An Integrated REDD Offset Program (IREDD) for Nesting Projects under Jurisdictional Accounting

Developed for the California Governors' Climate and Forests Task Force ("GCF")

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Executive summary

REDD has emerged as a cost-effective method of generating carbon credits with critical environmental and social co-benefits. However, concerns regarding accounting for leakage from REDD projects have delayed the acceptance of REDD credits into compliance systems. It is generally recognized that the larger the geographic region over which changes in forest cover are monitored, the more precise and complete the estimation of REDD credits from projects developed within this region. This increase in precision is due to the ability to more accurately account for non-intended changes in forest cover outside of project areas related to leakage. Therefore, the acceptance of REDD credits in a compliance system will require emissions accounting at a (sub)-national level. It is critical that while (sub)-national accounting systems are being developed, local REDD projects within a larger geographical region are catalyzed and encouraged, and that the carbon benefits from these initiatives flow to the responsible stakeholders.

The term "nested REDD" has emerged to describe the policy framework allowing offsets generated from spatially defined REDD project activities to be reconciled with reductions in deforestation or degradation within a much larger jurisdiction such as a state or other sub-national level. While nested REDD is being designed to address the limitations of project-based REDD, spatially explicit projects and project areas still exist under the nested REDD framework. The distinction is that, under nested REDD, the quantification of emissions reductions from projects must be reconciled with emissions that are accounted for across a larger region, referred to as the Jurisdiction.

In this paper, we introduce an Integrated REDD (IREDD) system, which is a nested REDD system where (1) credits can only be generated from formally registered project areas, (2) incentives are built-in to maximize the formally registered project area within a given jurisdiction, and (3) funding mechanisms are in place to support government programs and policies that promote reductions in deforestation but have no direct and causal relation with empirically observed emission reductions. In the paper, we substantiate how the IREDD approach avoids the creation of non-additional credits while providing support for private investment and rewarding project actions that are causally related to reduced emissions or greenhouse gas removals. The main arguments for an IREDD program are listed below.

- Any nested REDD program must decide whether to permit **offsets to be generated only in formally registered project areas, or also in areas without a registered REDD project**. The process of project registration requires spatial delineation, clearly defined land tenure, a project proponent with management responsibilities for the land, resources and carbon assets and a validation of project registration and accounting requirements following the rules of the IREDD program.

- Under a nested REDD program, offsets are only generated when the total emissions of the Jurisdictional level are smaller than a pre-determined crediting baseline for that Jurisdiction. As a consequence, the **total quantity of offsets generated at the Jurisdictional level is dependent not only on changes in forest cover in formally registered REDD project areas, but also on positive or negative changes in forest cover in non-project areas** on which no registered REDD activities are taking place. A successful REDD program with active market participation must contain (1) provisions for the treatment of performance in the non-project areas as well as the project areas and (2) effective mechanisms to transparently monitor and report the performance of project proponents on project areas.

- A REDD mechanism which allows for the generation of offsets from non-project areas, and awards control of these offsets to Jurisdictional Governments, creates a **natural conflict of interest in which the government benefits from having less area on which REDD projects are registered**. Since registration of project areas, along with other criteria, will require government approval, a system that allows offset generation in non-project areas will put non-project area land managers in direct competition with the government. **The robustness of the market for IREDD offsets depends on creating a direct and causal link between project actions and an increase in forest cover or a reduction in deforestation**. The most effective and transparent way to ensure there is a causal link between project actions and outcomes is to only allow credits to be generated on registered and pre-approved project areas.

- The design and implementation of a nested REDD mechanism appears to be much more difficult than a Jurisdictional level IREDD program that simply calculates Jurisdictional performance and leaves the devolvement of benefits to the government. The main reason for this difficulty is that nested REDD requires project and Jurisdictional accounting to be harmonized (RECOFTC, 2009), which requires a well-functioning institution at the Jurisdictional level capable of implementing the necessary accounting at the Jurisdictional level. **However, even if a system is introduced where offsets are only awarded to the Jurisdictional governments, who then devolve a share of the benefits from offsets to project proponents, much of the same work as with an IREDD program is needed to monitor project activities and identify causal relations between reductions in deforestation and project actions so that the risk of violating community and indigenous rights is reduced**.

- An effective REDD framework must prioritize investments in mitigating drivers that produce cost-effective results. Interventions at the local, especially community, level may be particularly responsive to funding that can be generated through implementation of REDD projects. In contrast, **national drivers may be more effectively addressed by policy reform and capacity building**. While there is no doubt that policies and programs set forward by a Jurisdictional Government are essential tools to address deforestation across the entire Jurisdiction, it is not possible to disentangle these actions into spatially explicit reductions in deforestation. Observed changes in deforestation in the non-project areas could be due to other actors who should be motivated to register their project(s). Policy design that allows reduced emissions or greenhouse gas removals in non-project areas to generate credits and assigns those credits to the Jurisdictional Government, rewards performance that is not necessarily causally linked to project actions, potentially eroding the value of a carbon offset.

- The paper posits that the **most effective way to harmonize performance in project areas within a larger region is to require payment from entities engaged in sanctioned deforestation**. Without any compensation from entities that are directly linked to deforestation, all other participants in the system incur the costs of these entities' deforestation.

- **Effective market participation and minimization of transaction costs will require a standardized set of clear and effective rules and contracts** to support the creation of IREDD offsets that apply across all Jurisdictions. Additionally, legal frameworks and remedies for non-performance must be established and consistently and uniformly applied to market behavior.

- A fully operational IREDD **requires a substantial amount of institutional capacity, which will require time and resources to develop**. The following four broad steps are envisioned before the IREDD system is fully

operational within a Jurisdiction: (1) signing of a formal "IREDD agreement" with the Compliance Mechanism to become a Jurisdiction in which offsets are recognized for compliance, (2) validation that the Jurisdictional Government has met the a priori institutional readiness criteria, (3) validation of the technical requirements needed to support carbon accounting, (4) offset Issuance and performance pool activation. This paper proposes that each of these steps be validated by either a third party validator or a to-be-created REDD Standards Board.

Glossary[1]

business as usual baseline	The forward-looking projection of emissions due to changes in land-use and land cover (t CO_2e per year) in the case that no IREDD program exists. Changes in land-use and land cover may include deforestation and afforestation/ reforestation, as well as forest degradation and forest regeneration.
Compliance Mechanism	Laws, regulations or international treaties that mandate the reduction of greenhouse gas emissions by government (as in U.S. Federal or California) or group of governments (as in UNFCCC).
Compliance Period	Time periods during which entities regulated under the Compliance Mechanism Government needs to demonstrate compliance and will be issued Jurisdictional Government Offsets. The duration of the Compliance Period is specified by the Compliance Mechanism.
Crediting Baseline at the Jurisdictional level	The emissions level (t CO_2e per year) below which a sub national/national Jurisdiction can generate credits.
Crediting Baseline at the project level	The emissions level (t CO_2e per year per year) below which an individual project can generate credits.
Crediting Period at the Jurisdictional level	Period over which the Jurisdiction may generate offsets under the Compliance Mechanism, as specified in the REDD agreement between the two parties.
Crediting Period at the project level	Period over which a project may generate credits.
Integrated REDD Offset program (IREDD Program)	A set of regulations, rules and guidance adopted by a Jurisdiction that allow it to have IREDD offsets recognized by a Compliance Mechanism that are based on reduced emissions over the Crediting Baseline from changes in land-use and land cover within the boundaries of the Jurisdiction.
IREDD Agreement	Agreement signed between the Jurisdiction and the Compliance Mechanism governing all terms of the IREDD program between the parties.

[1] Legal terms are capitalized.

Credits and Offset	**Credits =** reductions below crediting baseline that may or may not be eligible to become an offset **IREDD Offsets** = Offsets issued at the project level from an approved under the IREDD program and may be used under the Compliance Mechanism, subject to any limits[2] **Project Offsets** = project offsets(pre-IREDD offsets) that can be used, subject to limits, under the Compliance Mechanism before the IREDD program is active
Jurisdictional Government	(Sub-) national entity that participates with the IREDD program.
project activities	Actions that are eligible to receive offset credits that are reconciled at the Jurisdictional level
Project Entity	An entity within a country that is participating in the IREDD
Project Proponent	The recognized entity, which could be the government, who has tenure and management responsibility for a spatially defined area and has applied to have a recognized REDD project under the

[2] The major difference between the Integrated Offsets and Project Offsets is that Integrated Offsets are subject to Jurisdictional Accounting and completion of all requirements under the IREDD program.

1. Integrated REDD Offset Mechanism - Design Elements

1.1. Nested REDD Design: Rationale and Implications

The term "nested REDD" has emerged to describe the policy design where spatially defined project activities that reduce deforestation or degradation generate offsets that are reconciled with emissions from deforestation or degradation within a much larger Jurisdiction such as a state or other sub-national level, country, or geographic region. Even though a nested REDD design can exist under a voluntary offset system, this paper focuses on nested REDD within the context of a compliance system[3]. This paper (1) explores the issues related to the design options for a nested REDD policy and implications for market participation, benefit-sharing, and for incentivizing public as well as governmental REDD actions and (2) provides broad recommendations for nested REDD policy design options.

The first REDD paradigm to emerge was project-based REDD, wherein project proponents directly receive REDD offsets but are also responsible for establishing baselines, monitoring, measurement and for quantification of primary and secondary effects, including leakage. The institutional and governmental capacity required to support REDD projects is generally limited under a project-based REDD approach thus project proponents each develop their own carbon accounting infrastructure and often have difficulty gaining government approvals. Project-based accounting is limited in three ways.

(1) Baselines are project-specific and are, therefore, severely limited in geographic scope, which may make them less robust or even inconsistent with other projects or a larger geographic area.

(2) The decentralized nature of a project-based approach increases the probability of double counting due to overlapping geographic boundaries or overlapping carbon pools with other project types.

(3) Activity-shifting and market leakage beyond the geographic boundaries of the project area cannot be directly captured and accounted for.

A nested REDD design is a response to the limitations of project-based REDD. Within a nested REDD framework, projects and project areas still exist[4]. The difference with project-based REDD is that the quantification of offsets from REDD projects is reconciled with the emissions that are accounted for across a larger region.

The emerging regulatory frameworks of the UNFCCC and the U.S. require net REDD performance to be measured over a large geographical region, such as a country, state or province. In the rest of this paper, this large geographical region and its governing institution is referred to as the Jurisdiction and the Jurisdictional Government, respectively. Under these emerging regulatory frameworks, offsets are generated only when the total emissions of the Jurisdictional level are smaller than a pre-determined crediting baseline for that Jurisdiction. As a consequence, the quantity of offsets generated within a large Jurisdiction is limited by the net difference

[3] The concepts and design elements proposed in this paper can also apply to voluntary systems that may emerge.

[4] Within the context of a nested REDD framework, project areas are spatially defined areas where there is clearly defined land tenure, project proponent(s) with management responsibilities for the land, and all project registration and accounting requirements under the REDD rules are met. In areas where the government has ownership and management responsibility, there could also be eligible project areas.

between the (1) total actual emissions and (2) the emissions under the crediting baseline. A nested REDD system dictates how this total offset "pie" is divided among the numerous entities responsible for the performance, including all relevant stakeholders and participants in activities that reduce deforestation within the Jurisdiction, including the government.

Since the size of the total offset pie is partially determined by changes in forest cover in non-project areas, on which no registered REDD activities are taking place, a nested REDD system must contain provisions for the treatment of performance in the non-project areas as well as the project areas. A REDD mechanism which allows for the generation of offsets from non-project areas, and awards control of these offsets to Jurisdictional Governments, creates a natural conflict of interest in which the government benefits from having less area on which REDD projects are registered. Since registration of project areas, along with other criteria, will require government approval, a system that allows offset generation in non-project areas will put non-project area land managers in direct competition with the government. In addition, awarding governments control over the offsets from non-project areas implicitly transfers the ownership of these carbon offsets to the government, which could be in violation of laws on privately owned lands, and where rights to forest resources have been devolved to communities. At minimum, government control over offsets generated from non-project areas must be safeguarded by precise and transparent rules and third-party independent auditing, so that inefficiencies or even corruption can be minimized. This implies that a robust nested REDD policy has checks and balances that are supported by a REDD Standards Board, appointed by the Compliance Mechanism to oversee (1) any issues across Jurisdictions participating in the IREDD program (2) standards setting and (3) 3rd party auditing function[5].

