Ghana's REDD+ Registry
Pathways to Development

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Acknowledgements

In January 2012, Ghana's National REDD+ Secretariat created a technical working group (see Annex 1) to advise the development of a REDD+ registry for the country. As part of its deliberative process, the working group delegated a core team to draft a concept note about REDD+ registries and to make a set of recommendations for Ghana which would serve to guide the REDD+ Secretariat and National REDD+ Working Group on the development of such a registry. The authors are therefore most grateful to all of the members of this working group for the rich discussions, insights, guidance, and comments that informed this document. The process of thinking about a REDD+ registry for Ghana (and other African countries) has also benefitted extensively from the specific collaboration and insights of a few key people, including: Daniel Benefoh Tutu of Ghana's Environmental Protection Agency (EPA), Jacob Olander of EcoDecision (Ecuador), Joerg Seifert-Granzin of Mesa Consult (Bolivia), Mariano Cenamo of IDESAM (Brazil), and John Mason of Nature Conservation Research Centre (Ghana). The authors are also grateful to Mr. Robert Bamfo, the Head of Ghana's Climate Change Unit and National REDD+ Secretariat, for his leadership and support in this process.

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1. Background & Overview of REDD+ Readiness in Ghana

The emerging mechanism of Reducing Emissions from Deforestation and Forest Degradation (REDD+) presents opportunities for developing countries to contribute to climate change mitigation and benefit from associated financial flows. Specifically, such actions and measures are meant to result in the reduction of carbon dioxide emissions from forests, either by preventing their destruction or degradation, or by enhancing carbon stocks through tree planting, conservation, or sustainable management.

Ghana has been an active participant in this international process aimed at mitigating climate change, which poses a major threat to humankind on a global scale. In the quest to contribute to the realization of the goals and objectives of REDD+, the Government of Ghana, through designated state institutions, has been collaborating closely with key international and local partners to implement this evolving global mechanism.

The Forest Carbon Partnership Facility of the World Bank is currently providing support in the sum of US$3.4 million for the implementation of a 4-year REDD-Readiness Preparation Proposal (R-PP), which seeks to position Ghana to effectively participate in the evolving international REDD+ mechanisms. Although many aspects of the international system are yet to be determined, it is clear that for REDD+ to work it must enable results-based payments, either through markets or fund-based transactions. To facilitate transactions of this nature, detailed regulation and monitoring will be essential. Box 1 outlines the tasks and activities associated with the implementation phase of Ghana's R-PP.

In *Step 2*, the establishment of a carbon accounting registry is clearly identified as one of the activities to be implemented during the Pilot and Testing stage of Ghana's R-PP process. To date, crucial activities which have implications for the establishment of a carbon registry are underway, including setting of baselines and putting in place an effective MRV system for determining levels of success.

In addition, seven pilot projects have been identified for implementation under the REDD+ readiness preparation process, which should provide an opportunity for field testing the yet-to-be-established registry at various stages of its development.

2. Ghana's Registry Development Process

In January, 2012, Ghana's REDD+ Secretariat, located at the Climate Change Unit of the Forestry Commission, took the initiative to move the registry development process forward using a working group approach. This working group (see Annex 1 for list of participants), which met for the first time during the same month, is made up of REDD+ decision-makers, REDD+ experts, and key stakeholders from government and civil society. While the aim of the first meeting was to develop a baseline understanding of central concepts and issues about registries, the working group's ultimate aim is to inform and recommend a pathway for REDD+ registry development in Ghana which the government can use to guide the process.

At the first meeting, the working group designated a core team and charged them to follow up on critical questions and issues (seeking information and advice from other REDD+ countries and entities with registry experiences), and to draft a REDD+ Registry concept note. It was further agreed that the working group would then reconvene to review and finalize the concept note, and then hand it back to the Secretariat to use as a guide for the development of a functional and appropriate REDD+ registry for Ghana.

This document therefore represents the draft concept note, as put together by the core team. It has benefitted from the team's own internal discussions, as well as consultations (both formal and informal) with other private sector entities, international REDD+ experts, and expert REDD+ institutions based in Brazil, the Democratic Republic of Congo (DRC), Ethiopia, Kenya, and Tanzania.

Box 1: Ghana's R-PP Implementation Phases

The R-PP document represents Ghana's ongoing efforts to get 'ready' for a future mechanism for REDD+. It presents a three-step approach to REDD+ strategy development and establishment of the technical, policy, legal, management and monitoring arrangements necessary to enable Ghana to fully participate in a mechanism for REDD+. Implementation of the R-PP is anticipated to continue through 2013. The steps of this stage will include:

Step 1: Analysis, Preparation and Consultation

- Detailed analysis of REDD+ policy, legal and technical requirements
- Setting of the Reference Emissions Level (REL)
- Confirmation of institutional roles, responsibilities and oversight for REDD+, establishment of the entity responsible for MRV
- Selection of potential pilots / demonstration activities
- Continued consultation, information sharing and awareness raising on REDD+ strategy, legislative and institutional proposals
- Finalization of REDD+ strategy (to progress towards REDD+ readiness)

Step 2: Piloting and Testing

- Initial capacity building for pilots
- Establishment of pilots / demonstration activities
- **Establishment of carbon accounting registry**
- Testing of carbon measurement, accounting and MRV procedures
- Consultation around demonstrations and pilots
- Consultation on potential REDD+ policies, decisions and actions
- Training Needs Analysis for full REDD+ implementation

Step 3: Becoming Ready

- Approval of any new legislation (e.g. carbon rights) and legal texts (as required)
- Finalized financing mechanisms, procedures, audit and controls
- Finalized operating procedures for MRV entity
- Recruitment of staff
- Training and capacity building on the development and technical aspects of REDD+
- Operational plan to scale up REDD+ in Implementation Phase

