LAND TENURE JOURNAL

REVUE DES QUESTIONS FONCIÈRES

REVISTA SOBRE TENENCIA DE LA TIERRA

2·11

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LAND TENURE JOURNAL

The *Land Tenure Journal* is a peer-reviewed, open-access flagship journal of the Climate, Energy and Tenure Division (NRC) of the Food and Agriculture Organization of the United Nations (FAO). The *Land Tenure Journal*, launched in early 2010, is a successor to the *Land Reform*, *Land Settlement and Cooperatives*, which was published between 1964 and 2009. The *Land Tenure Journal* is a medium for the dissemination of quality information and diversified views on land and natural resources tenure. It aims to be a leading publication in the areas of land tenure, land policy and land reform. The prime beneficiaries of the journal are land administrators and professionals although it also allows room for relevant academic contributions and theoretical analyses.

REVUE DES QUESTIONS FONCIERES

La *Revue des questions foncières* est une publication phare, accessible à tous et révisée par les pairs de la Division du climat, de l'énergie et des régimes fonciers (NRC) de l'Organisation des Nations Unies pour l'alimentation et l'agriculture (FAO). La *Revue des questions foncières*, lancée au début 2010, est le successeur de la revue *Réforme agraire, colonisation et coopératives agricoles*, publiée par la FAO entre 1964 et 2009. La *Revue des questions foncières* est un outil de diffusion d'informations de qualité et d'opinions diversifiées sur le foncier et les ressources naturelles. Elle a pour ambition d'être une publication de pointe sur les questions relatives aux régimes fonciers, aux politiques foncières et à la réforme agraire. Les premiers bénéficiaires de la revue sont les administrateurs des terres et les professionnels du foncier, mais elle est également ouverte à des contributions universitaires et à des analyses théoriques pertinentes.

REVISTA SOBRE TENENCIA DE LA TIERRA

La *Revista sobre tenencia de la tierra* es una revista insignia, de libre acceso, revisada por pares de la División de Clima, Energía y Tenencia de Tierras (NRC) de la Organización de las Naciones Unidas para la Agricultura y la Alimentación (FAO). Es la sucesora de *Reforma agraria, colonización de la tierra y cooperativas*, que se publicó entre 1964 y 2009. La *Revista sobre tenencia de la tierra*, cuyo primer numero apareció a comienzos de 2010, es un medio de difusión de información de calidad que proporciona opiniones diversas sobre la tenencia de la tierra y los recursos naturales. Aspira a ser una publicación líder en el sector de la tenencia de la tierra, la política agraria y la reforma agraria. Los principales beneficiarios de la revista son los administradores de la tierra y los profesionales del sector aunque también da espacio a contribuciones académicas relevantes y análisis teóricos.

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REVUE DES QUESTIONS FONCIÈRES

REVISTA SOBRE TENENCIA DE LA TIERRA

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS

ORGANISATION DES NATIONS UNIES POUR L'ALIMENTATION ET L'AGRICULTURE

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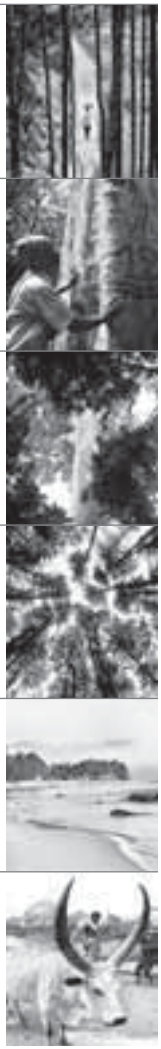

Preface

Thematic issue on land tenure and climate change

This thematic issue on land tenure and climate change was born in the aftermath of an expert group meeting organised by FAO in November 2010 to identify, review and raise awareness on key land and resource tenure issues and requirements for implementing climate change mitigation policies in the forestry and agriculture sectors. It was felt that there was a need for a platform to share information and experiences related to land tenure and climate change. This thematic issue aims to fulfill this need by bringing together theories and practices related to land tenure and climate change both from the mitigation and adaptation perspectives.

Despite the prominence of climate change questions in research, few studies have addressed the impacts of climate change on land tenure. Yet, the effects of climate change and their social and policy responses are causing changes to land tenure systems as well as to land use patterns. These changes are increasing competition over land, reducing access to resources and altering existing land tenure arrangements.

The increasing pressure on natural resources and the scale at which climate change adaptation

Préface

Numéro thématique consacré aux régimes fonciers et au changement climatique

Ce numéro thématique, consacré aux régimes fonciers et au changement climatique est né d'une réunion d'experts organisée par la FAO en novembre 2010, pour identifier, passer en revue et sensibiliser aux principaux enjeux fonciers sur la terre et les ressources naturelles ainsi qu'aux les conditions de mise en œuvre de politiques d'atténuation de changement climatique dans les secteurs des forêts et de l'agriculture. Il a été estimé nécessaire de mettre en place une plateforme d'échange d'informations et d'expériences sur les régimes fonciers et le changement climatique. Ce numéro thématique a pour ambition de répondre à cette nécessité, en rassemblant les théories et les pratiques liées aux régimes fonciers et au changement climatique, à la fois en termes d'atténuation et d'adaptation.

Malgré l'importance accordée au changement climatique dans la recherche, peu d'études ont abordé la question de ses conséquences sur les régimes fonciers. Les effets du changement climatique et les réponses sociales et politiques qui y sont apportées ont déjà modifié les systèmes fonciers et les modes d'utilisation des terres.

Prefacio

Número temático sobre la tenencia de la tierra y el cambio climático

Este número temático dedicado a la tenencia de la tierra y el cambio climático nació en el período posterior a la celebración de la reunión de un grupo de expertos organizada por la FAO en 2010. Dicha reunión tenía como objetivo identificar y examinar los problemas y requisitos relacionados con la tenencia de la tierra y los recursos, e intensificar la toma de conciencia sobre estas materias con vistas a la aplicación de las políticas de mitigación de los efectos del cambio climático en los sectores forestal y agrícola. Se estimó que existía la necesidad de crear una plataforma mediante la cual fuese posible compartir la información y experiencias relativas a la tenencia de la tierra y el cambio climático. Con el presente número temático se busca satisfacer esa necesidad, puesto que en él se han reunido diversas teorías y prácticas vinculadas a tenencia de la tierra y al cambio climático que se presentan tanto desde la perspectiva de la mitigación como de la adaptación.

Pese a la relevancia que en el campo de la investigación tienen los asuntos relacionados con el cambio climático, pocos han sido los estudios en que se han abordado las repercusiones que ese cambio ejerce sobre la tenencia

and mitigation measures need to be implemented make land tenure a central issue of concern. Flexible, realistic and fair solutions are needed to ensure the security of tenure and to clarify existing tenure arrangements. Climate change poses new challenges to tenure systems. Adaptation to climate change will in some places require that land is made available in safe and secure sites for temporary and permanent resettlements and that transparent compensations mechanisms are in place. From the climate change mitigation perspective, security of tenure is needed to foresee and plan management measures as well as to distribute benefits from compensation schemes. Mechanisms such as the Payment for Environmental Services (PES) are unlikely to succeed in the absence of an understanding of who holds the rights to land and carbon and tenure insecurity may also deter investments in the first place. This said, effective land tenure policies, institutions and measures are required to guarantee the security of tenure in the context of climate change. There is an urgency to act and to learn from various experiences and best practices.

The first four articles of this thematic issue concentrate on the REDD mechanism and on the PES looking at the implications they pose

Ces changements accentuent la concurrence sur la terre, réduisent l'accès aux ressources et modifient les arrangements fonciers.

La pression accrue sur les ressources naturelles et l'échelle à laquelle les mesures d'adaptation et d'atténuation liées au changement climatique doivent être mises en œuvre, font de la question foncière un sujet important de préoccupation. Des solutions flexibles, réalistes et justes sont nécessaires pour assurer la sécurité foncière et clarifier les arrangements fonciers existants. Le changement climatique soulève de nouveaux défis à l'égard des régimes fonciers. L'adaptation au changement climatique rendra nécessaire, dans certains cas, que la terre soit mise à disposition dans des sites surs et sécurisés – pour des installations temporaires ou permanente – et que des mécanismes transparents d'indemnisation soient mis en place. La sécurité foncière est également nécessaire en termes d'atténuation des effets du changement climatique, pour prévoir et planifier des mesures d'aménagement et pour répartir les bénéfices des systèmes d'indemnisation. Des mécanismes tels que les paiements pour services environnementaux (PSE) ont peu de chances de réussir si l'on ne sait pas qui détient les droits à la terre et au carbone. Par ailleurs, l'insécurité foncière peut également

de la tierra. Sin embargo, los efectos del cambio climático y las respuestas sociales y políticas que a él se asocian están provocando modificaciones en los sistemas de tenencia además de en las pautas de uso de la tierra. Esas modificaciones han determinado una mayor competencia por la tierra, acentuado las dificultades de acceso a los recursos y alterado los acuerdos de tenencia existentes.

El incremento de la presión sobre los recursos naturales y la escala en la que es preciso aplicar las medidas de adaptación al cambio climático y de mitigación de sus efectos hacen de la tenencia de la tierra un asunto que despierta graves preocupaciones. Para garantizar la seguridad de la tenencia y clarificar los acuerdos de tenencia en vigor, es necesario adoptar soluciones flexibles, realistas y justas. El cambio climático plantea nuevos desafíos para los sistemas de tenencia. Las intervenciones de adaptación requerirán que en algunas zonas se disponga de sitios seguros donde emplazar áreas de reasentamiento temporal o permanente, y que unos mecanismos transparentes de compensación estén ya en funciones. Desde el punto de vista de la mitigación de los efectos climáticos, la seguridad de la tenencia es vital para la previsión y planificación de las medidas de ordenación y la distribución de los beneficios que derivan de los planes

to land tenure and administration and proposing approaches to deal with the new challenges. The following two articles are centred around the adaptation of local tenure arrangements and livelihoods to climate change.

Finally, we would like to express our gratitude to the writers and many others, who have contributed to this thematic issue of the *Land Tenure Journal*.

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Director
Climate, Energy and Tenure Division

Paul Munro-Faure
Principal Officer
Climate, Energy and Tenure Division

décourager les investissements. Cela dit, il sera nécessaire de mettre en place des institutions et des mesures foncières efficaces pour garantir la sécurité foncière dans le contexte du changement climatique. Il est urgent d'agir et de s'inspirer des diverses expériences et pratiques existantes.

Les quatre premiers articles de ce numéro thématique se centrent sur le mécanisme de REDD et les PSE, en examinent les conséquences sur les régimes fonciers et l'administration foncière et proposent des approches destinées à affronter les nouveaux défis. Les deux articles suivants se consacrent à l'adaptation des arrangements fonciers locaux et des moyens d'existence au changement climatique.

Nous voudrions, enfin, exprimer notre gratitude à tous les auteurs et à tous ceux qui ont contribué à la réalisation de ce numéro thématique de la *Revue des questions foncières*.

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de compensación. Es poco probable que mecanismos como el pago por servicios ambientales (PSA) puedan tener éxito si no se sabe quiénes son los individuos que tienen derechos sobre la tierra y las emisiones de carbono; por lo demás, la inseguridad de la tenencia puede en primer lugar representar un impedimento para las inversiones. Partiendo de esta constatación, se requieren políticas, instituciones y medidas eficaces para garantizar la seguridad de la tenencia en un contexto de cambio climático. Es urgente actuar y aprender de las diferentes experiencias adquiridas y de las mejores prácticas existentes.

En los primeros cuatro artículos de este número temático se estudia el mecanismo REDD y los PSA, se analizan sus consecuencias para la tenencia y la administración de la tierra, y se proponen métodos para hacer frente a los nuevos retos. Los siguientes dos artículos se centran en la adaptación de los acuerdos de tenencia y los medios de vida locales al cambio climático.

Por último, deseamos expresar nuestra gratitud a los autores y a muchas otras personas que han contribuido a la realización de este número de la *Revista sobre tenencia de la tierra*.

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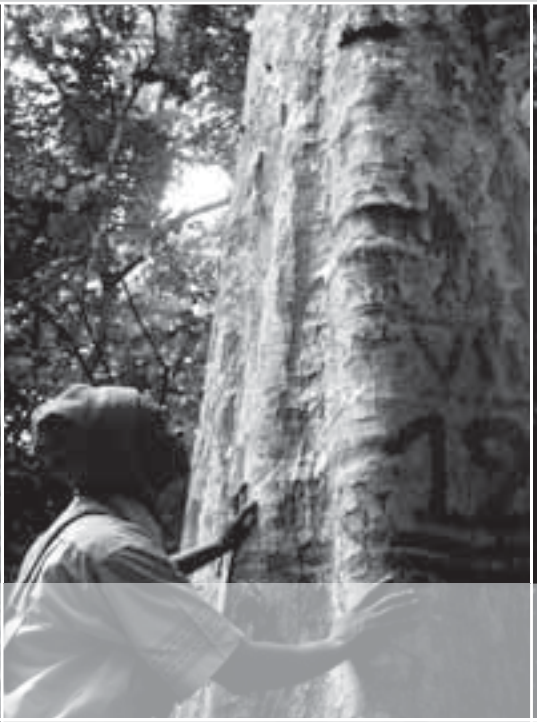



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EDITORIAL
Land tenure challenges in a changing climate

ÉDITORIAL
Les défis fonciers du changement climatique

EDITORIAL
Desafíos para la tenencia de la tierra resultantes del cambio climático

ABSTRACT

LAND TENURE

CLIMATE CHANGE

GOVERNANCE

Tenure security is central to the sustainable management of land and other natural resources and should be mainstreamed into climate change mitigation and adaptation schemes. Drawing from articles in this thematic issue, this editorial consolidates arguments raised and positions maintained by the authors. The articles highlight the fundamental importance of tenure security, recognition of rights and strong governance structures for climate change mitigation and adaptation schemes to be effective. Without these prerequisites, schemes may threaten the livelihoods of many and especially those of the vulnerable and voiceless. Various administration systems are discussed by authors including the comparison between full scale registration and more basic recording of rights. Authors

RÉSUMÉ

RÉGIMES FONCIERS

CHANGEMENT CLIMATIQUE

GOUVERNANCE

La sécurité foncière est un élément central de la gestion durable des terres et des autres ressources naturelles et elle devrait être prise en compte dans les plans d'atténuation et d'adaptation au changement climatique. En se fondant sur les articles du numéro thématique, cette note de la rédaction renforce les arguments soulevés et les positions affirmées par les auteurs. Ces articles soulignent l'importance fondamentale de la sécurité foncière, de la reconnaissance des droits et de l'existence de structures fortes de gouvernance pour que les plans d'atténuation et d'adaptation au changement climatique soient mis en œuvre avec efficacité. Sans ces conditions préalables, ces plans pourraient menacer les moyens d'existence de nombreuses personnes et en premier lieu les

SUMARIO

TENENCIA DE LA TIERRA

CAMBIO CLIMÁTICO

GOBERNANZA

La seguridad de la tenencia es una cuestión central de la ordenación sostenible de las tierras y otros recursos naturales, y debería ser incorporada en los planes de mitigación y adaptación a los efectos del cambio climático. Este editorial, que refleja los conceptos de los artículos contenidos en el presente número temático, consolida las argumentaciones y las posiciones sostenidas por los autores. Los artículos manifiestan la importancia fundamental de la seguridad de la tenencia y el reconocimiento de los derechos y la necesidad de dar robustez a las estructuras de gobernanza para que los planes de mitigación y adaptación a los efectos del cambio climático puedan ser instrumentos eficaces. En ausencia de estos requisitos previos, tales planes podrían suponer una amenaza

also outline debates surrounding whether carbon rights should be tied to land and natural resources rights and, if they should, how this may be done. This editorial concludes by re-emphasizing the need to consider tenure issues and governance structures into climate change mitigation and adaptation equations right from the outset, despite potential higher resource and time costs such considerations may impose.

plus vulnérables et les sans voix. Divers systèmes d'administration sont examinés par les auteurs qui s'emploient notamment à comparer l'enregistrement complet des droits avec l'enregistrement des droits de base. Les auteurs soulignent également le débat qui entoure la question de savoir si les 'droits carbone' doivent être liés aux droits à la terre et aux ressources naturelles et, si c'est le cas, comment ce lien doit-il être mis en œuvre. L'éditorial conclut en soulignant de nouveau la nécessité de prendre en compte les questions foncières et les structures de gouvernance dans l'équation de l'atténuation et de l'adaptation au changement climatique dès le début, malgré les dépenses élevées en ressources et en temps que cela suppose.

para los medios de vida de muchas personas, en especial las vulnerables y las no representadas en la sociedad. Los autores debaten sobre varios sistemas administrativos, incluida la comparación entre el registro integral de los derechos y las formas más elementales del registro; y ofrecen una síntesis de la discusión que versa sobre si los derechos relacionados con las emisiones de carbono deberían estar vinculados a los derechos sobre la tierra y los recursos naturales y, si lo estuvieran, qué disposiciones de procedimiento sería menester adoptar para dar realidad a esa vinculación. El editorial concluye haciendo hincapié nuevamente en que es indispensable inscribir desde el principio las cuestiones de tenencia y las estructuras de gobernanza en la ecuación de mitigación y adaptación climática, pese a los posibles mayores costes en concepto de recursos y de tiempo que este tipo de consideraciones pudiese conllevar.

INTRODUCTION

Land and natural resources tenure is one of the factors that needs to be mainstreamed as an initial consideration in climate change actions for interventions to be effective and sustainable. Unclear or insecure tenure and poor governance are important drivers of deforestation and unsustainable land management, and therefore crucial areas to address in the forestry and agriculture sectors, in the context of climate change. While strong action to adapt to and mitigate against climate change is urgently needed in many places, it is important to acknowledge that land tenure arrangements have far-reaching implications for livelihoods and development, and clarification of tenure is therefore a process that must be carefully executed.

In recognition of the importance of this challenge, an Expert Group Meeting was organized by FAO in November 2010 to discuss the role of land tenure in climate change mitigation policies. The objective was to identify key land tenure issues that affect climate change mitigation initiatives, in order to inform ongoing processes and projects. The summary of the meeting can be downloaded from www.fao.org/climatechange/65623.

This thematic issue of the Land Tenure Journal was conceived in the aftermath of the Expert Group Meeting. The editorial recognizes that climate change interventions include both mitigation and adaptation and neither should be neglected. Therefore, articles on climate change adaptation have also been included to bring to the forefront issues related to tenure in the context of adaptation.

Climate change mitigation and tenure

Articles related to climate change mitigation in this thematic issue focus on the REDD+ policy mechanism (REDD+ stands for efforts for reducing emissions from deforestation and forest degradation; and conservation, sustainable management of forests, and enhancement of forest carbon stocks) and on the related policy tool, Payments for Environmental Services (PES). Their challenges and potential benefits are discussed in the context of land tenure. REDD+ is likely to have increasingly important implications for how forests are managed, who manages them, and the development of related rules and regulations in numerous developing countries. Hence, the REDD+

mechanism has implications for tenure and property rights, and institutional governance arrangements over forest resources. This raises several critical questions that need to be addressed before any scheme or project can be effective: How can property rights be secured within a meaningful time frame to ensure continuing natural resource access for dependent communities? Who should obtain (which) benefits from the REDD+ mechanism or carbon PES schemes? Should carbon rights be defined and allocated at all, and if so, on which scale and in connection with what other resource rights? What time and cost effective land governance structures could be promoted? If the questions related to tenure are effectively addressed, the political momentum currently behind mitigation schemes may provide not only an opportunity to address climate change, but also an entry point for tackling poverty and food insecurity in developing countries. Knox *et al.*, Mitchell and Zevenbergen, Barnes and Quail, and Karsenty and Assembé bring together a dynamic and important debate on REDD+ and climate change mitigation in relation to land tenure.

Climate change adaptation and tenure

The effects of climate change can result in changes to livelihoods, human settlements, land use patterns and tenure systems. These changes and variations will demand greater resilience and adaptive capacity from local resource users. Institutions are facing greater pressures to enhance systems for disaster risk preparedness and management, for reallocation and redistribution of land as well as for redefining use and property rights both in rural and urban settings. Hence, the regions most affected by climate change may require improved systems for land use planning and for facilitating both planned and spontaneous migration that could be temporary or permanent. Concerns related to climate change adaptation are discussed in two case studies in this thematic issue. Worliczek and Allenbach explore the adjustment of local land tenure systems to climate change in Wallis Island, part of the French Overseas Territory of Wallis and Futuna in the South Pacific. Bonnet and Hérault concentrate on the adaptability of pastoral societies in the Sahel to drought and climate hazards. Both cases highlight the role that existing policies and institutional structures can play facilitating the adaptation to challenges of climate change.

The effects of climate change can result in changes to livelihoods, human settlements, land use patterns and tenure systems

RECOGNITION OF TENURE RIGHTS, SECURITY OF TENURE AND CLIMATE CHANGE SCHEMES

Security of tenure is the certainty that a person's rights to resources will be recognized by others and protected when these rights are challenged. People with insecure tenure face the risk that their rights to resources will be threatened by competing claims, or even lost as a result of eviction. Climate change makes tenure security even more important. One major concern is that climate change initiatives could change the value of land and other natural resources, leading to increased competition and disputes over them. Associated policies may also curtail access to natural resources and restrict mobility constraining livelihoods and cultural practices. However, ensuring tenure security is highly challenging due to the inherent complexity of tenure systems and the existence of multiple systems in one place (e.g. statutory as well as customary) and the lack of governance and institutional capacities to tackle such complexities. For example, customary tenure systems are often composed of overlapping or evolving rights, which are then further imbedded in larger statutory tenure systems. In the context of climate change mitigation schemes, the possible need to define and allocate carbon rights would add another layer of complexity.

How should a climate change mitigation and adaptation scheme take into consideration these complexities? Tenure security should be addressed right at the beginning, before or during the design of adaptation and mitigation strategies. Karsenty and Assembé argue that the most important measure is to recognize the rights of parties who are managing forest resources, giving them incentives to undertake actions against deforestation and empower them to enforce forest protection. PES schemes may be necessary to achieve these objectives in some areas. Tenure security of people managing natural resources is essential to promote equitable distribution of benefits and responsibilities, to fulfill long-term mitigation objectives and to provide stability to attract financiers to fund the mitigation programmes. In addition, for both adaptation and mitigation schemes to be sustainable, it is crucial that the people managing resources are able to plan activities with a mid to long term perspective. Insecure tenure discourages long term planning in favour of maximum short term profit.

Tenure security should be addressed right at the beginning, before or during the design of adaptation and mitigation strategies

Several authors argue that the rights and institutional capacities of existing customary, communal and socially legitimate tenure structures should be recognized. For Knox *et al.* this approach would allow the relevant groups "to continue to function fluidly and informally, while making them visible so as to protect them from new or opposing claims". For example, in relation to climate change adaptation, Bonnet and Hérault demonstrate the importance of strengthening the tenure structures of pastoralists whose livelihoods are based on mobility over large areas of land. In addition to being a socio-cultural characteristic, the mobility of pastoralists is a way to adapt to climate variability and to ensure access to water and other natural resources.

The authors of this thematic issue have contributed to the argument that clarifying and recognizing rights to resources, including possibly to carbon, is important for climate change adaptation and mitigation. At the same time, authors have highlighted the difficulties in ensuring tenure security, especially within a short timeframe. In order to comprehensively address these challenges and to achieve tenure security, the constraints of technology, associated financial costs and the capacity of institutions and governance structures must be considered. Therefore, even though tenure security is seen as fundamental to the success of climate change mitigation and adaptation, the challenges of ensuring tenure security should not be underestimated. These issues are elaborated in the following sections.

In order to comprehensively address these challenges and to achieve tenure security, the constraints of technology, associated financial costs and the capacity of institutions and governance structures must be considered

GOVERNING TENURE SYSTEMS IN A CHANGING CLIMATE

Governance is a key aspect in the nexus between land tenure and climate change. The articles of this thematic issue demonstrate that a number of rules, processes and structures should be put in place at national, regional and local levels to manage natural resources in view of climate change adaptation and mitigation. These governing structures may either build on existing statutory and customary institutions or they may be specifically created to respond to challenges of climate change. The manner in which the decisions about the access to, use of and control over resources are implemented and enforced, as well as the way that competing interests in resources are managed, is as central to the success of climate change adaptation and mitigation, as it is to the livelihoods of people.

A central argument in this issue is that improving governance does not necessarily call for new institutions. Worliczek and Allenbach remind readers of the potential of existing tenure systems to provide efficient and effective services to adapt to climate change. Drawing on the case of Wallis Island, where land is allocated through ancestry and through contextual need, they maintain that the flexibility of customary tenure systems may in fact be ideal for adaptation purposes. The highly versatile system provides a flexible structure within which to plan and carry out adaptation activities, including the potential need to relocate populations from the coastal areas to the interior of the island. However, the authors note that attention should be paid to the structure of the customary systems to ensure that they are able to absorb tensions between different stakeholders. In similar terms, structures and policies governing resource tenure should be open to a variety of livelihood strategies. Bonnet and Hérault stress the importance of tenure policies to be pliable and developed in consideration of the requirements, needs and spatial conceptions of pastoralists. As proposed also by the FAO Expert Group Meeting, feasible solutions may be reached through transparent and participatory processes encouraging dialogue and mutual understanding between stakeholders at all levels. Inclusive processes will ideally increase the ownership of activities and ease the management of changes.

Problems of power abuse, corruption and lack of transparency in the allocation of disbursements in PES schemes were raised by several authors. The main concern relates to the question of how to ensure that the payments benefit the correct parties. Knox *et al.* highlight that uniform rules of allocation of benefits should be established to minimize problems of power abuse. The abuse of power and corruption in climate change mitigation may take the form of benefits being captured by the wealthy (Mitchell and Zevenbergen, Knox *et al.*) or of incentives being designed with a bias towards wealthier groups expanding the land areas under their control (Summary of the Expert Group Meeting, URL referenced above). Corruption may worsen when the value of land and natural resources are increased and where land governance is generally weak. The combination of the two factors creates space and opportunity for speculation and money laundering. Corruption and abuse of power may also afflict the allocation of resources. In the case of REDD+,

Knox *et al.* consider the risk of governments awarding forest concessions or registering land over pre-existing customary tenure claims. Climate change adaptation schemes may also be susceptible to corrupt practices which may, for example, undermine the equitable reallocation of land and fair distribution of compensation. These arguments call for greater consideration of risks of corruption and for better governance in climate change schemes.

DEVELOPING COST-EFFECTIVE AND TANGIBLE SOLUTIONS

The articles have highlighted the need to secure tenure rights and pay attention to governance in the context of climate change adaptation and mitigation schemes. What practical solutions could be developed in light of these considerations?