The design and implementation of a nested REDD mechanism appears to be much more difficult than a Jurisdictional level IREDD program that simply calculates Jurisdictional performance and leaves the devolvement of benefits to the government. The main reason for this difficulty is that nested REDD requires project and Jurisdictional accounting to be harmonized (RECOFTC, 2009), which requires a well-functioning institution at the Jurisdictional level. However, if under a system where only the Jurisdictional governments are awards offsets by the Compliance Mechanism but Jurisdictions are to devolve the benefits of reducing deforestation to the land owners and recognized land managers, much of the same work as with a nested REDD mechanism is needed to reduce the risk of violating community and indigenous rights and of eroding the concept of carbon ownership. Without a nested REDD mechanism, the ownership of carbon is de facto put into the hands of the government on lands that are not owned by the government or where the government has devolved use rights. New Zealand adopted such a policy in 2002. The policy was immediately strongly opposed and eventually reversed in the establishment of their emissions trading scheme (Peskett and Harkin 2007). This policy before its reversal, in fact, led to an increase in deforestation as landowners sought to avoid liabilities associated with implementation of the policy (Savaresi and Morgera 2009). Even in countries where government land ownership is dominant, there are almost always legally recognized usufruct rights that devolve land resource management to communities. In conclusion, if resource management rights are devolved to communities, particularly use of trees, then the carbon rights should also be devolved and land managers should have the right to participate in markets and other funding schemes for their actions that generate offsets.

[5] The REDD Standards Board appointed by the Compliance Mechanism could leverage existing organizations like the VCS or others, or could be a new entity established to support this function.

1.2. Mitigation Strategies for Drivers of Deforestation at Multiple Geographic Scales

In most contexts, drivers of deforestation are complex and act at multiple geographic levels. Due to the complex nature of deforestation, a REDD framework that aims at mitigating deforestation in an efficient and effective manner must acknowledge this and provide the most appropriate incentives to affect deforestation at multiple geographical scales simultaneously. Figure 1 is an illustration of these multiple geographic scales for a hypothetical example. In this figure, a number of potential drivers of deforestation are separated according to two axes: (1) geographical scope, and (2) mitigation potential. The geographical scope is defined as the area where agents of deforestation are operating and having an impact on forests. For example, collecting fuelwood is a local driver in the example of the figure, with rural households collecting fuelwood in the forests and woodlands around their hamlets. Migrants from more densely populated areas are in search of farmland and are, therefore, typically operating at a provincial scale. By contrast, the granting of large economic land concessions is a national-level driver since their location and size are decided at a national government level. The second axis defines the potential for net mitigation of a specific driver, rather than mere displacement of the deforestation or degradation caused by the driver, thus causing leakage. As can be seen in the figure, most drivers acting at an international or national scale are more challenging to mitigate.

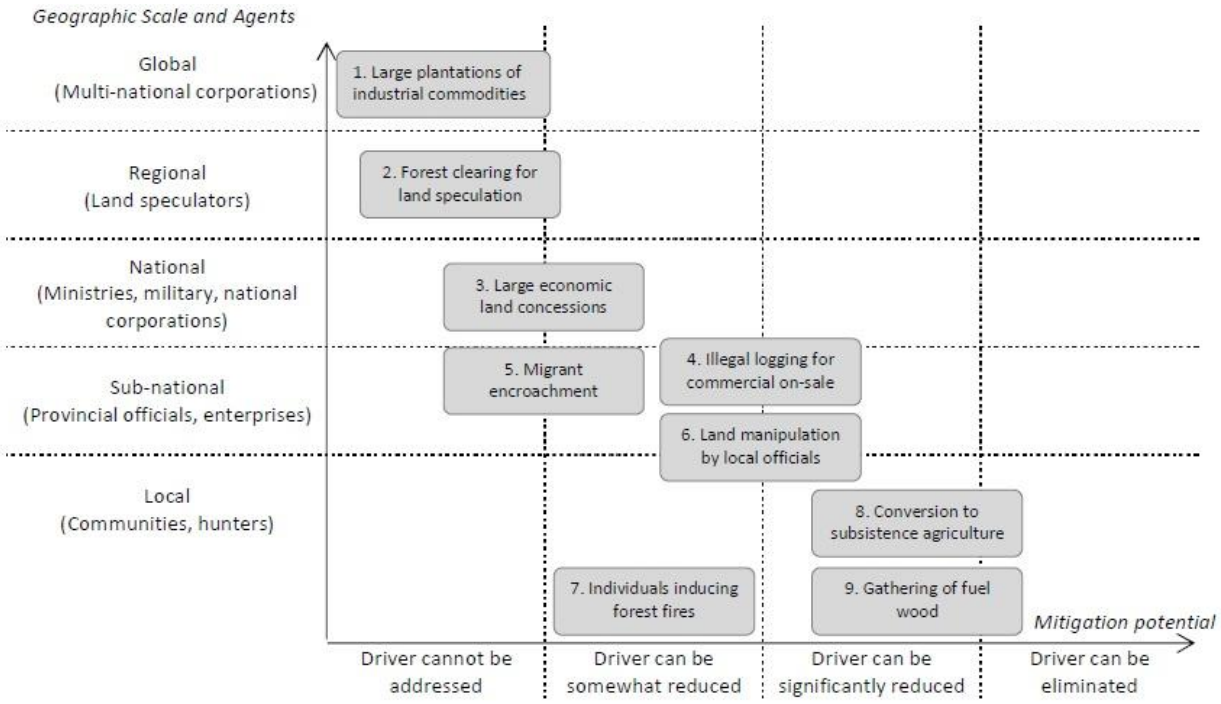

Figure 1. Multi-tiered Drivers of Deforestation by Geographic Source of Activity. Mitigation Potential refers to the potential to reduce each driver of deforestation by a sub-national REDD project, see text for further explanation (adapted from Poffenberger et al., 2010)

An effective REDD framework must prioritize investments in mitigating drivers that produce cost-effective results. Interventions at the local, especially community-level, may be particularly responsive to funding that can be generated through implementation of REDD projects (Figure 2). In contrast, national drivers may be more

effectively addressed by policy reform and capacity building, that are potentially supported by long-term stable financing through a fund structure aimed a both capacity building and GHG reductions through changes in national land-use planning.

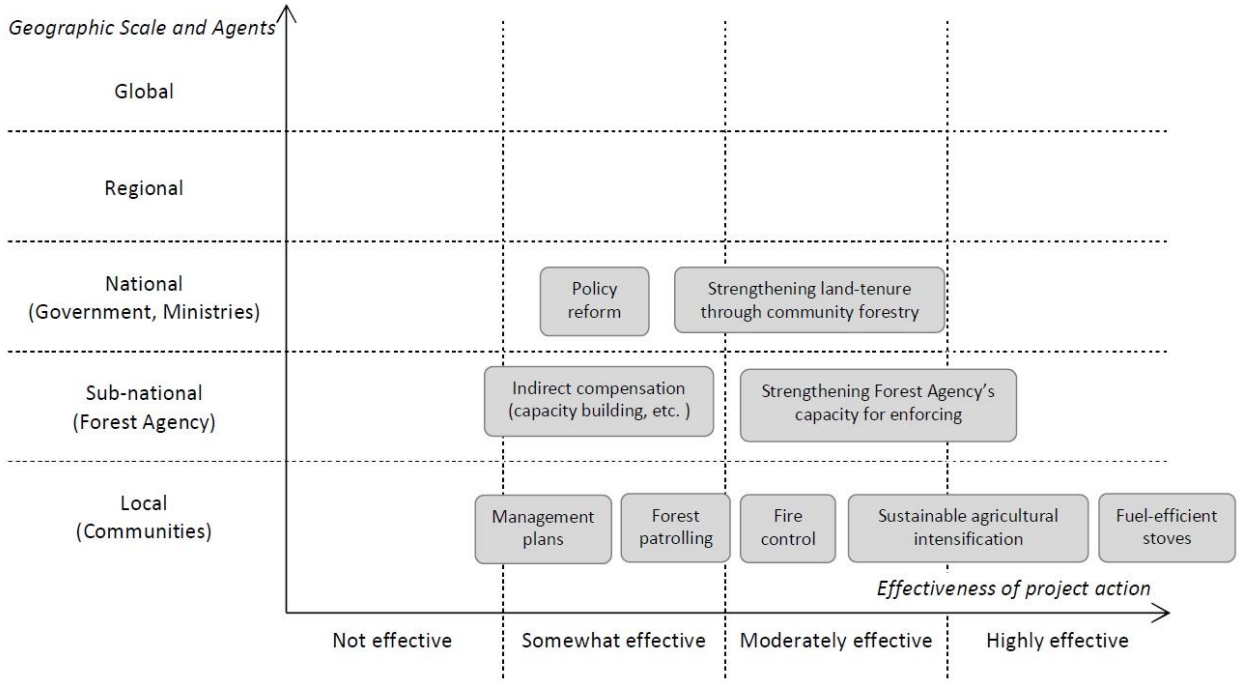

Figure 2. Multi-tiered Mitigation Strategy of Deforestation Drivers by Level, Actor, and Potential Effectiveness (adapted from Poffenberger et al., 2010)

1.3. Desired Outcomes and Design Elements

The rules and regulations for generating, issuing, controlling and governing nested REDD offsets must be carefully established to ensure that a number of desired outcomes are achieved. These outcomes center on maintaining the balance between the power of Jurisdictional Governments and project proponents, fostering the role of markets, and safeguarding land tenure and carbon rights. We identify the following discrete outcomes that an efficient and successful IREDD program should achieve:

- Offsets created (at the project level) are properly nested and therefore real and additional at the Jurisdictional level. In addition, the offsets are quantifiable, permanent, verifiable and enforceable.

- The government is incentivized to address drivers of deforestation that operate at a large geographic scale[6] while land owners or land managers are incentivized to address drivers of deforestation operating at a local scale.

[6] REDD can only provide an incentive to reduce deforestation for a government beyond the basic mandate of a government to ensure sustainable use of natural resources and support them with governance.

- The market mechanism for offsets allows for an efficient flow of funds and the ability for offset buyers and investors to transparently assess and manage risks associated with creation of the offsets.

- Land owners and land managers with rights to land resources and implicit or legally recognized rights to carbon can participate without bias or competition from the Jurisdictional Governments in the offset market.

- The actual implementation of the REDD policy is practically feasible within multiple Jurisdictions within a 1-4 year period.

A properly nested REDD framework that achieves the outcomes stated above is referred to as an integrated REDD mechanism, or IREDD program. The challenge when designing a framework to enable these desired outcomes is that solutions that meet one outcome may be in conflict with achieving other desired outcomes. Therefore, the rules must contain careful checks and balances so that the roles, rights and responsibilities of all stakeholders are clarified and in balance. Most importantly, the effect of setting a Jurisdictional crediting baseline creates a "zero-sum" game where those who cause deforestation that is lower than the crediting baseline are creating an asset and those who cause deforestation which is higher are creating a liability. The value of the carbon asset that is created is inextricably linked to the liability because there is no offset in an IREDD program unless the assets are greater than the liabilities. IREDD rules must recognize both the costs of emissions as well as provide rewards for reduced emissions.

We have identified four fundamental questions that represent essential design elements of an integrated REDD framework. These questions must be answered through the design of the IREDD program.

1. **Can offsets be generated only on registered project areas, or can they be generated on all land within the Jurisdiction?**

   A nested IREDD program must decide whether to allow offsets to be generated only in project areas, or areas where there is not a registered REDD project, i.e. the non-project areas. Projects areas are formally defined as spatially explicit areas where there is clearly defined land tenure, a project proponent with management responsibilities for the land, resources and carbon assets, and that has met project registration and accounting requirements following the rules of the IREDD program. Non-project areas are all areas not registered as project areas within a given Jurisdictional boundary, and could potentially become a project area in the future. Whether offsets may be generated from both project and non-project areas impacts both the potential to reduce deforestation and the risk to those who generate or buy offsets. If offsets can only be generated in project areas, land owners/managers of non-project areas would not be able to participate in the market for REDD or receive payment for reducing deforestation until they register the land and planned project activities.

   Once an area is registered and approved as a project area, a direct and causal link is established between the land management activities and the reduced emissions or greenhouse gas removals. The design of a REDD project must evaluate the drivers and agents of deforestation in the target area and then implement activities designed to reduce those deforestation drivers. For non-project areas, such a causal relationship does not necessarily exist. Non-project areas may be under many types of land ownership and management. While some lands - such as concession areas and private lands - will have clear tenure and management, the land tenure on other areas may be unclear or ambiguous. Clear tenure and an

identified land manager is a necessary, but not exhaustive, requirement to establish a causal link between a land manager's decisions and reducing deforestation. This raises the question of whether IREDD rules should allow for offset generation when no direct and causal link can be established between activities implemented by land managers and reductions in deforestation. The robustness of the market for IREDD offsets depends on creating a direct and causal link between project actions and a specific outcome, such as an increase in forest cover or a reduction in deforestation. The most effective and transparent way to ensure there is a causal link between project actions and outcomes is to only allow credits to be generated on registered and pre-approved project areas. To gain approval, projects must undergo a rigorous validation process in which the design of project activities and the eligibility of project areas are evaluated. Once successfully validated, project areas will be required to conduct on-going monitoring to verify that the project actions are effectively implemented and that the monitored forest cover changes, or lack thereof, are effectively linked to the registered project actions.