3. Introduction to REDD+ Registries

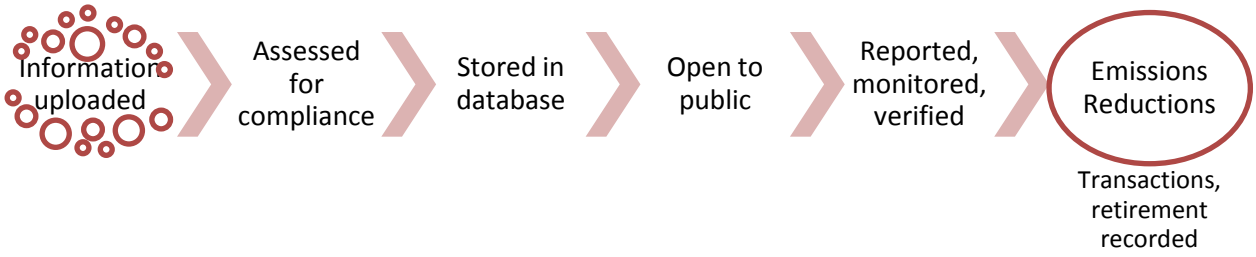
Registries for national carbon accounting and associated transactions constitute a crucial part of the infrastructure needed for realizing and consolidating REDD+. If designed in a comprehensive and transparent manner, a registry ensures that all the relevant data and information linked to REDD+ are captured, processed and stored in a centralized repository which is accessible to various categories of stakeholders and end-users for decision making purposes. This can be done at multiple scales, including national to sub-national and project levels.

A REDD+ registry is a data management platform that integrates technology, policies, and operational procedures to document, approve and track the development, compliance, performance, purchase, and retirement of emissions reductions (or removals) through either national, regulatory, or voluntary markets or systems. REDD+ registries aim to serve as a repository of reliable, easy-access information, to ensure accurate accounting of emissions reductions from projects or programs, and to foster compliance with established regulations and standards. As such, a REDD+ registry enables a country (or jurisdiction) to be fully informed of all REDD+ activities taking place within its boundaries, to vouch for the quality, value, and impact of projected or reported emissions reductions or removals,

and to follow the issuance of REDD+ credits/units and the issuance of results based payments, irrespective of where the units are transacting within a market framework.

In existing carbon markets, transactions are documented in registries where carbon offsets can be bought, sold or retired, and all these dealings tracked in real time and validated accordingly. The latter is particularly crucial for ensuring environmental integrity across different REDD+ initiatives and also promoting transparency and appropriate benefit sharing amongst stakeholders.

Figure 1: Flow of Information in a Registry



For most countries, the registry will be database driven, though the database does not have to be especially complex. Despite the fact that most of the attention to date has focused on registry technology and systems, at its core, a registry is simply an enabler of policies and rules. Therefore, the most complex elements of registry development are likely to be the policies and government finance requirements which are needed to support registry development and roll-out.

There are five critical functions or elements to achieving a successful REDD+ registry:

1. transparency;
2. accountability;
3. efficiency;
4. environmental integrity;
5. compliance.

A registry that cannot meet these five criteria will quickly lose the confidence of key REDD+ stakeholders, including project developers, communities, buyers, validators, etc., and will ultimately undermine its own objective.

To date, there are very few operational REDD+ registries in Africa. While many countries are exploring options in light of their REDD Readiness plans (R-PP), the DRC is the only African country engaged in REDD that has developed and begun to pilot a registry system. Box 2 gives an overview of Ghana's aims in developing a registry. At the global scale, however, many countries are articulating national and jurisdictional (sub-national) registries, depending on their respective REDD+ architectures. Registries are also being used in the voluntary market and in other sub-national markets focused on jurisdictional REDD+. Along similar lines, registries have been developed for the Clean Development Mechanism (CDM); the main registry sits in Bonn, Germany, while Ghana's national list of CDM projects is housed at the Ministry of Environment, Science and Technology (MEST). Registries are also being developed for Nationally Appropriate Mitigation Actions (NAMA), though in Ghana a NAMA registry has yet to be developed as NAMAs are only in the early stages of articulation. Furthermore, African countries are engaged in national accounting and reporting of national emissions, and as such are in the process of developing registries to monitor and to compile sector-level emissions data for reporting to the United Nations Framework Convention on Climate Change (UNFCCC). In Ghana, this is conducted by the Environmental Protection Agency (EPA).

Box 2: Aims and Objectives of Ghana's Proposed REDD+ Registry

In Ghana, the proposed REDD Registry has the following aims:

- Enable efficient and equitable development of REDD+ projects through a transparent process
- Develop regulations and procedures to guide the development of REDD+ projects
- Ensure that all projects meet national standards and fit into international frameworks
- Facilitate integrated accounting and reporting of GHG emissions and removals
- Provide a transparent platform for the public to access information about all REDD+ projects

It is also envisaged to serve the following objectives:

- Ensure clarity around the nature and ownership of REDD+ assets to efficiently and confidently enable the transaction of performance payments
- Promote transparency, credibility, and ensure legality (prevent money laundering and other illegal activities)
- Promote environmental integrity (avoid double-counting, manage leakage and REL setting, etc.)
- Ensure respect for social and environmental standards and safeguards
- Ensure a contribution to the national readiness process (information sharing and capacity building)

4. Managing & Structuring a REDD+ Registry

Who Manages the Registry?

The responsibility of operating and managing a registry is likely to fall to more than one institution or agency as the scope of expertise can be technically and functionally diverse. These roles could be filled by a government agency or department, or a third party entity (like a private sector company, an NGO, or a research institution). At a minimum, a fully operational REDD+ registry should include:

1. A decision-making body that administers the day to day coordination, analysis, monitoring and general operations of the registry;
2. A GIS /Remote Sensing centre of operation that generates or compiles forest data for monitoring, reporting, and verification (MRV);
3. A systems operator that is responsible for developing / operating the database platform and potential web-based interface through which a registry would function.

Following a phased approach, the management and decision making body would likely come first, followed by a forest monitoring and MRV unit (or these could be separate units), and finally by a systems operator as the system develops from a basic structure to a more sophisticated data-management facility.