In the FAO Expert Group Meeting, much debate surrounded the role of formal registration systems versus simple recording of rights, a discussion further explored in this thematic issue. The creation of formal registration systems for registering tenure rights is a time and resource consuming exercise. The fact that registration systems need to be adapted to local contexts and to take account of the complexities of existing tenure arrangements and land administration practices is a challenge that requires appropriate expertise and financial resources. Even if resources are available for an effective design, much time and commitment will still be needed for its full implementation. A full scale registration system, which requires a long time frame may not therefore be a feasible, or desirable solution for mitigation schemes such as REDD+, which aim to achieve measurable results in the near future. Mitchell and Zevenbergen point out that "consideration will be required to determine whether the implementation of formal land registration systems is the most cost-effective and appropriate approach".

In light of cost and time constraints, recording of rights including community and collective tenure rights, using simple recording methods could be the starting point. Mitchell and Zevenbergen underline that bottom-up consultative approaches should be applied where customary holders and resource users are included in the different steps of the recording process. They

are in favor of using cost-effective and innovative certification methods that record and map group and community rights. Conversely, they recognize that more conventional and formal land administration solutions could be applied if the time and cost constraints are justified by the extent of the REDD+ project and the presence of land titling projects nearby. The recognition of rights based on communities and groups may also be seen as an alternative for a single right holder based approach. Knox *et al.* argue that the single right holder based approach "could lead to evictions of tenants, denial of access to commons and further weaken women's rights on private and common land". Recording of tenure rights without full registration may also facilitate flexibility, thereby allowing for more adaptability in the context of change.

Recognition of rights based on communities and groups may also be seen as an alternative for a single right holder based approach

Knox *et al.*, Mitchell and Zevenbergen, and Karsenty and Assembé discuss the ties between rights to carbon, land and other natural resources. They agree that recognition and recording of resource rights are a means to meet the future needs of reporting and management of the REDD+ mechanism. Barnes and Quail go further in opening the discussion on carbon property rights. They present a carbon cadastre as an alternative for the identification of beneficiaries and management of incentives for climate change mitigation activities. They propose that carbon rights be dealt with at the meso-level following, for example, the model of wildlife conservancies in Namibia. Using this approach, international carbon funds or markets would be connected to individual and communal landholders through "carbon conservancies" in which only *de facto* and *de jure* landholders would collectively be eligible for membership. Individuals and communities would voluntarily form "carbon conservancies" and thereby legally formalize carbon rights. The authors propose that once the conservancies have acquired legal status, they may register the joint carbon property rights in a carbon cadastre. The perimeter polygon of the carbon conservancy would be further linked to the land cadastre.

The prerequisite of all solutions, whether recognition of rights is done at the individual or group level or whether they are tied to land or only to carbon, is the capacity of the institutions and structures to demarcate and register rights, update and maintain registries, resolve disputes and allocate payments where PES schemes are applied. As discussed, the long standing need for tenure security, compounded by challenges of climate change,

Prerequisite of all solutions is the capacity of the institutions and structures to demarcate and register rights, update and maintain registries, resolve disputes and allocate payments

may be best solved by supporting and developing existing systems, whether formal or customary, as compared to constructing entirely new institutions. The centrality of building capacity to improve the resource management and negotiation abilities of actors at national, regional and local levels was recognized in the FAO Expert Group Meeting. It concluded: first, stakeholders should be aware of existing mechanisms and understand their requirements. Second, their right holder position towards "outsiders" should be improved for climate change adaptation and mitigation to be sustainable. In particular, local communities and indigenous peoples might require additional support to be able to claim their rights, negotiate contracts and benefit from climate change adaptation and mitigation schemes.

CONCLUSION

Land and natural resources tenure should be addressed at the outset of climate change adaptation and mitigation schemes and be part of the design of policies, laws and activities. To keep up with the impacts of climate change, innovative solutions, flexibility of institutions and adaptability of livelihoods are required.

This thematic issue of the Land Tenure Journal aims to bridge the gap between climate change and tenure debates. It contributes to the current discussion presenting experiences and putting forward new proposals for consideration. This issue is by no means exhaustive. Not only is more debate needed in relation to the issues presented here, but also in relation to the wider context of cities and urban development, to other natural resources such as water and fisheries, and to global, regional and local governance of tenure.

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LAND TENURE AND PAYMENT FOR ENVIRONMENTAL SERVICES
Challenges and opportunities for REDD+

RÉGIMES FONCIERS ET PAIEMENTS POUR SERVICES ENVIRONNEMENTAUX
Enjeux et opportunités pour le mécanisme REDD+

TENENCIA DE LA TIERRA Y PAGOS POR SERVICIOS AMBIENTALES
Desafíos y oportunidades relacionados con REDD+

ABSTRACT

LAND TENURE

GOVERNANCE

PAYMENT FOR ENVIRONMENTAL SERVICES

This article highlights the land tenure implications of payment for environmental services (PES) mechanisms to reduce carbon emissions and enhance carbon sequestration, and offers suggestions for incorporating tenure into PES strategies. The first section begins with an overview of PES in the context of carbon-based approaches, focusing on one mechanism: REDD+ (Reducing Emissions from Deforestation and Degradation of Forest Resources). The second section discusses the myriad of tenure challenges associated with effective implementation of carbon-based PES schemes. These challenges are often found in countries where more complex forms of tenure prevail and exist alongside civil law systems; yet, many such countries host some of the world's largest forest carbon stocks. The third section

RÉSUMÉ

RÉGIMES FONCIERS

GOUVERNANCE

PAIEMENT POUR SERVICES ENVIRONNEMENTAUX

Cet article souligne les implications foncières des mécanismes de paiement pour services environnementaux (PSE) destinés à réduire les émissions de carbone et à accroitre la séquestration du carbone et avance des propositions pour incorporer les questions foncières dans les stratégies de PSE. Le premier chapitre propose une vue d'ensemble des PSE dans le cadre des approches à base de carbone, en se centrant sur le mécanisme REDD+ (Réduction des émissions causées par le déboisement et la dégradation des forêts). Le deuxième chapitre aborde les innombrables défis fonciers liés à la mise en œuvre des programmes de PSE à base de carbone. Ces problématiques se rencontrent souvent dans des pays qui connaissent des formes très complexes de régimes fonciers, parallèlement à des systèmes de

SUMARIO

TENENCIA DE LA TIERRA

GOBERNANZA

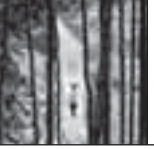
PAGO POR SERVICIOS AMBIENTALES

En este artículo se ponen de relieve las consecuencias en la tenencia de la tierra de los mecanismos de pago por servicios ambientales (PSA) destinados a la reducción de las emisiones y al aumento del secuestro de carbono, y se formulan indicaciones orientadas a incorporar las cuestiones de tenencia en las estrategias de PSA. La primera sección comienza ofreciendo una visión de conjunto de los PSA en el ámbito de los enfoques basados en el carbono, y en particular el mecanismo REDD+ (reducción de emisiones por deforestación y degradación). En la segunda se estudian los múltiples retos que plantea la aplicación de los programas de PSA basados en el carbono. A tales retos se debe a menudo hacer frente en países en desarrollo en donde rigen formas complejas de tenencia que coexisten

presents options for addressing tenure challenges, focusing on legal and governance measures but also stressing practical strategies that nurture the effectiveness of normative reforms. We conclude by emphasizing the importance of clarifying and securing resource users' rights to land and other natural resources to the ultimate success of climate change mitigation goals.

droit civil; ces pays possèdent encore souvent les plus grands stocks de carbone forestier de la planète. Le troisième chapitre propose différentes options pour affronter les défis fonciers, en se centrant sur les mesures juridiques et de gouvernance, ainsi que sur les stratégies pratiques susceptibles de renforcer l'efficacité des réformes normatives. La conclusion souligne l'importance de clarifier et de sécuriser les droits fonciers des utilisateurs des ressources ainsi que leur droit à la réussite finale des objectifs d'atténuation des effets du changement climatique.

con el ordenamiento jurídico de inspiración romanista; sin embargo, muchos de esos países albergan algunas de las mayores existencias forestales de carbono del mundo. En la tercera sección se presentan algunas opciones para abordar los desafíos vinculados a la tenencia desde el punto de vista de las medidas jurídicas y de gobernanza, pero haciendo también hincapié en las estrategias prácticas de las que depende la eficacia de las reformas normativas. Para concluir, se subraya la importancia de las acciones tendentes a clarificar y asegurar los derechos de los usuarios a la tierra, ya que ellos consideran como un derecho ver que las metas de mitigación del cambio climático pueden en definitiva conducir a resultados exitosos.



INTRODUCTION

Payments for Environmental Services (PES) follow five general principles: 1) that they should be voluntary transactions for 2) a well-defined environmental service or a form of land use likely to secure that service, which is 3) bought by at least one buyer from 4) a minimum of one provider, if and only if 5) the provider continuously supplies that service (Wunder, 2007:50)[1]. In their most common form, payments are made to local populations in exchange for either not engaging in land management practices expected to result in environmental degradation, or in exchange for adopting practices expected to generate ecosystem services, including carbon sequestration (Jack *et al.*, 2007).

International cooperation aimed at the reduction of greenhouse gases (GHG) has swelled, and PES designed to reduce or absorb emissions of CO_2 have risen to the forefront of climate change mitigation strategies. About 20 percent of global anthropogenic CO_2 and 17 percent of GHG emissions are attributed to deforestation and forest degradation (van der Werf *et al.*, 2009; IPCC, 2007), which, along with other forms of land use change, are the second leading cause of CO_2 emissions after fossil fuel combustion (Le Quere *et al.*, 2009; van der Werf *et al.*, 2009). Reducing Emissions from Deforestation and Degradation of Forest Resources (REDD+) has become a primary international vehicle for promoting GHG reductions. The '+' sign reflects inclusion of mechanisms that extend beyond efforts to curtail deforestation and degradation to embrace "the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries" (UN-REDD, 2011;1, citing UNFCCC Decisions 1/CP.13, 2/CP.13 and 4/CP.15).

REDD+ aims to mitigate the effects of deforestation and degradation on global atmospheric carbon levels by using international funds and/or market-based mechanisms to pay developing countries to keep their forests standing instead of cutting them down. REDD+ also seeks to incentivize actions that already contribute to forest carbon sequestration (e.g. conservation and sustainable management) as well as actions that will enhance sequestration

1 See de Koning *et al.* (2011) to understand how these principles are being applied in Ecuador's Socio Bosque Programme.

(e.g. reforestation). REDD+ schemes differ somewhat from traditional PES programmes in that REDD+ is being implemented on a national rather than a local scale. Nonetheless, REDD+ schemes still fit within the definition of PES because they provide an economic incentive for private, government and community landholders to conserve or sustainably manage land rather than submit it to deforestation. They thereby generate an environmental service in the form of reduced carbon emissions and increased sequestration.

This article aims to enhance readers' appreciation of the implications of land and resource 'tenure' – the systems of rules and authority structures governing the derivation of benefits from natural resources – for REDD+ implementation. It further seeks to equip policymakers and other development practitioners with ideas about how they can address tenure challenges associated with REDD+ implementation.

TENURE RELATED RISKS OF REDD+

Implementation of REDD+ could potentially produce significant benefits, not only for the environment and mitigation of climate change, but also by channelling financial resources from wealthier to poorer countries. The international focus on REDD+ has attracted attention to forest land tenure and governance issues[2], and encouraged some countries to revise outdated laws on land and forest rights[3]. If reforms strengthen the rights of local citizens

If reforms strengthen the rights of local citizens and are backed by robust implementation and enforcement mechanisms, rural communities in developing countries around the world stand to gain

2 For example, paragraph 72 of the UNFCCC Cancun Agreement on Climate Change (*Decision 1/CP.16*) "Requests developing country Parties, when developing and implementing their national strategies or action plans, to address, *inter alia*, drivers of deforestation and forest degradation, land tenure issues, forest governance issues, gender considerations and the safeguards identified in paragraph 2 of annex I to this decision, ensuring the full and effective participation of relevant stakeholders, *inter alia*, indigenous peoples and local communities."

3 For example, in 2009 Liberia enacted the Community Rights Law that has the intention of empowering "communities to fully engage in the sustainable management of forests in Liberia by creating a legal framework that defines and supports community rights in the management and use of forest resources." Other countries that have made changes to forest tenure include Angola, Argentina, Bolivia, Brazil, Cameroon, China, DRC, Gambia, Honduras, India, Indonesia, Mali, Niger, Romania, Sudan, Tanzania, Thailand and Venezuela. See Sunderlin, *et al.* 2008.

and are backed by robust implementation and enforcement mechanisms, rural communities in developing countries around the world stand to gain.

However, PES mechanisms such as REDD+ also pose risks that resource flows to developing countries will fail to benefit or may even harm those who depend on forest resources to live. Resource tenure is at the heart of this challenge. This section highlights the type of risks that implementation of REDD+ is likely to confront unless great care is taken to understand the tenure realities on the ground.

Complex tenure systems

Providing people with incentives to conserve or sustainably manage natural resources that sequester carbon involves establishing who has rights to receive benefits associated with actions leading to reduced emissions or increased sequestration. Benefits may be in the form payments or other types of compensation. We refer to these rights to benefits associated with carbon stored in biomass as 'carbon rights'. When carbon is sequestered, whether in trees or other vegetation or soil, one might assume that the right to benefit from the sequestered carbon accrues to the owner of the land upon which these resources exist. However, tenure systems are rarely so simple and tidy.

Providing people with incentives to conserve or sustainably manage natural resources that sequester carbon involves establishing who has rights to receive benefits

Resource tenure embodies a complex system of rights, rules, authority and procedures that govern how persons gain access and control over land and natural resources. Under most Western tenure systems, the dominant form of tenure vests all or the majority of these rights in one individual or entity, referred to as an owner[4]. This is not the case in many countries, particularly those in sub-Saharan Africa or Asia, or for many indigenous communities in Latin America, which frequently are host to multiple customary tenure systems that co-exist alongside the formal tenure system upheld by the state. Many customary tenure systems embody overlapping rights to land and natural resources. Multiple resource users may have different rights to the same

4 The term 'owner' in this paper refers to any person or persons (including whole communities) who are regarded as having broad and long-term perpetual use rights to land (not necessarily transfer rights or other rights), regardless of whether those rights are formally upheld in law or documented by the state.

resource or they may share the same rights. Rights may vary depending on season or natural conditions (Williams, 1998).

Within most customary tenure systems, certain individuals or groups are primary rights holders and have stronger rights than others. Male household heads are often the primary decision-makers when it comes to allocating and administering land for use by other members of the household, though some rights may be held in check by the larger community or community authorities (e.g. the right to sell). Women and children tend to hold secondary rights, as do tenants/sharecroppers, migrants, and pastoralists grazing animals on fallow land. Likewise, on commons, often one community holds primary rights, while other groups have certain use rights.

The clarity and precision of the rights required by carbon finance mechanisms may not align with the fluid and overlapping nature of customary tenure systems. How, for example, might carbon rights be assigned to land held as common property, where different users and communities have claims to the resources on the land that they either exploit simultaneously, in succession or in tandem? How can these schemes recognize the claims of holders of secondary rights and compensate them, rather than just holders of primary rights? In many African countries, customary tenure systems permit assigning separate primary rights to trees and to the land on which those trees grow (Unruh, 2008). To be effective, PES schemes must address complex situations where one resource is claimed by multiple users.

If instead REDD+ and other PES mechanisms adopt a single right holder approach, they could lead to evictions of tenants, denial of access to commons, and further weaken women's rights on private and common land. The deterioration of social equity, potential for land grabs, loss of food security, and conflict could follow as a result[5]. But applying models that benefit primary and secondary holders also present difficulties. The spectrum of overlapping rights would need to be adjudicated and recorded, including their spatial

5 While safeguards currently formulated in international climate change agreements call attention to land and forest tenure, to the rights of indigenous people and members of local communities, and to stakeholder participation, they do not specifically call for countries to respect complex tenure systems and recognize the rights of multiple users of land and natural resources.

and temporal dimensions. A system for allocating payments equitably among various right holders would need to be designed. The sheer numbers of claimants who might come forward at the prospect of payment could bring excessive capacity constraints and transaction costs for implementation.

On the carbon credit buyer side, fluidity and informality of customary tenure presents challenges too. Buyers demand stable, long-term contracts with confirmed right holders who can be held accountable for performance. The risk to investors will be high if verifiable, state-backed rights to land or trees cannot be established, or if these rights can be transferred to others without record of the transfer. Olsen and Bishop (2009) make the case that the costs of recognizing and clarifying rights to forest land and resources need to be included in assessments of the financial viability of REDD+.

Non-formal tenure

In many developing countries a large majority of the population, and particularly the poorest segment, lack state-backed rights to the land they occupy and the natural resources they use. In some cases entire tenure systems, notably customary systems, are not recognized in law. Hence, those who subscribe to these systems are more vulnerable to having their rights ignored by government than those who fall under the formal, state-sanctioned system. Yet, even where customary rural smallholders subscribe to legally sanctioned forms of tenure, they often lack the knowledge and access necessary to gain formal recognition of their land rights, which typically occurs through titling and registration (Mitchell, 2010).

When it comes to PES, resource-dependent communities with non-formal tenure face a high risk of: 1) being deprived of payments associated with the production of carbon benefits, 2) being displaced from the land they occupy and use, and/or 3) having their rights to use natural resources curtailed in law, imposing potentially unmanageable constraints on their livelihoods and culture. Moreover, failure to recognize users' rights to land and natural resource carbon stocks diminish user incentives to manage those resources in ways that preserve or sequester carbon.

PES calls for resource users to change (or maintain) certain types of behaviours in order to generate a desired environmental service. Resource users

are paid an incentive to adopt such behaviours, often because behavioural change implies an opportunity cost (e.g. foregoing harvesting wood for charcoal production). Legally defining who has rights to a resource enables those paying for the generation of environmental services to target the correct parties for compensation. Assuming that formal rights are actively upheld and enforced by the state, assigned right holders would have some legal assurance of their entitlement to derive benefits from a particular resource, including compensation for PES. This will provide further incentives to protect the resource. Vesting rights in resource users likewise provides investors with a means to hold carbon sellers accountable, and gives a reasonable degree of assurance that carbon benefits will be forthcoming (Cotula and Mayers, 2009). Clear legal frameworks for the assignment of property rights to users also reduces the risk to investors that contracts governing carbon projects will be abrogated by future legislation governing carbon or resource tenure or laws addressing distribution of benefits (Takacs, 2009).

Clear legal frameworks for the assignment of property rights to users also reduces the risk to investors

Clarity over land and tree rights is critical to protect the interests of parties offering payments (or other compensation) to elicit behaviour changes, whether these are donors funding REDD+, carbon credit buyers, or purchasers of easements. When rights are unclear, latent claims or new claimants to land and resources can readily emerge and contest the legitimacy of third party carbon interests. Moreover, where resource users lack tenure security, the gain from the immediate harvesting of a tree stands a higher chance of outweighing the expected returns from an insecure conservation arrangement. Clearly assigned rights that are upheld by the state can provide the assurance of perpetual revenue streams to environmental service providers, and the assurance of sustainable environmental benefits to buyers of carbon and other environmental services.

Legal recognition of property rights should not be equated with the typical Western system of titling and registering property rights, unless it is compatible with and affirms socially legitimate systems of non-formal tenure (Lavigne Delville in Mitchell, 2010; 15), and can be designed to offer equal access to the poor. There is ample evidence of failure when governments have privileged statutory rights systems that collapse rights into a single holder, as opposed to well-functioning, socially legitimate systems of customary

tenure. In this scenario the resulting problems range from widespread non-compliance with imposed systems, conflict in opposition to those systems, and the destruction of complex social and environmental protection systems. Takacs warns, "unless title is allocated fairly, respects local historical land use, and is legally enforceable, issuing title could conceivably disrupt informal local legal arrangements and thus make carbon investments less effective, synergistic, and equitable" (2009:62). Moreover, according recognition of rights for PES purposes only to individuals with registered titles or certificates could (further) widen socioeconomic cleavages[6].

State rights to resources *vis-à-vis* the rights of citizens

> *"Experience tells us that, as the value of standing forests or forest land increases, powerful actors tend to capture those values to the detriment of the less powerful, forest-dependent poor. If REDD+ increases value, it may also increase conflicts as claimants stand to gain more by winning control. Critical dangers with tenurial uncertainty include: customary rights being violated in the interests of inward investment, community interests being locked into abusive contracts of a long-term nature, and land speculation by investors at the expense of community interests."*
>
> *Source:* Cotula and Mayers, 2009

Recent evidence shows that 74 percent of the global forest estate is directly administered by governments rather than the private sector and communities (Sunderlin *et al.*, 2008). FAO similarly notes that 80 percent of the world's forests remain publicly owned (FAO, 2010: 119, 122). Although comparisons with earlier data indicate that tenure continues to shift in favour of community-held rights to forests, the rate of this shift is decreasing and is mainly limited to a few countries (Sunderlin *et al.*, 2008).

6 This approach is taken by Ecuador's Socio Bosque programme, which requires participants to title land that is eligible for payments. Poor families and communities possessing land but lacking title to it are unable to participate (de Koning *et al.*, 2011: 538).

State owned and administered forest lands present several challenges to achieving conservation and sustainable management objectives. Most developing country governments lack the ability to adequately protect resources and sanction non-compliance , because of low state presence and enforcement capacity (Cotula and Mayers, 2009). Second, tenure regimes that vest all or the vast majority of resource rights in the state[7] deprive forest dwellers of access to critical livelihood resources, thereby worsening poverty and undermining conservation by incentivizing 'catch while catch can' behaviours. Finally, pure policing approaches regularly create opportunities for selective enforcement, corruption and rent seeking (ibid.). Although some countries[8] have devolved varying degrees of rights to forest communities, Cotula and Mayers (2009) note that many shifts in favour of devolving control over forests are rooted in a lack of government financial capacity to administer forests, and that prospective REDD+ benefits could generate perverse incentives to reassert that control. Moreover, countries that give communities rights to engage in 'traditional' or 'subsistence' uses of land and resources[9] may classify carbon rights in biomass as non-traditional, depriving communities of entitlement to the payments.

Among countries that assert state ownership of all land or even just forests, lucrative PES schemes like REDD+ raise the risk that governments could interpret their 'ownership' to encompass carbon rights, without assigning those rights to communities who use and depend on carbon-sequestering resources. This is especially relevant where governments perceive that recognizing and enforcing exclusive rights of the state to forested land will yield the greatest and most direct financial benefits. REDD+ financial opportunities could result in large swathes of forested land being appropriated by the state or awarded as concessions to private interests for conservation purposes. Rising land values as a result of REDD+ or carbon markets are also likely to increase pressures

7 Examples include Central African Republic, Angola, DRC, Cameroon, Venezuela, Zambia.

8 For example, Cameroon, Brazil, Peru, India, Tanzania, Bolivia.

9 Examples include Colombia's Law 70 of 1993 governing collective land rights of Afro-Colombians and Angola's Regulamento Geral das Áreas de Conservação (draft).

from foreign and national elites and commercial actors to acquire land at the expense of the poor. Social inequality often leads to social grievances and conflict, which ultimately deflect investment. Deprived of both livelihood resources and carbon benefits, communities will face increasing threats to their survival, undermining the effectiveness of mitigation efforts (Cotula and Mayers, 2009).

Even if countries opt to recognize customary land and resource rights, they may be tempted to label areas not under occupation or agricultural use as unused or public land, available for PES, without investigating whether or not there are any pre-existing claims. In Mozambique, mounting outside interests in rural land for agribusiness led the government to undertake a mapping exercise to identify so-called 'empty land' where concessions could be awarded. Yet, in many countries, communities have long-standing customary claims to such land and may use it as a commons for gathering forest products, grazing animals, or simply as a land reserve. Referring to Africa, Unruh (2008) cautions, "Tribes, chiefdoms, lineages and clans claim vast areas within which degraded and unoccupied lands exist; and on which attempts at planting trees by 'outsiders' or at the behest of outsiders would be hotly contested."

Governments may seek to accommodate certain customary resource rights, but curtail others. Some, like Angola, limit forest rights of local communities to 'subsistence rights' and exclude rights to commercialization of resources. Such policies could result in the exclusion of rights to carbon benefits (Cotula and Mayers, 2009). In Ghana, people possess rights to trees only if they have planted them[10]. Natural trees are the property of the state and can only be used for non-commercial purposes in communal forests[11]. In Cameroon, formal recognition of rights to planted trees is only accorded to those who have registered title to their land (Egbe, 2001).

In many countries, private rights to exploit and benefit from land are restricted to surface rights, while governments retain rights to sub-surface

10 See Ghana's Timber Resource Management (Amendment) Act, 2002.

11 Ibid.

resources[12]. Such policies would potentially preclude landholder entitlement to sub-surface carbon benefits, directing such benefits to the state. Vesting such rights in the state also threatens to compromise landholders' assurance of being able to manage land and above-ground carbon stocks for reduced emissions and carbon sequestration over the long term. Hence, investors will want certain guarantees that the state will not alter assigned management rights or give cause to the landholder to relinquish their management responsibilities (e.g. by enticing them with a more lucrative offer).

State ownership of land or forest land is not a problem *per se*, provided that the law makes provisions for perpetual or long-term use rights to that land and forest resources, that rights are secure, and that those rights include the right to retain all or a sizeable portion of the benefits derived from the land and resources. This is critical to creating the necessary incentives to adopt conservation behaviour, including managing land for reduced emissions and increased sequestration. If forest communities feel their rights could be undermined through arbitrary government takings or imposition of laws requiring owners/users to hand over a substantial portion of carbon benefits to the government, incentives will fail to materialize.

Legal pluralism and conflicting claims

In many countries tenure is governed by different bodies of law and governing authorities, a situation known as 'legal pluralism'. As discussed above, customary tenure systems frequently operate alongside statutory systems, but their complexity often runs deeper than this. Typically, multiple customary tenure systems reside within a single national border. Religious doctrines may add another layer (or even be the dominant layer) of law governing tenure, especially in societies with large Muslim populations (Sait and Lim, 2006). In some cases, alternative bodies of law are codified in formal law, such as in India where different inheritance laws apply depending on which religion one adheres to. However, in most African countries, customary tenure systems tend to be multiple and highly diverse.

12 Some examples include Guyana, Peru, Indonesia, the DRC, and Brazil.

Some statutory law in Africa extends legal recognition to customary land rights – such as in Uganda, Mozambique, and Namibia – and in some cases to customary authorities as well, such as in Ghana and Tanzania. In many other instances, however, alternative bodies of law and governance authorities are not recognized in formal law and there are conflicts between the formal and non-formal. Where such conflicts exist, there is a risk that REDD+ will heighten incentives for governments to award forest concessions or register forested land to private interests over top of pre-existing customary tenure claims. In Liberia, for example, land claimed by most of the indigenous population in the country's interior is classified as public land, enabling the government to award large areas to commercial interests, e.g. for the exploitation of timber and rubber. Whereas Indonesian law recognizes customary land rights, their recognition often varies by province and rights are often overridden by commercial projects deemed to be in the national interest (Colchester *et al.*, 2006; Barr *et al.*, 2006).