Project areas could include land that is directly controlled by the Jurisdictional Government, which presents the opportunity for governments to participate in the offset market. The question remains whether the IREDD program should allow for offsets to be generated from actions or changes in policy which cannot be directly linked to a reduction in emissions or greenhouse gas removal. Examples of such actions, broadly referred to as "policies and programs", include improved land tenure laws, and stronger infrastructure for enforcement. While there is no doubt that policies and programs set forward by a Jurisdictional Government are essential tools to address deforestation across the entire Jurisdiction, it is not possible to disentangle these actions into spatially explicit reductions in deforestation. Observed changes in deforestation in the non-project areas could be due to a host of alternative influences and actors. Policy design that allows reduced emissions or greenhouse gas removals in non-project areas to generate credits and assigns those credits to the Jurisdictional Government rewards performance that is not necessarily causally linked to project actions. Policies and programs at the Jurisdictional level are not necessarily causally linked to empirically observed changes in deforestation or reforestation. Moreover, if Jurisdictional Governments are allowed to generate credits from policy and programs on non-project areas, these governments are in direct competition with independent land managers in non-project areas who may wish to register these lands as project areas. The lack of a causal link between policies and programs and observed changes in reduced emissions or greenhouse gas removals should not discourage Jurisdictional Governments from enacting these policies and programs. The IREDD program should instead encourage these policies and programs through other means beyond directly awarding IREDD offsets, particularly to the extent that they can serve to clarify land tenure and protect forest resources from illegal exploitation.

For these reasons, we recommend creating a IREDD program in such a way that (1) credits can only be generated from project areas, (2) incentives are built-in to maximize the project area in a given Jurisdiction, and (3) funding mechanisms exist to support government programs and policies where no direct and causal relation exists between the certain actions or changes in policies and empirically observed emission reductions. This approach will avoid generating non-additional credits while providing support for private investment and rewarding project actions that are causally related to reduced emissions or greenhouse gas removals.

2. **In the case where offsets are generated on non-project areas, who controls and economically benefits from offsets?**

If IREDD policy design moves forward with rules that allow for creation of tradable offsets from both project and non-project areas, a set of complex questions arise: how are offsets from non-project areas managed, and to whom are benefits distributed? Emissions reductions taking place in non-project areas can be caused or influenced by multiple actors, and care must be taken to ensure that benefits from activities in these areas accrue to the appropriate rights holders. Government ownership of any offsets generated on non-project areas should not be de facto assumed, and systems must be established to clarify ownership and manage offsets in a transparent and auditable way. The pooling non-project offsets into a single financial structure, for example a trust fund, may allow for distribution of benefits, but does nothing to establish control of the offsets generated. Control of offsets influences issues such as when the offsets are sold, at what price and with which risk covenants. The very nature of pooled structures eliminates individual control of assets, as they are managed for the benefit of all participants.

Even in situations where control of offsets is not considered an issue, benefit sharing for offsets in non-project areas raises a number of concerns. To reward the desired behavior over the long term, i.e. actions that reduce deforestation, a payment-for-performance mechanism must be established. This requires identifying the actors who directly contributed to the performance and setting-up mechanisms to ensure long-term protection of the offsets. However, this type of accountability is similar to what is required of areas that are formally registered as project areas. Therefore, instead of allowing offsets from non-project areas, non-project areas that reduce their deforestation should be incentivized to be registered as project areas.

How to account for emissions from government-sanctioned deforestation is a question that further complicates the inclusion of non-project areas. It is important that the rules and regulations of the nested REDD framework require payment in cases where deforestation occurs due to sanctioned activities such as concessions or newly developed roads. This will ensure that deforestation in sanctioned areas does not cancel out offsets generated in other areas which result from having the closed IREDD offset system that is based on Jurisdictional accounting. It may seem controversial to require payment from entities engaged in sanctioned deforestation but without it, all other participants in the system incur the costs of these entities' deforestation. Therefore, sanctioned activities must be charged for REDD related emissions. Two options for determining how these deforestation charges can be levied include: (1) charging for the total emissions from deforestation or (2) charging for deforestation above the average historical deforestation rate in concession areas. This would also require that a price be established to convert emissions into dollars. These fees would be levied to concession holders, road builders or other entities that participate in sanctioned deforestation.

3. What performance mechanisms can be put in place to insure IREDD offsets are predictably generated?

Designing a performance mechanism for nested REDD requires an understanding of various components of risk and how each of these components impact project performance. Performance in the REDD sector at a Jurisdictional level requires that there are (1) reductions below the Jurisdictional crediting baseline and (2) on-going maintenance of these reductions (i.e. permanence). In the nested REDD context, obtaining reductions below the crediting baseline and maintaining permanence of these reductions become primary risk factors. Mitigating these risks depends largely on having clearly defined land tenure, with clear accountability for who is responsible for managing the land. This requires that a Jurisdiction looking to participate in the REDD market develop the ability to establish and track land management

responsibilities. IREDD program rules that require land managers to register their projects as a prerequisite for participation in the IREDD program support the development of land tenure clarification and tracking by providing a built-in incentive for land managers to register their land.

Besides clearly defining land tenure and management responsibilities, a formal project registration process requires a detailed plan for reducing deforestation and institutes on-going monitoring requirements. For these reasons, offsets generated from formally recognized projects are inherently less risky. Additionally, these projects can be directly held accountable for performance. It follows that the larger the proportion of non-project area to project area within the Jurisdiction, the greater the overall risk within that Jurisdiction. An IREDD program that recognizes offsets only from formally registered project areas, including government registered projects, encourages Jurisdictions to maximize the land that is registered and requires clear management plans and responsible land managers. Maximizing the registered project areas, coupled with the requirement that the areas with sanctioned deforestation pay for the costs of deforestation, lowers the overall performance risk of the Jurisdiction. It allows a Jurisdiction to establish a performance pools for registered areas and focus attention on areas where land management plans are less established.

Besides the proportion of registered project areas to non-project areas, another element that contributes to IREDD offset risk is the extent to which the crediting baseline, agreed upon within the Compliance Mechanism, is set below the business-as-usual baseline. If the crediting baseline is below the business-as-usual baseline, the Jurisdictions and all the participants within the REDD mechanism start out "in the hole". This provision will delay a critical source of funding for REDD activities that could be made available through the IREDD offset market. If the design of IREDD program allows Jurisdictions to place performance above the business-as-usual baseline into a Jurisdictional performance pool, instead of making it a hurdle above which offsets are created, three key goals could be met: (1) insurance is provided for offsets from project areas from the underperformance in non-project areas, (2) financial support is created for Jurisdictional policies and programs that cannot be registered as projects because they are not spatially explicit, and (3) contributions are made to the "shared responsibility" of the Jurisdiction to reduce deforestation beyond business-as-usual by having a percentage of these credits permanently retired. The management of the Jurisdictional performance pool and the calibration of each of these components require further examination.

In addition to the Jurisdictional performance pool described above, two other performance pools would be established: (1) a project permanence pool to insure against reversals in project areas, and (2) a REDD mitigation cost pool that would be used to insure project offsets against underperformance and provide funding for Jurisdictional policies and programs. These three performance pools are critically important mechanisms in insuring against risks associated with the IREDD program. The mechanics to manage the three performance pools is discussed in section 2.4.

4. Who is responsible for controlling project registration, offsets issuance, performance pool management and enforcement of rules?

The implementation of IREDD program requires a clear assignment of roles and responsibilities between the Compliance Mechanism, the Jurisdictional Government, the Project Proponents, 3rd Party Validators/Auditors, the REDD Standard's Board and Registries. It also requires determining who will make

the rules, how adherence to these rules will be enforced and what checks and balances can be used to ensure consistent application of rules and manage grievance between stakeholders, and sanction infractions.

It is clear who the Compliance Mechanism, Jurisdictional Government, and Project proponents are in the IREDD program, but the 3rd party validators/auditors, REDD Standards Board and the Registry entities will require identification to support the IREDD program. There are however, international organizations that could step-in and fulfill these responsibilities. The 3rd party validators/auditors can be appointed based on the approval system used by the CDM for DOEs or the approved validator system used for the VCS or other standards boards. The independent REDD Standards board, could use the existing CDM infrastructure or select another standards board to support the implementation of REDD rules. Registries, as discussed later in this paper, can be selected from the current set of operational registries including Markit, APX and others.

Before IREDD offsets can be issued, the Jurisdictional Government must engage in a number of concrete activities that range from preparing for institutional readiness to quantifying the historical deforestation rates and setting a crediting baseline. Each of these activities will lead to a concrete outcome that is one milestone in the direction of being completely ready for the IREDD program. Each of the milestones is dependent on a number of decisions that must be made by the Jurisdictional Government and the Compliance Mechanism. In addition, each of the milestones must have mechanisms for independent checks and balances. Table 1 illustrates how the responsible parties for each of the milestones on a Jurisdiction's path to become IREDD ready must be outlined and indicates how checks and balances can be set among negotiating partners and responsible parties. The table should not be interpreted as a prescriptive requirement, but rather as an attempt to show how each step in the process to become fully IREDD ready requires careful design to ensure integrity.

Table 1. Negotiating partners, responsible parties, checks and balances for major milestones to bring a Jurisdiction into a Compliance Mechanism. JG = Jurisdictional Government, and CM = Compliance Mechanism

Milestone	Who can negotiate?	Responsible Party	Check	Balance
JG has signed an agreement to participate in the CM	The CM sets all the broad-level requirements defined by CM	Both the JG and the CM authorities sign the agreement	The agreement must be as similar as possible across Jurisdictions, to avoid ad-hoc and potentially biased or unfair rules.	Agreements must be made publicly available.
JG has built the institutional readiness	The CM sets all requirements. Additional requirements may be set by the JG	JG with support from donor organizations	Institutional readiness is audited by 3rd party validators that are approved by REDD standards board and CM.	Accepted by CM, made publicly available
The business-as-usual baseline is developed at the Jurisdictional level	The REDD Standards Board specifies guidance and minimal precision, and adjustments of the historical deforestation in REDD rules and JG specifies methods.	JG gets method validated and completes calculations, with support from active projects in Jurisdiction	3rd party validators that are approved by REDD standards board and CM	Accepted by CM, made publicly available
The crediting baseline at the Jurisdictional level is agreed upon	CM specifies adjustments made from business as usual baseline to Crediting Baseline (if any)	JG negotiates with CM, and calculates the agreed adjustments to business as usual baseline	3rd party validators that are approved by REDD standards board and CM	Accepted by CM, made publicly available
The business-as-usual baseline is further specified at the project level	The REDD Standards Board specifies guidance and minimal precision in REDD rules and JG specifies methods	JG gets method validated and completes calculations, with support from active projects in Jurisdiction	3rd party validators that are approved by REDD standards board and CM	Accepted by CM, made publicly available and downloadable for use by project proponents
The crediting baseline is further specified at the project level	CM specifies methodology in REDD rules; any adjustments to business as usual baseline, are required to be spatially "allocated"	JG completes	3rd party validators that are approved by REDD standards board and CM	Accepted by CM, made publicly available and downloadable for use by project proponents
The project registration requirements are established and the approval process is specified	Minimum requirements are fully defined under the CM, additional requirements may be set by JG	JG and REDD Standards board	3rd party validators that are approved by REDD standards board and CM	Accepted by CM, made publicly available

Milestone	Who can negotiate?	Responsible Party	Check	Balance
Project registration approvals are managed and tracked	Pre-determined, see above	JG for some components, REDD standards board for some, use existing registration systems like Markit, APX others for tracking	3rd party auditing of process and dispute resolution process provide by 3rd party	Accepted by REDD Standards Board, made publicly available
Actual emissions are measured at the Jurisdictional level	CM specifies guidance and minimal precision in REDD rules and JG specifies methods	JG gets method validated and completes calculations, with support from active projects in Jurisdiction	3rd party validators that are approved by REDD standards board and CM	Accepted by CM, made publicly available
Actual emissions are measured at the project level	CM specifies guidance and minimal precision in REDD rules and JG specifies methods	Project proponents with data provided by JG	3rd party validators that are approved by REDD standards board and CM	REDD Standards board, made publicly available
Offsets for use in CM are issued	Rules specified by CM allow only registered project-based credits to be eligible for IREDD offsets	Issuance controlled by REDD Standards board, after evaluation of whether adequate credits are in Performance Pools	3rd party validators that are approved by REDD standards board and CM	REDD Standards board, made publicly available
Jurisdictional performance pool is effectively managed	REDD rules adopted between JG and CM specify management of pool priority of project offsets	JG	3rd party validators that are approved by REDD standards board and CM	REDD Standards board, made publicly available
Project performance pool is effectively managed	REDD rules adopted between JG and CM specify management of pool for project permanence	JG	3rd party validators that are approved by REDD standards board and CM	REDD Standards board, made publicly available
GHG mitigation cost Pool is effectively managed	REDD rules adopted between JG and CM specify management of pool priority of project offsets	JG	3rd party validators that are approved by REDD standards board and CM	REDD Standards board, made publicly available
Offsets are accepted for compliance	CM based on any limits placed in International Offsets	CM	3rd party validated accounting	Publicly available, made publicly available

In addition to the main roles of each IREDD governing body, it must be clear under each of these steps what legal agreements support roles, how any disputes are solved and what sanctions can be levied for non-performance.