At the core of a registry is the administrative body which will manage day to day operations and decision making. This unit would draft or coordinate the development of the rules, protocols, and associated template documents of the registration process, which could take on a phased registration approach. It would receive and store information and documents, and be responsible for quality control—scrutinizing the quality and credibility of information and documents submitted to the registry and ultimately approving or denying requests and submissions from prospective developers or buyers. In fulfilling these responsibilities, the registry's administrative body can perform these tasks itself or collaborate with other organizations.

With some tasks, input from a committee of experts, validation/verification by an international standard, or contracting to a third party may improve the efficiency and cost-effectiveness of the process, in addition to ensuring the integrity of registered projects. For example, due diligence checks are more effectively conducted by banks, who perform this service on a day to day basis, as compared to governments which are typically not organized to check whether a business is legally incorporated, financially sound, and engaged in good business practices. Requiring that the Voluntary Carbon Standard (VCS) validates the content and feasibility of a Project Design Document (PDD) prior to its "approval" by a registry is another way to ensure that prospective projects are sound and in compliance with international standards. As projects advance into implementation, the registry body could also require that recognized international verifiers (e.g. VCS) verify the project's reported emissions reductions or removals, thereby ensuring access to international markets or funds.

Box 3: DRC's REDD Registry

The DRC is the first country in Africa to pilot a REDD registry. The DRC Registry system is structured such that day to day administration of the Registry is performed by a Technical Commission under the National REDD Committee (Ministry of the Environment, Conservation and Tourism). The technical commission has developed an arrangement with ProCredit Bank to conduct all due diligence checks on all prospective project developers, and it requires that any project meets both national and international standards, including VCS validation and verification for projects, and CCBA for social and biodiversity co-benefits. Forest monitoring for the Registry is carried out by the DRC National Forest Monitoring System. The online operational system is being developed (currently in pilot phase) by the FAO (UN-REDD) and partners. This system uses Brazil's open-source TerraAmazon platform (renamed TerraCongo) to provide GIS, image processing, database management and data access functionalities.

5. Operating a Registry

Moving from the concept of a REDD+ registry and its management structure to actual implementation and operationalization raises a new series of questions and choices. Countries must choose the type of platform and technology that is most appropriate for their national circumstances. Countries have to determine the type and flow of information to be captured by the registry. Countries need to acknowledge and cater for the inherent risks in REDD+ projects and set up appropriate buffer accounts. And finally, countries need to figure out how to balance timely implementation with the costs and time associated with full-scale functionality.

Registry Platforms & Technology

For the registry platform and its associated technology there are three options:

1. using proprietary software and systems, which come at a cost
2. choosing open-source software to build a platform
3. forgoing a national or jurisdictional registry and simply requiring projects to register under the VCS system or an alternative registry

The first two options are the most realistic, whereas the third option is likely to pose many problems and challenges for African nations. Under the third option, a project would not be registered until it had reached validation under the VCS, a process that could take years. Not only would governments or other jurisdictions lose oversight, but they might also lose potential revenue. Currently, Markit provides the registry for the VCS and charges projects approximately $0.12/tCO2 registered.

Proprietary environmental registries that provide licenses and services have the advantage of being able to provide a tailored package that ensures security and disaster recovery. For example, Ghana could choose to purchase an operating license and then receive training from the registry company in how to operate the system. Along the way it could request further support and technical backstopping. Alternately, Ghana could opt to hire the company to host and operate the registry on its behalf. While potentially attractive, companies that develop and run environmental

registries are for-profit businesses whose model aims to make money, resulting in potentially costly contracts that necessitate long term commitments.

Unlike proprietary software or systems, which come with restrictive copyright licenses and a price tag, open-source software can be given away for no charge. Comparatively, open source software is seen as providing better value in terms of: 1) lower costs and long-term affordability, 2) security, 3) flexibility (e.g. no vendor 'lock in'), 4) interoperability, 5) better quality, and 6) transparency (citation Casson and Ryan). Yet one of the greatest barriers facing wide acceptance of open-source software relates to the lack of technical and general support. It is interesting to note that in 2009, the US White House switched its content management system (CMS) from a proprietary system to an open-source CMS[1].

The DRC opted for an open source system that essentially links a simple, web-based database interface to its forest monitoring interface, which is called TerraCongo. TerraCongo was adapted from Brazil's existing Registry and Forest Monitoring system, called Terra Amazon. Brazil's forest monitoring system is a remote sensing and GIS based information system that uses the National Institute for Space Research (INPE) TerraLIB GIS functions (http://www.terralib.org/) and SPRING software (http://www.spring.org.br/). Both of these Brazilian frameworks can be downloaded for free.

While suitable tools for a registry, they are by no means a requirement. DRC is running a simple web-based database interface, which links to its forest monitoring toolbox (TerraCongo), but a country could alternatively link this database to Google Earth, or to another forest monitoring platform.

Table 1: Advantages & Disadvantages of Proprietary and Open Source Systems

	Advantages	Disadvantages
Proprietary	• Country-specific, custom made package • Provides security • Option to host & operate • Technical training & backstopping for in-country operation • Disaster recovery guarantee	• Restrictive copyright licensing • High cost • Vendor dependent • Security level restricted by in-house knowledge, expertise • Non-compatibility with other systems
Open Source	• Low cost • Long term affordability • High level of security • Flexibility - no vendor lock in • Interoperability • Better quality • Transparency	• Lack of technical & operational support

What Information is Captured?

Over time, a registry could oversee national, jurisdictional, private or community-based projects or programs focused on emissions reductions or removals that seek to engage in carbon funds, compliance markets, voluntary markets, bilateral programs, or national emissions reductions programs. Potential attributes of a project or a program which a registry would capture, assess, monitor, and share might include information about project proponents, project financing, the location of a project, compliance with national or international standards, level of project advancement, and market linkages. Table 2 (below) outlines some of these potential attributes.