Other pluralism challenges to PES arise in cases where governments permit the co-existence of two tenure systems on the same land. How will resource rights and rights to carbon benefits be assigned where land is under a concession, and local communities have been allowed to retain rights to occupation and to exploit resources only for subsistence purposes, and not commercial purposes? It may also be difficult to reconcile disparate preferences between concessionaires, communities and carbon investors concerning the proper governance authority to protect rights, enforce responsibilities and settle disputes. Concessionaires and investors are not likely to agree to have their disputes heard by a customary dispute resolution institution, whereas local communities may be distrustful of the formal justice system or lack access to it altogether. Thus, effective solutions to PES will likely require legal recognition of customary or otherwise socially legitimate tenure systems, allowing them to continue to function fluidly and informally, while making them visible so as to protect them from new or opposing claims.

Effective solutions to PES will likely require legal recognition of customary or otherwise socially legitimate tenure systems

As countries prepare for PES programmes like REDD+, the question becomes, will governments make efforts to ensure that all socially legitimate tenure systems are recognized and that carbon rights regimes align with these

systems? Furthermore, can this be done without overwhelming countries' capacity to administer and enforce the law, and without creating a level of complexity and uncertainty that would deter investors?

Carbon rights

Increasing attention has been given in the REDD+ literature to defining rights to carbon to facilitate environmental service payments. Yet, few countries have legislation specific to carbon rights[13] (Knox *et al.*, 2010).

> *"Notably, REDD-plus contracts and agreements will be impossible to negotiate and enforce if carbon rights are undefined, yet in many countries major challenges remain with respect to the prerequisite step of clarifying tree and land tenure."*
>
> *Source:* Mayers *et al.*, 2010

As noted at the outset of this article, 'carbon rights' refers to the right to benefit economically or otherwise from reduced emissions from or increased sequestration by carbon stored in biomass, since presumably other uses or benefits associated with carbon in isolation do not exist. So far, developing countries have not explicitly articulated carbon rights in their laws, though some countries make those rights implicit. Mexico, for example, entitles landowners to receive benefits associated with environmental services generated from resources located on their land, implicitly assuring rights to carbon benefits (Corbera *et al.*, 2010). Costa Rica grants landowners rights to plants attached to their land. However, to benefit from PES, a landowner must transfer the right to trade and benefit from carbon to the state under contracts that compensate landowners (Takacs, 2009). Likewise, Ecuador does not have laws defining carbon rights; its Socio Bosque programme, which is being included in the country's national REDD+ strategy, compensates participating individuals or communities for each hectare of forested area that they set aside for conservation (de Koning *et al.*, 2011).

'Carbon rights' refers to the right to benefit economically or otherwise from reduced emissions from or increased sequestration by carbon stored in biomass

13 New Zealand, six states in Australia, and the province of Alberta, Canada, have passed carbon rights legislation.

Some recent analyses point to the importance of defining carbon rights in law, especially if such rights are to become transferable legal interests (see Takacs, 2009 and Kennett *et al.*, 2005). Absent specification of rights to carbon, even formal rights to land and carbon sinks, may be interpreted as not including rights to benefit from carbon storage. If such legal interpretations automatically become law or are adopted in statute, then contracts that assign rights to carbon based on rights to land or other natural resources may be unenforceable (ibid.). As carbon rights become lucrative, well-positioned interests may take advantage of ambiguities to assert rights to carbon, even where land and natural resource rights are clear.

Yet, whether specifically assigning rights to carbon in law is actually necessary, or even desirable, is debateable. On the one hand, defining rights to carbon as separate from the carbon sink (e.g. trees) could facilitate the transfer of those rights to third parties, without transferring rights to the land or to the carbon sink itself. That in turn could enable packaging of these rights into less risky instruments for investors.

However, separation and trading of carbon rights carries a risk of negative externalities. Buyers of carbon rights need to be assured that the holders of rights to the carbon sink will not engage in behaviours that infringe on the quantity of the carbon stored. Many economically-beneficial use rights associated with land and trees contribute to carbon emissions and diminish sequestration potential, such that the incentives of different right holders would be at odds with each other. One option to align incentives would be to share payments from the generation of carbon benefits among different resource right holders. For such benefit sharing systems to work, the present value of expected benefits needs to outweigh sufficiently the expected benefits from land uses that increase emissions or reduce sequestration potential. Separating carbon rights from land and tree rights is also likely to add to the number of right holders requiring payments, and ultimately increase the complexity and cost of PES.

Awareness, capacity and governance challenges

> *"Because poor, local communities are less likely (compared to savvy investors) to be well versed in the ins and outs of carbon projects, it is crucial that any laws regulating forest carbon-as-property include provisions for fair partnerships with local communities. Poor people who have formal or informal land rights might sell their rights to investors at low prices and lose their traditional sources of sustenance in the process."*
>
> *Source:* Takacs, 2009; 12

Even when legal reforms are instituted, many rural communities do not know their rights or lack access to the institutions that can help them to claim or defend rights. Corruption within those institutions may be an additional limiting factor. Communities often are unaware of the real or potential value of their resource base and lack the necessary skills to negotiate effectively with private investors and government officials. Communities pursuing PES schemes often confront negative consequences as a result of unlevel playing fields between contracting parties (Griffiths, 2007). This includes unwittingly accepting curtailment of rights, assuming unmanageable risks and being shorted on expected payments. Negative experiences are not confined to PES schemes. In the absence of clear and robust rights, forest communities have been denied entitlements to timber revenues or have seen these entitlements disappear or diminish (Wily, 2007). Experiences with community–investor partnerships that are grounded in secure community rights are more positive. For example, contracts that explicitly recognize existing tenure of communities within concession areas have been shown to generate more reliable profits, reduce displacement of local communities, and even improve resolution of local land conflicts (Nawir and Santoso, 2005).

Even where clear tenure systems exist and most rights are formalized, if there are significant inequities in the distribution of landholdings (e.g. Brazil and Colombia), the wealthy will capture the majority of the benefits of PES. Indeed, PES may exacerbate inequalities, reinforce inequitable power structures, and fuel social grievances and conflict.

In countries where government administration and enforcement is weak, implementation of legal recognition of property rights will be compromised regardless of how well articulated these rights are (Takacs, 2009). It is not uncommon to encounter statutory tenure systems that overwhelm government capacities and impede their ability to assign and administer formal rights. This is a clear risk if developing countries seek to adopt separable and tradeable carbon rights. Governments likewise could be challenged to effectively, equitably and transparently administer REDD+ payments.

OPTIONS FOR REDUCING THE RISKS AND POSITIONING RURAL COMMUNITIES TO BENEFIT FROM REDD+

Though tenure risks associated with climate change mitigation approaches abound, effective solutions are possible with a rigorous understanding of how risks manifest themselves in different environments. We offer a series of generic approaches that may be considered as a starting point for provoking discussion and fostering a more determined and constructive commitment to confronting the inherent challenges.

Reform REDD+ and other PES policies to ensure recognition of tenure

In spite of the myriad of tenure challenges and risks noted above, most international agreements on PES mechanisms have not explicitly insisted that local community rights and provision of clear and secure tenure to land and carbon stocks must be a pre-requisite for funding or approving PES-like projects (Griffiths, 2009). This includes the Forest Carbon Partnership Facility (FCPF), which is subject to the World Bank's social and environmental safeguard policies. Safeguards are designed ensure that the Bank's programming, including REDD+ programming, does not unintentionally inflict harm on people living in the countries it seeks to benefit.

The Bank's safeguard policy on Indigenous People is potentially the most explicit when it comes to addressing tenure risks. It provides that Bank funded projects:

"Put in place an action plan for the legal recognition of customary rights to lands and territories, when the project involves: (a) activities that are contingent on establishing legally recognized rights to lands and territories that Indigenous Peoples traditionally owned, or customarily used or occupied; or (b) the acquisition of such lands."[14]

However, an action plan does not ensure that these customary rights are secured in the law, let alone enforced in practice. Moreover, it potentially excludes communities that depend on forest and other carbon stock resources but may not fall under the definition of indigenous or tribal.[15]

The UN-REDD Programme guidelines likewise address the rights of indigenous and forest dependent communities. They require that UN-REDD activities adhere to the UN Declaration on the Rights of Indigenous People, ILO Convention 169, and the UNDG Guidelines on Indigenous People's Issues (UN-REDD Programme, 2009). In doing so, it implies that REDD+ activities must engage in free, prior and informed consent with indigenous peoples when it comes to land and natural resources that they have traditionally owned, occupied or used (presumably even if these property rights are not recognized in a given country's laws). However, there are no provisions in the guidelines to ensure that these traditional rights are recognized in law, nor that indigenous and forest dependent people are entitled to carbon rights associated with their traditional rights to land and natural resources.

14 World Bank Operational Policy 4.00: Piloting the use of borrower systems to address environmental and social safeguard issues in Bank-supported projects. March 2005. URL: http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/EXTPOLICIES/EXTOPMANUAL

15 ILO Convention 169 on Indigenous and Tribal Peoples provides the following criteria for 'indigenous' classification: "descent from the populations which inhabited the country, or a geographical region to which the country belongs, at the time of conquest or colonization or the establishment of present state boundaries and who, irrespective of their legal status, retain some or all of their own social, economic, cultural and political institutions" whereas 'tribal' peoples are persons whose "social, cultural and economic conditions distinguish them from other sections of the national community, and whose status is regulated wholly or partially by their own customs or traditions or by special laws or regulations."

The World Bank's safeguard policy on Involuntary Resettlement would appear to apply in the event that REDD+ funding results in land takings. Yet, the policy only discourages projects from inducing involuntary displacement and mandates resettlement assistance. In cases where displaced persons lack formal legal rights, non-specific resettlement assistance is recommended in lieu of compensation for lost assets. It is unclear if the Bank would have any obligation to provide resettlement assistance to people displaced as a result of governments allocating land to private investors for REDD+ programming.

The agreement reached at the 2010 UNFCCC (United Nations Framework Convention on Climate Change) Conference of the Parties (COP 16) in Cancun contains important steps forward, but nevertheless remains deficient when it comes to protecting land and resource rights as well as the right to carbon benefits from those resources. Paragraph 72 of the COP 16 convention 'requests' that developing countries address forest and land tenure issues as well as ensure stakeholder participation. Appendix 1 of the convention urges "respect for the knowledge and rights of indigenous peoples and members of local communities" in the implementation of REDD+ activities (UNFCCC, 2011). However, assurances that participating countries will respect the *customary land and resource rights* of forest-dependent communities do not form part of the agreement. Moreover, the agreement is not binding.

The unfortunate result of not having rigorous and straightforward policies to ensure the tenure landscape is analysed and addressed in advance of REDD+ implementation is that many participating countries have not given meaningful consideration to tenure risks as part of the "readiness" strategies for REDD+ (Knox *et al.*, 2010).

Multilateral and bilateral agencies can support REDD+ and other PES to improve policies and procedures by:

- Strengthening international safeguard provisions by requiring recognition of customary land and natural resource tenure systems, and the rights of local communities to derive benefits from the carbon sequestered in resources over which they have property rights, regardless of whether or not those rights are documented (e.g. through titles) or accorded explicit recognition in national law;

- Instituting rigorous assessments of the tenure-related risks of REDD+ and other PES in each participant country;
- Channelling dedicated support to countries for addressing the risks;
- Monitoring progress on creating socially equitable and secure resource rights, and positioning rural communities to receive PES benefits;
- Reserving grant funding for countries that have made substantial progress in alleviating tenure concerns.

Clarify and provide legal recognition of the land and resource tenure of communities

As noted above, many people in developing countries rely on benefits derived from land and natural resources over which they lack formal rights. Their claims to resources are frequently not upheld by the law and they often lack access to the information and economic means required to gain formal registration and title. Formal systems may be incompatible with socially legitimate informal systems, further dissuading people from pursuing formalization (Bromley, 2008).

Avoiding displacement or exclusion of resource users from PES benefits as a result of absent or unclear legal rights will necessitate that the resource rights of local users are upheld in law and respected by authorities. Rights clarification should begin with land. Rights to trees and other carbon sinks and rights benefits from reduced emissions/sequestration of carbon from those sinks should be nested within clear, state-sanctioned rights to the land on which sinks reside. Layering and clarifying rights to resources that store carbon (e.g. trees, vegetation, sub-surface soils) diminishes the potential for contested claims and misaligned incentives. Two types of legal clarification instruments – statutory law and rights documentation – need to work in tandem if the power of the state is to back people's claims to carbon benefits.

Legal clarification instruments – statutory law and rights documentation – need to work in tandem

Clarification in statutory law. Approaches to recognizing land rights in statutory law have grown more diverse during the last few decades. Whereas many national laws formerly only recognized private rights to land that had been titled and registered to individuals or awarded by governments through concessions, this recognition is expanding to include rights to groups and communities based on ancestral and extended customary occupation and

use. For people classified as indigenous, international law protects rights to ancestral land (e.g. the UN Declaration on the Rights of Indigenous Peoples and ILO Convention 169 on Indigenous and Tribal Peoples). International law also ensures indigenous communities receive some of the highest forms of protection if their rights are violated.

Gradually, some countries are granting statutory recognition to rights that are not surveyed and recorded in a registered title, such as certificates of individual or group rights based on delimitation or demarcation of boundaries. This may reflect a realization that issuing, acquiring or transferring a registered title can be a costly and cumbersome process for both the government and the landowner; or, it may reflect a desire for alternatives that can accommodate greater sharing of rights and responsibilities between communities and government (e.g. co-management agreements). The specifics of the instrument itself are not critical, so long as the law and the instrument together provide legal clarity over who is entitled to receive compensation for behavioural changes associated with reducing emissions and increasing sequestration.

Countries such as Mozambique, Tanzania and parts of Malaysia do not require documentation of land rights (e.g. registered title), but rather extend statutory recognition of perpetual use rights based on good faith occupation (van den Brink *et al.*, 2006; Colchester and Fay, 2007). Landholders may need to acquire state certification of their rights (e.g. title) to enjoy the full breadth of their rights (e.g. to access credit or receive benefits from government programmes), but their rights as stated in law would provide legal protection against other claimants.

These legal innovations merit consideration, particularly for countries with large numbers of land and resource-dependent rural communities whose rights lack state recognition. Countries that have adopted these innovations are better prepared to direct the rewards of PES to those who depend on these resources. Yet, typically many other complementary reforms and actions are needed in order for statutory rights to be effectively upheld in practice. As Takacs states, "Laws on paper are one thing; laws in effective practice can be quite different" (Takacs, 2009, p.23).

Unless a country's legal framework specifies that those who hold rights to land and carbon stocks are also entitled to benefits generated by those carbon stocks, there is always a risk that interpretation of the law will exclude

such rights. Important actions to pave the way for PES include review of participant country legal frameworks to identify their implications for rights to carbon benefits and to address ambiguities. In general, where rights to land and carbon sinks run together, it makes sense from an incentives standpoint that those who hold perpetual use rights to land also have rights to the carbon benefits generated from carbon sinks on that land. Where those right holders are primarily living in poverty, such guarantees also treat concerns over equity and social justice.

Where rights to land and carbon sinks run together, it makes sense that those who hold perpetual use rights to land also have rights to the carbon benefits

Laws could be amended to make clear that perpetual use right holders are entitled to benefits generated by their land and natural resources (subject to other limitations in the law), and that this entitlement extends to naturally occurring benefits, in addition to those generated through their own investment. Rights to carbon benefits could be used as an example, but would not necessarily have to be if the potential for ambiguous interpretation is eliminated. For other countries, it may be sufficient to define rights to trees and other carbon sinks to encompass all benefits generated by those resources, including sequestered carbon. Whether rights to specific benefits can be transferred or not can be left up to individual countries if and when they have the systems in place to manage carbon markets.

In countries where the state holds rights to trees on private land, reforming statutory law to assign those rights to landholders will enable carbon-based PES to work more effectively and equitably. Where separate perpetual rights to trees accrue to private persons, the law may want to uphold social norms governing the sharing of benefits, provided that those norms do not conflict with principles of social justice. Indeed, this would apply to any circumstances where different persons or groups hold perpetual, overlapping rights to land and carbon stocks.[16] On the one hand, instituting uniform rules on the allocation of resource rights and economic benefits may help protect

16 However, in the case of persons and entities that hold temporary rights over land (e.g. tenants), it is probably wise to assign carbon rights to landowners (and other holders of perpetual use rights), who are in the best position to manage resources for long-term generation of carbon benefits. Landowners can then contract with tenants and directly provide them with the necessary incentives to use land and carbon stocks, and apply practices that will yield promised carbon benefits. Moreover, laws that might seek to guarantee tenants rights to carbon benefits could instigate their eviction by landlords keen to ensure that they capture the full benefits of PES.

the poor from seeing their rights captured by those who wield more power. However, local norms can be quite diverse and evolve in response to new circumstances. Instituting uniform rules could easily impose rigidity and the inability to tailor benefit-sharing arrangements according to the extent of resource rights held by the parties and local norms of fairness. Under these circumstances, contracts may prove a better option.

Up to this point, we have presented options that are compatible with assigning private rights to land and carbon stocks. Notwithstanding their merits on the grounds of conservation incentives and equity, efforts to ensure communities and smallholders are entitled to 100 percent of the payments generated by carbon projects are likely to be met with resistance by many participant country governments and could fail to improve tenure security and livelihoods. Recognition also needs to be given to the fact that governments can provide valuable services to rural communities to improve their ability to meet PES objectives. For example, in areas of resource competition, adequate patrols of trained and armed forest guards are likely to be needed to help communities defend rights to their forest resources. A fair and efficient judicial system is needed to address disputes associated with REDD+ and other PES programmes. Institutions will need to be set up to channel payments to communities in a timely and transparent fashion. Governments need resources and incentives to perform these duties appropriately and thoroughly.

In all cases, ensuring that the array of PES stakeholders adopt behaviours and provide services that are conducive to project and programme success will necessitate provision of adequate incentives to each of those stakeholders. Building that incentive structure starts with the process of stakeholder identification and an analysis of their interests and abilities, so as to address the possible opportunity costs of such behavioural change.

Documentation of rights. Documented formal land rights certify that the bundle of rights held by individuals, families or groups to a particular piece of land or resources pertaining to that land are recognized by the state.

The process of documenting the scope of rights, demarcating the geographic boundaries within which those rights apply, and having those rights registered or otherwise validated by the state, has important advantages. It clarifies the nature and extent of rights one is entitled to exercise over a piece of land and

its associated natural resources, and the geographic location that those rights apply to, thereby serving as a piece of *evidence* against competing claimants that is backed by the power and authority of the state. To the extent that the government has the capacity and will to enforce those rights, it can go beyond serving as evidence and actually *protect* the holder from competing claimants, including the state. This will depend on rights associated with the certificate or title *vis-à-vis* the legal rights of other claimants. The rule of law matters significantly in this respect.

These attributes are critical for PES to function well, as entitlements to resources imply entitlements to payments. To be as effective as possible and mitigate the potential for carbon rights to be challenged, certification must make clear the right of landholders to the benefits generated by the resources attached to that land, including those that are generated naturally and without investments by the landholder. Framing it as such ensures the inclusion of carbon benefits within the entitlement bundle. In cases where the state holds the rights to subsurface minerals and hydrocarbon resources, these could be explicitly excluded in law. However, reforms should be careful not to exclude rights to soil organic carbon (Takacs, 2009). This could result in landholders being excluded from PES for subsurface carbon sequestration or reduced emissions derived from the adoption of improved soil management practices.

Nevertheless, most land administration systems are set up to record single owner private property systems and are not equipped to accommodate complex systems of overlapping and shifting rights. Innovations in recording layered systems of rights are emerging. Such systems are being developed and experimented with through the efforts of the Global Land Tools Network and partners (Lemmen, 2010; Mitchell, 2010).

It is likely to be simpler and less administratively cumbersome to vest rights in primary right holders, but these tend to be men rather than women, farmers rather than pastoralists or hunter/gatherers, autochthonous communities rather than migrants, traditional authorities rather than their constituencies. In other words, this strategy could further weaken the rights of those who are more vulnerable, contributing to widening social cleavages. Even if documentation reflects the rights of secondary right holders, substantial inequities in power relations between groups are likely to impede them

from securing entitlements to payments. Moreover, individual titles that collapse rights to land and vest them in a single person or couple are often incompatible with these systems, and can result in depriving holders of secondary rights to livelihood resources and assets.

Certified community land rights. Increasingly, in countries where governance rights to land and resources are often vested in a community, tribe or other group (even if rights to most resources are assigned to families and individuals), legal reforms are enabling these communities to have their territorial rights demarcated and certified by the state. When it comes to PES, certification of community rights has several advantages. It is likely to: 1) be less expensive than individualization approaches, both for recording rights and making PES payments[17]; 2) legitimate systems of customary tenure and preserve overlapping rights; 3) result in assigning PES benefits to whole communities, rather than privileging primary right holders (though not entirely because community certification may exclude certain secondary right holders, such as pastoralists and other seasonal migrants); and 4) assign long term and often inalienable rights over large forested areas, making them attractive from a carbon investor's standpoint. A few elements are critical: 1) vesting title in the whole community and establishing representative structures that have the capacity and incentives to act in the best interests of community members (including the less powerful); 2) recording established rights in the national cadastre to ensure their public visibility and provide clear evidence of state recognition of community rights; and 3) working with communities to establish a means to receive and disburse payments – equitably and in a manner that generates the appropriate conservation incentives. Places that uphold community land rights in law include Mozambique, Tanzania, Ecuador, Colombia and Panama.

Although this approach has similarities to community forestry and community-based natural resource management in terms of devolving rights

17 Estimates by Hatcher (2009) indicate that costs of recognition of community tenure ranging between US$0.05/ha and US$9.96/ha compare favourably to costs of titling household plots, ranging between US$9.44/ha and US$36.78/ha

and governance authority to communities, the two approaches embody distinct differences. Under community forestry, communities often have a more limited set of rights than they do when communities' lands are demarcated and titled (or otherwise certified) in the name of the community. Rather than being perpetual, rights under community forestry may be for specific periods or subject to government termination. Governments will also tend to have greater power to oblige certain resource conservation behaviours, rather than this being a voluntary decision by the community. As a result, community forestry may offer less tenure security and therefore fewer incentives to adopt conservation behaviours.

Despite the multiple advantages of community land rights for PES, they are not immune to elite capture. Evidence from Ghana shows that land has been sold by customary leaders at the expense of communities that occupy and rely on it. In the case of PES, powerful persons could hoard PES benefits and sell off community resource rights for personal gain. Assigning rights in the name of the community should be reinforced by establishing community assemblies as governance bodies and electing trusted community members to govern the distribution of benefits. Mitigating the potential for PES to exacerbate social inequality also requires looking beyond legal solutions and complementing these with investments in social change processes, as discussed below.

Assigning rights in the name of the community should be reinforced by establishing community assemblies as governance bodies

Encumbrances. For carbon-based PES to work effectively, rights to carbon need to be tied to perpetual rights to land and 'run with the land', such that even if land is sold or rented, the new owner/renter then inherits an encumbrance (Takacs, 2009; Kennett *et al.*, 2005). In such situations, owners will need to compensate renters – e.g. provide a share of the payments or other compensation received – so that renters continue to manage land for carbon benefits. The same would be true for other secondary interests in land.

In many developed countries, conservation easements can be attached to a private landholder's title and provide a means by which the government or a private sector interest can restrict the landholder from activities that would interfere with conservation objectives. Doing so assures the 'permanence' of the environmental service and minimizes risks that the management of land for carbon will be abandoned if the land is sold.

To work effectively in a context where communities are resource-dependant, easements would need to permit certain uses of the land necessary to meet livelihood needs (including income generation): for example, rights to gather non-timber forest products or hunt game. However, these rights need to guarantee to an investor that their exercise would not interfere significantly with carbon storage and value. However, the separation of rights in this fashion does not offer a ready solution. Even if carbon right holders gain management rights over the land and restrict the rights of land and tree owners to resource use, they will need to incur supervision costs to ensure contracted agreements are respected. Adequate compensation will need to be offered to alter the incentives of those who control the land and its associated carbon stocks.

For countries with weak land administration systems, easements in the traditional sense may not be a viable option. Easements for carbon sequestration call for a carbon rights registration system linked to the land registry, such that future land buyers are alerted to easements. The situation may be simpler if the law requires that land is leased to the carbon right holder to manage. However, this has implications on the duration of those rights and would impose restrictions on the trading of carbon and management rights to others, since this would be at the discretion of the landowner. Instead, it may be worthwhile to give consideration to easements attached to community land titles, provided that adequate incentives for compliance and mechanisms of enforcement are in place. Easements are likely to lower transaction costs and be most attractive when they apply to large swathes of community land where strong local governance systems are in place.

Co-management agreements. Co-management agreements provide legal mechanisms whereby communities and governments share rights and responsibilities to use and manage land and natural resources. Examples of co-management arrangements can be found in numerous and geographically diverse locations, including the Philippines, India, Ecuador, Bolivia, Cameroon and Tanzania. Governments typically have stronger rights to land than they would if the land were held under community title, stronger rights to impose restrictions on land and resource use, and stronger ability to dissolve the rights of communities. Yet, there can be advantages to co-management, such as

the state having a joint stake in the resource and therefore greater incentives to protect the area. Governments also have stronger, legally-sanctioned enforcement capacity – for example, they can hire and post guards at the border of forested areas to prevent encroachers – whereas communities rarely have this kind of authority and may also lack the capacity to compensate guards. Moreover, if violation of the rules occurs within the community, members can face challenges in sanctioning their own neighbours (Lawry, 1990).

There can be advantages to co-management, such as the state having a joint stake in the resource and therefore greater incentives to protect the area

When it comes to PES, co-management arrangements may represent a compromise that governments are willing to make, instead of creating strict protected areas. The opportunity to share benefits may enhance incentives for resource protection and capacity. This is especially so if governments recognize that strict protection approaches have limited effectiveness where resource demands are high, and that communities with the same incentives to conserve can greatly complement and enhance the monitoring and enforcement capacity of the state. For example, some co-managed areas in Ecuador offer opportunities to indigenous residents as government-employed park guards and wildlife trackers. Some co-managed areas are managed as parks or conservancies. Revenues from these can be directed to enhancing carbon management and protection capacity, as well as making investments in infrastructure and facilities that improve public welfare. Carefully crafted co-management agreements that vest significant governance power, resource rights and benefit entitlements in communities are worthy of further exploration.