5. **How does the crediting baseline get set relative to the business-as-usual baseline, taking into account the requirement of no deforestation by 2050?**

   A technical description of the relation between the historical deforestation rate, the business-as-usual baseline and the crediting baseline can be found under "Crediting Baseline" in Section 2.3. This section focuses on the effect of setting the crediting baseline relative to the business-as-usual baseline. By setting the crediting baseline below the business-as-usual, the Compliance Mechanism effectively discounts credits or more precisely sets a threshold under which no offsets are issued. Reasons for setting the crediting baseline below the business-as-usual baseline may include mechanisms to: (1) remain conservative and reduce the risk of bringing non-additional offsets into the Compliance Mechanism, (2) stimulate an increase in efficiency of REDD actions, especially when the gap between the crediting baseline and the business as usual baseline is gradually widened over time, and (3) gradually phase out the potential for generating offsets during the Compliance Period. However, setting the crediting baseline too low will discourage participation in the REDD framework particularly in the near-term where reducing deforestation is critical. Recent modeling exercises with the OSIRIS model (Busch et al., 2009) indicate that setting the crediting much smaller than 80%-90% of the business-as-usual scenario completely eliminates REDD participation. The exact threshold at which REDD participation ceases is dependent on the country.

   There are two broad options by which a crediting baseline can be adopted. First, the Compliance Mechanism may require that activities in the Jurisdiction are only issued IREDD offsets if the total greenhouse gas emissions from deforestation in the Jurisdiction are smaller than the crediting baseline. Under this option, it is unlikely that private investors or market mechanisms will invest in REDD projects before the threshold has been effectively reached. Therefore, the responsibility for decreasing the deforestation before the crediting baseline threshold is reached primarily lies with the Jurisdictional Government and funding from non-market sources. Even though this option has a very low risk of bringing non-real offsets into the Compliance Mechanism, this option seems sub-optimal as it will most likely delay critical market-based funding needed for the rapid implementation of actions and changes that decrease deforestation and severely by increasing the investment risk for private investors. The second option, to apply a crediting baseline, is to allow offsets to be generated from the beginning of the Compliance Period, as long as the crediting baseline is used for calculating the IREDD offsets. The second option represents a ton-for-ton discounting mechanism, in which all tons are discounted with the ratio of the crediting baseline over the business-as-usual scenario.

1.4. Sectoral Scope: RED, REDD, REDD+, IFM, A/R and ALM

Ideally, the IREDD policy design should support a full sectoral approach, in which credits from all land-based carbon activities are included. In other words, it would recognize not only credits from reducing emissions from deforestation, but also credits from reduced emissions from degradation and improved forest management (REDD+), afforestation/reforestation (A/R), and agricultural and rangeland management (ALM). While there is still lack of clarity on whether a sectoral approach to land-use change or a REDD+ approach will prevail under the UNFCCC, many developing countries have included the land-use sector under their targets and have submitted actions under the Copenhagen Accord (Copenhagen Accord 2009; AWGLCA 2010). However, a full sectoral approach is challenging given the technical complexities of measuring forest degradation, soil carbon stocks and non-biomass emissions from agricultural activities. Therefore, we strongly recommend following an approach in which a full sectoral approach is attained after three phases.

- **Phase 1.** Inclusion of credits from avoided deforestation and afforestation/reforestation. This requires an analysis of historical deforestation, for which sufficient data are available for most Jurisdictions. This phase is feasible within 1 to 4 years in many jurisdictions. Even though the emphasis of most compliance systems is on avoided deforestation, there is no reason why afforestation/reforestation cannot be included in this first phase as the accounting for A/R can be supported by what is needed for nested REDD. In addition, the risk of REDD is lowered if A/R can also receive marketable offsets, as A/R projects often provide alternatives to unsustainable forest use, such is the case with establishment of woodlots.

- **Phase 2.** Inclusion of avoided degradation and improved forest management. This requires an analysis of historical degradation. Currently, sufficient historical data is unavailable to quantify historical degradation in many areas. However, these data may become available in 5 to 8 years, depending on the region and availability of cost effective high-resolution historical remote sensing data.

- **Phase 3.** Inclusion of agricultural and rangeland management. This requires an analysis of historical changes in soil carbon. Again, limited but insufficient historical data are available, and the inclusion may be feasible in 5 to 10 years.

Note that for all three phases, all potentially significant secondary emissions from sources must be included and some Jurisdictions will be prepared for these phases sooner than others.

1.5. The Role of Markets in Creating Incentives to Reduce Deforestation

There are a number of tools that can and must be used to reduce deforestation. This paper focuses specifically on market-based IREDD offsets, but having an understanding of the variety of ways in which deforestation can be addressed is critical to designing a functioning IREDD program. These tools for reducing deforestation include:

- **Political Pressure.** Pressure either from international sources such as foreign governments, multilateral and bilateral agencies, or from local interest groups, NGOs, private sector players, as well as individuals can help encourage governments to reduce deforestation through mobilizing political interests. The political pressure is often materialized through financial and aid incentives to prompt governments to take action. Governments in developing countries are subject to pressures from many external sources, particularly from donor agencies. Sometimes these governments are obliged to bow to such pressure, at other times they resist it, or at least attempt to change the outcome of policy deliberations.

- **Political Will.** A government's political will to reduce or eliminate deforestation is constituted out of a nation's political culture which will determine how that country values its forest resources. This political will determines the level of commitment a government demonstrates in promulgating and enforcing laws and regulations that can protect their forest resources. Such policies can stress different facets of natural resource management, how much community involvement is promoted, how private individuals play a role, how markets contribute to the successful implementation of policies. Ultimately, it is the level of commitment that a government expresses by the application of policies and laws in managing and protecting its forests. Decisions must be made at different governmental levels to put the appropriate policies in place, and then ensure these policies are effectively followed over time.

- **Concessional Funding.** This is funding that is offered on favorable terms that often requires it be spent on economic development and governance problems, and often with some designation of expected change

in governmental behavior. This could include funding for IREDD readiness that includes the development of baselines, establishment of monitoring systems for actual emissions, support for Jurisdictional policies and programs, and IREDD approval systems.

- **Development Assistance.** This includes funds for direct expenditures by developed countries on programs in developing countries on specific programs and sectors. This could also fund IREDD readiness including the development of baselines, establishment of monitoring systems for actual emissions, support for Jurisdictional policies and programs, and IREDD approval systems.

- **Market-Based Funding.** This is funding generated by market transactions of a particular commodity or product. The market provides price signals to market participants for the commodity or product, and allows the project proponent the ability to source investment capital.

In the context of creating the IREDD program, a market needs to evolve that will provide for the sale and purchase of the IREDD offsets that are generated by market participants. As in any market, the IREDD market is simply a mechanism in which those who produce the carbon commodity transact with those who wish to purchase the carbon commodity. It is nothing more, and nothing less. Like any financial market, it needs to function smoothly, provide efficient pricing on the assets being transacted, and demonstrate a high degree of transparency with regard to rules that impact the value of the commodity, and how they are applied to participants. The market cannot solve the problems of deforestation, nor should it be expected to but the market functions to establish a price for the reduction of deforestation by transmitting price signals and facilitating transactions according to the agreed upon rules. More specifically, the IREDD market can achieve the following outcomes:

- Pay for the generation of a carbon asset and ensure that the risk and return potential can be accurately assessed and captured by investors

- Allow regulated entities/investors to interact directly with producers of the assets so as to be able to develop transactional terms that best facilitate investment

- Drive payment for performance for high quality IREDD offsets

In order for the market to effectively play the role described above, it needs to be governed by a standardized set of clear and effective rules that apply across all Jurisdictions, contracts need to be standardized, legal frameworks and remedies for non-performance need to be established and such rules need to be consistently and uniformly applied to market behavior. By the market's functioning efficiently, transaction costs can be lowered. As with any new system, over time the IREDD program will improve and participants will learn how efficiently generate IREDD offsets, which will catalyze the growth of the market.

There are some lessons can be drawn from experiences in existing carbon markets to inform the development of an IREDD framework. The CDM market, with what many see as an arduous and prolonged set of rules and processes to develop projects, has demonstrated that a multilateral institution may not be the appropriate framework to oversee such a market. Given that the CDM is global in scale, and constitutes the first attempt at creating such a large carbon market, oversight by the UNFCCC was necessary. However, while efficiency under the CDM has not been promoted and transaction costs have not reduced, involvement of the UNFCCC has allowed for the establishment and enforcement of a centralized set of rules and processes. Rules under the CDM have also been refined over time, but this process can be prolonged and slow to advance (Reyes 2010). The ability to have a

centralized market system that can refine rules over time is imperative to a new market. In contrast, having each Jurisdictional Government set and manage the REDD offset market in their Jurisdiction, would create such a fragmented market that would be impossible for investors and offset buyers to effectively navigate, and would eliminate the ability to refine rules over time. The IREDD framework being proposed must be guided in its growth, and experiences of participants must be leveraged to inform the function of the market, much as the EU/ETS has done since its inception.

1.6. Compatibility between Compliance and Crediting Periods

A Compliance Mechanism requires that Regulated Entities comply with their allowed Annual Emissions over specific Compliance Periods. With IREDD, the Crediting Period refers to the time period during which IREDD offsets generated within an approved Jurisdiction can enter the Compliance Mechanism. The duration of a Crediting Period would be limited but much longer than the duration of the Compliance Periods. IREDD offsets would be allowed to enter the Compliance Mechanism and be used by a Regulated Entity during the current Compliance Period as long as the vintage year IREDD offset did not exceed the end of the current Compliance Period. This would include IREDD offsets from vintages preceding the start of the current Compliance Period, as long as they meet the eligibility rules for the IREDD project start date.

1.7. Summary of Framework for Emissions and Offset Calculations

An IREDD program that is properly nested requires a full reconciliation of (1) crediting baselines that are valid at the project level with the overall Jurisdictional crediting baseline, but also (2) the total actual greenhouse gas emissions occurring at the Jurisdictional level with the greenhouse gas emissions occurring at the project level.

- A **crediting baseline** will be agreed and set in the IREDD agreement between a Jurisdiction and a Compliance Mechanism, and will be relevant across the entire geographic scope of the Jurisdiction. However, quantification of credits from individual geographic areas, including at the project level, within the Jurisdiction will require a crediting baseline that is valid for the geographic areas. Since not all areas within the Jurisdiction will have a similar deforestation threat and emissions, a Jurisdiction must allow geographically-explicit crediting baselines that must be reconciled with the Jurisdictional crediting baseline.

- The IREDD agreement will require the Jurisdiction to monitor its **actual greenhouse gas emissions** across the whole Jurisdiction. Within the Jurisdiction, individual project proponents must monitor their project activities, and the impact of these activities on forest cover in the project and leakage areas. Again, differences in actual monitored greenhouse gas emissions at the project level must be reconciled with the total greenhouse gas emissions at the Jurisdictional level.

Once the performance requirements of the Jurisdiction - as set forward in the IREDD agreement - are met, only the net emission reductions or greenhouse gas removals from registered project actions and in registered project areas can be converted into tradable IREDD offsets within the Compliance Mechanism. To facilitate this requirement, each Jurisdiction must have a dedicated set of accounts that manages the performance of the Jurisdiction and the IREDD project offsets. This account will be referred to as the Performance Accounts. These accounts function as the mechanism to ensure that the performance required at the Jurisdictional level can be monitored and met, and that project proponents whose offsets are authorized retain ownership and control, which is a key criterion for tracking performance and attracting private capital.

