interested in the data. Consent for the sharing of data must be obtained prior to the release of any data, and these decisions must be founded upon an understanding of the full range of issues and opportunities implicated by the sharing of that data. Project participants received training in the principles of free, prior and informed consent (FPIC); following these was fundamental to guarantee that data collected would be shared and used the most responsible and considerate way.

Data classification was initially discussed in meetings with village leaders, councillors and project participants. Meetings centred on understanding what sort of data had been collected, what information had been generated, and the risks and benefits involved with sharing this with different actors (e.g. companies, governments, NGOs and other communities). These exercises highlighted sensitivities around data that revealed natural resource locations or village-level social problems (such as alcoholism); these were highly sensitive even when these were to be shared at the community level.[4]

Once a clear understanding of the monitoring results and classification system was reached (using questionnaires), it was then taken to each village to be discussed and agreed in communal assemblies over several months.

It must be noted that while great efforts are needed to address data classification prior to monitoring (i.e. highlighting sensitivities prior to data collection), in some cases the significance of the data was only really understood once it was analysed and visualised. Therefore, it became clear that classification processes need to run in parallel with monitoring activities, as data classifications will require regular revisions over time. The local data management capacity needs to be strong enough to manage these ongoing discussions.

Lessons

- ❖ The principles of free, prior and informed consent (FPIC) are fundamental to guarantee that data collected is shared and used the most responsible and considerate way.
- ❖ Consensus around the classification of different data outputs is not only important at the outset, but is an ongoing process that requires revisions as data is collected.

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[4] Inter-village resource conflicts exist as a result of overlapping legal and customary rights over land and growing pressures on natural resources from external – frequently illegal – activities.

3. Data access

Recording and agreeing on a project's key stakeholders and their roles in data sharing is important for streamlining data sharing.

The protocol developed in Guyana specifies who must be consulted before any data can be shared. It defines the level of involvement of community and external actors (see Figures 3 & 4).
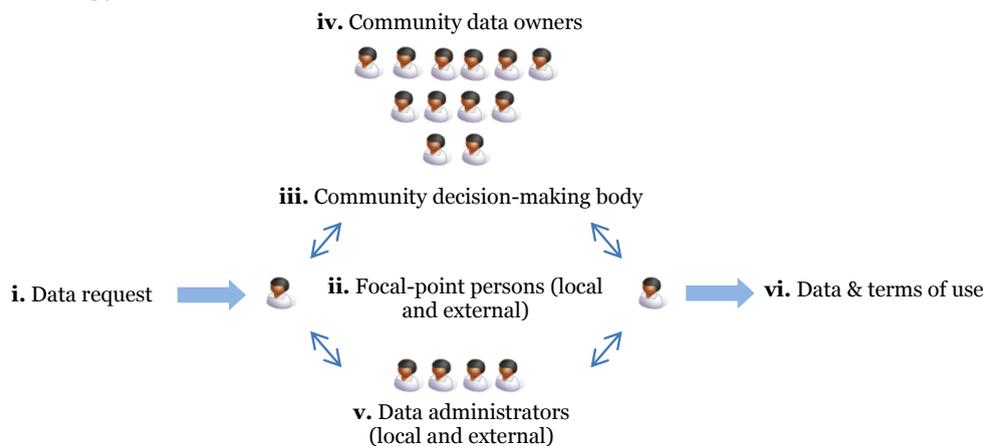
Under each data classification (green, amber, red), there is a specific process that needs to be followed for that dataset to be shared and accessed by external actors. The decision-making process is based on the traditional village management structures, which helps ensure local acceptance and ownership of the process.

These guidelines and the agreements on roles make sure that data is used in a most careful and considerate way, taking into account the concerns and decisions of the communities. This also ensures that the project effectively addresses any data sharing requests that might arise throughout the course of the project and thereafter.

Figure 4. Developing a roles diagram

The diagram below shows the following data sharing processes and roles:

i. Data sharing or access requests are submitted via an online website portal or through emails to community and facilitator focal points.

ii. The community and facilitator data focal points examine and log the request and can, depending on the classification, either proceed with sharing the data, or

iii. Pass the request on to the community decision-making body - the North Rupununi District Development Board (NRDDB)[5]; or

iv. Ask that it is discussed further in community assemblies with each village council.

v. Once agreements and terms are reached, the data sets are then requested from the appointed data administrators who have access to the system. These individuals provide access details or data sets to the focal points.

vi. The focal point can then deliver the data and terms of use to the relevant party.

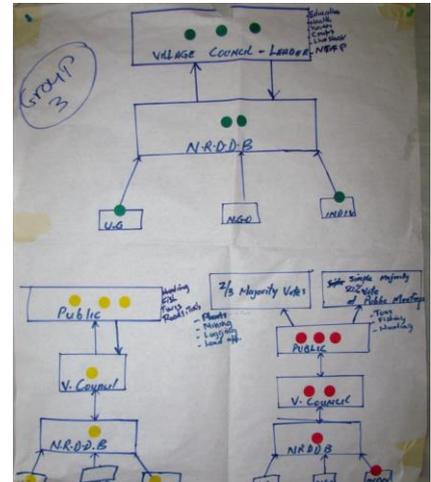**Figure 5. The data sharing processes and roles**

iv. Community data owners

iii. Community decision-making body

i. Data request → **ii.** Focal-point persons (local and external) → **vi.** Data & terms of use

v. Data administrators (local and external)

Lesson

❖ In projects where many parties are involved, clear roles and processes are essential to ensure that communities maintain control over how data is used and who can access it.