Contracts. Many PES schemes use contracts to govern rights to benefits, responsibilities and liabilities of the parties, among other terms. If negotiated fairly, contracts are a reasonable alternative when the law fails to provide the necessary protection or minimum standards. Yet, because they represent agreements between specific parties, they are more liable to benefit more powerful and informed parties and disadvantage those who are less savvy in distilling the implications of different arrangements, possess weaker negotiation skills, or lack full information on the current and potential future value of their resources (Griffiths, 2007). For contracts to work well, the legal framework needs to set forth the minimum standards for rights recognition and benefit entitlements, and include legal aid for parties that

require it. For investors, contracts also have their drawbacks if rights are not spelled out clearly in law. They bear the risk that contract provisions could be abrogated once law is created (Takacs, 2009). While contracts are an option for project-based PES, they are not adequate for REDD+ which seeks to establish a national accounting approach for determining emissions reductions. A uniform set of rules governing rights to carbon benefits and entitlements to payments will be critical for REDD+ to operate at scale.

Tradeability. Insufficient analysis has been dedicated to assessing the merits and the risks of separating rights to carbon benefits from rights to land and associated carbon stocks to facilitate carbon trade. On the one hand, rights separation will likely be more favourable to the creation of offset markets, the pooling of small carbon projects, spreading risk, and augmenting demand for carbon credits. But separation also risks consolidation of carbon rights in the hands of a few, due to market imperfections, information asymmetries, and disparities in the capacity to manage complexity and access finance. Also, rights-based administration systems in most developing countries will be unable to accommodate sporadic carbon rights registration systems the poorest may also lack the means to access such a system effectively. Hence, systems of tradeable rights risk being biased towards the wealthy and informed (Peskett *et al.*, 2008). While restricting transactions may cause market inefficiencies, such curbs may impose needed safeguards by inhibiting the flow of resources towards those who have better knowledge, networks and capital, and away from the poor who depend on the resources.

Other legal reform options. Apart from addressing the legal framework governing rights to land, carbon sinks and carbon benefits, other legal measures are likely to be needed to ensure PES yields socially positive impacts. These include:

- *Clarification of entitlements to benefits.* Rights to benefits generated through carbon sequestration and reduced emissions, including monetary benefits, should be spelled out in law to eliminate ambiguities and the risk that interpretations of the law could result in certain types of rights or benefits being excluded.
- *Restrictions on justifications for expropriation.* When governments have broad grounds to appropriate land or eminent domain laws are vague,

the tenure security of landholders can be weakened, deterring carbon buyers from investing. Both tenure and investor security are enhanced when: 1) justifications for public takings are narrow and limited to public use; 2) governments are required to demonstrate clearly the public use benefits and broader social benefits to a body that is representative of citizens' interests; and 3) the government is required to pay compensation for takings.

- *Reform of productive exploitation laws.* Many countries have laws that require landholders to make productive use of their land in order to retain rights to it. In some instances, laws may need to be revised to broaden the terms of productive use to encompass REDD+ activities.
- *Commitments to regulate and proactively rein in powerful interests.* Unless country governments and donors tackle the primary drivers of deforestation (e.g. the logging industry, agribusiness and urbanization), PES schemes like REDD+ are unlikely to have any meaningful impact.
- *Redistribution of natural assets.* Where significant disparity in landholdings exists, redistributive reforms may be necessary to prevent PES schemes from further exacerbating social inequality and consolidation of power.

Facilitating reforms in practice

> *"When law in practice props up existing exploitation schemes, when it denies the rights and blocks the potential of poor people at local level – it is the practice, rather than the letter of the law that needs to be engaged with."*
>
> *Source:* Cotula and Mayers, 2009

Policy and law often reflect a society's principles and intentions and can establish the rules for how it will achieve those intentions. Whether law is effectively implemented will depend on: 1) the extent to which it accurately mirrors societal values; 2) people's knowledge of the law and procedures for defending their rights; and 3) enforcers of the law having adequate human and financial capacities and the will to fulfill their duties. This section treats the latter two conditions in the context of PES.

Knowledge and capacity. While examples of positive policy and legal reforms on tenure are increasingly plentiful, examples of effective campaigns to publicize those laws and the procedures by which people can exercise their rights are much scarcer. Governments often lack the resources to do an adequate job, especially in reaching areas and groups that may be isolated from the media. Ignorance also arises when civil society had little engagement in the reform process.

As PES programmes to reduce GHGs (greenhouse gases) proliferate and become more lucrative, awareness will be even more crucial. The vocabulary and structures for PES, and notably carbon markets, are new, complex and rapidly evolving. Equipping forest and agricultural communities with knowledge of their rights will take time and may clash with the urgency of the climate change mitigation agenda. Awareness needs to be accompanied by capacity building that enables communities to claim and defend rights, negotiate with government and private sector interests, understand entitlements to revenues, and structure effective and just governance systems so as to mitigate power disparities between communities and investors. Attention to ensuring the rights and priorities of women and vulnerable groups must permeate capacity building efforts.

Attention to ensuring the rights and priorities of women and vulnerable groups must permeate capacity building efforts

A major focus of the REDD+ Preparedness processes – and critiques of those processes – has been on stakeholder consultations. Communities and other stakeholders must receive accurate and complete information about their obligations and entitlements under PES schemes, including tenure and benefit distribution implications, and their rights to decline engagement.

Capacity and will of government. If governments are to administer and enforce laws that protect the resource rights and benefit entitlements of rural communities, they need to be adequately equipped. However, state presence in many rural or less populated forest areas is minimal or even absent. Where presence exists, officials regularly lack the vehicles and other equipment necessary to perform their jobs. Often, there are shortcomings in technical capacity. Salaries for government staff tend to be low compared with the private sector (Gorodnichencko and Sabirianova Peter, 2007; Adamchik and Bedi, 2000), and budgetary constraints can leave officials going unpaid for extended periods.

However, inadequate government performance is not altogether the result of impoverished systems. In many countries, rent-seeking is rife, and can be particularly so with institutions that allocate or administer land rights. PES raises land and forest values and may invite malfeasance. Rent-seeking behaviour can be moderated partially through increasing transparency, but is unlikely to be meaningful unless official incentives are aligned with upholding the law. Governance systems that support downward accountability to local citizens can help temper elite monopolies over rights and benefits. Efforts to bolster the political power of women and other marginalized groups can likewise help shift the balance of power. Vesting authority, resources and accountability in local governments and supporting civic action on the part of local communities can put pressures on the state to enforce resource rights and the law more broadly. For PES programmes to take root and thrive, both state and non-state authorities will need to be held accountable from above and from below for administering and enforcing rights and ensuring fair and equitable distribution of PES benefits. Governments and donors must create strong accountability structures that are reinforced by commitments from the highest levels of leadership.

Both state and non-state authorities will need to be held accountable from above and from below for administering and enforcing rights and ensuring fair and equitable distribution of PES benefits

CONCLUSION

There is substantial international momentum behind PES programmes aimed at reducing GHG emissions and enhancing carbon sequestration. As the world prepares to undertake major investments in climate change mitigation, key questions remain:

- Will PES programmes constitute a major source of capital for developing countries with significant carbon stocks, especially forests?
- If PES attracts aid and private capital flows, will it result in poverty reduction or will it sharpen income and asset disparities, potentially exacerbating poverty and social grievances?
- Will women and vulnerable groups be served by these programmes, or will they be largely excluded?

The answers to these fundamental questions will depend on whether rural communities – particularly those who rely most on trees, soils, vegetation and other carbon resources, and have the greatest stake in their conservation – are compensated for the opportunity cost of not exploiting them. Communities need to possess the tools to exclude or temper the actions of other actors who would profit from resource exploitation. In other words, they need legal and control rights over resources and the means to exercise those rights effectively.

The direction that large scale PES will take with respect to resource rights is not only important in terms of international commitments to human rights and poverty reduction, but also in terms of whether PES will end up being an effective tool for mitigating climate change, or a colossal waste of resources. Success is only likely to be realized when the incentives of governments and rural communities are aligned and both are poised to benefit from PES programmes. One of the most potent ways of achieving this alignment is through restructuring and clarifying resource and carbon rights and entitlements to PES revenues. Put simply, the distribution and security of resource rights is set to have an ever larger influence on the pace and severity of climate change. We ignore their fundamental importance at our own risk.

The distribution and security of resource rights is set to have an ever larger influence on the pace and severity of climate change

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TOWARD LAND ADMINISTRATION SYSTEMS TO SUPPORT CLIMATE CHANGE MITIGATION PAYMENTS

VERS DES SYSTÈMES D'ADMINISTRATION FONCIÈRE SUSCEPTIBLES DE SOUTENIR LES PAIEMENTS POUR ATTÉNUATION DU CHANGEMENT CLIMATIQUE

HACIA LA ADOPCIÓN DE SISTEMAS DE ADMINISTRACIÓN DE LA TIERRA EN APOYO DE LOS PAGOS POR LA MITIGACIÓN DE LOS EFECTOS DEL CAMBIO CLIMÁTICO

ABSTRACT

CARBON SEQUESTRATION

LAND ADMINISTRATION

REDD

PAYMENT FOR ENVIRONMENTAL SERVICES

Climate change mitigation projects in developing countries have the potential for significant negative impacts on land users. In particular, land users with socially legitimate but informal tenure that is not recorded using a statutory process are at risk of exploitation from the powerful elite. A detailed understanding of *de facto* property rights is important in protecting the rights of legitimate beneficiaries of climate change mitigation projects, and this is recognized in international declarations. Land administration systems have the potential to assist in formally recognizing and recording both *de jure* and *de facto* rights to land and resources. This paper analyses the requirements for land administration

RÉSUMÉ

SÉQUESTRATION DU CARBONE

ADMINISTRATION FONCIÈRE

REDD

PAIEMENT POUR SERVICES ENVIRONNEMENTAUX

Les projets d'atténuation des effets du changement climatique dans les pays en développement peuvent avoir des impacts négatifs significatifs sur les utilisateurs des terres. Il s'agit notamment de ceux qui disposent de droits fonciers informels mais socialement légitimes, qui ne sont pas enregistrés selon des procédures reconnues et qui risquent d'être exploités par les élites puissantes. Une compréhension détaillée des droits de propriété *de facto* est essentielle pour protéger les droits des bénéficiaires légitimes des projets d'atténuation des effets du changement climatique, et cela est reconnu dans des déclarations internationales. Les systèmes d'administration foncière peuvent apporter une assistance, en reconnaissant formellement

SUMARIO

SECUESTRO DE CARBONO

ADMINISTRACIÓN DE LA TIERRA

REDD

PAGO POR SERVICIOS AMBIENTALES

En los países en desarrollo, los proyectos de mitigación de los efectos del cambio climático pueden traducirse en importantes repercusiones adversas para los usuarios de la tierra. En particular, los usuarios cuyos derechos de tenencia, socialmente legítimos, son de índole informal porque no han sido objeto de registro mediante escritura corren el riesgo de ser víctimas de la explotación de minorías selectas poderosas. Tal como ha sido expresado en las declaraciones internacionales, para proteger los derechos de los auténticos beneficiarios de los proyectos de mitigación del cambio climático es imprescindible entender cómo funcionan los derechos *de facto* que se aplican a la propiedad.

in the implementation of climate change mitigation policies through payments for environmental services (PES). The authors review existing approaches to administering land tenure on climate change mitigation projects, and consider how current and innovative approaches to land administration may be applied.

This discussion draws on a review of the literature as well as a review of seven climate change mitigation projects in Africa, Asia and South America. The authors argue for the importance of formally recording and recognizing *de facto* land rights and point out the risks of ignoring these rights, while acknowledging the complexity and difficulty of incorporating this understanding into the design of climate change mitigation projects.

et en enregistrant les droits à la terre et aux ressources *de jure* comme *de facto*. Ce document analyse les conditions nécessaires, en termes d'administration foncière, pour la mise en œuvre des politiques d'atténuation des effets du changement climatique, à travers les paiements pour services environnementaux (PSE). Les auteurs passent en revue les approches existantes en matière d'administration foncière dans les projets d'atténuation des effets du changement climatique et examinent de quelle façon les approches novatrices actuelles peuvent être appliquées.

Ce débat s'appuie sur une analyse des documents existants et sur l'examen de différents projets d'atténuation des effets du changement climatique en Afrique, Asie et Amérique du Sud. Les auteurs soulignent l'importance de l'enregistrement et de la reconnaissance formelle des droits fonciers *de facto* et mettent en évidence les risques qu'il y a à ignorer ces droits, tout en reconnaissant la complexité d'intégrer ces dispositions dans la conception des projets d'atténuation des effets du changement climatique.

Los sistemas de administración de la tierra pueden ser útiles instrumentos para el reconocimiento oficial y el registro, tanto *de jure* como *de facto*, de los derechos sobre la tierra y los recursos. En este estudio se analizan los requisitos para la administración de la tierra en lo relacionado con la ejecución de las políticas de mitigación climática mediante el pago por servicios ambientales (PSA). Los autores pasan en revista los enfoques existentes relacionados con la gestión de la tenencia contenidos en los proyectos de mitigación, y examinan las modalidades de aplicación de los procedimientos actuales y nuevos destinados a la administración de la tierra.

La discusión presentada en este trabajo se basa en un análisis de la literatura y en la reseña de siete proyectos de mitigación realizados en África, Asia y América del Sur. Los autores abogan por el registro y el reconocimiento oficiales de los derechos *de facto* a la tierra y señalan los riesgos que conlleva su desconocimiento, admitiendo cuán complejo y difícil resulta incorporar los conceptos que nacen de esta comprensión en el diseño de los proyectos de mitigación.

INTRODUCTION

Payments for environmental services (PES) aim to provide incentives for resource users to engage in sustainable land management practices in return for payment (Engel *et al.*, 2008). One example is the Clean Development Mechanism (CDM), which allows developed countries to implement mitigation projects in developing countries that help in meeting their Kyoto targets, by earning saleable certified emissions reduction credits. CDM projects are limited to reforestation/afforestation projects, and this limitation has led to the development of projects called REDD (Reducing Emissions from Deforestation and Forest Degradation). Subsequently, the term REDD+ was developed to include sustainable forest management as well as afforestation/reforestation. There are also projects developed by private interests under various Voluntary Carbon Market (VCM) mechanisms. This paper will focus primarily on REDD, REDD+ and VCM projects, since these make up the majority of existing projects. For simplicity the acronym REDD will be used to refer to both REDD and REDD+ projects.

While the objectives of REDD and VCM projects are sound from a climate change mitigation perspective, they are typically implemented on forest and agricultural land involving significant natural resources that are often contested. In particular there is potential for conflict over forests where a significant value is placed on the natural resources. For example, Larson *et al.* (2010) have listed several examples where the livelihoods of rural communities have been affected by state policies, or the intrusion of others on state-owned forest concessions, forest classification schemes and mining concessions, involving subsequent evictions or severe limitations on livelihoods. Hatcher (2009) has noted, "Resource rights are almost always contested, and initiatives to legally recognize resource tenure are often highly political with context specific complications and complexities". Deforestation and degradation is driven by complex social, economic and geographical factors (Kaimowitz and Angelsen, 1998; Hatcher, 2009).

There is potential for conflict over forests where a significant value is placed on the natural resources

It has been estimated that 71 percent of forested lands are administered by government (White and Martin, 2002) and 9 percent by communities (Sunderlin *et al.,* 2007). Where forests are managed by communities

the rights to resources are often complex and informal. The Rights and Resources Initiative (2008) stated "Many forested communities, particularly in developing countries, are chronically poor and badly governed. They suffer disproportionately from conflicts, humanitarian crises and corruption, which often spread nationally and internationally. The property rights of forest communities are widely unrecognized, and the human and civil and political rights of indigenous peoples, women and other marginalized groups in forest areas are frequently limited".

The people most vulnerable to being exploited in these circumstances are those with socially legitimate rights to the land and resources on which a project is implemented (for example customary and indigenous groups), but who may not have statutory records of these rights.

People most vulnerable are those with socially legitimate rights to the land and resources but who may not have statutory records of these rights

Article 17 of the Universal Declaration on Human Rights (United Nations General Assembly, 1948) affirmed every person's fundamental right to own property, and that no one shall be arbitrarily deprived of property. The protection of property rights was subsequently reaffirmed in the 2009 Anchorage Declaration that outlined the demands of indigenous peoples on Member States and the UNFCCC, and called for all initiatives under REDD to "secure the recognition and implementation of the human rights of Indigenous Peoples, including security of tenure, ownership, recognition of land title according to traditional ways, uses and customary laws, and the multiple benefits of forests for climate, ecosystems and Peoples before taking any action" (Indigenous Peoples' Global Summit on Climate Change, 2009). As many REDD and VCM projects occur on indigenous or customary lands, it is important that the process of recording rights to land and resources include adequate consultation with these communities, and that the traditional ways, uses and customary laws relating to land be understood during project design and implementation.

It is important that the process of recording rights to land and resources include adequate consultation with communities, and that the traditional ways, uses and customary laws relating to land be understood

In most countries there is a legal pluralism regarding rights to land and resources. It is common for a statutory system of recording de jure land rights to operate in parallel with (but separate to) a local or customary system of understanding the de facto rights to land and resources. Only a rather small percentage of private land in developing countries is recorded under a statutory system; many ordinary and legitimate land users still do not enjoy

full security of tenure for a variety of reasons. Much more common is that ordinary people in these societies occupy and use land under a range of socially legitimate (or otherwise) forms of tenure. An adequate understanding of both their de facto and de jure rights is needed before decisions can be made on who the likely participants in and beneficiaries of a REDD or VCM project will be. Ignoring either the de facto or de jure rights is one of the main reasons for conflict over land and resources.

In a study carried out in Aceh, Indonesia, on REDD and the tenure of local communites, Dunlop (2009) recommended enhancing the tenure security of forest dependant communities through REDD. She argued that ultimately all land ownership information should be registered at local level in the State land registry (BPN) to enhance tenure security. However, she also acknowledged the substantial improvements to land governance and capacity building that would be required to achieve this.

The reporting requirements of REDD and VCM projects derive from the international accountancy standards. These rely on strict formal approaches, and therefore require a legal land tenure instrument to which carbon credits can be attached. Where land is held under de facto (often customary) but not de jure rights, this may create difficulties in registering and selling carbon emission trading rights under the Kyoto Protocol. The authors argue that to protect de facto rights to land and resources, this will require the development of appropriate land administration systems. We also argue that the development of state-oriented land administration systems managed at the local level may be better able to protect the rights of local landholders and communities against land grabbing by overseas investors and other powerful interests.

An adequate understanding of de facto and de jure rights is needed before decisions can be made on who the likely participants and beneficiaries will be

LAND ADMINISTRATION REQUIREMENTS FOR CLIMATE CHANGE MITIGATION PROJECTS

In assessing the way in which land administration systems may be suited to REDD and VCM projects, it is instructive to consider the carbon reporting requirements of projects, and the current approaches to administering land

tenure. In this section we first consider the aspects of carbon reporting requirements that involve land tenure, and also summarize the literature on the aspects of rights to land and resources that should be recorded on REDD and VCM projects.

Carbon reporting requirements

The 2006 Intergovernmental Panel on Climate Change (IPCC) *Guidelines for National Greenhouse Gas Inventories* provides guidance for the Agriculture, Forestry and Other Land Use (AFOLU) sector, and is intended to improve consistency and completeness in the estimation and reporting of carbon accounting. Guidelines also exist for project activities involving Land Use, Land-Use Change, and Forestry (LULUCF) which form one of the components of greenhouse gas reporting. These guidelines apply to projects under the CDM and REDD+ projects but not to projects under the VCM. However, the guidelines focus on carbon reporting requirements and only indirectly refer to property rights issues.

Both guidelines are similar, and three generic approaches are suggested, depending on the circumstances of the project and country. The approaches also differ in the degree of use of geo-referenced and spatial data.

The first approach is to use existing government datasets to identify the total area of each individual land-use category; its methodology typically requires the combination of several datasets.

The second approach involves a national or regional survey of land use and land-use change, in each of the land use categories, and also where land use has changed categories.

The third approach involves spatially explicit data collection regarding land area, land use and land-use change, and may allow land-use conversions to be tracked. An important consideration here is that the buyers of reduced emissions will seek assurances that the accounting is accurate, reliable and close to real time. For example, on the Juma REDD Project in Brazil, monitoring involved the calculation of deforestation, carbon stocks and dynamics, biodiversity and the socio-environmental and socio-economic conditions of communities. Data collection involved a combination of satellite remote sensing and in-field investigations and

assessments. A detailed study on this combination *vis à vis* of community forest monitoring for the carbon market can be found in Skutch (2011).

Under the CDM mechanism the so-called *Procedures to demonstrate the eligibility of lands for afforestation and reforestation project activities* require that project participants demonstrate the eligibility of projects by providing information to demonstrate that the amount of vegetation on the land is within the CDM criteria, and that the proposed activity is consistent with afforestation/reforestation guidelines. Spatial information such as aerial photographs or satellite imagery complemented by ground reference data, or land-use or land cover information in digital or paper form or from ground based surveys, is recommended to support this process. Additional information such as land-use or land cover information from permits and plans, or information from local registers such as a cadastre or other land registers, may also be useful.

The continued development of remote sensing technology will increase its application to these projects. FAO/UNDP/UNEP (2008) have noted that remote sensing techniques had been widely tested and were recommended as a tool for REDD monitoring, assessment and verification, but noted that it was more feasible for some ecosystems and land uses and carbon accounting approaches than for others. Countries differ in their conditions and capacity, and there is a need for prioritizing the most essential aspects at the start of a project and then building capacity from there. The variability of REDD requirements implies the need for flexibility in the design of land information systems, and full national ownership of REDD monitoring systems along with international collaboration as an important consideration (FAO/UNDP/UNEP, 2008).

Required land information

What information on rights to land and resources needs to be recorded? Childress (2010) has argued that the depiction of all potential property rights, "is presumably a prerequisite for the type of detailed land management schemes which are expected to provide clarity and security for REDD schemes". In practice this will require the development of a comprehensive inventory of the land tenure of each parcel, and the de facto use and occupation within and surrounding a REDD or VCM project site, before any recording of interests can proceed. This will involve an extensive search of statutory

tenure records and also a survey of informal rights, i.e. those not recorded under the statutory system. Also important for the sustainability of records of property rights is that the rules with respect to transferability, inheritance, extinction and subdivision of carbon property rights are clear and generally accepted, including separate carbon rights if applicable.

Land administration systems provide a framework for depicting all potential property rights. However, the experience of formal (conventional) land titling in many developing countries has been unsatisfactory, often impacting the poor and vulnerable. There are a range of reasons for this including poor government capacity, poor governance, and inappropriate technical solutions. In order to meet the needs of carbon reporting, improved land administration systems for recording rights to resources will need to be developed, where property rights are informal and complex (e.g. where land is held in communal ownership).

To meet the needs of carbon reporting, improved land administration systems for recording rights to resources will need to be developed

Recent advances in land administration systems provide the potential to comprehensively record interests in land and address some of the limitations of previous approaches. The process broadly involves adjudication, demarcation, recording of rights, and registration or certification. From the discussion so far it could be suggested that the land information required to support the REDD and VCM inventorying and reporting process includes:

- Preliminary identification of the location of project areas and interests in resources (cadastral mapping).
- Identifying the unique identity of the individuals, families, trust, conservancy or community that manages the land, and the names of members, the constitution of any trust, conservancy or community involved, and details of how payments will be shared (i.e. recording interests in land).
- The legal status of the underlying land and whether this land tenure is recorded in a cadastre or land registry (i.e. recording interests in land).
- Details of all other interests in land including concessions, leases and other interests in the natural resources (recording interests in land).
- Any existing de jure or de facto restrictions on the use of forests or carbon (recording interests in land).
- Identifying and marking the project boundary and internal project areas based on a consultative and participatory process. Definition and description of the boundary of the carbon project perimeter (i.e. demarcation).

- Marking the location of boundaries of these interests in land and resources (i.e. demarcation).
- Calculating the land area, carbon stocks and their spatial distribution at various time intervals (land use and land cover mapping).
- Providing improved tenure security for the beneficiaries of climate change mitigation payments (legal recognition or certification/registration).

Source: Adapted from Barnes and Quail, 2010a; Childress, 2010

In the discussion that follows we describe land administration systems that have been implemented in developing countries that have elements of relevance to the needs of REDD and VCM projects.

EXISTING APPROACHES TO ADMINISTERING LAND TENURE ON REDD AND VCM PROJECTS

In this section we will first present a short overview of land tenure and administration issues in a number of actual REDD and VCM projects. Some related land and natural resource information systems are also described to see if lessons can be drawn from them.

A review of the case study projects

Seven case study projects were reviewed and these are summarized in Table 1. These involve REDD and VCM projects in South America, Africa and Asia, and range from small-scale to very large projects. The projects included a range of land tenures including smallholder landholdings, community and indigenous land, state land, private land with insecure tenure, and private land with secure tenure. In each case there has been considerable work associated with carbon accounting and reporting, and identification of the full range of land tenures and interests in the project land. However, more recent projects have tended to avoid areas with insecure tenure and most were implemented on state land where the land users are relatively well known and represented by communities. The exceptions were the Juma Reserve project in Brazil, where approximately 20 untitled land holdings covered about 15 000 hectares, and

the Sofala Community Carbon Project, which found that there were 245 families living in the project area. Project boundaries were typically chosen so that people would not need to be relocated (e.g. the Ulu Masen Project). As a result most have identified the relevant local communities and undertaken consultation with community representatives (e.g. Juma Reserve, Ulu Masen, Noel Kempf). Demarcation of boundaries was only undertaken where there was considered to be a threat from people outside the project area (e.g. the Sofala Community Carbon Project). In most cases remote sensing imagery or aerial photography was used to monitor deforestation rates (e.g. Ulu Masen).

Table 1
List of case study projects reviewed

REDD PROJECTS	AREA	OBJECTIVES	TENURE
JUMA Reserve REDD Project, Brazil	589 612 ha	Reducing greenhouse gas emissions from deforestation	Traditional communities with 15 038 ha claimed as private property but not occupied.
Noel Kempf Mercado Climate Action Project, Bolivia	750 633 ha	Reduced deforestation & degradation (reducing slash and burn agriculture)	Noel Kempf Mercado National Park occupied by indigenous communities.
Pearl River Basin Project, China	4 000 ha	CDM, reforestation, watershed management	State land occupied by communities and individual farmers.
VCM PROJECTS	AREA	OBJECTIVES	TENURE
Ulu Masen Ecosystem, Aceh, Indonesia	750 000 ha	Reforestation, restoration and sustainable community logging	Forest dependent communities with a mixture of communal and individual property rights to land. The forest is managed by the village and the Mukim.
Tengchong Small-scale Reforestation for Landscape Restoration, China	467.7 ha	Restore buffer zone around a nature reserve, reduce soil erosion	Public land managed by communal groups, collective property, and individual farmers.
Scholel Te Plan Vivo Project, Mexico	7432 ha	Afforestation, reforestation, agroforestry, forest conservation and restoration	Small-scale farmers, forest dwellers and other land users with recognized land tenure or user rights.
Nhambita Community Carbon Project, Mozambique	Pilot project 35 000 ha	Forest management, agro-forestry and non-timber forest products	Communities and smallholders in Gorongosa National Park under a form of collective or customary tenure, with some families in scattered homesteads.