1.8. Interaction with National REDD

In cases where IREDD programs are implemented both at the sub-national and the national level within the same country, both levels must be explicitly reconciled. The simplest and most straightforward way for doing this is to simply exclude the geographic area of the Jurisdictional Government from the national REDD system. More elaborate reconciliation could include a compensation mechanism by which the sub-national Jurisdiction compensates the national government or bordering Jurisdictions for any cross-boundary leakage caused by REDD activities within the original Jurisdiction, or vice versa. However, a compensation mechanism can only be established when there is a clear causal relationship between deforestation occurring in a different Jurisdiction and project activities in the original Jurisdiction.

1.9. Managing Participation in Multiple Compliance Mechanisms

With the parallel UNFCCC and U.S. (including states versus federal) tracks for development of REDD regulations, it is likely that REDD offsets will be allowed into multiple compliance systems. Thus, REDD participants within a Jurisdiction could be in a position to generate REDD offsets in multiple Compliance Mechanism systems. The rules for generating offsets under these Compliance Mechanisms are likely to be subject to different crediting baselines, eligibility rules and offset limits. Jurisdictional governments should have the flexibility to participate in more than one Compliance Mechanism, and if so the REDD participants within the Jurisdiction should be able to participate in the Compliance Mechanism that provides the highest value for their REDD offsets. This potential participation within multiple Compliance Mechanisms will require robust rules to ensure that offsets are only counted once.

2. Approval Process for IREDD

A Jurisdictional Government will be required to go through a multi-step approval process including third party validations and verifications to bring IREDD Offsets into the Compliance Mechanism. These include:

- **Step 1.** Execution of an IREDD agreement with the Compliance Mechanism to become a Jurisdiction in which offsets are recognized for compliance *= Agreement Date*
- **Step 2**. Validation that the Jurisdictional Government has met the A Priori Institutional Readiness Criteria *= Institutional Readiness Date*
- **Step 3**. Validation of the Technical Requirements needed to support carbon accounting *= Technical Readiness Date*
- **Step 4**. Offset Issuance and Performance Pool Activation *= Operational Date*

2.1. Step 1. Execution of IREDD Agreement between Jurisdictional Government and Compliance Mechanism

The agreement between the Compliance Mechanism and the Jurisdictional Government details the requirements that the Jurisdictional Government must fulfill to allow IREDD offsets from their Jurisdiction to be accepted in the Compliance Mechanism. It legally binds the Jurisdictional Government to the rules set out by the Compliance Mechanism and the IREDD regulations that the Compliance Mechanism has developed. Included in this agreement are the actions that must be completed by the Jurisdictional Government, the process required for each step and sub-step, the timeframes for completing the steps, the on-going requirements for maintaining the Jurisdiction's eligibility with the Compliance Mechanism. The agreement will also specify the minimum time period for which the Jurisdiction will participate and the requirements for the Compliance Mechanisms in accepting offsets, managing their approval process and how disputes will be resolved between the Jurisdictional Government and the

Compliance Mechanism. To ensure fairness within the Jurisdiction and participation by international buyers in IREDD offsets, this agreement will also specify the process for dispute resolution between participants including the agreement to use an internationally accepted dispute resolution arbiter such as the International Chamber of Commerce.

2.2. Step 2. Validation that the Jurisdictional Government has met the Institutional Readiness Criteria

A substantial amount of institutional capacity is required at the Jurisdictional level to administer an IREDD system. This institutional capacity must follow specific rules and guidelines set forward by the Compliance Mechanism and the REDD Standards Board. The institutional readiness of a Jurisdictional Government must be formally validated by the Compliance Mechanism, REDD Standards Board and/or an appointed 3rd party, depending on the readiness component. Only after the institutional readiness is positively validated and all relevant requirements are met, is the Jurisdiction allowed to bring IREDD offsets into the Compliance Mechanism. The following section outlines the high-level institutional readiness requirements that must be developed and will be validated under the IREDD program.

Eligible Countries and Sub-national Entities

The Compliance Mechanism should allow IREDD offsets from any country, or sub-national entity within a country, provided that (1) the country is included on the list of eligible countries as specified by the Compliance Mechanism and (2) the sub-national entity within a given country has legally recognized autonomy and a governance structure that meets the requirements for decentralized authority as outlined below. Each Compliance Mechanism may maintain rules allowing or disallowing countries or sub-national entities to participate based on sovereign, security or other issues. Due to technical reasons discussed in step 3, it will be required that the area of a Jurisdictional Government exceeds a pre-determined minimal size.

Presence of Decentralized Authority

Decentralization involves shifting power, authority, and decision-making control from the national government of a country to a geographical subdivision such as states or provinces within the country. Three main types of decentralization can be distinguished: (1) fiscal, (2) administrative and (3) political. Fiscal decentralization is characterized by the distribution of financial resources to regional stakeholders and governments rather than only to the national government. Administrative decentralization is concerned with the delegation of authority to provincial, district or local governments, which may still remain accountable to a central authority. Political decentralization is indicated by the extent to which local governments have specific discretionary authority, and are accountable to local populations, thereby enabling their participation in the decision-making process (Ribot 2004). Decentralized governance is increasingly favored by many developing countries as the most suitable mode of governance through which poverty reduction interventions can be conceived, planned, implemented, and monitored and evaluated (Kauzya 2007). In Indonesia, for example, management of forest resources has been devolved to the regional governments since 1999 in an effort to ensure equitable distribution of benefits to regional and local actors. Many hope that the process of decentralization will facilitate increased participation by communities in problem analysis, project identification, planning and implementation, as well as oversight which in turn will increase ownership and the likelihood of sustainability of such initiatives. Without a considerable amount of decentralized authority, Jurisdictions cannot enter into IREDD agreement that will be binding with Compliance Mechanisms.

The level to which each of the indicators of decentralization are present and functioning within a Jurisdictional Government affects that Government's ability to perform under the requirements of IREDD program. Fiscal decentralization, broadly defined in this context by a Jurisdictional Government's access to local revenues and resources, will impact the Jurisdictional Government's ability to implement the requirements under the IREDD program and accept any form of financial risk inherent in the program.

Of all the indicators of decentralized authority, political decentralization is perhaps the most important factor in enforcing the terms of the IREDD program because it determines the level of control a Jurisdictional Government has in setting policy and laws and enforcing them. Political decentralization can be understood to refer to either or both of the following: (1) transferring the power of selecting political leadership and representatives from central governments to local governments, and (2) transferring the power and authority for making socio-politico-economic decisions from central governments to local governments and communities. The first could be accomplished by demonstrating choice of political leadership through elections or through the implementation of law or legislation that devolves authority to regions within a given Jurisdiction. An approach to the second is for the central government to establish minimum standards or safeguards necessary to help protect natural resources and rights holders, thereby also defining areas of discretionary authority that are necessary for decentralized management, and to respond to site-specific natural resource conditions (Ribot 2004; Larson and Ribot 2009). For IREDD to be successful, the level of political decentralization must be adequate to ensure that the Jurisdictional Government can (1) be held accountable for performance under the IREDD program by the Compliance Mechanism, (2) control land-use policy and governance and 3) have the ability to hold participating project proponents accountable under the IREDD program.

Demonstration of Land Tenure Accountability

Documented land tenure, which includes clearly defined land ownership and land-use rights, is an important element in implementing IREDD, and thus, a precursor to a Jurisdictional Government's eligibility under the IREDD program Clearly documented land tenure requires that the Jurisdictional Government develop formal documentation or law which defines the legally recognized categories of land ownership and land usage rights. A common framework for representing land tenure schema is a table outlining various ownership categories and the usage right associated with these categories. An example is reproduced below in Table 2. Tables or similar structures representing land ownership and tenure should include references to which laws and regulations define and govern both ownership types and land-use rights.

Table 2. Example of a structure to systematically clarify forest and land usage rights for different types of ownerships.

		Forest/Land Usage Rights				
		Leasehold	By permit	Communal Law (e.g. community forestry)	Conservation Easement	Protected Area
Ownership	Government					
	Communal					
	Private					

Beyond clear definition of land tenure rights, the enforceability of these rights, as well as recognition of these rights by Jurisdictions is of critical importance to the success of the IREDD program. Tenure must be acknowledged

for both legally recognized land usage rights that govern communal land tenure as well as land-use rights valid for a set period time and specific entities, like concessions and community forestry areas. Documenting all ownership and tenure types within a given Jurisdiction using spatially defined boundaries is critical in order to set baselines, determine eligibility of project actions and verify actual GHG reductions at both the Jurisdictional Government level and project level. Once a table detailing land ownership, tenure and land use is completed, a map with boundaries must be demarcated for each type of tenure. This map should be produced from data that is within 2 years of the Jurisdictional Government Application date. This does not require individual parcels to be demarcated, only the contiguous areas governed by each type of ownership and tenure scheme. For each type of ownership, the forest and land usage rights should be made explicit.

Rights Holders' Safeguards

Beyond the IREDD program design elements which must ensure rights holder safeguards, other elements on IREDD implementation must also meet these requirements. A significant amount of work has been undertaken to develop the REDD+ Social and Environmental Standards, (CCBA and CARE International 2010) which are entering a pilot phase with the first country and sub-national governments. While designed to voluntary adoption, these standards could help to set requirements to ensure rights holders' protections under the IREDD program as the REDD+ Social and Environmental Standards are specifically designed to guide national and sub-national entities in developing REDD policies and programs that safeguard the rights of indigenous peoples and local communities. These guidelines can be leveraged to ensure that safeguards are in place in the IREDD rules that are developed by the Compliance Mechanism and Jurisdictional Governments. The REDD+ standards are designed to work for new government-led REDD+ regime(s) implemented at national or state/provincial/regional level that are expected to emerge out of on-going UNFCCC and related negotiations, and are relevant for any form of fund-based or market-based financing. By providing a comprehensive framework of key issues to address with respect to the social and environmental performance of a REDD+ program, the standards provide guidance to assist with REDD+ design and also provide a mechanism for reporting on the social and environmental performance of REDD+ programs.

REDD Data and Project Tracking

A Jurisdictional Government must establish a transparent approval process that records and provides public access to all project activities that seek to generate IREDD offsets. Only activities that are registered with the Jurisdictional Government can be considered for IREDD Offsets. A registry would be used to track this information and the issuance of IREDD offsets. For projects, the Registry will at minimum contain the following information: the area(s) of activities using GPS coordinates and shape files, the land ownership and tenure, the implementing organization(s) responsible for the planned activities, the carbon rights holders (to the extent they differ for the implementing organization), and a well documented implementation plan for the proposed activities.

The Jurisdictional Government will use a registry approved by the Compliance Mechanism to store and manage all the data required for the IREDD program. For registration of REDD project areas the initial data required will include an upload of all shape files for the project areas, the documents required under the registration process and an approval document demonstrating the Jurisdictional Government approval and the 3rd party approvals as required. This registry can also track the crediting baseline data for projects and the monitoring data required by projects. There are existing registries such as Markit or APX where much of the functionality that is needed to support IREDD is operational and internationally accepted. These registries can be leveraged to by the Compliance Mechanism, Jurisdictional Governments and other market participants to eliminate the requirement to develop registries.

2.3. Step 3. Validation of the Technical Requirements Needed to Support Carbon Accounting

A number of technical elements must be put in place before Jurisdictions are ready to support the creation and administration of IREDD offsets. As for the institutional readiness (step 2), one or more formal validation steps are needed in which the technical capacity and data that has been developed by the Jurisdictional Government are independently validated. This section contains a very high-level background on the steps that are required to create a business as usual and crediting baseline. Setting the exact level of detail of technical requirements that is put forward by the Compliance Mechanism and REDD Standards Board (vs. the level of detail that can be specified by the Jurisdiction) is a delicate exercise in which ensuring data quality must be balanced with incentivizing innovation. This section contains some suggestions for setting this level.

Principles of REDD Quantification

Following the general principles of the Intergovernmental Panel on Climate Change Good Practice Guidance (IPCC GPG) approach to greenhouse gas accounting, emissions are calculated by multiplying activity data with emission factors. Within the context of REDD, activity data are the difference in areas of land-use and land-cover change, while the emission factors are the emissions associated with the types of land change, which are closely related to the differences in carbon stock density. Therefore, calculations for REDD emission reductions require at least three sources of data: (1) historical and current remote sensing data to quantify activity data, (2) carbon stock densities to develop emission factors, and (3) social data to measure leakage and non-biomass related emissions.

- **How can data quality be ensured?** Due to the (1) complexity in defining standard measurement procedures and (2) the rate of technological innovation, especially for remote sensing, the development of overly prescriptive standard procedures that are to be followed by the analysts working for the Jurisdictional Government should be avoided[7]. Rather than relying on standardized procedures to ensure data quality, the IREDD program rules and guidelines must specify a minimal precision of the data, as well as an unambiguous procedure to quantify the precision. Only credits for which the input data attain the minimal precision will be valid to become IREDD offsets. The exact thresholds and parameters that define the minimal precision is a political decision. For example, it could be required within the bilateral agreement between the Jurisdictional Government and Crediting Mechanism that all data have a minimal precision level of 25% at a confidence level of 90%[8].