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5 See http://nrddb.org/

4. Data reporting

Reporting to local and external stakeholders is a vital step in community-based forest monitoring. To inform decision-making effectively, data must be shared in the most appropriate format for different audiences. This will help achieve two-way data flows - so that relevant information reaches decision-makers, who will then provide policy and management responses that are appropriate and useful for communities. The dissemination of results from forest monitoring initiatives is essential for improving local decision making for resource management systems (Danielsen, F. *et al,* 2010).

This project aimed to report back to communities within one month of data collection, though this was a challenge due to the complexities of data analysis. The project maintained regular information flows to wider audiences within the local communities through meetings, workshops, posters, maps, videos and short reports, as well as other media outlets such as radio (see Figure 6).

The monitors received training in making presentations on the results to their communities. This helps to encourage communities to become more engaged and interested in the results. It is also important to involve communities interpreting results through discussions and visualisation of data, and also to develop useful reports (see Figure 7). There is also a strong ethical argument for investing time and effort in ensuring that information is returned to the communities who generated it.

At the external level, reporting requires the active participation of other stakeholders in order to align information and results to different policies and developments, and to achieve the right level of technical detail. All sixteen Makushi communities agreed that information on the drivers of deforestation and forest degradation, biomass and traditional farming could be shared through formal reports to the Guyana Forestry Commission. These can be used to inform the development of national forest monitoring and safeguard information systems as part of Guyana's Low Carbon Development Strategy.

In the initial formulation of a community-based forest monitoring initiative, it is imperative to consider how different technological tools can determine the way in which data is shared and reported. For example, recording video and audio interviews or typed answers using electronic questionnaires (on Open Data Kit forms), has an impact on how rapidly data is analysed in comparison to georeferenced data points that are easier to process. The effectiveness of data reporting with external stakeholders will ultimately depend on information needs and the compatibility of chosen methodologies.
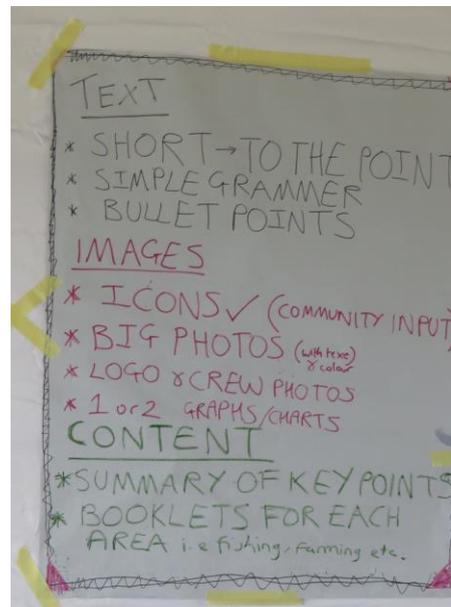
Figure 6. Sharing information on Radio Paiwomak

Figure 7. Agreed community report content

Lesson

❖ Data must be shared in the most appropriate format for different audiences, and must consider the choice of methodologies and tools for reporting the monitoring results.

Conclusions on FPIC-based approaches for data sharing

The propagation of participatory monitoring models and the increasing use of technology[6] can empower local populations and inform external policy interventions; equally, it can generate risks to communities if clear data sharing protocols are not established and agreed. While effective information flows are critical for decision-making, further attention is needed on how community-generated data is appropriated and used at the community level and beyond.

Developing frameworks and standards based on FPIC principles are key prerequisites to enable effective and equitable information sharing. While community-based forest monitoring initiatives will vary in terms of the level of local participation and involvement of external actors (see Danielsen, F. *et al,* 2009) and the themes or purpose of monitoring (i.e. data may be collected for different end users), communities should be involved in deciding how and with whom data is shared. Issues of data sensitivities also need to be worked out through continuous consultations and participatory processes. Such considerations are paramount for maintaining local rights.

The protocol and approach adopted as part of this community-based forest monitoring initiative in Guyana shed some insight into data sharing among communities when using technology, and when data has both local and external relevance. Although data sharing agreements were put in place to protect information that the communities considered to be sensitive, this alone cannot guarantee a clear and functional process; strong community management capacity and wider data sharing standards are needed for this initiative to be an effective model as part of scaling up efforts.

Agreeing processes for reporting and sharing data is a necessary step for rights-based data sharing, and to avoid trade-offs between respect for community-rights and efficient data transfer. Ultimately, data sharing, rather than being an automatic step, requires serious attention within community-based forest monitoring initiatives.

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Citation

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6 See forestcompass.org for more technology-based monitoring projects worldwide.

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