There are various reports publicly available that outline the way in which climate change mitigation projects have been implemented, including their approach to carbon reporting. Most of the projects reviewed used participatory mapping techniques to identify interests in land and to gain community agreement on these rights and the location of boundaries. For some projects this included meetings with community group representatives (Ulu Masen); for others it involved extensive social and cultural surveys (Noel Kempf). Many of the projects used geospatial information. For example, the Tengchong Small-scale Reforestation for Landscape Restoration project used Landsat imagery and GPS to determine the coordinates of the corners of 13 parcels of land; project activity areas were marked with red lines on land cover maps, and used in interviews to confirm the existing land use. On all of the projects reviewed there was use of remote sensing imagery.

It is clear from this review that in each project there was an intention to undertake extensive community consultation to establish rights to resources, and to establish which land may be suitable for use and who has rights to this land. What is not so clear is how these rights to land were recorded, how the full complexity of social and customary tenures were detailed, and how these records would be updated to record changes in the complex relationships between people, land and resources.

Lessons from international experience indicate that there is potential for conflict over land where the method of recording rights has not included sufficient community consultation. Community administered systems of recording rights can be effective where there is little demand for land from outside interests. However, in the context of REDD projects there may be considerable pressure for land from people outside of the local communities. Existing formal land administration systems have the potential to record rights in a more comprehensive and transparent manner, and help protect the property rights of beneficiaries. In general, the implementation of formal land administration systems is complex and previous attempts have often not addressed the land tenure problems, or indeed exacerbated them. Therefore in the following sections we provide examples of alternative systems that may be adapted for use in REDD and VCM projects.

In the context of REDD projects there may be considerable pressure for land from people outside of the local communities

Information systems used for natural resource monitoring

The Rural Resources Institute (2008) has noted that in order to improve the recognition of property rights and forest ownership and access, "Effective ways should be found to reconcile agrarian reform, titling, adjudication, and the allocation of land for resource extraction with the effective recognition of forest tenure". Land administration and information systems are part of this. There have been examples of projects where comprehensive land information systems were developed that linked information on resources with information on land tenure. Two systems of particular relevance to REDD and VCM projects are the EU Integrated Administration and Control System (IACS), and a deforestation change detection technique developed in Mato Grosso, Brazil, called Systema de Alerta de Desmatamento (SAD).

Under the IACS, each EU country is required to develop a Holding Register that identifies each parcel of agricultural land and who can claim the payments to be made on it, supported by a Land Parcel Identification System (LPIS) based on cadastral maps, spatial data, aerial photography, or satellite imagery. National governments typically use a process of asking land users to verify the land-use/cadastral maps and the records of ownership and tenancy. There are analogies to REDD projects related to the need for verification of rights to land from beneficiaries. Like those REDD projects, there are benefits in being able to link the monitoring of land cover with knowledge of tenure. FAO (2006) has argued that, "Governments should consider developing the IACS system into a land tenure database by adding tenure data to those on occupancy required for CAP purposes". The lessons for REDD and VCM projects are in the distinction between the actual user and the statutory holder of property rights, as well as in the need for verification of records of rights to land and resources from beneficiaries.

In the second example from Brazil, significant deforestation was occurring in Mato Grosso state on land of which approximately 76 percent comprised private rural properties. Under the legislation, private landholdings were required to be registered in the State Environmental Licensing System of Rural Properties (SLAPR), and the amount of deforested area in each property cannot exceed 20 percent. However, properties covering only 21 percent of the territory were registered under SLAPR. In response, the SAD system was

developed combining daily image composites from Moderate Resolution Imaging Spectroradiometer (MODIS) that were validated by high resolution satellite images. The SAD system was able to monitor daily changes in forest cover. When matched with cadastral data, and other state environment agencies' GIS datasets, it was possible to identify and prosecute the landholders responsible. Through this process it was found that most of the deforestation occurred on rural properties not registered under the SLAPR system (de Souza *et al.*, 2010). The lesson for REDD and VCM projects is that clarity on property rights helps in making the land user more accountable.

HOW FORMAL LAND ADMINISTRATION SYSTEMS CAN HELP?

Early in this paper it was revealed that existing REDD and VCM project guidelines only provide limited requirements regarding how project beneficiaries are identified and how their property rights are recorded. However, the risks for poor and vulnerable groups from REDD and VCM projects implies that more comprehensive approaches are required. This is reinforced by international conventions on human rights as discussed earlier. We consider that the carbon reporting requirements will require the development of a rigorous system that records interests in land and resources, issues a legally recognized instrument of land tenure, and is capable of being updated with changes to land use or land tenure. The other critical aspect is that the land administration system should be developed with active participation from the project beneficiaries. A review of the literature reveals that the discussion on how to record property rights on REDD and VCM projects is at a very preliminary stage. However, the land administration literature contains many examples of innovative systems for recording complex rights to land and resources, and these may be considered for implementation on REDD and VCM projects.

The carbon reporting requirements will require the development of a rigorous system that records interests in land and resources, issues a legally recognized instrument of land tenure, and is capable of being updated with changes to land use or land tenure

Formal land administration systems provide an opportunity to bridge the gap between the limited project requirements for recording property rights that currently exist, and the comprehensive processes needed to understand fully the complexities of the existing de jure and de facto rights to land

and resources. However, we need to learn from the lessons of previous failed attempts to implement formal land administration systems. Mitchell *et al.* (2011) noted that where systematic land titling programmes exist near potential REDD or VCM project sites it may be possible to justify their expansion to cover the project area. Similarly, where sporadic land titling is being undertaken on a large nearby development project, it may be possible to expand the scope of this titling. In both cases this will depend on factors such as the capacity and technical capabilities of the land agencies, as much as the economic analysis. However, land titles cover a small percentage of total land in developing countries, and an even smaller percentage of land covered by forests.

This section suggests alternatives to systematic and sporadic land titling, and includes some of the more innovative land administration systems operating in developing countries that may be successfully applied. It is a summary of a more detailed discussion by Mitchell *et al.* (2011). These innovations in land administration systems relevant to PES projects may be broken up into the various components of the process, and include the demarcation of boundaries, cadastral and participatory mapping, mapping of social tenures and the recording of rights, and certification.

Demarcation of project boundaries

Since the early 2000s many developing countries have developed more decentralized land administration systems and introduced technology that has reduced the cost of recording and certifying land rights. Low-cost land certification or registration approaches have been implemented that reduce costs by using handheld GPS for field surveying, local labour and equipment for field surveys, aerial photography or satellite imagery as an alternative to field surveying, and the digitization and computerization of land records to improve efficiency. Systems have been developed to record complex social tenures including maps of tenure types derived from measurements using handheld GPS. Much of this technology is relatively low-cost and readily applicable to REDD and VCM projects.

Systems have been developed to record complex social tenures

Cadastral and participatory mapping

Cadastral mapping allows the identification of and agreement on the different types of tenure and their boundaries. Cadastral maps are derived from an adjudication process that involves participation and agreement on the extent of rights by all parties. Typical low cost cadastral mapping uses aerial photography, satellite imagery or topographic plans as a base for developing the cadastral maps, supported by field verification. In Namibia, for example, aerial photography was available for much of the country and provided the base for cadastral mapping (Kapitango and Meijs, 2010). In Ethiopia, high resolution imagery was used for adjudication (Lemmen and Zevenbergen, 2010). This is instructive for REDD and VCM projects which typically involve the acquisition of satellite imagery to assist with carbon accounting and reporting.

Cadastral mapping allows the identification of and agreement on the different types of tenure and their boundaries

More complex land tenures such as customary or indigenous lands often include rights that overlap and require a more comprehensive understanding of the social tenures, in order to adequately record both the de facto and de jure rights. Community or customary land adjudication is becoming increasingly participatory and consultative.

Mapping social tenures and overlapping rights

There are a range of tenures that may be considered socially legitimate that are not recorded in a formal (statutory) land administration system. These include customary land that is administered according to de facto rules and procedures that cannot generally be easily described relative to a discrete parcel. Overlapping claims to land and resources, or rights that are contested, are more difficult to record in a sufficiently comprehensive manner.

A range of tenures that may be considered socially legitimate are not recorded in a formal land administration system

Several systems have been developed to record customary or complex social tenures. Two examples include Rural Land Maps (Plans Fociers Ruraux – PFRs) used in West Africa in the 1990s to record customary and complex rights to land and resources, and a process developed under the Solomon Islands Customary Records Act 1992 for recording of customary interests in land. Both involved a bottom-up consultative approach including discussions with stakeholders to determine the de facto rights situation, although the

Solomon Islands system was not implemented at the time. The PFR process has since developed into a process De Wit and Norfolk (2010) called the "Mozambique methodology for community land delimitation". This process typically involves community education, participatory rural appraisal and mapping of rights, adjudication, cadastral mapping, and the issueance of a Community Land Certificate. Costs are kept low through the use of maps instead of extensive field surveys, and the use of GPS to georeference key points and interests in land.

Augustinus (2010) noted the gap between how conventional land administration systems recorded rights and the range of tenures that exist on pastoral and customary lands. The Social Tenure Domain Model (STDM) as a concept derives from this observation, and is the basis of tools that are able to record any form of land and resources rights. Using this approach makes it possible to record both de jure rights and de facto claims to land and other resources verified through adjudication (Zevenbergen and Haile, 2010). It records parties (an identifiable single entity such as a person, family or group), land rights (de jure ownership, usufruct, leasehold, state land, and social tenure relationships), and spatial units (areas of land where the rights and social tenure relationships apply) (FIG *et al.,* 2010; Lemmen and Zevenbergen, 2010). The proof of concept was given via prototype software developed for the Global Land Tool Network (GLTN) (Lemmen, 2010). The first piloting of the improved version is now underway in Uganda. Some other software developers also aim to incorporate the STDM concept in their software, such as 'Open Title' (ILS, 2010). Another software system for recording complex rights is the Talking Titler, which allows flexibility in the way data relating to people, land and evidentiary media (titles, survey plans, descriptive documents, oral testimonies, videos, photographs, etc) can be stored and related. The system also supports a mix of paper-based and digital documents (Barry, 2006).

The Social Tenure Domain Model is a basis of tools able to record any form of land and resources rights

Certification

The limitations of the manner in which land titling schemes record complex rights to land in certification and registration documents are well known, especially in countries with poor governance (e.g. Hatcher, 2009). Conventional

land registration is typically based on a model of individual parcels and individualized tenure resulting in difficulties in recording the complexity of de facto rights.

Alternatives such as the certification of land tenure or of land use can be less onerous than registration of titles or deeds. Both can be used to verify claims to land, and in the absence of registered land titles may be the best evidence of de facto property rights.

Many REDD and VCM projects occur on customary or communal lands, and several innovative approaches have been developed to record these rights. There are several ways in which customary land has been certified. A common approach is to do this by treating customary or community lands as a single parcel, certified in the name of a recognized community group through their accepted representatives – for example, in Uganda, Malawi, and the Ivory Coast (Alden-Wily, 2003). Another approach involves Community-Based Natural Resource Management (CBNRM) schemes that devolve group-based property rights to customary land secretariats (UN-HABITAT, 2008). Fitzpatrick (2005) provides a detailed discussion on the alternatives for legal recognition of customary tenure. For example, PFRs record all individual and collective rights to land and natural resources through extensive community consultation. In Benin, for example, proprietors receive a 'land certificate'. The state does not grant them authenticity; however they can be sold or used as collateral (Lavigne Delville, 2010).

Customary land has been certified treating customary or community lands as a single parcel, certified in the name of a recognized community group through their accepted representatives

A range of low-cost alternatives for certification have been implemented in developing countries that typically aim to reduce costs through decentralization of administration, and the introduction of local labour and low-cost technology. A low-cost certification system was implemented in Ethiopia that involved the use of standard forms to administer changes to tenure that were completed in the field in consultation with land holders and other stakeholders. Land boundaries were demarcated where needed using local materials, and land certificates were issued to households (UN-HABITAT, 2008). The Namibia Community Land Administration System (NCLAS) consists of communal deeds (register) and the communal cadastre (map), and utilizes low-cost software that produces certificates, village maps, registers, and index cards.

Carbon rights

There has been some discussion in the literature on the adaption of cadastres to suit carbon reporting and accounting (e.g. Van der Molen, 2009). Cadastral information should establish a sound information base and a land administration system can provide a suitable legal land tenure instrument to which carbon credits can be attached. "In the case of 'unbundled' property rights, with the separation of carbon credit titles, these registers and cadastres should be able to register such rights (registration) and to attach appropriate geometric attributes." (Van der Molen, 2009). Barnes and Quail (2010b) argued that, "beyond the specific information content in a carbon cadastre, it is essential that this cadastre serves as a vehicle for publicizing carbon property rights in as transparent and accessible a manner as possible. It should not be used as a mechanism for asserting national control and may best operate below the national level."

Cadastral information should establish a sound information base and a land administration system can provide a suitable legal land tenure instrument to which carbon credits can be attached

CONCLUSION

Climate change mitigation projects bring change, and tenuous tenure security and a lack of recognition of access rights reduce the resilience of people. The poor are the most vulnerable in this situation. At the outset the stakes are raised when the landholder with rights to land or resources is recognized as an eligible beneficiary of project payments. Second, the use the land is currently put to will often change in line with project requirements. International experience shows that governments and the powerful elite often attempt to draw as much as possible from the payments their way, especially when land (and resource) governance is generally weak. Providing accurate and complete land tenure information is a part of improving land governance in general, and the position of the less powerful land users, regardless of their tenure types, in particular. It is therefore important to record both the de facto and de jure property rights. Ignoring either one will create problems in the implementation of climate change mitigation projects. However, land administration in most of these forested areas is very complex and involves many competing interests. Furthermore, the percentage of forested areas

covered by any form of formal land recording is even lower than average in the developing world. Based on the examples currently implemented, we can also see that it is difficult to incorporate all these interests into the administration and implementation of a PES scheme.

The authors suggest that an early step in the development of REDD and VCM projects should be the creation of a comprehensive inventory on land tenure within the project area, and also on adjacent lands. However, this is not a trivial exercise and the complexity of recognizing and recording the full extent of rights to land should not be underestimated. Many attempts to formally record customary rights to land, for instance, have been unsatisfactory. The authors argue that this complexity should be considered in REDD and VCM project design, and appropriate procedures for recognizing property rights based on best practice in land administration should be integrated formally into the guidelines for the design and reporting of projects.

Recent advances in land administration provide tools that are likely to improve the information available and therefore enhance reporting and governance; however, further empirical evidence is needed to assess their effectiveness fully. The land administration system implemented must be appropriate to the land tenure context of the REDD or VCM project and utilize an innovative land administration approach. For instance, careful consideration will be required to determine whether the implementation of formal land administration systems is the most cost-effective and appropriate approach for a proposed REDD or VCM project. Such land administration projects tend to be very expensive. However, the costs may be justified if the REDD or VCM project is large and an existing land titling project is nearby. Alternatively, acknowledgement and recording of group or community areas combined with direct payment to those groups or communities could be a workable solution in certain places, with the group or community deciding on the methods for further distribution of funds. Mapping based on aerial photography or satellite imagery, and land tenure or resource inventories at family or individual level, might be the solution elsewhere. The geospatial technologies needed both for carbon monitoring and for land administration might bring opportunities for cost sharing, although this requires further study.

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LAND TENURE CHALLENGES IN MANAGING CARBON PROPERTY RIGHTS TO MITIGATE CLIMATE CHANGE

ENJEUX FONCIERS POUR LA GESTION DES DROITS DE PROPRIÉTÉ DU CARBONE DANS L'ATTÉNUATION DES EFFETS DU CHANGEMENT CLIMATIQUE

LA GESTIÓN DE LOS DERECHOS DE PROPIEDAD DE CARBONO RELACIONADOS CON LA MITIGACIÓN DE LOS EFECTOS DEL CAMBIO CLIMÁTICO PLANTEA RETOS EN MATERIA DE TENENCIA DE LA TIERRA

ABSTRACT

CARBON CYCLE

REDD

CARBON PROPERTY RIGHTS

CARBON CADASTRE

Scientific evidence suggests that increasing amounts of carbon in the atmosphere are causing climate change that will result in global warming, sea -level rise and more extreme weather events. In response to anthropogenic climate change, market-based mechanisms have been proposed to mitigate these rising carbon dioxide emissions. One of these mechanisms is known as REDD (Reduction of Emissions from Deforestation and forest Degradation). It works to prevent the loss of forests that play a key role in sequestering carbon and regulating the global climate. Globally, REDD has attracted increasing attention as a cost-effective means of reducing emissions, and organizations such as

RÉSUMÉ

CYCLE DU CARBONE

REDD

DROITS DE PROPRIÉTÉ DU CARBONE

CADASTRE DU CARBONE

Il est scientifiquement démontré que les quantités de plus en plus importantes de carbone émises dans l'atmosphère sont responsables du changement climatique et, partant, du réchauffement planétaire, de l'élévation du niveau de la mer et de phénomènes climatiques toujours plus extrêmes. En réaction à ce changement climatique d'origine anthropique, des mécanismes, basés sur le marché, ont été proposés pour atténuer ces augmentations. Un de ces mécanismes est connu sous le nom de REDD (Réduction des émissions causées par le déboisement et la dégradation des forêts). Il s'emploie à prévenir les pertes de forêts qui jouent un rôle essentiel dans la séquestration du carbone et

SUMARIO

CICLO DEL CARBONO

REDD

DERECHOS DE PROPIEDAD DE CARBONO

CATASTRO DEL CARBONO

Existen pruebas científicas de que el aumento de las concentraciones de carbono en la atmósfera conducirá al recalentamiento mundial, al alzamiento del nivel de los mares y a la aparición de acontecimientos climáticos extremos. Para responder al cambio climático antropogénico se han propuesto mecanismos basados en el mercado cuya finalidad es mitigar el incremento de las emisiones de dióxido de carbono. Uno de ellos es el REDD, o reducción de emisiones por deforestación y degradación. Mediante él se persigue evitar la pérdida de bosques que tienen una función clave en el secuestro de carbono y la regulación del clima global. En todo el mundo, REDD ha

the United Nations and World Bank have accumulated significant funds for its implementation.

From a cadastral perspective, mechanisms such as REDD raise three major questions: 1) Who 'owns' or has rights to resources such as forests which contain the carbon pools? 2) How can the governance structure for REDD be designed so that incentives to conserve forests reach the level of those who derive their livelihoods from forest products? 3) If carbon credits are to be exchanged on a carbon market, what cadastral information would be required to secure these rights in a 'carbon cadastre'?

To address these three questions this paper draws on the authors' land tenure experience in the Amazon basin, Central America and sub-Saharan Africa.

la régulation du climat au niveau planétaire. Le mécanisme REDD a attiré une attention de plus en plus soutenue au plan mondial, en tant que moyen économique de réduire les émissions et des organisations comme les Nations Unies et la Banque mondiale ont mobilisé des fonds importants pour sa mise en œuvre.

D'un point de vue cadastral, des mécanismes comme le REDD soulèvent trois grandes questions: 1) Qui « possède »'', ou dispose des droits de ressources comme les forêts, dans lesquelles se situent les bassins de carbone ? 2) Quel type de structure de gouvernance REDD faut-il mettre en place pour que les incitations à préserver les forêts parviennent au niveau des populations qui tirent leurs moyens de subsistance de l'exploitation des produits forestiers ? 3) Si les crédits carbones peuvent être échangés sur un marché du carbone, de quelles informations cadastrales faut-il disposer pour sécuriser ces droits dans un « cadastre du carbone » ? Pour aborder ces trois questions, cet article s'appuie sur l'expérience des auteurs en matière de régimes fonciers dans le bassin de l'Amazone, l'Amérique centrale et l'Afrique sub-saharienne.

sido objeto de una siempre mayor atención como mecanismo rentable para la reducción de emisiones, y organizaciones como las Naciones Unidas y el Banco Mundial han reunido fondos cuantiosos destinados a su ejecución.

Desde el punto de vista del catastro, se plantean tres grandes cuestiones relacionadas con los mecanismos del tipo REDD: 1) ¿quién «posee» o tiene derechos sobre recursos tales como los bosques que contienen sumideros de carbono?; 2) ¿qué diseño debería tener la estructura de la gobernanza en materia de REDD para que los incentivos de conservación lleguen a las personas que obtienen sus medios de vida de los productos forestales?; y 3) si los créditos de carbono se han de intercambiar en el mercado, ¿qué información catastral se requerirá para que los derechos invocados en un catastro del carbono sean seguros?

En el presente artículo estas tres cuestiones se abordan con arreglo a las experiencias que los autores han sacado en el ámbito de la tenencia de la tierra en la cuenca amazónica, en América Central y en el África subsahariana.

INTRODUCTION

Scientific evidence suggests that increasing amounts of carbon in the atmosphere are causing climate change that will result in global warming, sea-level rise and more extreme weather events (IPCC, 2007). In this paper we first summarize carbon fluxes, reservoirs and residence times and discuss how perturbations to the carbon cycle are altering climate regimes as a result of a number of factors, including human use of fossil fuels, land-use change and widespread deforestation. The consequences of rising anthropogenic emissions are already underway, with expectations of unprecedented costs to the global economy and loss of functioning ecosystems that may threaten life on Earth.

Market-based mechanisms have been proposed to mitigate rising carbon dioxide emissions using a 'cap-and-trade' system. The cap-and-trade system was introduced in the United States in the 1980s to abate acid rain arising from sulfur dioxide emissions from the combustion of coal. The implementation of this system has effectively eliminated acidity in lakes and forests in the eastern USA and western Europe. Carbon dioxide, by contrast, has more sources and sinks, making abatement more challenging and the defining of the related property rights more ambiguous. Because forests are a major carbon source and sink, various strategies have been proposed to reduce emissions from deforestation and forest degradation (REDD), as well as to augment existing forest stocks through replanting and restoration.

Property rights to carbon stocks is increasingly recognized as an integral part of the climate change debate

Land tenure, and more specifically property rights to carbon stocks, is increasingly recognized as an integral part of the climate change debate. Property rights issues have been raised with respect to: communally-held land (Randrianarisoa, Vitale and Pandya, 2008) including indigenous lands (Griffiths, 2007); insecure tenure leading to deforestation (Porrua Garcia-Guerrero, 2008; OCC, 2008; Parker *et al*., 2008); legal conceptions of a carbon property rights (Boydell, Sheehan and Prior, 2008; Takacs, 2009; Quan and Dyer, 2008; Munden Project, 2011) and the need to clarify who will be the beneficiaries of carbon payments through mechanisms such as REDD (Forest Dialog, 2008). Property rights to forests and/or carbon have been recognized as a key issue

in almost all the major climate change reports, such as the Eliasch (OCC, 2008) and Stern reports (Stern *et al.*, 2007), and the various IPCC reports (IPCC, 2003; IPCC, 2007).

The first part of this paper focuses on the nature and dynamics of carbon, how changes in the carbon cycle have contributed to climate change, and the mechanisms that have emerged to address climate change. This is the broader context within which carbon property rights are emerging. The Peruvian Amazon is used to illustrate the complex bundle of rights that need to be considered when dealing with the challenge of registering carbon property rights; the concept of a carbon conservancy as a meso-level organization for holding carbon property rights is also explored. Finally, a governance structure is proposed which suggests the use of a carbon cadastre.

THE CARBON CYCLE

Understanding the nature and characteristics of the resource to be registered is a necessary first step in examining carbon within a property rights framework. Carbon dioxide is most commonly emitted to the atmosphere by the combustion of coal for the production of electrical power, the burning of petroleum products for transportation, the removal of carbon during the production of cement and the clearing of forests for agricultural expansion. Once combusted, oxidized carbon enters the atmosphere where it is sequestered by plants, via photosynthesis, or by the oceans where it resides as a carbonate or bicarbonate ion.

Carbon re-enters atmospheric circulation when trees are burned to clear land for pasture, bio-fuels or food crop production. If the tree is harvested for timber, the wood will decay and return its carbon to the atmosphere at a slow, steady rate, although this varies considerably depending on climatic conditions. The root mass left below ground will decompose and the resulting carbon will eventually migrate to rivers and oceans. Significantly, the growing tree will no longer exist to grow leaves and biomass to sequester carbon. Aged leaves will also no longer fall to the ground to form soil carbon. Most

importantly, unless the carbon is locked in forest biomass over the long term, it will contribute to the growing stock of greenhouse gases in the atmosphere with long-term climate change consequences.

The IPCC (2007) currently estimates anthropogenic CO_2 emissions at 32 billion tonnes per year, of which 47 percent remains in the atmosphere until sequestered over a period of approximately 300 years. It is estimated that 20 percent is sequestered by oceans and 15 percent by terrestrial systems. A recent study found that tropical forests alone sequester 18 percent of anthropogenic carbon, representing one-half of the terrestrial carbon pool (Lewis *et al.*, 2009). Of all the major terrestrial biomes, forests, especially in the tropics, make the greatest contribution to global climate regulation (Sedjo, 1993). They store 86 percent of the world's above-ground biomass and 73 percent of the world's soil carbon. Tropical forests comprise 47 percent of the world's forests; of these, 50 percent are in South America, 30 percent in Africa, and 20 percent in Asia. Tropical forests store approximately 50 percent more carbon than forests outside the tropics on account of their longer growing season and higher growth rates (FAO, 2005).

With growing evidence of anthropogenic climate change, it is important to identify the sources of emissions, as well as sinks. The largest source of carbon emissions has been from fossil fuels, followed by land-use change stemming predominantly from the conversion of forests to agriculture. Drivers of land-use change include agricultural expansion, urbanization, population increase, affluence and technological change. Deforestation, or the conversion of forests to agricultural land, accounts for the loss of 13 million hectares each year (FAO, 2005). While forest degradation does not result in the total removal of forest, it does reduce ecosystem functioning and changes species composition, and is widespread in the tropics (Sasaski and Putz, 2009). Deforestation is estimated to have released 1.1 to 2.2 PgC/ year (Gullison *et al.*, 2007), with degradation estimated to have emitted the same amount (Gaston *et al.*, 1998). South America and Africa have suffered the largest net loss of forests, estimated at 4.3 and 4.0 million hectares respectively from 2000 to 2005 (FAO, 2005).

Deforestation accounts for the loss of 13 million hectares each year

CARBON MARKETS AND REDD

The United Nations Framework Convention on Climate Change (UNFCCC) established the Kyoto Protocol in 1997 that bound industrialized signatories (so-called 'Annex countries') to emissions reductions of five greenhouse gases. In 2005, the European Emissions Trading Scheme (EU ETS) was initiated as a market trading mechanism, through which large-scale emitters such as power plants could purchase pollution credits, which are then used to invest in greenhouse gas reduction projects elsewhere. Under a cap-and-trade system, a limit or allowance is set on the amount of carbon a company can emit. If the allowance is exceeded, the company can then buy an allowance or credit elsewhere, or else faces heavy fines. The seller, in turn, is rewarded for having reduced emissions. Other trading regimes emerged later under the compliance markets and include the New South Wales state scheme in Australia and the UK ETS in the United Kingdom.