- **How can good quality of measurement be incentivized?** To assure that all IREDD offsets remain real, calculations must be discounted according to the aggregated uncertainty, as calculated using error propagation or a Monte Carlo analysis[9]. Only the emission reductions that would be attained with e.g.,

[7] Some standard procedures may be developed where it makes sense. The measurement of biomass stock densities using allometry is a perfect example of a procedure that should likely be standardized at the PE level. In contrast, remote sensing analyses are much more challenging to standardize since the operations are likely more subjective. In addition, remote sensing data products are evolving at a rapid rate

[8] Note that combining variables that have 90% precision in an equation will reduce the precision of the result of the equation to below 90%. The IREDD agreement must specify the data elements that are subject to the minimal precision set forward in the IREDD agreement.

[9] In an error propagation approach, the error of the result of a mathematical operation on multiple data elements with a defined precision is calculated using simple rules that are generally overestimating the error. In a Monte

90% confidence are to be considered real. The discounting procedure also promotes better measurement since higher precisions will lead to more emission reductions. Project proponents have a direct incentive to invest in reliable monitoring and verification systems since these will lead to more IREDD offsets.

Baselines - General Principles

Carbon credits are calculated by subtracting the crediting baseline from the actual greenhouse gas emissions. The crediting baseline does not only represent the business-as-usual scenario, what would have happened in absence of the IREDD program, but also includes the uncertainty associated with the business-as-usual scenario. In other words, the greenhouse gas emissions from the crediting baseline are always smaller than the greenhouse gas emissions under the business-as-usual scenario, and thus, the calculated IREDD offsets are smaller than the actual emission reductions. Baselines are usually expressed as a volume of CO_2 equivalents per year. However, in some circumstances, baselines are expressed as a change in the hectares of forest area per year within this section. Table 3represents baselines expressed as either a change in area (top panel), or a change in emissions (bottom panel). Note that only in cases where emissions from deforestation are included, there is a direct relation between emissions and a change in forest area. In case emissions from forest degradation are included, it is better to only express a baseline as a change in emissions. To develop a crediting baseline, three steps are necessary.

- **Extrapolate historical rates of deforestation (and degradation)**. The historical extrapolation is the direct linear extrapolation of past deforestation observations into the future. It is calculated by developing a time series of wall-to-wall historical land-use and land cover maps, and calculating the rate of deforestation. Once the historical analysis is completed and validated, it is set for the entire Crediting Period.

- **Adjust historical extrapolation to a business-as-usual baseline**. The business-as-usual line represents the forest dynamics that are truly expected to happen, given not only the historical deforestation rates, but also expected changes in economic development, increase in population, and scarcity of forest land. In practice, it is calculated by adjusting the historical extrapolation upward or downward using various factors. Similarly as for the historical extrapolations, it is set for the entire Crediting Period.

- **Apply crediting factors to create the crediting baseline**. The business-as-usual baseline is adjusted to a crediting baseline which can be used to calculate offsets. The crediting baseline represents the emissions from landuse and landcover change that can be generated at the Jurisdictional level. The crediting baseline may be re-visited and possibly recalculated at regular intervals during the Crediting Period (e.g., every 10 years as is illustrated in Figure 3) to ensure that a deforestation goal that was set forward in a IREDD program rules and guidelines is effectively reached by the end of the Crediting Period.

Carlo approach, the resulting error is calculated by simulating a large series of possible input data elements and their effect on the result.

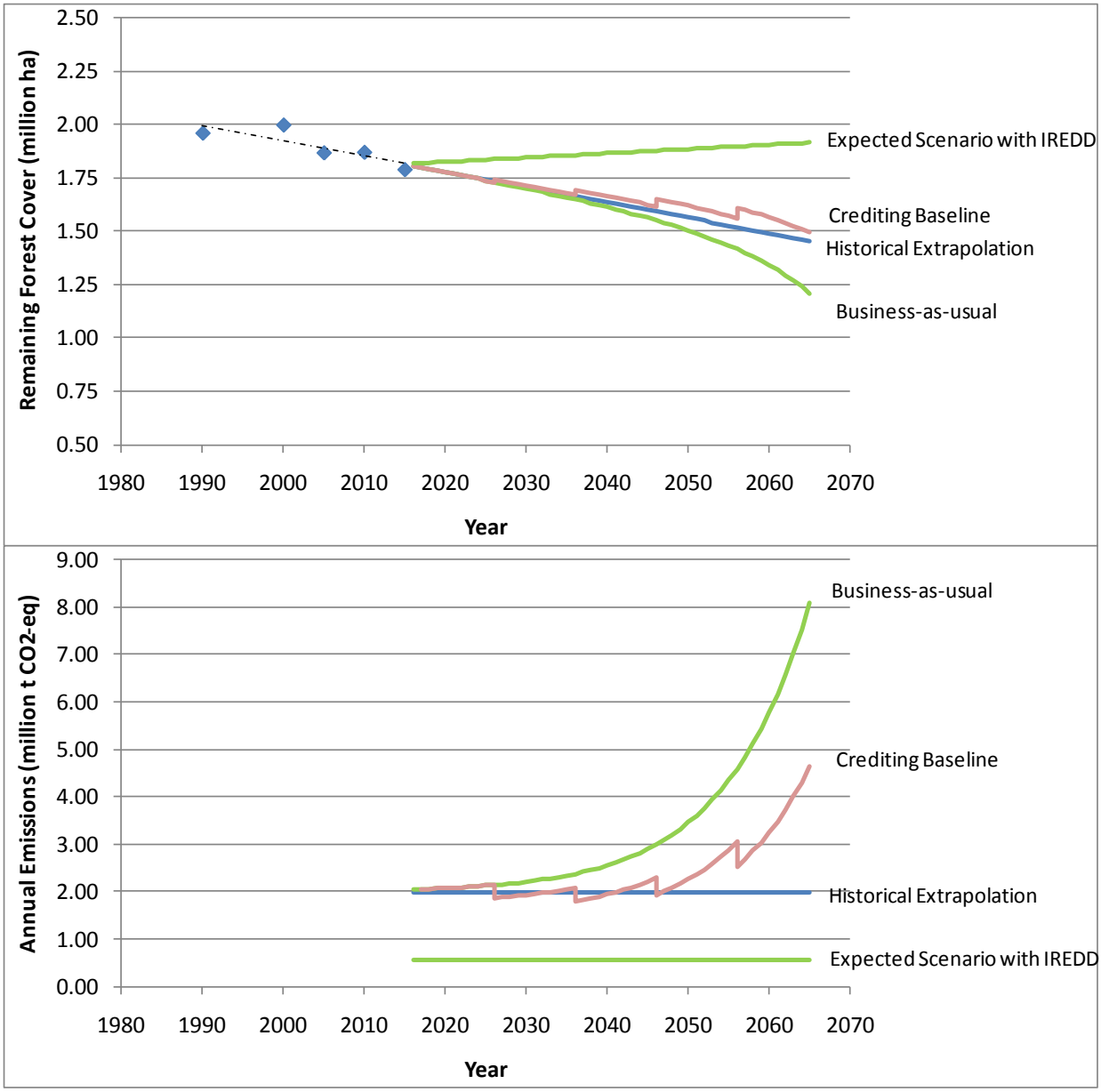

Figure 3. Remaining forest cover and annual emissions at the PE level. In the example, the Compliance Period starts in 2015.

In Figure 3, the crediting baseline is adjusted every 10 years, the duration of the crediting baseline validation period.

Spatial and Temporal Boundaries for Jurisdictions

- **Spatial boundaries**. There is an optimal size of the total area that is entering the bilateral agreement. If the size is too small, the administrative overhead and related transaction costs will become prohibitive. Also, the pooled risk will be too great and the buffer pool mechanism will not be effective. In addition, smaller areas will have a greater potential for leakage across their boundaries, and trans-boundary. In conclusion, it could be required to put forward a minimum size of the total land within the Jurisdiction,

e.g., 2 million ha[10]. Larger areas have the risk becoming unmanageable and contain too many possible combinations of land-tenure context, land class, and deforestation dynamics so that monitoring becomes overly complex. It is not necessary to require a maximum size of the Jurisdiction. The complexity of a monitoring increases with increasing size of the Jurisdiction, and at a certain size, the extra complexity of managing the monitoring of an area with a larger size will not justify the greater potential to generate REDD offsets.

- Within the context of spatial boundaries, a distinction must be made between intra-boundary leakage and trans-boundary leakage. Intra-boundary leakage is automatically accounted for in an IREDD program since all credits are reconciled with changes in land cover at the Jurisdictional level. Intra-boundary leakage is beyond the geographical scope of the Jurisdiction, and can either be accounted for using discounting factors, or using specific agreements with neighboring Jurisdictions where the leakage is occurring, or perhaps even through a reconciliation at a national level based on national-level monitoring. The latter of the approaches may prove to be very difficult and complex since even more stakeholders are introduced in the accounting process. In addition, in many cases there will be no direct causal relation between the deforestation observed outside the boundaries of a Jurisdiction and project actions occurring within the Jurisdiction. In any case, the IREDD program rules and guidelines must set forward clear rules and regulations on how trans-leakage should be accounted for.

- **Temporal boundaries**. The optimal frequency of verification and the maximum duration of individual projects are dependent on factors such as the expectation of future economic development and the political stability. We recommend that a Compliance Mechanisms requires a Jurisdiction to fix a specific frequency of verification and a maximum duration in an IREDD agreement within a range of possible values.

- **GHG Boundaries and Carbon Pools**. Following the CDM, the PE level requirements must include secondary emissions from all sources. A well-defined list of exceptions may be added. Regarding carbon pools, it is sensible to follow the approach of voluntary carbon standards and define at the PE level which carbon pools must be included in the carbon accounting (at minimum the aboveground and belowground carbon in trees), which pools are optional together with the inclusion criteria, and which carbon pools are excluded. In areas of peat swamp forests, it may be required to include peat as a carbon pool.

Historical Deforestation Rates

The only way an IREDD program to be truly inclusive is if a spatially explicit and comprehensive ("wall-to-wall") baseline is available. This section contains a brief overview and analysis of the importance of the most important parameters of a historical deforestation rate analysis. The issues outlined in this section are discussed at length in Baker et al. (2010) and The Terrestrial Carbon Group (2010).

- **How many images should be included in a historical land-use change analysis?** The baseline that is to be developed by or for the PE must be based on an analysis of historical land-use change rates. As an absolute minimum, the analysis of historical deforestation must be based on three images, so that two rates of deforestation are available. For example, very often a time series of Landsat from around 1990,

[10] The smallest entity within the Governors' Climate and Forests Taskforce is the Cross Rivers State in Nigeria with an area of 2 million ha.

2000, and 2005 are used to quantify historical deforestation. However, it is strongly recommended to require at least 4 or 5 images. The comparison of remote sensing images is often complicated due to changes in phenology. Therefore, it is often challenging to determine whether observed changes in spectral signature are due to land use changes or changes in seasonality.

- **What about the second D?** Current global estimates of forest dynamics focus on conversion of forest land to non-forest land. However, these estimates often do not include emissions from forest degradation, where densely stocked forests are converted into sparse forest. Even though current remote sensing sensors are able to detect differences in biomass stock density, insufficient historical images are available to develop a reliable analysis of the rate of forest degradation. Analogously as for the analysis of historical deforestation rates, the analysis of historical forest degradation rates require a minimal number of historical images, which are simply not available yet in the case of forest degradation. Therefore, at least at first, it will be very challenging to develop a reliable forest degradation baseline. The IREDD program must recognize this and provide incentives to the Jurisdiction to start acquiring remote sensing (RS) data of sufficient quality to quantify forest degradation during the Crediting Period, so that at some point in the future, when sufficient historical forest degradation data are available, a baseline that includes forest degradation can be developed and offsets from avoided forest degradation can be generated. In addition, even if at first no RS-based forest degradation baseline can be developed, a mechanism could be allowed in which offsets from increases in forest biomass can be generated. This mechanism can only be allowed on areas where no or limited natural regeneration is taking place.