[1] Wikipedia. May 28 2012. (http://en.wikipedia.org/wiki/Open-source_software#cite_note-25 Sourced from: Geoff Spick (@Goffee71) (2009-10-26). "Open Source Movement Finds Friends at the White House". *Cmswire.com*. Retrieved 2012-03-25.

Table 2: Potential Registry Stages and Associated Information Requirements

STAGE	TYPE OF INFORMATION SUBMITTED
Project Registration	Names and information about project proponents and partners
	Legal and fiduciary information about proponents and their compliance with due diligence check
	Project Idea Note (PIN) document, including location and GPS coordinates
	Indication of standard(s) the project is applying to
	Explanation of project financing by sources and amounts
	Registration Either Accepted or Denied by Registry Management / Admin body
Project Design	Project Design Document (PDD), including: - GPS coordinates of project boundaries and reference area - Carbon stock information for each land cover type (discreet classes) - Projected avoided emissions (as tCO2 or hectares) - Description of project activities - Detailed implementation plan - Description of land and tree tenure, ownership, proof of ownership
	Prior informed consent from all stakeholders, including all communities in project area
	Geo-located with forest monitoring system to show no overlap with other projects
	Validation report by Standard (e.g. VCS)
	Validation report on co-benefits (e.g. CCBA)
	Validation of compliance with social and environmental safeguards
Project Implementation	Official start date of project
	Description of the status of project/program implementation according to registry set time frame
	Yearly accounting of avoided emissions (as tCO2 or hectares) or carbon benefits realized
	Documentation of external validator's report or national MRV validation of project emissions reductions
Market Linkages	Connects to carbon markets or other international carbon/ emissions reduction registries to facilitate transfer or purchase of verified carbon units (VCU) or other types of credits.
	Enables online tracking of credits, including purchase, transfer (if applicable), and retirement of credits.
Conflicts / Complaints	Platform and mechanism for registration of complaints or grievances and oversees appropriate redress mechanism.

To enable the process, regulations, forms and templates will be required to facilitate submissions and tracking of project compliance and status. Therefore, it would be the role of the REDD+ Secretariat (registry management body) to set the step-wise process and create the requisite criteria and templates through which a registry would operate. This body would also need to establish time frames within which each project or program would have to comply and move a project forward, otherwise they lose their "registered" status.

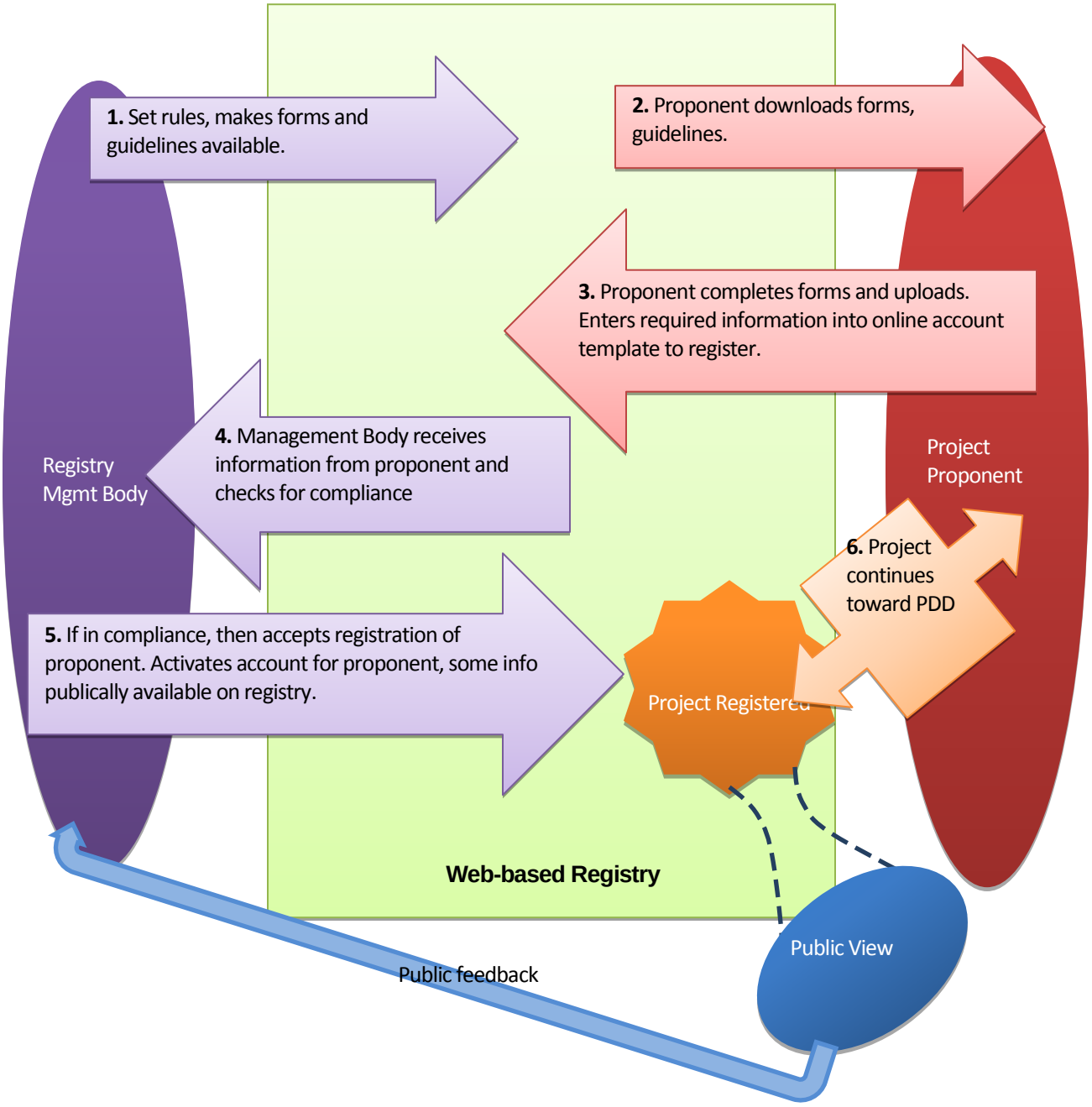
A hypothetical example is that a project could be required to submit a Project Development Document (PDD) within 3 years (maximum) of submitting the Project Idea Note (PIN). The registry would be able to track project advancement within this time frame and alert authorities and proponents to impending deadlines. Similar to the rule setting and oversight responsibilities of the Management and Administrative body, the Forest Monitoring or MRV Auditing body