Kyoto signatories from less industrialized or 'non-Annex countries' can be recipients of carbon reduction projects through the Clean Development Mechanism (CDM). Since approximately 20 percent of global anthropogenic carbon emissions stem from loss of forests, which is greater than the total emissions from the transportation sector, strategies to mitigate forest loss from non-Annex countries play an integral role in climate stabilization (IPCC, 2007). The Stern Report (Stern *et al.*, 2007) also identified reducing deforestation as one of the more cost effective abatement strategies. In other words, compared with the development of costly pollution control devices for the industrial sector, forests represent the 'low-hanging fruit' in the range of options for reducing carbon emissions.

The EU ETS does not allow carbon forestry projects to be transacted directly between EU ETS investors and project recipients. For this reason, project development through the CDM is channelled through the World Bank and the UN. At the time of writing only afforestation and reforestation (A/R) projects are allowed, but because of stringent CDM project development guidelines and higher transaction costs, most A/R projects have come about through voluntary markets, as are avoided deforestation projects.

A variety of carbon exchanges in Europe and the United States, as well as approximately 200 independent retail companies, market 'charismatic carbon' projects in the forestry sector. These projects offset emissions for various corporations interested in green imaging or individual consumers who wish to offset their individual actions such as airplane travel. Such projects utilize any number of existing standards for project design and implementation. Transactions that occur outside of GHG exchanges are referred to as 'over-the-counter' trades.

Despite the global economic downturn after 2008 and reduced industrial activity, carbon markets have weathered the storm, exhibiting a growth rate of 6 percent, although a decline in market activity has plagued the voluntary markets. The value of the formal carbon markets has risen steadily from US$10 billion in 2005 to US$144 billion in 2009 (World Bank, 2009). The bulk of this (US$118 billion) was transacted through the EU ETS, much of which comprised the consolidation of undervalued portfolios rather than project origination.

Despite the global economic downturn after 2008 carbon markets have weathered the storm

Despite the enormous sums of money transacted for emissions reductions, forests have captured very little of this relative to other sectors. Under the CDM, which allows reforestation/afforestation, only fourteen projects have thus far been implemented, up from one in 2008 (UNFCC-CDM, 2011). Stringent CDM project development guidelines raise transaction costs, making these projects less financially viable. Forestry projects have been streamlined into the voluntary markets where the price of carbon is lower (Robiedo and Ok Ma, 2008). By the end of 2009, the global market for carbon offset forestry had garnered US$150 million, representing two million hectares of forest sequestering 21 million tonnes of carbon. UNFCC-regulated CDM offsets are perceived as higher quality given their strict project development guidelines and procedures; they consequently capture a higher value (Ecosystem Marketplace, 2009). Project certification for voluntary markets can increase the value of carbon. Two of the most popular are the Voluntary Carbon Standard (VCS) and the Community, Conservation and Biodiversity Alliance (CCBA) Standard. The VCS is very similar to CDM guidelines and technically difficult to achieve. The CCBA standard requires significant engagement with community stakeholders, which is necessary yet costly.

In preparation for REDD, the UN and World Bank (with considerable assistance from the Norwegian government) have devised various funds to assist with capacity building and project planning. The World Bank Biocarbon unit, in conjunction with conservation groups and local NGOs, has three REDD projects underway (Woods Hole Research Center, 2008), although the bulk of activities are reforestation projects. The World Bank's Forest Carbon Partnership Facility assists countries in REDD preparations including designing large-scale systems for incentive payments (World Bank, 2009). In a similar vein, the UN-REDD Programme, in partnership with FAO, UNDP, and UNEP established a multi-donor fund in 2008 to provide funding for REDD activities (UNDP, n.d.). In addition, Norway has funded projects in seven pilot countries, including Tanzania, Indonesia, Brazil, Guyana.

To the disappointment of many, no binding agreement on REDD+ emerged from the 16th Conference of the Parties (COP 16), the UNFCCC's climate change summit held in Cancun in December 2010, but there remains hope that one can be reached by 2012. Financing, baselines (against which to measure progress), monitoring, and leakage (forest conservation in one area leads to increased deforestation in another area), were some of the more difficult areas of negotiation. Nevertheless, a 'fast-track fund' was agreed upon including US$3.5 billion for REDD+ activities.

CARBON PROPERTY

The local to global dynamics of carbon and the difficulties that have been experienced in finding adequate market and governance solutions represent a massive challenge to formulating and trading carbon property rights. Carbon property defies our conventional categorization of property into 'immovable' and 'movable' property. In addition, its ubiquitous nature – almost 20 percent of the human body, for example, is comprised of carbon – presents new challenges that go beyond those of water, air or intellectual property rights. Since carbon occurs in the subsoil as well as in above-ground biomass, the ocean and the atmosphere, it presents a new challenge to the field of land tenure and property rights. Who owns the rights to the carbon in its various

Carbon property defies our conventional categorization of property into 'immovable' and 'movable' property

manifestations is a complex question that will vary from one country to the next and becomes particularly contentious when subsoil rights to minerals and hydrocarbons are discussed. To avoid becoming mired in the complexities of soil carbon we focus instead on above-ground carbon stored in forests, which has been identified by REDD as the most feasible carbon pool to conserve.

The most common conceptualization of property rights is the 'bundle of rights' paradigm. In this paradigm property is conceptualized as a bundle of rights with each right being a 'stick' in the bundle. The privately held 'sticks' in the bundle – alienation, development, mortgage, subdivision, etc – are usually emphasized, but in most property systems the government does hold some of these 'sticks'. Typically, a government will hold back the rights to tax, to control land use (police power) and to expropriate private property for public purposes (eminent domain). Land and resource tenure in different cultures may be bundled differently, especially where new tenure forms have emerged. For example, governments in Latin America often hold back specific rights such as alienation *(inalienable)*, subdivision *(indivisible)*, prescription or adverse possession *(imprescriptible)* and mortgage (*inembargable*) when titling indigenous or peasant communities. In addition to these land rights, resource rights may also be withheld, most notably through restrictions on deforestation.

Land and resource tenure in different cultures may be bundled differently

Figure 1 illustrates one example of how land and resource rights are bundled in the Peruvian Amazon. This distinguishes not only the three major tenure categories – state, indigenous communities and private – but also how rights are divided depending on whether they pertain to natural resources, land or the subsoil. Rights to above-ground and subsoil resources are treated differently, as the latter are often the dominion of the state (*la patria*) which may transfer usufruct rights via concessions to non-state entities (e.g. timber companies, conservation groups).

Figure 1 also shows how bundles of rights vary across different resources and what fundamental divisions exist between bundles to above-ground resources like trees, land and subsoil resources. The layers also demonstrate the potential overlap of different tenure regimes. For example, an indigenous community (*comunidad nativa*) may have title to the land, but rights to natural resources may be assigned to different parties through a forest concession, a brazilnut concession, or a communal reserve. Furthermore,

the rights to resources under the indigenous land may be subject to subsoil mining and petroleum concessions. A similar overlapping of tenures may exist on state and private land. This example illustrates the additional complexity when land tenure is broadened to include resource tenure which is necessary when dealing with a resource such as carbon.

This separation of rights has been institutionalized by dividing the management of rights and interests pertaining to different resources among different government entities. In Peru, for example, the mining cadastre is handled by the National Institution of Concessions and Mining Cadastre (INACC), while rural land titling, until recently, was carried out by the

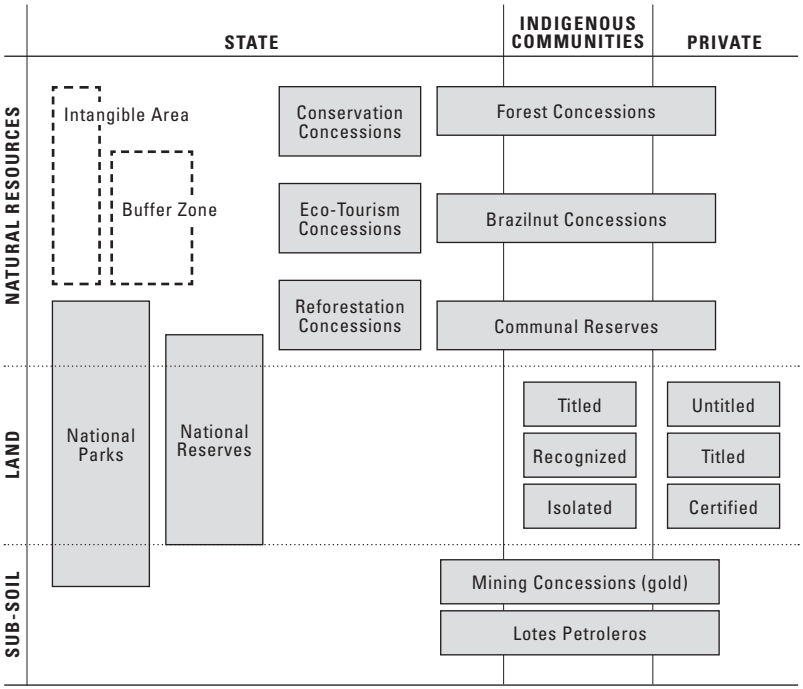


Figure 1
Bundles of rights in the Peruvian Amazon

Ministry of Agriculture (now handled by a Commision for the formalization of Property Rights - COFOPRI). On the other hand, forestry concessions and resource information are the responsibility of the National Institute of Natural Resources (INRENA), which manages a cadastre of protected natural areas.

REDD is by definition focused on forest carbon pools and it is therefore important to know who controls the rights to these forests. White and Martin (2002), in their global survey of forest tenure in 24 countries, covering about 93 percent of the world's natural forests, revealed that 22 percent of forests worldwide are either reserved for (via usufruct rights) or owned by community and indigenous groups. They also found that forests were home to approximately 60 million indigenous people. A follow-up study by Sunderlin, Hatcher and Liddle (2008) found a continuing shift away from government ownership and administration towards community and private tenure. Communities, indigenous and otherwise, are therefore important stakeholders and stewards of the world's forests. This is particularly true in Latin America, as shown in Figure 2.

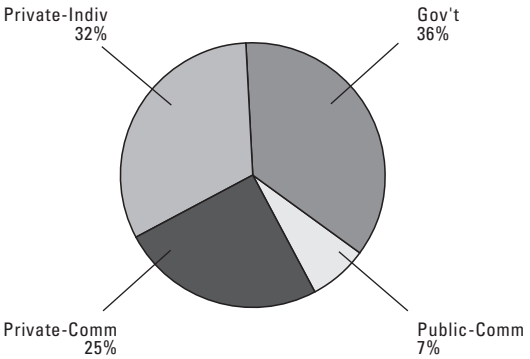


Figure 2
Forest tenure in Latin America by percentage area (2008)

A number of REDD studies conclude that "clear and secure property rights, either at the individual or the community level, are necessary to establish PES (payment for enviornmental services) systems" (Angelsen, 2009, p.135). For the most part these studies refer to security of land rights, and in some cases rights to trees. But what about carbon property rights that are separable from land or timber rights? Takacs (2009) distinguishes between five different types of carbon property rights – sequestered carbon, carbon sinks, carbon sequestration potential, carbon credits, and usufruct rights. Several Australian states have defined a carbon property or 'carbon sequestration right' that can be registered (Larson *et al.*, 2008). This right is treated as a type of English common law easement (profit *à prendre*) which allows the holder to take or use the soil or products of the land. However, questions have been raised about this interpretation (see Boydell *et al.*, 2008) and practical experience with these rights is minimal.

REDD GOVERNANCE AND CADASTRAL CHALLENGES

In an ideal world clear land title would be a prerequisite for defining and conveying carbon property rights. Experience to date with land titling and continued tenure insecurity shows that in reality this requirement would likely be the kiss of death to many carbon projects and would favour those parties that already have formal title. Except for increasing areas that are being titled to indigenous or traditional groups in Latin America, titled land is still largely in the hands of the wealthy and politically connected. We suggest that other options could be explored that do not rely on formal titles as a prerequisite for granting carbon property rights. Relying on formal titling will skew REDD initiatives towards the titled landholders, adding to the number of projects that have failed to address the interests of the poor.

Although land tenure has been recognized as an important factor in REDD and more generally in payment for environmental services (PES), addressing land tenure issues in this context is often not seen as integral to REDD or PES projects:

> *Land tenure issues are often particularly salient for the poor. PES programs do not generally require land titles, but they do require reasonably secure land tenure. Where tenure is particularly insecure, it may be impossible to implement a PES program. Indeed, attempting to do so may be counterproductive, as it may attract additional settlers and/or result in more powerful groups displacing poorer, less powerful households. Solving tenure problems, however, is usually beyond the purview of PES programs.*
>
> *Source:* Pagiola, 2007, p.2

We believe that it is naive, if not short-sighted, to expect REDD to work without explicitly dealing with tenure security. However, within this context, security pertains to forest tenure and not necessarily land tenure. Like Pagiola, we also recognize that tenure security does not necessarily require formal land titles, but can be attained through well-functioning customary tenure systems (USAID, 2011).

It is naive, if not short-sighted, to expect REDD to work without explicitly dealing with tenure security

We have previously argued for aggregating carbon property rights and incorporating multiple land parcels (titled or untitled), and for these rights to be attached to a new entity made up of these landholders (Barnes and Quail, 2010). The member landholders may be groups of communities or individual landholders, or a combination of both. Aggregating is necessary not only to ensure that untitled parcels are included, but also to scale up so that leakage can be contained. Leakage occurs when activities such as logging or farming are restricted by a conservation intervention and shifted to outside the project area, resulting in no net increase in the conservation of resources. Other authors have made the case for matching the scale of institutions with the scale of the natural resource that is being managed (Murphree, 2000), and in most instances carbon stocks are best dealt with at a more mesoscale than the individual parcel level. What meso-level governance models of this kind already exist and how have they fared? One that immediately comes to mind is the system of wildlife conservancies in Namibia (NACSO, 2008).

Carbon stocks are best dealt with at a more mesoscale than the individual parcel level

Wildlife 'conservancies' in Namibia were first established in the late 1990s following the passing of the Nature Conservation Amendment Act (5 of 1996) which laid out the governance structure and rules for communal

conservancies. To create a conservancy, communities have to define the conservancy boundary, formulate a constitution, elect a conservancy committee, design a plan for the equitable distribution of benefits, and demonstrate the ability to manage funds. By 2009 a total of 59 communal conservancies had been established covering an area of 132 697 km^2 (16.1 percent of the entire country) and incorporating 234 300 people (NACSO, 2010). The average area of a conservancy is approximately 225 000 hectares.

Although the conservancy concept was initially created on privately-owned land, the focus and growth of conservancies in Namibia has been on communal land operating on a customary tenure basis. Traditional communities do not have registered land titles, but are defined by the Traditional Authorities Act of 2000 as:

> *... an indigenous homogeneous, endogamous social grouping of persons comprising of families deriving from exogamous clans which share a common ancestry, language, cultural heritage, customs and traditions, who recognize a common traditional authority and inhabit a common communal area, and may include the members of that traditional community residing outside the common communal area ...*
>
> *Source:* Sec. 1(b)

Community-based natural resource management (CBNRM) in Namibia and elsewhere in the region grew out of a need to improve wildlife management. Conservancies have therefore focused on devolving rights to wildlife, although CBNRM has always envisaged the ultimate devolution of other rights (Child and Barnes, 2010). But at present, conservancies only convey rights to certain wildlife.

A conservancy is given rights to a sustainable annual wildlife quota (e.g. 10 elephants, 3 crocodiles) determined by the Ministry of Environment and Tourism, and it may enter into contracts with external partners, such as tourism and safari operators. Many conservancies sell their wildlife rights to safari operators who in turn bring in hunters from Europe, North America and elsewhere. These hunters pay tens of thousands of dollars to hunt an elephant, for example, and this provides an external market for these wildlife resources. The community may also gain other benefits, such as income or

jobs from tourism lodges located on the conservancy, and the meat from the commercial hunt. In this way conservancies are designed to promote sustainable resource management by transferring wildlife rights to the community and giving them access to the benefit stream from hunting and tourism (Suich and Child, 2008). The success of this approach has been demonstrated through: 1) the rapid growth in the number of members and areas under conservancies; 2) increased incomes; and 3) recuperation of key wildlife species (NACSO, 2010).

Conservancies are designed to promote sustainable resource management

Using these conservancies as a model for carbon conservancies, we propose a governance structure that connects international carbon funds and markets to individual and communal landholders through meso-level carbon conservancies (see Figure 3). This model depends on groups of individuals or communities voluntarily forming carbon conservancies (as is the case with Namibian conservancies) and formalizing these through the government. Only de facto (with agreement of all neighbours) and de jure landholders will be eligible for membership in a conservancy. Once they have acquired this legal status, they may register their joint carbon property rights in a carbon cadastre and registry which is linked to the land cadastre and registry. However, it is recommended that only the perimeter polygon of the carbon conservancy should be reflected in the land cadastre, and that details relating to the carbon and membership remain with the carbon cadastre.

A conservancy-type of structure is being considered by forest conservation organizations – the Tanzania Forest Conservation Group and Mjumita – in two REDD pilot sites in Tanzania. Drawing from the Namibian model, Mjumita will form the backbone of the meso-level conservancy that will link communities in Tanzania with global carbon markets. Recognizing that deforestation and degradation are linked to forests that do not have clear ownership, Tanzania enacted a series of Land Acts in the late 1990s making it perhaps one of the most conducive nations for the creation of a carbon conservancy. This legislation divides land into general, reserve and village lands. Under the Village Land Act, which promotes community-based land management, communities can set aside reserved land for future individual or communal use. The Forest Act of 2002 further facilitates the formation

of reserves by allowing communities to delineate Village Forest Reserves, which can be managed under a participatory forest management (PFM) arrangement. Forest land tenure is defined through a combination of legal and customary rights, whereby usufruct rights on communal lands can be sold, but not the land itself. A Joint Village Land Use Agreement is filed in the Village Land Register if two ore more villages agree to share or manage land together, as in the event of forming a conservancy (Wiley, 2003). Tanzania's village land system may provide an ideal legal framework for the carbon conservancy concept.

One of the key elements in a REDD project is the monitoring of deforestation and forest degradation. REDD projects are required to show that deforestation and degradation have declined when compared with a defined baseline or historical deforestation reference scenario. Monitoring is also necessary to determine if the REDD project has caused deforestation and degradation to 'leak' to surrounding areas. Monitoring should therefore be focused on an area larger than the carbon conservancy to cover what we have termed a 'leakage monitoring area'. Under the Voluntary Carbon Standard (VCS), a leakage belt that extends an area roughly double the size of the project area is required to be managed at the project level. We believe this monitoring function should be done by an external, non-governmental entity (but with government representation) with no direct financial interest in the REDD project. Global Witness, a non-profit company which has focused on monitoring logging, legal compliance and forest law enforcement, and also promotes transparent and equitable governance, is a good example of such an entity (Global Witness, 2009). It has developed an 'independent forest monitoring' (IFM) approach which addresses many of the REDD monitoring needs.

Monitoring should be focused on an area larger than the carbon conservancy

The role of government in REDD projects located in weak governance states is a difficult issue. Sovereign rights and legal jurisdictions and mandates need to be respected, but at the same time REDD projects will only be effective if governance structures are transparent, accountable, and free of corruption. Figure 3 presents a governance structure for REDD in which government's role would be to: 1) make relevant policies, laws, and standards; 2) manage the contracting of revenue and monitoring units; 3) approve conservancy

REDD projects will only be effective if governance structures are transparent, accountable, and free of corruption

constitutions in an efficient manner; 4) control carbon and land cadastres/registries; and 5) build local capacity. It also needs to be recognized that capacity will have to be developed at the government level as well.

In 1998 FIG (International Federation of Surveyors) set out its vision for a future cadastral system, termed 'Cadastre 2014'. It envisaged that future cadastres would "show the complete legal situation of land, including public rights and restrictions" (Kaufmann and Steudler, 1998). It rightly called for the integration of more natural resource information in the cadastre, particularly when restrictions impact the rights to that resource. Presumably, this would now include the restrictions on forests through the implementation of REDD projects. Conceptually this makes good sense and the linkage between a carbon and land cadastre in Figure 3 is consistent with this integration. However, the problem faced in areas where most forest carbon is located (e.g. the Amazon) is an almost complete absence of any cadastre. Even in Brazil, a recent study was forced to use catchment areas as a proxy for private land parcels because a cadastral map (or integrated cadastral database) was simply not available (Stickler, 2009). In those few cases where cadastral data is available for a whole jurisdiction (e.g. Pando, Bolivia), only a single parcel can be queried at a time and only small-scale cadastral maps are available via the Internet. Public registries are rarely truly public.

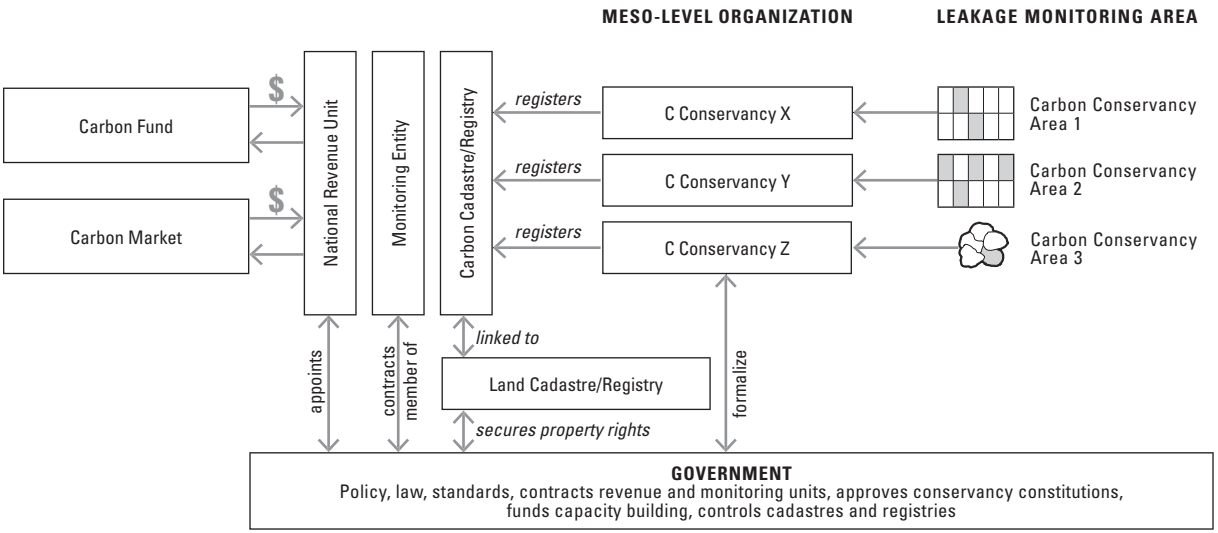
It is against this institutional background that we have conceptualized a carbon cadastre and registry. We cannot assume that all the parcels underlying forest carbon are titled and registered (dark parcels in Figure 3 indicate titled land parcels). Yet REDD cannot wait 10 to 20 years for systematic titling efforts to cover the country, or even partially so in individual provinces or states. In the governance scenario outlined here, the conservancy includes both titled and untitled parcels, but carbon property rights will be assigned to the conservancy. A carbon cadastre therefore only operates at the scale of the conservancy.

REDD cannot wait 10 to 20 years for systematic titling efforts to cover the country

At a minimum, the following information is required to secure carbon property rights and support the REDD process:

- A definition and description of the boundary of the carbon conservancy perimeter;
- A unique identity of conservancy and names of current members;

Figure 3
Proposed governance structure for REDD and carbon property rights



- A conservancy constitution, including how payments will be shared;
- Legal status of underlying land and linkage to land cadastre if applicable;
- Other secondary rights (e.g. concessions) over the land or resources;
- Restrictions on forest/carbon use;
- Carbon stocks and their spatial distribution.

It is also important that the rules with respect to transferability, inheritance, extinction, subdivision etc. of carbon property rights are clear and generally accepted. Beyond the specific information content in a carbon cadastre, it is essential that this cadastre serves as a vehicle for publicizing carbon property rights in as transparent and accessible a manner as possible. It should not be used as a mechanism for asserting national control and may best operate below the national level.

CONCLUSION

At the international level, there is growing consensus that a national approach to REDD should be adopted, primarily to deal with leakage in which deforestation conserved in one place is displaced to another. What we have proposed in this paper is more applicable to a nested approach, which allows for direct interaction between local forest managers and global carbon markets at the meso/conservancy level. There is some concern that giving too much control of carbon property rights to national governments would create perverse incentives leading to unintended deforestation. This occurred in New Zealand, where the implementation of carbon forestry projects led to a rise in deforestation between 2002-2007 (Cox and Peskett, 2010).

In this paper we have summarized the biophysical aspects of the carbon chain, and how this has been radically shortened through unprecedented use of fossil fuels, as well as land-use practices that cause deforestation and release sequestered carbon. REDD has emerged as a potential mechanism for slowing and eventually reversing this trend, but international agreement on how to implement REDD has been difficult to reach. Since there is no legal history for identifying and registering a carbon property right, we have argued for a focus on these rights as they pertain to forest carbon. Land and forest tenure in places like the Amazon is complex, as illustrated by the case of Peru. Attempting to define carbon rights through sequestration potential or in some other less tangible manner will further complicate these rights.

We have proposed a governance scenario which builds on the wildlife conservancy model in Namibia and identifies 'carbon conservancies' as the holding unit for carbon property rights that are formalized in a carbon cadastre/registry linked to the land cadastre/registry. Tanzania's progressive land laws can serve as a model to form the backbone of such a cadastre for other REDD participating countries that cannot afford or desire individual land titling. We have made the case for an independent monitoring unit, especially where governance is weak, as well as the need for agricultural intervention strategies that can increase productivity sustainably. Finally, we have suggested what kind of cadastral information would be necessary to support the REDD process.

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LAND TENURE AND IMPLEMENTATION OF REDD+ IN CENTRAL AFRICA

LES RÉGIMES FONCIERS ET LA MISE EN ŒUVRE DE LA REDD+ EN AFRIQUE CENTRALE

SISTEMAS DE TENENCIA DE TIERRAS Y LA APLICACIÓN DE REDD+ EN EL ÁFRICA CENTRAL

ABSTRACT

DEFORESTATION

REDD+

PAYMENT FOR ENVIRONMENTAL SERVICES

CARBON RIGHTS

Central African countries are elaborating strategies for the implementation of the main elements of the REDD+ mechanism (Reducing Emissions from Deforestation and Forest Degradation). Among the measures needed to avoid deforestation and to introduce indicative systems for the conservation of forests, reforms to adapt land tenure systems to international agendas fixed by the major conventions on environment are the most important. In customary systems, the appropriation of land by families is handed down through "wood chopping" rights (droit de hache) — the visible transformation of the environment through activities such as deforestation. In modern

RÉSUMÉ

DÉFORESTATION

REDD+

PAIEMENT POUR SERVICES ENVIRONNEMENTAUX

DROITS CARBONE

Les pays d'Afrique centrale sont en train d'élaborer des stratégies de mise en œuvre des principaux éléments du mécanisme REDD+ (Réduction des Emissions issues de la Déforestation et de la Dégradation). Parmi les mesures nécessaires pour contenir la déforestation et introduire des systèmes incitatifs pour la conservation des forêts, les réformes en vue de l'adaptation des régimes fonciers aux agendas internationaux fixés par les grandes conventions sur l'environnement sont des plus importantes. Dans les régimes coutumiers, l'appropriation familiale du foncier dans les zones boisées passe par le « droit de hache », la transformation visible de l'espace par le travail, donc le déboisement.