- **What can the Jurisdictional Government prescribe to standardize RS analysis done by the project proponents?** Instead of requiring that project proponents follow an overly prescriptive remote sensing procedure that may soon to be found obsolete, guidelines must be developed that only require the use of a common classification key during remote sensing analysis. Having a common classification key among projects will simplify reconciliation between project-based accounting and Jurisdictional-level accounting and streamlines the accuracy testing. Only when a common classification key is used, can the quality of a land-use change product can be checked by truly independent analysts. Note that the land categories in the classification key include both forest and non-forest classes. In addition, this classification key should be hierarchical in nature, so that more precise classes remain retrospectively compatible with broader classes. At the highest level, the six top-level land categories for greenhouse gas inventory reporting from the IPCC Report on Good Practice Guidance for Land Use, Land-Use Change and Forestry (section 2.2) could be used. More refined levels could split the forest class according to forest type and stocking density. The wall-to-wall land use and land cover analysis at the Jurisdictional level should be done using at minimum the six top-level land categories.

The IREDD program rules and guidelines must require that all historical land-use change analysis executed by the Jurisdiction is validated by a third party. Only when the historical analysis is cross-checked and verified by the third party, the data can be used to inform the business-as-usual baseline.

Business-as-Usual

Historical deforestation rates are not necessarily a good predictor of future deforestation rates. In areas where forest cover is high and economic development low, deforestation may accelerate over time. Conversely, when forest cover is low, deforestation may decrease. Future deforestation rates can be quantified by adjusting the historical deforestation/degradation rates to local circumstances. We strongly recommend keeping the adjustment

procedure as simple as possible and the number of parameters that can be considered limited. In practice, it is extremely difficult to parameterize the impact of each of the local circumstances. A detailed overview of the different design options to adapt historical observations for local circumstances can be found in da Fonseca et al. (2007) and Busch et al. (2009). We propose to use the following parameters to adjust deforestation rates for local circumstances:

- Current and expected population density
- Current and expected GDP per capita
- Relative forest area
- Governance variables.

Historical deforestation rates can be adjusted by a factor that is dependent on these four factors. In other words, using the factors above, a number of discrete cases of local circumstances can be defined, such as "high forest cover, low historical deforestation rate, high development potential", or "low forest cover, high historical deforestation rate, high development potential". For each of these discrete cases, a maximal adjustment factor can be set by the Compliance Mechanism (for an example, see Table 3). The IREDD program rules and guidelines can determine the exact adjustment factors by running a scenario analysis using a global cost/benefit model for REDD such as OSIRIS (Busch et al., 2009).

Table 3. Example of how historical observations can be adjusted according to local circumstances to develop a business-as-usual baseline.

Historical Deforestation	Remaining Forest Cover	GDP/ Capita	Adjustment of Historical Baseline to get Business-as-Usual
>0.5%	<25%	>$500	Adjust historical baseline emissions downwards with 0-20%
>0.5%	<25%	<$500	Adjust historical baseline emissions downwards with 0-20%
<0.5%	<50%	>$500	Use historical baseline without adjustment
<0.5%	<50%	<$500	Use historical baseline without adjustment
>0.5%	>50%	>$500	Use historical baseline without adjustment
>0.5%	>50%	<$500	Use historical baseline without adjustment
<0.5%	>50%	>$500	Adjust historical emissions baseline upwards with 0-10%
<0.5%	>50%	<$500	Adjust historical emissions baseline upwards with 0-20%

After the adjustment factors are defined and validated, the business-as-usual scenario is fixed for the entire Crediting Period, but subject to updates according to the guidelines for baseline resets.

Crediting Baseline

Once the business-as-usual emission level is available, a crediting baseline must be set. A crediting baseline established below the business-as-usual reference emission level is proposed so that IREDD offsets remain conservative and are adjusted for gradual increases in the efficiency of emission reductions. The factor by which the business-as-usual emission level is adjusted to achieve the crediting baseline should be well calibrated using a scenario-analysis and a model such as OSIRIS (Busch et al., 2009). If the adjustment is too high and occurs too rapidly, project proponents will be discouraged from implementing projects. If the phasing out occurs too slowly, the potential to generate IREDD offsets that are not real or verifiable increases. Since it is impossible to predict what the effects will be of a large-scale IREDD program on forest dynamics, we recommend allowing the crediting

baseline to be adjusted during the Crediting Period, in a pre-defined manner based on the success of the IREDD program. Obviously, the rules to adjust the crediting baseline must be fixed. The crediting baseline can only be changed at certain "gates" during the Crediting Period, and the change must be specified in the REDD program rules and guidelines and explicitly validated by a third party. We will refer to the period in between two gates as "crediting baseline validation periods". The concept of crediting baseline validation periods is illustrated in Figure 3. Every 10 years from 2015 onwards, the crediting baseline is adjusted, resulting in the jagged curve of the crediting baseline as shown in Figure 3.

Forest Carbon Stock Measurements at the PE-level

Quantifying the total greenhouse gas emissions at the Jurisdictional level requires a network of permanent sampling plots to calculate the appropriate emission factors. Further guidance on setting up and measuring permanent sampling plots can be found in text such as Pearson et al. (2008). We will limit the scope of this section to a discussion of broad design elements to measure forest carbon stock measurements. Once the permanent plots are established, they must be measured periodically (every two to three years). In addition, next to the network of permanent sampling plots, a set of randomly located non-permanent plots must be measured periodically to check the unbiased nature of the permanent plots. The network of permanent sampling plots, and the occasional non-permanent plots serve as a (1) source for setting high-level emission factors at the Jurisdictional level, (2) source of data to calibrate and validate remote sensing classification products, (3) reference dataset to detect gradual changes in forest biomass from forest degradation and forest regeneration, and (4) benchmark to test alternative carbon stock density quantification methods. Given the importance of having access to a set of permanent sampling plots, it is recommended to standardize the carbon measurement procedures as much as possible. Project proponents may only use carbon stock density quantification procedures of which the precision exceeds the precision of the standardized procedures.

Making a Crediting Baseline Geographically Explicit

Even though a jurisdictional crediting baseline is representative for a large region, it cannot be directly used for individual projects or areas within that region. A larger region will always have smaller areas with higher or lower deforestation rates compared to the average deforestation rate. REDD projects should only be developed on areas that are effectively under a deforestation threat. Therefore, the sub-national area must be broken down into smaller geographical units that have area-specific baselines, as the basis for accounting of avoided unplanned deforestation at the project level.

Baselines developed by project proponents tend to be expensive to produce, incompatible with other baselines and only applicable for the conditions in the specific project area. On the other hand, top-down baselines often lack the detail necessary to do project-level accounting. We recommend using a hybrid approach, in which the baseline *quantity* of deforestation is fixed for fairly small geographically defined forest strata, while the exact *location* of deforestation may be set by a project proponent, and must still be approved by a third party.

- **Stratifying the Jurisdictional area**. Once the historical deforestation or degradation rate is available at the Jurisdictional level and third-party validated, it must be made geographically explicit by distributing the deforestation/degradation rate over smaller spatial units ("strata") in such a way that the area-weighted average deforestation/degradation rate equals the Jurisdictional-level deforestation/degradation rate. The stratification must be conducted by the Jurisdiction and may be based on orohydrographic features (proximity to waterbodies, slope, aspect, etc.), biophysical features (soil type, vegetation type, etc.), condition of the forest, or socio-political features (tenure regime, population density, etc.). Further

guidance for forest stratification can be found in forestry handbooks (e.g., Hoover 2008). It is envisioned that strata of about 500-1,500 ha are ideal. For large Jurisdictions, we recommend to develop the stratification system in a hierarchical fashion. The total Jurisdiction is first split up in broad areas according to broad institutional and biophysical conditions that can be envisioned as "reference regions." Within each reference region, different forest strata can be defined (The Nature Conservancy and Baker & McKenzie 2010, Cortez et al. 2010).

- **Identifying the deforestation risk for each stratum**. Ideally, the breakdown of a Jurisdictional-level crediting baseline into smaller spatial geographical units is based on a land-use change model. However, calibrating a fully spatially resolved land-use change model for a geographical region as large as a Jurisdiction is technically challenging. Very often, the accuracy of the results of a land-use change model is low and the model outcome is not robust. Therefore, instead of using a land-use change model that yields detailed predictions with high spatial detail, it is more opportune to introduce a broad discrete risk rating system in which 500-1,000 ha tracts of forest land are divided into 5-7 "deforestation risk" classes, as illustrated in Figure 4. Following Poffenberger et al. (2010) and Lambin and Geist (2006), the deforestation risk class could primarily be set based on:

    (1) *Historical deforestation and proximity to previously deforested areas.* The deforestation risk is usually highest near areas that have been recently deforested.

    (2) *Physical constraints from geography*. Elevation, slope and aspect often have a dominant influence of the suitability of land for various non-forest uses.

    (3) *Remaining forest cover*. In most areas, forest cover will not fall below a minimal forest cover threshold.

The relationship between deforestation risk and proximity to deforested areas can be empirically calibrated based on historical observations of deforestation and the spatial driver variables.

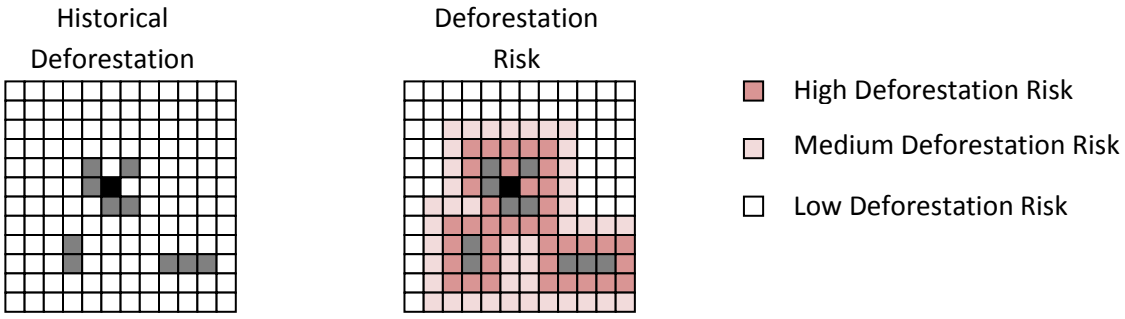

Figure 4. Deforestation risk as a proxy for making an entity level crediting baseline geographically-explicit. Grey and black squares indicate areas that have been deforested in the past. Red shades indicate the broad deforestation risk class. In this example, areas that are closer to the deforested areas have a higher deforestation risk class.

Once the deforestation risk classes are calculated for each forest stratum by the Jurisdiction, and the total area in each of the deforestation risk classes is known, it is possible to assign a crediting baseline to each deforestation

risk class. Obviously, assigning a crediting baseline to a deforestation class must be done in such a way that the crediting baseline at the Jurisdictional level equals the sum of the crediting baselines at the forest stratum level.

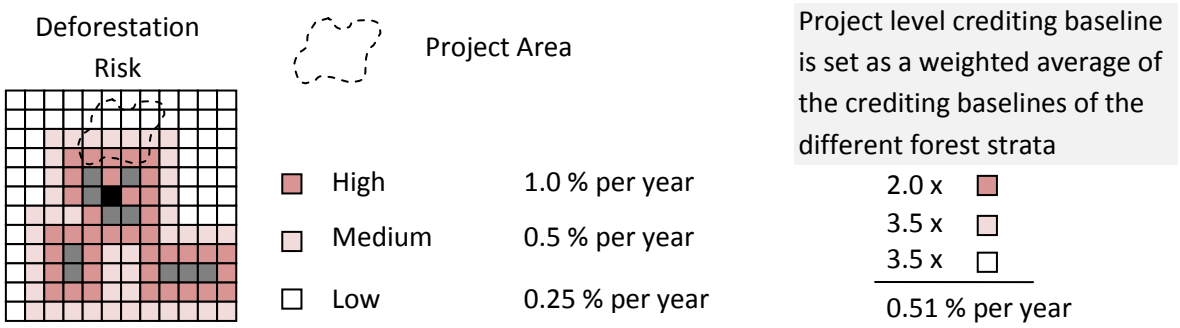

Figure 5. Project-level crediting baseline is set as a weighted average of forest-strata crediting baselines

Refining of the crediting baseline by project proponents. The project level crediting baseline only sets the *quantity* of deforestation, the *location* of deforestation still has to be set by project proponents. Since the calculation of offsets is based on emission factors and discrete land-use and land-cover classes, setting the location of deforestation is equivalent to setting the deforestation rate for each of the land classes found in the project area. As a conservative assumption, it could be required that the baseline deforestation should take place first on forest areas with lower forest carbon stock density, unless a more sophisticated land-use change model is calibrated by the project proponents and a completely spatially explicit crediting baseline that must be validated.

2.4. Step 4. Offset Issuance and Performance Pool Activation

Once Steps 1 to 3 are complete and all requirements for 3rd party validations, REDD Standard's Board Approvals and Compliance Mechanism Approvals are met the Jurisdiction is ready to activate their IREDD program and have IREDD offsets issued that can accepted under the Compliance Mechanism.