would need to check (and update) the declared geo-location of the proposed project, make sure that there is no overlap with other projects, and make the project visible on a public map, which can be accessed on the registry web page to promote transparency. The body would also check the project's reported avoided emissions or emissions benefits to make sure that they comply with national or regional level data. The unit could be responsible for the national validation of a project's emissions data and then if it is in compliance the results could be, acknowledged on the registry.

Flow of Information

The use of a web-based system enables an iterative process between the body (or bodies) managing the registry, project proponents, and the public, including community leaders, potential investors, and researchers. Figure 2 shows an example of the flow of information leading to project registration.

Figure 2: Project Registration Process and Information Flow



Buffers

Non-permanence risk is one of the most under-acknowledged facets of REDD+ projects, especially in the calculation of potential carbon benefits, and yet non-permanence risk factors are very real. In Africa, forests, standing trees in the landscape, and tree planting projects face a multitude of risks, including fire, pests and diseases, political insecurity, poor project management, and climate change (to name only a few factors). Under the VCS, risk is quantified as being *internal, external, or natural* (See Table 3).

Table 3: Summary of Potential Non-Permanence Risk Factors

Internal Risks:

- Project management, including need for ongoing enforcement to protect carbon stocks and capacity of management team
- Financial viability
- Opportunity costs and associated pressures of alternative land uses
- Project longevity based on legal agreements or requirements

External Risks:

- Land tenure, including ownership and resource access/use rights
- Community engagement, consultation of households inside and within 20 km of project boundaries
- Political risk, based on World Bank Institute World Governance Indicators, adjusted if country is engaged in international REDD+ readiness initiatives

Natural Risks:

- Significance and likelihood of fire, pest and disease outbreaks, extreme weather events such as hurricanes, and geological risk such as earthquakes and volcanoes.

Source: VCS AFOLU Non-Permanence Risk Tool (2011)

In the case where a project that has received outside investment or has already gone to market loses some of its REDD+ assets as a result of fire or non-performance or some other risk factor, someone will be held liable for the lost "credits" or projected emissions reductions. The goal of a buffer account is to act as a national or sub-national savings account or insurance package to cover an investor's losses. In principle, REDD+ Registries can facilitate the establishment of a buffer account and a method for calculating project risk such that projects are not overly optimistic in calculating projected benefits (and earnings) and investors are able to re-coup their investments when unforeseen events occur.

Implementation- Phased Approach

In Ghana, there will probably be very few demonstration projects, pilot projects, or site-specific activities generating (or aiming to generate) emissions reductions for the next few years. Therefore, tracking these projects as they develop and any associated transactions should not be that difficult. With some government oversight and monitoring, it could also depend on the existing VCS registry system to monitor the first credits going to the voluntary markets.

Therefore, the most practical option for Ghana is to adopt a phased approach, which would entail starting from something relatively simple and not aiming to overbuild or overspend too early. A major mistake would be to develop a high tech, high-cost registry that effectively sits empty due to the lack of projects. Instead, following a phased approach would allow time to develop the necessary procedures, criteria, monitoring standards, and safeguards, and to build up capacity for MRV to track what is actually happening on the ground. Initially, Ghana should be wary of over-spending on the registry at a time when there are very few projects or programs.

Table 4: Implementation Phases

Phase 1 - Launching a Registry	
Aim	• Capture core information about all REDD+ activities in Ghana to facilitate simple tracking and compliance. • Establish the precedent that all REDD+ activities, projects and programs should be registered with the REDD+ Secretariat.
Capacity	• Track performance either through tonnes of CO2e reduced or removed (as reported by VCS registry) or through other metrics or proxies (hectares of avoided deforestation). • Can function whether or not MRV system is fully developed. Where MRV is un-developed would help to inform MRV development and provide early tracking of activities. • Jump-start the process of establishing REDD+ registry policies, standards, procedures, and safeguards.
Set-Up & Tech Platform	• Designate registry host (REDD+ Secretariat) • Desktop registry using Excel or other familiar database programs. • Face to face interactions at Sec. or similar office charged with Administration. • Posting of basic rules, procedures on FC website and in national newspapers. • Forms available at FC office or website • An initial registry could also operate through a more sophisticated, electronic platform. • Require registration under VCS or other international standards so that market transactions and performance are monitored/registered.
Strengths	• Avoids excessive costs associated with high-tech registry that will be largely void of any project activities for early years. • Enables the country to quickly establish a database of information about all activities, projects, and stakeholders, and helps to prevent unscrupulous actors from engaging in questionable activities in the name of REDD+ without government knowledge. This is very important because REDD+ is in its early days in Ghana and perceptions of failure or negative outcomes (particularly with communities) could significantly damage the country's ability to achieve successful REDD+ outcomes. • Avoid loss of potential revenue due to "unknown" projects • Enable government to charge fees or percent of emissions reductions to generate operating income for registry.
Phase 2 - Functional National Registry for Tracking Project Development	
Aim	• Fully operational national registry that enables project registration and monitoring, and is connected to functional forest monitoring and accounting system.

Capacity	• Equip to register and monitor REDD+ projects through the various stages of project development, ensuring compliance with national and international standards.
	• Guides projects to international registries to support market transactions.
	• Enables tracking of results based payments.
	• Records outcome of projects and number of REDD+ units issued.
	• Operation of the registry supported by:
	  - Establishment of rules, procedures, and safeguards.
	  - The setting of regional and integrated national REDD+ reference levels, enabling performance tracking.
	  - Establishment of a national buffer account.