SUMARIO

DEFORESTACIÓN

REDD+

PAGO POR SERVICIOS AMBIENTALES

DERECHOS DE CARBONO

Los países del África central están elaborando estrategias encaminadas a la aplicación de los principales elementos que componen el mecanismo REDD+ (reducción de emisiones por deforestación y degradación). Entre las medidas para contener la deforestación y fomentar la conservación de los bosques, revisten una importancia considerable las reformas cuya finalidad es adaptar los regímenes de tenencia de tierras a los programas internacionales, los cuales tienen su origen en los principales convenios sobre cuestiones ambientales. En el sistema tradicional de tenencia, la apropiación territorial familiar en zonas de bosque supone la práctica del «derecho de hacha», es decir la transformación visible del espacio por el trabajo y en

tenure systems, the constitution of private property passes through environmental enhancement – clearing as an initial condition of development. Responding to the populations' security of tenure aspirations and, at the same time, adapting the incentives in favour of forest conservation as opposed to their conversion to agriculture, involves working on the tenure rights and the recognition of local collective heritage by putting in place parallel systems of remuneration when deforestation is avoided, which should not be confused with the distribution of "carbon rights".

Dans les régimes modernes, la constitution de la propriété privée passe par la « mise en valeur », le défrichement comme condition initiale du développement. Répondre aux aspirations de sécurité foncière des populations tout en modifiant les incitations afin de favoriser la conservation des forêts plutôt que leur conversion à l'agriculture implique de travailler sur les droits fonciers, la reconnaissance des patrimoines fonciers collectifs locaux, tout en mettant en place parallèlement des dispositifs de rémunération pour déforestation évitée, qu'il ne faudrait pas confondre avec la distribution de « droits carbone ».

consecuencia la deforestación. En los regímenes modernos, la propiedad privada se forma gracias a las iniciativas de fomento, y el desbroce constituye la condición inicial del desarrollo. Para responder a las aspiraciones de seguridad de la población en materia de tenencia, y al mismo tiempo incitar a las personas a obrar en pro de la conservación de los bosques - en lugar de abocar a los terrenos boscosos a la conversión con fines agrícolas - es preciso llevar a cabo una reforma del derecho de tierras y reconocer el patrimonio local de las tierras de propiedad colectiva; pero es necesario asimismo crear dispositivos para remunerar la deforestación evitada, que no habría que confundir con la distribución de los « derechos de carbono ».

INTRODUCTION

Le foncier est vu par la majorité des pays participants au processus REDD+ comme une question clé pour la mise en œuvre des mesures permettant de réduire la déforestation et la dégradation (Davis *et al.*, 2009) (Encadré 1 explique le mécanisme REDD +). Cependant, comme le rappelle Larson (2011:547) : « *REDD+ is not primarily a tenure reform, nor are local rights among its priorities* ». Le problème est d'autant plus délicat que les ministères en charge de la mise en œuvre de REDD+ sont ceux en charge des forêts et/ou de l'environnement, et n'ont pas, en général, les affaires foncières dans leurs attributions. Or, on peut penser que REDD+ ne peut atteindre ses objectifs que si les mesures prises concernent l'ensemble des politiques qui ont un impact sur les forêts, et ne se cantonnent pas au cadre sectoriel étroit des politiques forestières. Les changements dans le domaine du foncier constitueront donc un test majeur pour juger des chances de succès de cette initiative. En Afrique centrale, où les enjeux liés à la REDD+ sont particulièrement importants compte tenu de l'étendue et de la densité des forêts, l'agenda des réformes foncières trouve une actualité nouvelle et la possibilité de fonder un régime juridique du foncier forestier plus favorable au maintien du couvert boisé est ouverte.

REDD+ ne peut atteindre ses objectifs que si les mesures prises concernent l'ensemble des politiques qui ont un impact sur les forêts

L'article examinera d'abord les modalités d'appropriation de l'espace et des ressources dans les régimes coutumiers puis les raisons de l'inadaptation des législations aux enjeux de la lutte contre la déforestation. On mettra ensuite en évidence la nécessité de la reconnaissance de droits exclusifs aux populations pour le développement de paiements pour services environnementaux, et l'on discutera la notion de « droits carbone ». Enfin, on formulera plusieurs propositions opérationnelles pour une évolution des régimes fonciers forestiers.

LE RAPPORT À L'ESPACE ET LES MODALITÉS D'APPROPRIATION DES RESSOURCES DANS LES RÉGIMES FONCIERS COUTUMIERS DES ZONES FORESTIÈRES D'AFRIQUE CENTRALE

Les sociétés agraires traditionnelles, en Afrique comme ailleurs, ont toujours combiné dans des proportions variables la part de « l'individuel » et du « collectif » qui sont généralement étroitement associés : l'exploitation de

Encadré 1
Le mécanisme REDD+

La déforestation représente environ 10-15 pourcent des émissions annuelles anthropiques de CO2 et affecte principalement les pays en développement qui ne sont pas soumis à des obligations de maîtrise de leurs émissions dans le cadre du protocole de Kyoto. L'originalité de la REDD (Réduction des Émissions issues de la Déforestation et de la Dégradation) est d'être un mécanisme incitatif qui se propose de rémunérer les États et/ou les acteurs locaux pour leurs résultats dans la lutte contre la déforestation. Au fur et à mesure des discussions, le champ des activités éligibles s'est élargi sous la pression de différents pays et groupes d'intérêts. La « dégradation » des forêts d'abord, puis la « gestion forestière », les plantations d'arbre et, enfin, la « conservation », constituent les activités couvertes par REDD+, appelé ainsi depuis Bali (2007).

L'architecture et les modalités de mise en œuvre du mécanisme n'ont pas été définies et font l'objet de débats serrés dans lesquels les intérêts des États et de différents acteurs économiques et sociaux s'opposent. L'architecture la plus communément évoquée, s'articule avec le marché international du carbone : les pays industriels et les entreprises pourraient acheter aux pays en développement ces « crédits REDD+ » pour remplir une partie de leurs propres objectifs, volontaires ou contraignants, de réduction d'émissions. Cette intégration au marché est contestée par de nombreux mouvements sociaux, qui redoutent une « marchandisation » des écosystèmes, et une recentralisation de la gestion des forêts qui serait dominée par des objectifs de stricte conservation ou de plantation. D'un autre côté, un mécanisme REDD+ qui serait tourné vers l'investissement public peut être un moyen de susciter et de financer des réformes structurelles dans l'agriculture, la foresterie et les régimes fonciers afin de s'attaquer aux causes de la déforestation et de la dégradation des forêts.

la ressource se fait sur une base individuelle (en fait familiale) tandis que l'utilisation de l'espace est totalement codifiée. Le rapport à l'espace n'est jamais un rapport direct, il dépend d'une médiation, celle de la communauté, et est étroitement lié au statut social de l'individu défini par sa position dans le groupe qui, seul, a les moyens de contrôler cet espace (Verdier, 1986). La notion « d'espaces-ressources » (Barrière, 1996) est utile pour comprendre comment, au niveau local, se combinent appropriation foncière et maîtrise des ressources sur des espaces à géométrie variable selon les types d'activités pratiquées et les différents groupes qui les pratiquent.

L'exploitation de la ressource se fait sur une base individuelle tandis que l'utilisation de l'espace est totalement codifiée

Aux alentours des villages forestiers, l'appropriation foncière ne concerne souvent qu'une faible partie de l'espace utilisé pour la collecte de produits non-ligneux et la chasse, suivant ses différentes modalités. Il s'agit des champs, qui sont généralement assez proches des cases, les jachères, ainsi que les terrains en réserve, futurs lieux de défrichement et pré-affectés aux groupes familiaux ou à des communautés identifiées. Ces modalités de l'appropriation foncière peuvent être traduites en termes de maîtrises exclusives à un ou plusieurs groupes[1]. Au-delà, les maîtrises foncières cèdent la place à des modalités d'appropriation des ressources, lesquelles font intervenir à des degrés divers le contrôle de l'espace. Le sol n'est plus prioritairement un objet de maîtrise, mais le support des activités de chasse, de collecte et d'extraction[2]. Certains arbres font l'objet d'appropriation exclusive ou prioritaire, suivant leur emplacement et la distance au village (Cozannet, 1993, pour l'est du Cameroun).

La logique « topocentrique » des régimes coutumiers

Ce qui fonde la connaissance d'un espace dans les représentations modernes c'est la connaissance des limites de cet espace, qui permet de le classifier et éventuellement de l'affecter. Les « modernes » se situent donc dans l'espace à partir de repères géométriques issus de la représentation cartographique, de la possibilité technique de se positionner à partir des lignes perpendiculaires que sont la latitude et la longitude. En milieu de forêt dense, les différentes populations se situent dans l'espace à partir de réseaux de pistes, support de différentes activités et de repères topocentriques[3] : la connaissance d'un espace passe par celle des lieux (clairières, anciens champs, mares, arbres, etc.) qui structurent un espace ouvert. Les limites sont souvent incertaines (sauf rivières ou lignes de crête séparant les zones d'influence des groupes) mais dans la distance aux lieux habituels de vie et d'activité.

En milieu de forêt dense, les différentes populations se situent dans l'espace à partir de réseaux de pistes, support de différentes activités et de repères topocentriques

1 Pour cette notion de maîtrises foncières, voir Le Roy (1996).

2 Voir également J. Weber (1996), pp. 17-18.

3 L'espace est organisé à partir de lieux particuliers, chaque élément ayant une fonction qui implique une maîtrise particulière de l'espace. Sur les conceptions indigènes de l'espace et les logiques topocentriques, voir Bohannan, P. (1963) et Le Roy, E. (1991, p. 314).

Dans certains cas, les lignages possèdent une forte autorité sur les territoires qu'ils considèrent être les leurs, l'accès aux ressources foncières et fruitières est strictement codifié et les limites territoriales sont bien connues. Mais il est fréquent que des conflits internes au sein des villages handicapent l'action collective, conduisant à des situations proches de « l'accès libre » ou à des contextes qui voient des personnes détentrices d'autorité foncière tenter de monnayer l'accès au foncier forestier à des demandeurs extérieurs. La plupart du temps, la tenure des arbres et du foncier relève d'une combinaison entre droits des individus, des familles, des lignages ou des clans. Ces droits varient selon les lieux de la production, les droits sur les arbres étant distribués différemment selon leur valeur économique et leur emplacement géographique (certains arbres proches des habitations sont appropriés par les familles ou les individus, d'autres arbres plus éloignés étant l'objet d'appropriation plus collectives).

Il est fréquent que des conflits internes au sein des villages handicapent l'action collective, conduisant à des situations proches de « l'accès libre »

Entre ces deux situations bien tranchées (contrôle et connaissance précise du territoire vs. situation d'accès libre), il existe toute une gamme de situations dans lesquelles l'action et les délibérations collectives sont plus ou moins effectives. Par ailleurs, les frontières des espaces collectifs ne sont pas toujours connues pour toutes les parties de la forêt. Certains droits fonciers sont souvent largement virtuels quand les densités de population sont très faibles, comme l'indiquait Pourtier (1986) pour le Gabon :

> *« Au-delà du terroir, dans l'espace interstitiel entre deux villages, les droits sont plus flous ou complexes. Ils n'ont de réalité qu'en cas de compétition, donc à partir d'une certaine densité (...). La réalité des différents droits fonciers dépend fondamentalement de la densité de population ; ils ne sont effectifs que dans la proximité des îlots d'habitat, dans la sphère reconnue des espaces périvillageois. Si ceux-ci sont contigus, la démarcation entre territoires est efficiente. Dans le cas contraire, l'espace se dilue dans l'inconnu des non-lieux où les droits n'ont plus de consistance ».*

Takforyan (2001), Karsenty et Marie (1998), ainsi que Vermeulen (2000) ont fait des observations similaires pour l'Est-Cameroun. En outre, les revendications d'accès aux ressources du foncier forestier peuvent porter

sur des espaces situés bien au delà des limites de la forêt villageoise ; ceci a été noté également par Pourtier (1986) : « *La non-coïncidence fréquente entre appartenance clanique et localisation (surtout dans les sociétés de filiation matrilinéaire) peut compliquer les choses* ». Même constat chez Pierre *et al.* (2001), toujours pour le Gabon : les auteurs indiquent que les lignages qui revendiquent des droits sur une même forêt peuvent être dispersés sur plusieurs villages. Mais, dès qu'il s'agit de foresterie communautaire, les législations nationales tendent à assimiler communautés et villages, ce qui ne reflète pas toujours la réalité sociologique qui prévaut sur le terrain.

L'INADAPTATION DES RÉGIMES FONCIERS FORESTIERS OFFICIELS

Les législations foncières en Afrique centrale ont été élaborées dans les années 1960 et 1970 et sont marquées par le poids important qu'avaient les États dans l'activité économique, l'importance de la « mise en valeur » pour le développement agricole et l'absence de préoccupations environnementales qui conduisait à considérer les forêts comme des espaces improductifs – qu'il fallait précisément « mettre en valeur ». Les codes forestiers, de leur côté, se sont attachés surtout à réglementer l'exploitation forestière sur des espaces généralement réputés domaniaux, et se sont peu attardés sur la question du foncier forestier.

Les législations foncières en Afrique centrale sont marquées par le poids important qu'avaient les États dans l'activité économique, l'importance de la « mise en valeur » pour le développement agricole et l'absence de préoccupations environnementales qui conduisait à considérer les forêts comme des espaces improductifs

Dans plusieurs pays d'Afrique centrale, l'accession à la propriété privée passe par une procédure héritée de la période coloniale, l'immatriculation. L'immatriculation est une procédure de création de la propriété plutôt que de constatation. L'immatriculation, acte volontaire qui confère un très haut niveau de sécurité juridique, a été conçue pour le développement d'une agriculture entrepreneuriale (ou capitaliste) pas pour la petite paysannerie ni pour des communautés[4]. L'immatriculation est une procédure lente et onéreuse, qui suppose de se déplacer dans la capitale pour effectuer les démarches auprès

4 Même si en Afrique des immatriculations à titre collectif de « terres de tribu » ont été pratiquées par l'administration coloniale française, notamment au Maroc et à Madagascar.

des services du cadastre. En pratique, les populations rurales ne se sentent pas concernés par ce dispositif, sauf en cas de pression foncière forte dans les zones périurbaines notamment. Les populations, en général, occupent donc sans titre les terres qu'ils ont reçues en héritage ou par attribution de la communauté. Les transactions foncières (achat et ventes) s'effectuent en dehors des procédures foncières légales, avec des actes sous seing privé, qui sont pris en compte par de nombreux tribunaux de droit commun lors de jugements de conflits fonciers.

En République Démocratique du Congo (RDC), l'article 53 de la loi du 20 juillet 1973 sur le régime des biens, appelée communément la loi foncière, indique que le sol est la propriété exclusive, inaliénable et imprescriptible de l'État.

> *« Par cette disposition, l'État congolais a nationalisé le sol, mettant ainsi un terme d'une part au régime de la propriété foncière, d'autre part à la distinction entre terres domaniales et terres indigènes, consacrés par le législateur colonial (...) Ces dernières, qualifiées de terres indigènes dans la législation coloniale, étaient régies par les coutumes locales et gérées par les autorités coutumières. Elles étaient la propriété des communautés indigènes »*
>
> *Source:* Mugangu Matabaro, 2008

Cette loi n'étant pas abolie, le régime de l'immatriculation n'est pas accessible aux particuliers. Cependant, la formule de la concession foncière perpétuelle permet de contourner cette difficulté : en Afrique centrale, un autre moyen d'accéder au titre foncier est le régime de la concession foncière, qui ne donne pas la propriété pleine et entière du bien mais confère des droits exclusifs à son titulaire, sous réserve de « mise en valeur » (Encadré 2). Au Cameroun, cette possibilité est ouverte sur les dépendances de deuxième catégorie du domaine national, c'est-à-dire des terrains libres de toute occupation effective. Au Gabon, la concession reste le principal mode de mise à disposition des particuliers du domaine privé de l'État et peut donner lieu à un transfert de propriété. En RDC, il est possible d'obtenir une concession perpétuelle qui permet à son bénéficiaire de jouir indéfiniment de son fonds aussi longtemps que sont remplies les conditions prévues par

la loi (paiement d'une taxe et mise en valeur). La concession perpétuelle est cessible et transmissible, mais seulement entre les personnes physiques de nationalité congolaise. Autrement dit, on se trouve bien dans une situation de propriété mais l'objet transféré est le droit de concession, pas – en principe – le bien immobilier lui-même.

Encadré 2
Domaine national et gouvernance

Le domaine se compose de biens publics, c'est-à-dire de biens appartenant à des personnes publiques. Il faudra distinguer la nature de la personne qui est propriétaire, soit sur l'affectation ou la non-affectation des biens considérés, soit sur l'opposition domaine public, domaine privé. A partir de la reconnaissance d'un droit de propriété aux personnes publiques, le *domaine public* se fonde l'affectation du bien à l'usage du public ou au profit d'un service public. *Le domaine privé de l'État* est souvent un droit résiduel, lorsque le bien n'est ni domaine public, ni propriété privée des personnes. Mais dans plusieurs pays africains, le domaine privé couvre de très importances proportions du territoire.

Le *domaine national* est une catégorie originale qui ne concerne en Afrique que le Togo, le Sénégal et le Cameroun. Au Cameroun, le domaine national est défini de manière résiduelle, englobant les terres qui ne font pas partie du domaine public et privé, et celles qui ne sont pas immatriculées. Au Togo, des terres détenues par les collectivités coutumières ou selon le droit coutumier ont été exclues du domaine national, mais pas au Cameroun. La logique du domaine national est, théoriquement, celle de l'administration d'un patrimoine collectif. Les textes recourent à des expressions ambiguës, dans le vocabulaire administratif, comme celle de « maîtrise » de l'État sur ces terres. Aucune procédure spécifique d'aliénation n'est prévue au profit des particuliers, alors que l'incorporation au domaine privé de l'État est possible (par voie de décret au Cameroun). On est en présence d'un paradoxe : le domaine national possède tous les traits d'une forme juridique originale entre la propriété étatique et la propriété privée, qui devrait être administrée dans le souci du bien commun en consacrant l'exercice des droits coutumiers individuels et collectifs. Mais au Cameroun, la constitution d'un domaine national en 1974 a été

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perçue comme une entreprise de nationalisation des terres appropriées de manière coutumière. Le privilège de redistribution des terres du domaine national conféré à l'État, explicitement (Togo) ou implicitement (Cameroun et Sénégal) justifie en partie cette perception. L'absence de procédure d'aliénation (au profit des particuliers ou des communautés, notamment) est plus l'expression d'une tutelle pesante de l'État que d'une sage gestion visant à préserver les systèmes locaux des effets désintégrant de la propriété privée individuelle[5].

Ce statut apparaît ainsi plus générateur d'insécurité que de protection, les populations restant sous la menace de décisions arbitraires de l'administration, de l'appétit foncier de fonctionnaires peu scrupuleux ou d'investisseurs disposant de solides appuis politiques. Pourtant, il semble nécessaire que les pays d'Afrique Centrale puissent disposer d'un statut foncier permettant l'exercice des droits coutumiers collectifs et/ou leur évolution possible vers des formes plus ou moins individualisées de tenure, y compris la propriété privée individuelle lorsqu'elle répond à des besoins concrets de sécurité foncière et qu'elle ne constitue pas un « coup de force » contre les droits coutumiers et notamment ceux des couches les plus défavorisées. Considérer la terre et les ressources naturelles comme un patrimoine collectif des nationaux semble constituer une solution intéressante et prometteuse. Encore faut-il que les droits des communautés et des individus soient assurées face aux tentatives d'appropriation illégitimes et à l'arbitraire potentiel de l'administration – les deux phénomènes étant souvent liés. En clair, l'idée originale d'un domaine national comme catégorie « de transition », permettant aux droits collectifs et individuels à la fois de se perpétuer et d'évoluer, n'a pas tenu ses promesses du fait de problèmes de gouvernance. Il est nécessaire de faire évoluer ce cadre pour répondre aux besoins pratiques de sécurisation foncière des différents acteurs.

5 La possibilité de constitution de la propriété privée est toutefois ouverte, soit par reconnaissance de droits d'occupation préexistants, soit par le biais de la dévolution définitive à un concessionnaire.

La situation des forêts

Les forêts restent très largement propriété publique en Afrique centrale. Plusieurs législations permettent la constitution de forêts privées, généralement par le biais des plantations, sauf en RDC où des forêts naturelles sises sur des concessions foncières sont reconnues propriété du concessionnaires foncier. En pratique, la foresterie privée est quasi-inexistante. Quatre pays (Cameroun, Guinée Équatoriale, Gabon et RDC) ont adopté des dispositions juridiques permettant l'exercice de la foresterie communautaire, avec des forêts communautaires constituées au Cameroun et en Guinée Équatoriale. Mais seul le Cameroun a prévu que les collectivités publiques locales (ici, les communes) puissent avoir un domaine privé forestier. Enfin, le statut juridique réel n'est pas toujours en phase avec l'intention du législateur : la constitution en droit d'un domaine forestier permanent passe par le classement effectif des forêts, ou par un acte juridique formel équivalent visant à verser des massifs forestiers précis dans la catégorie visée. Mais seul le Cameroun a entamé un vaste processus de classement pour les forêts de sa partie méridionale.

La dualité entre le droit positif « moderne » et les droits coutumiers qui régissent largement les rapports sociaux et les pratiques quotidiennes d'accès à la terre, est un constat valable pour tous les pays de la sous-région. L'articulation entre le droit foncier positif, les pratiques d'accès à la terre régies par le droit coutumier, et les codes forestiers constituent un défi juridique et institutionnel que les pays devront aborder tôt ou tard.

L'articulation entre le droit foncier positif, les pratiques d'accès à la terre régies par le droit coutumier, et les codes forestiers constituent un défi juridique et institutionnel que les pays devront aborder

Conséquences d'une articulation insuffisante entre lois foncières et forestières

Sur le plan de la législation, la forêt va être tout à la fois soumise au cadre juridique général des biens fonciers, mais elle se distingue des espaces cultivés par un régime spécifique, le régime forestier qui assigne des objectifs de gestion propres à ces espaces et les soumet à l'autorité d'une administration spécialisée, porteuse de « l'intérêt public ». Les codes forestiers ont souvent été préparés sans souci d'intégration avec les lois foncières – à l'exception notable de la RDC où s'affirme une certaine continuité dans la conception des deux codes. La source de cette difficulté provient de la notion de « mise en valeur » et son corollaire, les « terres vacantes ». Les lois foncières tendent à assimiler

l'absence de « mise en valeur » à la vacance des terres, c'est-à-dire à ne pas prendre en considération les activités diffuses d'utilisation des ressources forestières, la mobilité et les maîtrises temporaires sur le foncier forestier.

Dans la mésure où les titres fonciers qui procurent un niveau de sécurité foncière élevé, dépendent de la mise en valeur, les familles qui veulent obtenir une concession foncière et soustraire ainsi au régime forestier les terrains qu'ils utilisent vont tendre à accroître leur effort de défrichement et à se débarrasser des arbres de valeur commerciale sur leurs terres plantées. Le régime forestier permet en effet à l'administration d'attribuer des droits d'exploitation à des professionnels du bois sur les ressources ligneuses naturelles sur les terres non titrées individuellement (propriété privée, concession foncière) ou collectivement (forêt communautaire, concession communautaire), ce qui met dans une situation inconfortable les familles qui utilisent leurs patrimoines fonciers en conservant une réserve forestière (même si c'est pour des défrichements futurs), ou qui pratiquent de longues jachères marquées par la repousse de forêts secondaires comportant des arbres potentiellement commercialisables. En clair, l'accession à un niveau plus élevé de sécurité foncière passe par l'imposition d'une empreinte agraire bien plus visible sur l'espace, conduisant à l'accroissement de la déforestation.

Conséquences de la dualité entre régimes modernes et coutumiers

La déforestation n'est pas causée par un régime foncier particulier : la domanialité privée n'est pas synonyme d'une protection effective par des administrations qui manquent de moyens, les régimes coutumiers se fondent sur le « droit de la hache » (donc le déboisement) pour reconnaître des droits fonciers exclusifs et l'expérience montre que les communautés ne choisissent pas toujours de conserver les forêts qu'elles considèrent être les leurs si s'ouvrent des opportunités économiques plus intéressantes.

Ainsi, dans l'est de la RDC, il a été rapporté que les chefs coutumiers accordaient des autorisations d'accès aux scieurs artisanaux en échange de rémunérations personnelles, et ce aux dépens du reste de la communauté. Des situations similaires ont été signalées dans le Bas-Congo et sur le plateau Batéké. Par ailleurs, il est courant dans toute la sous-région de voir des possesseurs coutumiers vendre à des exploitants (artisanaux ou non) un ou

plusieurs arbres situés dans le prolongement de ses champs ou sur ses jachères, et ce sans solliciter l'autorisation du ou des chefs coutumiers. Ces différentes pratiques ne sont, bien sûr, pas légales (les administrations forestières sont court-circuitées), et dans les cas d'espèce leur « légitimité » au regard des représentations locales peut faire l'objet de débats internes aux communautés (le propre des coutumes étant – au contraire des « traditions » – d'être des catégories dont le contenu peut évoluer).

Les causes de la déforestation sont avant tout à rechercher du côté de l'économie, des systèmes techniques et de la démographie. Cependant, les différents régimes fonciers exercent une influence parfois non négligeable sur le rapport des individus et des groupes à leur environnement, notamment quand les conditions socio-économiques changent. Le manque d'effectivité du droit « moderne » étatique dans les zones forestières d'Afrique centrale, conjugué à un affaiblissement des capacités des communautés à faire respecter un certain nombre de règles coutumières, ouvre la voie à une situation d'entre-deux dans laquelle certains acteurs utilisent la référence à la « mise en valeur » (référence qui fait écho au « droit de hache » et au « droit de feu » des systèmes coutumiers) pour établir des droits personnels découlant du déboisement.