Project and Project Proponent Eligibility

- **Project Eligibility.** The Compliance Mechanism should provide clear eligibility criteria for projects. These criteria will depend on the exact project type (RED, REDD, REDD+, IFM, A/R, or ALM). Most project eligibility criteria will be similar to the eligibility criteria found in project-based programs such as the CDM and VCS. Typical eligibility criteria are the requirement of a specific land-cover status at some point in the past (e.g., REDD projects can only be developed on land that has been under forest cover for the past 10 years), or the requirement to have prior informed consent of all stakeholders living in the project area, etc.

- **Proponent Eligibility**. Types of project proponents include private landowners, concession holders, private entities, NGOs, community groups or others who have land management ownership or usage rights or have been legally appointed to act on behalf of land owners or managers.[11] The Compliance Mechanism may set forward criteria for project proponents to be allowed to participate in IREDD program. These criteria must ensure that project activities and IREDD offsets are generated with the highest integrity. One obvious example of such a criterion is the requirement that the project proponents

[11] The VCS has a detailed definition of project proponent that can be used under the IREDD program.

have the sole rights to the carbon. Other requirements that impact the project proponents' ability to participate in the IREDD market are solvency and technical capacity to implement and monitor project activities according to commercial standards.

Project Registration

Project registration occurs when a project proponent(s) seeks to develop a REDD project and have IREDD offsets recognized under a Compliance Mechanism where the Jurisdiction has been approved. A REDD project will require a specific validation during which project activities will be explicitly approved based on an in-depth description of technical details and the ex-ante credit calculations. Project verification is the ex-post check of the quantification of actual IREDD offsets that were generated by the REDD project. At each stage in the process, a third-party will check that the data provided is rigorous, the calculations of baseline, project estimates, secondary emissions, and additionality are correct, and all necessary criteria and requirements were followed.

Monitoring by Jurisdictional Governments

All greenhouse gas emissions and removals related to land-use change must be monitored at the Jurisdictional level. The quantification of emissions at the Jurisdictional level requires (1) an annual wall-to-wall remote sensing analysis similar to the one used to analyze the historical deforestation rates, (2) a re-measurement of the carbon stock density in the permanent sampling plots. Exact procedures and limitations of remote sensing procedures and carbon accounting procedures in general are covered extensively in the literature (e.g., Baker et al. 2010 and The Terrestrial Carbon Group 2010).

Monitoring by the Project Proponents

All project activities that will lead to emission reductions from which IREDD offsets are generated must be carefully monitored by the project proponents. The requirements for monitoring of the project activities must be set by the Jurisdiction, and broad requirements must be agreed in the IREDD agreement. Monitoring includes tracking the implementation and geographic location of any action that reduces deforestation, together with an analysis of any potential secondary effects such as leakage and emissions from sources. Next to monitoring of the implementation of the project activities, the effects of the project activities on the carbon stocks must be quantified. Project proponents must have the choice to either use the Jurisdictional monitoring of carbon stocks, or perform more precise measurements, as long as the level of precision is quantified in an unbiased manner. A mechanism must be included to reward project proponents for more precise measurements; this can be done through an accuracy deduction mechanism.

Resetting the Crediting Baseline

The section "Determining the ARB accepted Crediting Baseline" details the setting of baselines at the Jurisdictional and project levels. These baselines must be updated at regular time intervals, or when specific triggering conditions take place, such as the occurrence of a large natural catastrophe. All events that may trigger a baseline update must be clearly defined in the IREDD program. When the Crediting Baseline is updated at the Jurisdictional level, it also must be updated at the project level.

Activation and Management of Performance Pools

As outlined in section 1.3, three performance pools are established in the design of IREDD program: (1) the Jurisdictional Performance pool, the (2) Project permanence pool and (3) REDD mitigation cost pool. The Jurisdictional performance pool and REDD mitigation cost pool are funded with credits from Jurisdictional level performance and from areas of sanctioned deforestation. Credits are placed in these pools and used to convert

qualifying project credits into IREDD offsets for use in a Compliance Mechanism. Within this mechanism credits based on actual performance are placed in the pools, and when projects meet IREDD offset requirements and complete the validations they are deducted from these pools and converted into IREDD offsets. To insure against the permanence risk for registered projects, the Project Permanence Pool will be populated with IREDD offsets from by registered projects. Figure 6 depicts the performance pools and the flow credits and IREDD offsets. The quantity of credits placed in the Project Permanence Pool is based on an assessment of Project-specific risk using a pre-determined set of risk factors, much like the way project-based performance pools work under the VCS and CAR standards in the Voluntary Markets.

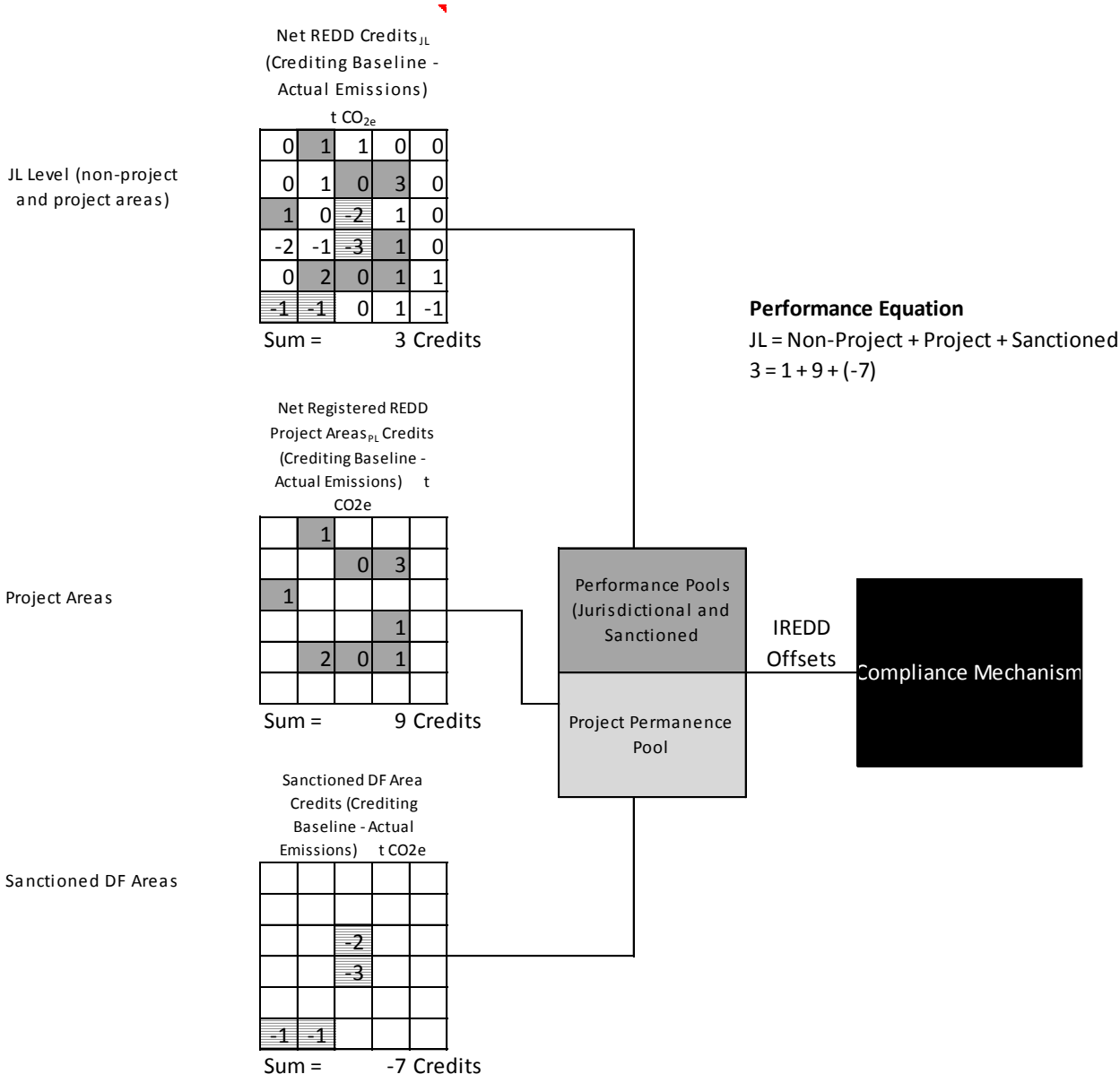

Figure 6. Conceptual example of the calculation of the flow of credits and its relation to the performance and project permanence pools.

3. Pathway from Project-Based Accounting to a Fully Functioning IREDD

The ability to issue IREDD Offsets requires a substantial amount of institutional capacity that is not available today in most jurisdictions that would benefit from an IREDD program and the resulting market. However, by adopting a phased approach, project level REDD offsets can be generated - within specified limitations, as this institutional capacity is developed. In addition to creating an incentive for early action, this phased approach will engage private and governmental stakeholders from the very beginning and provide valuable experience necessary for the development of this institutional capacity and drive critical private funding to REDD projects.

As Jurisdictional Governments develop their capacity and gain sufficient experience to support the creation, registration, and tracking of IREDD Offsets under the IREDD program, the early action of pre-IREDD projects can be used to support the development of institutional accounting framework for a fully nested REDD program. We outline four discrete phases in this pathway.

3.1. Phase 1. Pre-IREDD Project Offsets Phase

In the first phase, REDD offset from projects that aim to become part of a future compliance system must register with the Jurisdictional Government and meet the requirement under an approved program. In this phase, projects may be based on previously developed protocols or methodologies (E.g. VCS/CDM), providing that these have been approved by the Compliance Mechanism, and will be eligible for offset under the Compliance Mechanism providing that the requirements of the standards and any additional ones set by the Compliance Mechanism and Jurisdictional Government are met. In addition, there are limits on the number of projects and credits that can be generated, the crediting period, the period for project registration, validation, project start, and use of vintages of verified tons, as well as on the number of years during which a Jurisdictional Government can be recognized for project crediting before it moves to the next Phase.

During this phase, the Jurisdictional Government will develop institutional readiness, a historical baseline, and develop the required comprehensive procedures for classification and monitoring. At minimum, a hierarchical classification key and procedures for accuracy assessment of remote sensing analyses will be developed. At the end of the phase, the baseline will be submitted to a third-party validation body and certified, which will enable a transition to phase 2.

Benefits	• Inventory of all projects • No potential for double counting
Risks	• Project credits within the same Jurisdictional Government are not fully comparable, since they are based on different accounting procedures • The development of Jurisdictional Government-level monitoring procedures may take a very long time due to political maneuvering

3.2. Phase 2. Jurisdictional-level Baseline and Monitoring Procedures Adopted at the Project Level

In the second phase, projects registered under phase I must convert their baselines to the spatially explicit REDD emissions that have been developed and validated for the Jurisdictional Government. These projects must also adopt the classification and monitoring procedures developed at the Jurisdictional Government level. The transition to phase 2 crediting must happen within a relatively short time frame (e.g., 2 years) while still allowing

sufficient time to projects to undertake the necessary work. If projects fail to transition to the new baseline during this period, no new credits can be generated by the projects and a fully new project development document must be submitted to the third-party validators.

Since a standardized baseline is used, and the data requirements for monitoring will be identical across projects, Project Offsets from multiple projects will be directly comparable. This will allow the experiences of specific projects with the proposed classification and monitoring procedures to be shared and applied to other projects. In addition, an explicit third-party certification will be required during the baseline update to ensure that all projects use the correct baseline. The Jurisdictional Government will track project conversion status, receive the audit documents from the third-party validator and will register any new projects that are created during this phase.

Benefits	• Credits and performance are directly comparable • Experience can be gained to fine-tune monitoring procedures
Risks	• Leakage cannot yet be quantified at the Jurisdictional Government level • No true cross-check of the monitoring data is feasible, as Jurisdictional Government-level land use change data is not yet available

3.3. Phase 3. Baseline and Monitoring Adopted at the Jurisdictional-level

In the third Phase, the Jurisdictional Government will have developed the capacity to perform annual monitoring, conduct high-quality biomass inventories and execute some monitoring of social variables. Since wall-to-wall monitoring is taking place, activity-shifting leakage can be accounted for at the Jurisdictional Government level. Phase 3 credits must be discounted conservatively since no full reconciliation of the Jurisdictional Government level and the project level is achieved yet.

At the end of this phase, the reconciliation mechanism must be fully developed and, again, certified by a third party, to transition into the final phase. The monitoring data developed by the Jurisdictional Government, including land use change data and carbon stock change data must also be explicitly verified by a third party auditor, as agreed in the bilateral agreement. Project proponents are allowed to monitor at a higher level of accuracy than is done for the Jurisdictional Government-level database.

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