Platform	• Web-based data-base platform linked to national forest monitoring system and supported by established criteria and procedures.

Strengths	• Able to prevent double accounting • Revenue generated from national tax/fee for market transactions on a per ton basis. • Can communicate emissions reductions with other national accounting bodies. • Significantly reduces the risk of illegal activities or negative social impacts
Phase 3 - Participation in National or International Markets or Funds	
Aim	• Registry infrastructure is expanded to participate in international REDD+ markets (directly) or through an established national market in REDD+ units.
Capacity	• As REDD+ markets evolve more fully, and if countries opt to establish national markets, then the registry infrastructure is expanded to facilitate these trade/market transactions.
Platform	• Same as above, but expanded linkages and scope of operation.
Strengths	• Supports compliance, monitoring, and tracking of projects from conception, to issuance of credits, to national and/or international market transaction within a national system.

6. Financing a Registry

Costs & Financing of the Registry

There is very little information available on the costs associated with building and running a national REDD+ registry. Private sector companies are wary of providing cost estimates for their registry services without non-disclosure agreements. However, informal discussions with technical experts in other leading REDD+ countries suggest that some companies marketing registry development (proprietary, customized registry software) and management could charge approximately $600,000 to build a registry, and $100,000 per year to operate and provide technical support to the registry. In addition, these companies may charge a fee of $0.12 per VER sold on international markets. There are no comparative costs available for Registries developed using open source software and donor support.

Possible sources of funding could include donor governments or international agencies, government budgets, tax revenue (existing or new ecosystem service user payments), charging all projects a % of their emissions reductions, or a fee-based registry (e.g. proponents pay as they go). A registry could be funded through any combination of these options.

The risk with donor funding is that it is unlikely to continue in perpetuity. Rather, it could serve as critical start-up finance to assist in the development or initial contracting for a registry. Charging projects a percentage of emissions reductions could generate substantial revenue, but not all projects will necessarily engage in voluntary markets and not all projects will be successful, creating a scenario where a few projects pay for the services rendered to all users of the system. This model would also fail to bring any revenue early in the process. While it might not result in substantial sums, projects could be asked to pay fees as they move through compliance and monitoring processes, which a registry facilitates. Given these cost challenges, it is important that a registry uses a low-cost system that would enable long term use and sustainability of the system.

7. Registry Linkages and Scale

While a national REDD+ registry does not have to adopt international registry structures or standards (like that of the Voluntary Market, VCS, CCBA), at a minimum, it is important that a REDD+ registry is able to fluently link with international standards and registries so as to gain the confidence of investors and ensure efficient project development and transactions. As noted above, a national REDD+ registry could require project developers to comply with voluntary market standards, like that of the VCS and CCBA, enabling faster registry roll-out (no lag time as national standards are debated and legislated) and easy linkages with international mechanisms.

Similarly, a REDD+ registry does not necessarily need to incorporate other national climate change initiatives (CDM, NAMAs, National Emissions Accounting), but using a registry to build compatibility between these initiatives could

certainly offer many practical benefits, reducing workloads and accounting challenges. For example, a REDD+ registry could be structured such that it directly informs AFOLU accounting for a country's National Emissions Accounting. Furthermore, a REDD+ registry should consider how to create linkages with CDM-Forestry projects so that the emissions reductions associated with carbon stock enhancement connect logically to emissions reductions produced through plantation establishment.

Registries can be developed at national or sub-national/jurisdictional scales. Key factors in determining which is most appropriate include: whether a country is a republic or is a federal system with independent states, the human resource capacity required to develop and manage multiple registries, the financial viability of operating national and sub-national registries, and the expected number and distribution of emerging or existent REDD+ projects and programs across the country. Essentially, three options exist.

1. To institute sub-national/jurisdictional registries in line with state-level REDD+ initiatives (e.g. Brazil). Accounting at a national level can then be performed by summing the information emerging from each state's registry.
2. To develop sub-national registries in particular states/regions if these are the only areas where REDD+ will be piloted, and then potentially scale up to a national registry as the program expands. In federal countries like Ethiopia or Nigeria this could be an appropriate approach.
3. To develop a national-level registry that covers all REDD-able areas of the country, but could incorporate data filters that enable managers/operators to assess project development and emissions reductions at various scales.

8. Rules & Regulations

The most complex elements of registry development are likely to be the policies and government finance requirements which are needed to support registry development and roll-out. In addition, standards must be set or adopted to ensure the value of REDD+ assets, and avoid a situation where the value or quality of emissions reductions from one project has greater legitimacy than those claimed from another project.

Regulations

A REDD+ registry should be supported by guiding policies and regulations that set the criteria and process for REDD+ accreditation. This includes determining the type of information that should be disclosed, and regulating what is made publically available through the registry and what remains confidential within the registry. Further, registry regulations should necessitate compliance with other national policies, rules, and laws, and facilitate issuance of fees, levies or taxes.

In many countries, a registry will require legal backing in the form of Ministerial-level policies and associated regulations (or acts) so that the registry has the power to make decisions, and project proponents are compelled to follow the established rules. In the DRC, the National REDD Coordination drafted an official document, the "*Procedural Manual for Compliance with National REDD+ Accreditation*" which effectively spells out the criteria and process for engaging in REDD and the associated role of the registry. The Ministry of Environment, Conservation of Nature, and Tourism then issued a *Ministerial Order* providing backing to the process and criteria, including the registry.

Depending on the country and the nature of the R-PP process, the pathway to establishing a full legal framework for REDD+ and a registry is likely to take time. Whereas registry implementation should not be held up by a slower legal process, which would likely be the case in Ghana and many other African countries, mandates, roles, criteria, processes, fees, and procedures need to be well defined and consequences for non-compliance articulated. Hence, comprehensive guidelines in the form of a detailed manual, with backing from the appropriate Ministry (or lead body), will greatly strengthen the registry process early on. It is also worth noting that most projects today require a

"Letter of No Objection" from the Designated National Authority (DNA) to be able to engage in voluntary markets or other funds. At the national or jurisdictional level, issuance of this letter should be contingent upon registration and compliance, so as to further strengthen the authority of the registry.

In the future, when African countries have moved through the R-PP process and the associated piloting and testing periods, there will come a time when enactment of comprehensive legislation will be necessary to support regulated carbon assets and carbon trading. While the focus is usually on the legal ownership of the carbon asset and the right to benefit, such legislation should also support registry rules and procedures.

Fees and Taxes

As noted earlier, registry development and operation is not necessarily an inexpensive process. Given that project developers and stakeholders stand to benefit considerably from the myriad services that a REDD+ registry provides, there is ample ground to consider a fee-based approach to registration and compliance. Attaching fees to initial registration, the procurement of forms, or other aspects of compliance (like third party due diligence checks) will encourage serious stakeholders with well thought-out project ideas and discourage proponents who have not taken the time to think through the viability of their business-case. Fees could be stratified, based on the origin or type of project developer (e.g. a community initiative, as compared to a Ghanaian company or a non-Ghanaian private sector entity).

It is highly unlikely that all registered REDD+ projects will come to a financial payout, but the hope is that some projects will be able to benefit from a market transaction. Governments that have supported or facilitated REDD+ should also benefit in such transactions. Taxes are inherently unpopular, but most governments already have established taxation mechanisms or levies that target major financial transactions across sectors, and this could come to include REDD+ transactions. In addition, legislation could enable REDD+ authorities to specifically earmark a percentage of emissions reductions or a portion of the revenue from carbon transactions to support REDD+ structures and services, like that of the registry. This type of revenue could prove to be critical when donor support for REDD+ has waned, but the national or jurisdictional structures for REDD+ still require operational support. The key to setting fees, taxes, or levies is establishing rates which are fair, but do not discourage or cripple project development, investment, or implementation.

Requiring Compliance with International Standards

In addition to thinking about national or jurisdictional regulations or guidelines, international standards, like those used in the Voluntary Market, are vital for the establishment of registries and for ensuring conformity between national and international rules (See Section 7: registry Linkages & Scale). International standards, like the Voluntary Carbon Standard (VCS) detail the requirements, rules and specifications for how emissions reductions or removals in carbon projects are to be quantified, monitored, reported and verified. Standards ensure that the carbon offsets generated by a project are scientifically credible and robust, have a real impact on the atmosphere, and are fungible. Standards also serve as the rulebook for methodology[2] developers when designing new carbon accounting methodologies.

When used together, international standards and a REDD+ registry partially mitigate the 'changing goalpost' problem. While countries take the time to set their own national regulations and procedures, they can rely upon international standards to set the rules for early REDD+ projects, ensuring the value and robustness of the developing credits. In addition, should an international compliance market come online, it is likely that it will adopt (or adapt) existing international standards within the context of national circumstances.

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[2] Methodologies are developed and validated to meet the requirements of a given standard for a given project type. A methodology delineates the steps a project developer must follow to demonstrate additionality and the baseline scenario, and describes which GHG sources, sinks, and reservoirs will be included and how they will be measured and monitored to calculate net GHG emission reductions. Some offset systems, which do not allow independent methodology development, combine standards and methodologies into single documents, which are sometimes termed protocols.

9. Crucial Elements of a Functional Registry

It is no secret that critics of REDD+ anticipate many short-comings and challenges to its success. Many of the criticisms are based on the assumption (not necessarily unfounded based on past track records) that transparency, equity, and environmental integrity will be compromised by governments and entities that lack the capacity or the will to change the current deforestation/degradation paradigm. As mentioned in the introduction, a REDD+ registry plays an important role in ensuring that the REDD+ process is honest, transparent, and efficient, and that it ensures environmental integrity, accountability, and compliance with requirements and standards. This section looks at these concepts in greater detail.

Transparency & Efficiency

Across Africa, the forestry sector in many countries has been strongly criticized over the years for a lack of transparency and efficiency, leading to the prevalence of illegal practices and activities. Given that REDD+ is meant to serve as a large-scale incentive to alter business as usual practices and modes of operation, which have either directly or indirectly facilitated deforestation and degradation, a transparent and efficient registry system and process is absolutely essential to building confidence in REDD+ efforts and assets. Box 4 highlights critical tenets of a REDD registry.

Box 4: Important Tenets of a Transparent, Efficient, and Functional Registry

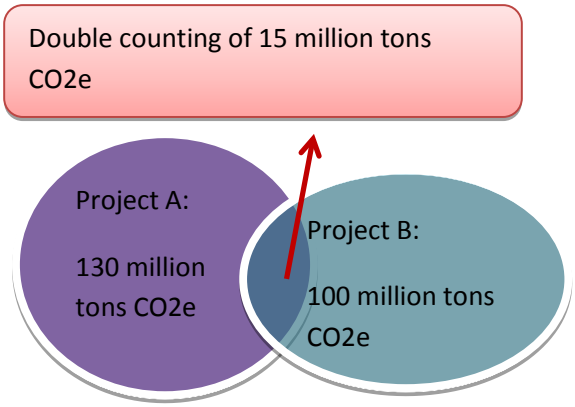
- Centralized storage of information and tracking
- Platform that is easily accessible by stakeholders and the public
- Low transaction costs, but appropriate fees to ensure serious engagement and sustainability
- Clear guidelines for reporting and registry account management
- Many functions and types of information publically accessible
- Other classified information limited to account holders, regulators, and managers to protect privacy
- Real time record of compliance, performance, unit ownership
- Transaction history available by customer, units and unit balances
- Tracking of co-benefits and safe-guards
- A portal/pathway for lodging grievances, questions, complaints, disputes that are responded to in a timely manner following established procedures
- Scalable infrastructure can integrate with other registries / outside markets as need evolves

Without a transparent process, critical stakeholders, including donors, investors, or buyers, will lack confidence in the registry system itself and ultimately in the integrity or value of the REDD+ credits (units) evolving out of the system. As a result, projects could fail if they try to enter the voluntary market and investors and buyers prefer to invest in other countries.

Environmental Integrity

One of the most important aspects of a registry system is that it guarantees the environmental integrity and validity of emissions reductions associated with the national or jurisdictional REDD+ initiative. Thus, a registry sets up checks to make sure that the avoided deforestation, avoided degradation or enhancements of carbon stocks that are projected or reported are accurate. In doing so, a registry greatly reduces the risk of double accounting, either between projects or between national and sub-national jurisdictions (See Figure 3). It can also serve to assign units within national REDD+ schemes to individual or collective rights holders or beneficiaries, not only reducing project development transaction costs, but also addressing potential disputes over rights and equity.

Figure 3: Double Counting of Avoided Emissions



A good registry prevents over-reporting or over-selling of emissions reductions units, and it can ensure that units do not exceed the national or sub-national reference scenario. A registry linked to a functional forest monitoring system will help to account for and manage leakage from projects, and a registry facilitates the creation of a national or jurisdictional buffer account to accommodate risks.

Accountability

A registry should carry out or facilitate (through third-party entities) checks of project documents and registration materials to make sure that they are legitimate, including due diligence checks on project developers. It should define a step-by-step approval or registration process to ensure that projects or programs are in compliance with approved regulations and procedures. These rules can either be based on national regulations or on international standards (like those used in the voluntary market), or both. With regard to accountability, a phased approach that initially relies upon international standards and procedures could be very useful while the national or state government moves through the process of writing and approving regulations and implementation legislation.

A registry that does a poor job on this front risks the following challenges, which could greatly undermine the REDD+ process:

- Illegitimate entities engaged in questionable activities (e.g. money laundering, carbon cowboys)
- Varied methods for quantifying avoided emissions / removals (e.g. comparing apples with oranges)
- Private sector view that working in the country is risky
- Project credits sold which cannot be captured under national reporting
- Haphazard project development (e.g. government is not aware of on-going initiatives)
- Loss of potential tax / carbon revenue that could otherwise benefit the state and support REDD+
- Adoption of benefit sharing arrangements that might not meet acceptable national standards.

10. Ghana's Road Map: Recommendations & Way Forward

This concept note attempts to outline the various registry development choices and options in the hopes of helping Ghana, and other African countries, select a nationally appropriate pathway to registry implementation and operation. Table 5 outlines some of the major decision points of a registry, and makes Ghana-specific recommendations based on the country's particular geographic and political characteristics, capacity, financial resources, and level of REDD+ development.

In making these recommendations, the authors' aim is not only to provide decision-making guidance, but also to stimulate contextual debate and practical thought, which will ultimately facilitate the development of a REDD+ registry that can ensure environmental and social integrity. Having completed the concept note, the decision about whether these recommendations are followed, adapted, or not rests with Ghana's REDD+ Secretariat and the National REDD+ Working Group.

Table 5: Recommendations for Ghana's REDD+ Registry

Aspect of the Registry	Ghana Recommendation
Managing & Structuring a Registry	*Management & Admin Body*: Expand National REDD+ Secretariat to host REDD+ registry, with oversight by National Climate Change Steering Committee *Designate Forest & MRV Unit*: Situate this unit at Forestry Commission (RMSC) with expert advisory board made up of FC, CERSGIS, and FORIG staff, and with NGO/civil society representation. *System Operator*: Conduct an assessment to determine whether local or international expertise is required, and if possible use Ghanaian expertise. 3rd party operator is preferable to in-house operation from standpoint of efficiency, commitment to quality, and timeliness.
Operating a Registry	*Platforms & Technology:* Choose Open Source software (option #2 described above) because it provides greater short and long-term affordability, security, flexibility. Ask UN-REDD / FCPF to support transfer and adaptation of open-source technology to partner countries (e.g. TerraCongo being adapted to Ghana context). This promotes intra-African learning and falls within mandate of REDD+ capacity building. *Implementation:* It is highly recommended that Ghana adopt a phased approach to implementation so that the goals and value of a registry are balanced by capacity, demand, piloting progress, and costs.
Linkages & Scales	*Linkages:* At least initially, adopt VCS/CCBA standards for REDD+ projects but quickly move to open up conversations with CDM DNA (EPA) and NAMA registry to make sure that CDM Forestry and Carbon Stock Enhancement accounting, NAMA accounting, and REDD+ project accounting are in alignment. *Scale: D*evelop a national-level registry that covers all "REDD-able" areas of the country, but could incorporate data filters that enable managers/operators to assess project development and emissions reductions at various scales or geographies. It is conceivable that this registry could be paired to other national climate change registries, like a future NAMA registry, with the REDD+ registry as one type or sub-set of NAMAs. This registry could also incorporate CDM projects. For accounting purposes, emissions reductions from REDD+ should be compatible with other types of emissions reductions and should feed into the national emissions accounting process for the AFOLU sector. It is recommended that a national approach would be the best option for a country like Ghana, which is a Republic of relatively small area (as compared to countries like DRC, Ethiopia, etc) with emerging capacity and financial resources in terms of REDD+. What is interesting in this option is that while Ghana seeks to establish sub-national REDD+ reference levels, based on ecological gradients and deforestation driver variables, a national registry could function to help monitor activities and account for emissions reductions within the context of each sub-region. Eventually, emissions reductions could be allocated to projects based on a "cookie-cutter" approach that was managed and monitored within the registry.
Financing a Registry	Set-up the registry using financial support for the R-PP process and associated donor sources. Generate at least partial operational capital from registry fees, and then institute a percentage-based levy on emissions reductions transactions (market or fund based) to support the services that the registry provides and associated maintenance costs. In the long term, the registry should be self-financing.

Annex 1: Ghana Working Group Participants

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