La reconnaissance juridique des droits fonciers familiaux au sein des régimes coutumiers : nécessaire mais insuffisant pour prévenir la déforestation

Une reconnaissance plus systématique par les législations de droits privatifs individuels, familiaux ou des droits coutumiers sur les espaces forestiers ne produira vraisemblablement pas d'effets directs en termes de réduction de la déforestation. Pour les ménages ruraux, l'amélioration du niveau de vie passe par le développement de cultures annuelles ou pérennes comme le palmier à huile, le cacao, le café, souvent aux dépens du couvert forestier. Le rapport à la forêt dépend avant tout des représentations et des usages des ressources (lesquels ne sont pas figés et peuvent évoluer plus ou moins rapidement) et des opportunités économiques perçues par les populations – l'apparition de nouvelles opportunités peut d'ailleurs contribuer à faire évoluer rapidement les représentations (Feintrenie *et al.*, 2010).

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Les populations autochtones, étroitement dépendantes des ressources forestières, ont généralement des usages plus favorables au maintien du couvert forestier que les autres groupes, comme le montrent – au niveau mondial – les analyses de Chhatre et Agrawal (2009). Et la reconnaissance de droits fonciers à ces populations constitue un moyen de les protéger contre des spoliations de terres venant d'acteurs extérieurs (et qui se conduisent souvent à des dégradations ou à la conversion de la forêt à d'autres usages) (Larson, 2011 ; Cotula *et al.*, 2008). Pourtant, l'instauration de « territoires autochtones », qui répondrait peut-être à des attentes locales et à un souci légitime de justice, ne garantirait pas que ces forêts seraient mises à l'abri de la déforestation. En Papouasie-Nouvelle-Guinée, la propriété des terres est reconnue aux clans, lesquels négocient avec les sociétés forestières et d'autres acteurs économiques les droits d'exploitation, probablement dans des conditions de mauvaise information sur les conséquences des différentes exploitations (très peu régulées en Papouasie). Il n'en reste pas moins qu'entre 1972 et 2002, 15 pourcent des forêts de la Papouasie ont été déboisées malgré la propriété collective reconnue aux clans. Et les délibérations collectives prises au sein de ces clans quant au choix entre exploitation industrielle et conservation tournent généralement à l'avantage de l'exploitation (Novotny, 2010).

L'instauration de « territoires autochtones » ne garantirait pas que ces forêts seraient mises à l'abri de la déforestation

COMBINER RECONNAISSANCE DE DROITS EXCLUSIFS ET PAIEMENTS POUR SERVICES ENVIRONNEMENTAUX

Si la déforestation n'est pas due à un régime foncier particulier et si la propriété communautaire des terres n'est pas une condition suffisante pour que les populations décident de gérer durablement ou de conserver les forêts plutôt que de les convertir à d'autres usages, il faut alors envisager des incitations économiques pour ces populations. D'où l'idée de « paiements pour services environnementaux » (PSE) afin d'encourager les populations à choisir le maintien du couvert forestier et non la conversion. Mais la faisabilité de tels paiements, qui implique de conclure des contrats avec des groupes qui deviendront responsables du maintien du couvert forestier pour justifier leurs rémunérations, dépend de la reconnaissance de droits

Il faut envisager des incitations économiques pour ces populations afin d'encourager les populations à choisir le maintien du couvert forestier et non la conversion

exclusifs des différents acteurs locaux sur des territoires assez précisément identifiés. En effet, si la reconnaissance de droits coutumiers (au profit et des communautés villageoises et des populations autochtones) n'est pas susceptible de produire automatiquement une protection du couvert forestier, elle n'en est pas moins nécessaire pour responsabiliser des populations sur des espaces précis à travers des contrats de paiements pour services environnementaux (ou de « déforestation évitée »). En effet, une communauté doit être en mesure, légalement et pratiquement, d'empêcher défrichement et exploitation illicite sur une forêt qu'elle s'est engagée, par contrat, à protéger. Faute de cette capacité légale et effective, le « payeur » potentiel (pour le service environnemental que constitue la lutte contre la déforestation) sera réticent à traiter avec une communauté incapable de prévenir les actions individuelles, externes ou internes au groupe, dommageables pour l'écosystème forestier.

En Afrique, de nombreux acteurs plaident pour une rémunération du stock de carbone forestier, c'est-à-dire pour des paiements correspondant aux stocks de carbone estimés dans les forêts sur pied. Toutefois, il n'est en aucune manière acquis que ce type de rémunération sera accepté dans un éventuel accord international post-Kyoto établissant le mécanisme REDD+ : les propositions discutées tendent, en majorité, à rémunérer des flux (mesurés par la réduction de la déforestation) et non des stocks. Même « l'approche par les stocks de carbone » (carbon stock approach, Prior *et al.*, 2007) ne propose pas la rémunération de tout le stock de carbone forestier d'un pays[6]. Le système des paiements pour services environnementaux – qui sera l'un des instruments incontournable du futur régime climatique relatif aux forêts – peut être utilisé pour rémunérer des stocks de carbone, notamment si cela est effectué dans le cadre d'un programme national de PSE, à l'instar de ceux qui a été mis en place au Costa Rica, au Mexique ou en Equateur. L'une des difficultés avec une telle approche est toutefois que

6 L'approche est de définir une réserve forestière permanente (objectif national de maintien de forêts permanentes) pour laquelle aucun crédit commercialisable ne sera émis. Seuls les projets de conservation ou de gestion durable entrepris en dehors de cette réserve seront considérés comme « additionnels » et pourraient recevoir des crédits commercialisables pour le stock de carbone conservé.

le paiement pour tous les stocks de carbone forestier conduit à payer à la fois les agents (propriétaires, entreprises ou communautés) qui auraient déboisé sans le paiement et ceux qui n'avaient pas l'opportunité ou le souhait de déboiser. Les recherches (Pfaff *et al.*, 2008 ; Ferraro, 2009) ont montré que la très grande majorité des agents qui ont reçu des paiements dans le cadre des programmes de PSE pour la conservation des forêts au Costa Rica ont bénéficié d'un « effet d'aubaine », c'est-à-dire qu'ils n'auraient pas déboisé même sans les paiements.

Les « droits carbone » : une question pertinente ?

Les services environnementaux sont, par nature, des biens collectifs (ou publics) et désignent des actions (l'entretien des paysages, le maintien de la qualité de l'eau, la réduction de la déforestation, par exemple). Seuls les agents qui rendent effectivement le service environnemental ont une légitimité à recevoir des crédits carbone (ou des rétributions financières), pas les « propriétaires » fonciers. Tout parallèle avec une rente foncière serait inapproprié. Si l'on prend l'exemple du carbone, la question n'est pas de déterminer le propriétaire des molécules de dioxyde de carbone (question qui a peu de sens, et qui reviendrait à tenter de déterminer de droits de propriété sur la pollution) mais la propriété des « crédits carbone » qui pourraient être versés en contrepartie d'une contribution active à la fixation du CO_2 de l'atmosphère (par des plantations) ou au maintien du carbone dans un espace (par l'évitement de la déforestation). Cette question est résolue pour les plantations : il existe un mécanisme avalisé par la convention Climat (le mécanisme de développement propre, ou MDP) et très encadré par des règles précises, qui affecte les crédits carbone au promoteur du projet de plantation (qui peut être une entreprise, une communauté, des collectivités publiques locales ou l'État). Pour la « déforestation évitée », tout dépend de l'architecture que recevra le mécanisme REDD+ : basé sur les résultats nationaux, sur les projets, sur une combinaison des deux. Comme pour le MDP, il est probable qu'une architecture basée sur les projets (laquelle est loin d'être acquise pour REDD +) impliquera des activités (définition d'un scénario de référence, contrôle et vérification) engendrant des coûts pour le promoteur du projet, lequel sera fondé à attendre un retour sur investissement (donc la propriété des crédits carbone).

Seuls les agents qui rendent effectivement le service environnemental ont une légitimité à recevoir des crédits carbone, pas les « propriétaires » fonciers

Dans les paiements pour services environnementaux, la propriété formelle de la terre est donc une question seconde par rapport aux actions effectivement entreprises par les usagers des terres et des ressources. En termes de droits, ce qui importe est que les usagers disposent de droits effectifs de gestion des terres et de droits d'exclusion de tiers (Wunder et Werz-Kanounnikoff, 2009), afin que ceux-ci puissent mener efficacement leurs actions de lutte contre la déforestation. On peut proposer les principes suivant : si les projets s'effectuent sur des forêts communautaires (ou les forêts des concessions foncières détenues par des communautés), les communautés seront fondées à demander un partage de ces crédits au titre d'une forme de « rente foncière » ou du manque à gagner entrainé par le renoncement à la conversion de tout ou partie de la forêt (tout dépend du traitement qui sera donné à la question de l'additionnalité). Quant à l'État, et à moins que ce ne soit lui qui investisse directement dans les plantations, il ne semble guère fondé à revendiquer des droits de propriété sur les crédits carbone forestiers obtenus à travers ce type de projet, dans la mesure où ce n'est pas lui qui fournit l'effort (effort d'investissement à travers la plantation, ou coût d'opportunité du renoncement à la déforestation ou à l'extension de cultures agricoles). Par contre, de la même manière qu'il est légitime pour un gouvernement de prélever des taxes foncières quand la terre est utilisée comme actif économique, les pouvoirs publics peuvent toujours décider de lever une taxe sur les crédits carbones obtenus par les parties prenantes au projet.

Dans les paiements pour services environnementaux, la propriété formelle de la terre est une question seconde par rapport aux actions effectivement entreprises par les usagers des terres et des ressources

Ces analyses effectuées et ces différents principes posés, il s'agit de proposer aux gouvernements d'Afrique centrale des mesures concrètes et pragmatiques en termes dévolution du régime foncier légal qui semblent nécessaires pour permettre la mise en œuvre de la REDD+. En outre, ces mesures vont dans le sens d'une meilleure prise en compte des pratiques locales dans le droit susceptible de conduire à une meilleure sécurité foncière des populations locales. Elles visent également à introduire de nouvelles représentations de la relation entre l'appropriation et l'usage des écosystèmes naturels, en revoyant la place de la notion de mise en valeur dans les codes forestiers et fonciers.

SIX PROPOSITIONS OPÉRATIONNELLES POUR UNE ÉVOLUTION DES RÉGIMES FONCIERS FORESTIERS AU SERVICE DES OBJECTIFS DE LA REDD+

1. Réviser la notion de « mise en valeur » dans les codes forestiers et fonciers. La mise en valeur est une notion marquée par des représentations du monde rural et de l'environnement aujourd'hui dépassées, où le progrès consistait à faire reculer les forêts et autres espaces naturels pour les « artificialiser » par la mise en culture permanente. Or, aujourd'hui, la conservation de la biodiversité en vue de son utilisation durable est une activité qui peut être considérée comme relevant d'une forme de mise en valeur d'un espace naturel. Le remplacement de la notion de « mise en valeur » par une notion de « contribution active au développement durable et à la conservation de l'environnement » pourrait constituer une solution.
2. Les gouvernements tendent à répondre aux aspirations des populations rurales de se voir reconnaître des droits réels, par la possibilité de solliciter des « forêts communautaires ». Cette solution est intéressante, mais reste insuffisante dans la mesure où elle ne permet pas la reconnaissance de droits réels que sur une portion du territoire effectivement utilisé par les populations locales. Or, les communautés sont en mesure d'identifier les espaces sur lesquels elles exercent différents droits d'usage, espaces qui ne s'arrêtent pas à la porte des concessions forestières ou des aires protégées. L'identification cartographique de ces espaces (terroirs ou finages) couplée avec l'identification des différents droits exercés sur ces espaces par les différents groupes d'acteurs qui l'utilisent devrait constituer une priorité des mesures politiques nationales spécifiques, ou NAMA (Nationally-appropriate mitigation actions), dans le cadre de la REDD+.

   Mais l'identification des différents droits doit s'appuyer sur la définition de catégories d'appropriation foncières/fruitières qui reflète le mieux possible les pratiques effectives des acteurs. Les enquêteurs devront recevoir une formation spécifique pour apprendre à utiliser ces catégories et ainsi à ne pas « trahir » les pratiques locales en voulant les retranscrire dans un univers simplifié. Une fois ces droits identifiés, il conviendra de procéder

La mise en valeur est une notion marquée par des représentations du monde rural et de l'environnement aujourd'hui dépassées, où le progrès consistait à faire reculer les forêts

à leur enregistrement dans des systèmes d'information qui pourront être géré au niveau des collectivités publiques locales ou des institutions déconcentrées de l'État. Une étape ultérieure serait leur prise en compte dans de nouvelles générations de lois foncières et forestières, afin que ces droits ne soient plus considérés sous le seul angle de la catégorie (subalterne) des « droits d'usage ».

3. Organiser la foresterie communautaire de manière à ce qu'elle articule deux espaces :

   Un espace *exclusif* sous forme de concession (forestière ou foncière) à titre collectif, englobé dans un espace plus large, non-exclusif;

   Un espace *non-exclusif*, identifié par des cartes dressées avec les communautés et leurs voisins, espace qui peut recevoir des limites précises (si cours d'eau, lignes de crête…) ou floues (zones grises, notamment en cas d'utilisation partagée de certaines ressources avec les communautés voisines dans les confins). Ces espaces non-exclusifs, que nous nommons finages mais que d'autres analystes nomment terroirs (comme par exemple Pourtier, 1986), peuvent se superposer à d'autres statuts, comme les concessions forestières ou les aires protégées et être identifiées dans les cahiers des charges des entreprises ou des organisations de conservation.

   Les contrats de PSE pourront être conclus plus aisément sur l'espace exclusif que sur les espaces non-exclusifs, là où les communautés ne sont pas les seules à exercer des droits légitimes. La mise en place de PSE centrés sur la conservation ou la gestion durable de la forêt à l'échelle du finage risque d'entraîner plus de difficultés liés aux exigences de coordination de multiples ayants droit, et donc des coûts de transaction plus élevés, mais rien n'empêche d'intervenir à cette échelle.

4. Pour l'établissement d'un État de droit, la présomption de domanialité privée sur les forêts doit être abandonnée dans les pays où elle a cours. Cela ne signifie pas qu'il faille renoncer à ce que l'État devienne propriétaire de forêts, mais cela veut dire que la constitution du domaine privé de l'État doit se faire selon les principes du droit et les procédures appropriées, qu'elles se nomment « immatriculation », « classement », « enregistrement » ou autres. Ces procédures, dont la logique est de s'appuyer sur des enquêtes contradictoires et des tenues de palabre (pour

Pour l'établissement d'un État de droit, la présomption de domanialité privée sur les forêts doit être abandonnée

respecter les droits des différentes parties prenantes), doivent conduire à la constitution **en droit** d'un domaine privé de l'État et des collectivités publiques locales. Une fois le domaine privé de l'État (et des collectivités publiques locales) constitué, la question du statut des autres forêts pourra se poser plus clairement et recevoir des solutions adaptées aux besoins des différents usagers du foncier forestier.

La solution qui prévaut au Cameroun constitue une option possible : les forêts font, par défaut, partie du « domaine national », patrimoine collectif de la nation, tant qu'elles ne sont pas classées (au nom de l'État ou d'une commune) ou qu'elles n'entrent pas dans le domaine privé de particuliers. Mais l'absence de cette notion de domaine national dans les autres pays de la sous-région fait que cette formule n'est pas facilement transposable.

5. Il est important de travailler à une mise en cohérence et une continuité des lois foncières et des lois forestières. Le code forestier de la RDC (2002) présente une certaine cohérence, ce qui permet d'articuler la notion de concession foncière avec la propriété des forêts, comme le montre l'article 8 du code forestier : « *Les forêts naturelles ou plantées comprises dans les terres régulièrement concédées en vertu de la législation foncière appartiennent à leurs concessionnaires* ». Au Cameroun, une telle articulation semble envisageable, mais se pose alors le problème de la « mise en valeur » qui empêche une communauté d'accéder à une concession foncière sur des espaces boisés si elle ne les convertit pas à l'agriculture. Une fois cet obstacle levé, il est souhaitable que les espaces exclusifs reconnus aux communautés (qu'ils se nomment concessions communautaires, forêts des communautés locales, forêts communautaires) puissent recevoir – à la demande de leurs usagers – un statut de « concession foncière » sur lequel la propriété des forêts naturelles ou plantées pourra être reconnue au titulaire (personne morale) de la concession.
6. Il semble essentiel que les pays d'Afrique centrale qui ne l'ont pas encore fait introduisent la notion de « domaine forestier permanent » dans leurs codes forestiers et fonciers respectifs. L'identification d'un domaine forestier permanent, objectif de maintien à long terme de terres sous couvert forestier, devrait constituer l'objectif essentiel des plans de

Il semble essentiel que les pays introduisent la notion de « domaine forestier permanent »

zonage, à l'exclusion de propositions trop détaillées d'affectation des terres, génératrices de conflits. Certains pays, comme le Cameroun, ont décidé de faire correspondre le domaine forestier permanent et de domaine privé de l'État. Ce choix présente l'avantage de simplifier le cadre logique de classification des forêts, mais il n'a rien d'obligatoire : il serait tout à fait envisageable d'avoir des forêts communautaires sur le domaine forestier permanent – comme l'envisageaient les premiers textes d'orientation de politique forestière du Cameroun au début des années 1990.

Instituer légalement une distinction entre *forêts permanentes* (ou domaine forestier permanent) et forêts non permanentes permettra de délimiter l'utilisation respective de la réglementation contraignante (logique du « command-and-control ») et des instruments économiques qui pourraient être développés dans le cadre de REDD+. Dans le domaine permanent, la priorité serait donnée à l'application stricte des lois interdisant la conversion des terres à des usages agricoles, tandis que sur les forêts non permanentes l'utilisation d'incitations (de type paiements pour services environnementaux) pourrait rémunérer différentes formes de contribution active au maintien du couvert forestier face aux opportunités de conversion.

Instituer légalement une distinction entre forêts permanentes et forêts non permanentes permettra de délimiter l'utilisation respective de la réglementation contraignante et des instruments économiques

CONCLUSION

Les mesures proposées ici dans le domaine du foncier forestier en Afrique centrale ne sont pas forcément subordonnées à la nécessité de mettre en place le mécanisme REDD+. Plusieurs d'entre elles constituent des recommandations récurrentes des organisations internationales (comme l'enregistrement des droits fonciers ou l'identification d'un domaine forestier permanent). Depuis 2006, et sans lien avec la REDD+, un pays comme Madagascar a aboli, la présomption de domanialité sur le foncier rural[7] au profit d'une notion propriété privée « non titrée », regroupant

7 www.madagascar-tribune.com/Suppression-de-la-presomption-de,691.html

l'ensemble des terrains occupés depuis des générations mais qui n'ont pas fait l'objet d'une quelconque procédure d'immatriculation. Une mise en œuvre équitable de REDD+ nécessite, en revanche, une adaptation ou une transformation des régimes fonciers pour éviter que l'augmentation potentielle de la valeur des terres boisées (surtout si REDD+ est basé sur des projets de conservation tournés vers le marché international du carbone) ne rende les communautés et populations locales dépourvues de droits réels, soumises au risque de dépossession au profit « d'investisseurs carbone » (Cotula et Mayers, 2009). La dynamique REDD+ peut constituer un levier pour effectuer ces changements dans les régimes fonciers, mais certains pays peuvent être réticents à entreprendre de telles transformations qui heurtent des intérêts acquis et portent également des risques de conflits (comme l'enregistrement des droits). Les mouvements sociaux et la société civile sont divisés face à REDD+, qu'ils voient soit comme une menace pour les droits des communautés soit comme une opportunité de lutte contre la pauvreté. Les citoyens africains ont tout intérêt à s'intéresser à l'architecture et au contenu de ce nouveau mécanisme et de peser pour que sa mise en œuvre soit l'occasion de réformes trop longtemps différées dans le domaine de la gouvernance du foncier.

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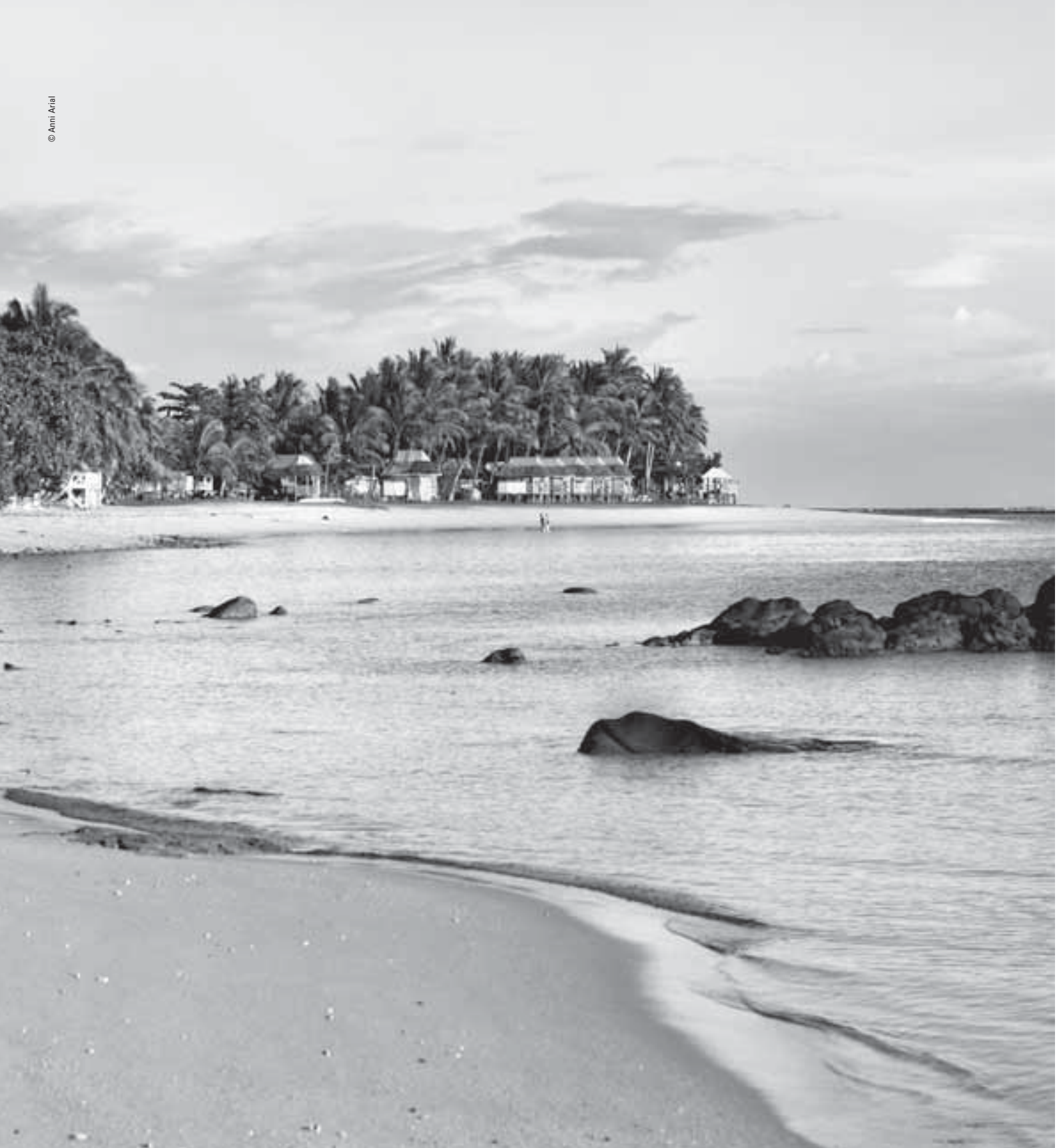

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CUSTOMARY LAND TENURE AND THE MANAGEMENT OF CLIMATE CHANGE AND INTERNAL MIGRATION
The example of Wallis Island

RÉGIMES FONCIERS COUTUMIERS ET GESTION DU CHANGEMENT CLIMATIQUE ET MIGRATIONS INTERNES
L'exemple de l'île de Wallis

TENENCIA CONSUETUDINARIA Y LA GESTIÓN DEL CAMBIO CLIMÁTICO Y LA MIGRACIÓN INTERIOR
El ejemplo de la isla de Wallis

ABSTRACT

CUSTOMARY LAND TENURE

WALLIS ISLAND

SEA LEVEL RISE

INTERNAL MIGRATION

This paper focuses on possible scenarios of land use and land tenure in the event of a permanent sea level rise on Wallis Island, part of the French Overseas Territory Wallis and Futuna in the South Pacific. This island holds a unique place in the French system, having its own king and a traditional power structure relying on Polynesian traditions. Land issues are managed through customary law, and this system offers flexible opportunities that can respond to contextual need. Land tenure is based on lines of descent; those who are 'part of' a certain land parcel are identified through his or her ancestry. This traditional system needs to be analysed as regards its effectiveness and its ability to respond to new environmental and

RÉSUMÉ

DROIT FONCIER COUTUMIER

ILE WALLIS

ÉLÉVATION DU NIVEAU DE LA MER

MIGRATION INTERNE

Ce document examine les divers scénarios possibles en matière d'utilisation des terres et des régimes fonciers en cas d'élévation permanente du niveau de la mer dans l'Ile de Wallis, partie du territoire français d'Outremer de Wallis et Futuna, dans le Pacifique Sud. Cette île occupe une place unique dans le système français, car elle dispose de son propre roi et de sa propre structure traditionnelle de pouvoir, basée sur les traditions polynésiennes. Les questions foncières sont gérées par le droit coutumier et ce système offre une souplesse bien adaptée aux problématiques et besoins locaux. Les régimes fonciers sont basés sur les lignées de descendance, les 'ayant droit' d'une certaine parcelle de terre

SUMARIO

DERECHO AGRARIO CONSUETUDINARIO

ISLA DE WALLIS

AUMENTO DEL NIVEL DEL MAR

MIGRACIÓN INTERIOR

En este estudio se examinan diversas hipótesis sobre el uso y la tenencia de la tierra en la isla de Wallis en caso de un alzamiento permanente del nivel del mar. Wallis forma parte del Territorio Francés de Ultramar de Wallis y Futuna, y está situada en el Pacífico Sur. La isla tiene un estatuto administrativo único en las disposiciones jurídicas francesas, ya que es regida por un rey y su estructura gubernativa se inspira en las tradiciones polinesias. Las cuestiones territoriales se manejan conforme a la ley consuetudinaria: este procedimiento, que ofrece oportunidades flexibles, permite hacer frente a las necesidades que derivan de las contingencias. La tenencia se funda en las líneas de ascendencia: los individuos que « pertenecen » a una determinada parcela se identifican

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political challenges. Local resource use, and shifting residency and agriculture patterns challenge land tenure. With the majority of the population inhabiting the coastline, potential migration opportunities to the higher interior of the island within the residents' own properties in the event of sea level rise need to be explored. Every Wallisian has access to several land parcels, which are distributed across the island.

étant identifiés par leurs ancêtres. Ce système traditionnel doit être analysé du point de vue de son efficacité et de sa capacité à répondre aux nouveaux enjeux environnementaux et politiques. L'utilisation des ressources locales et les changements de résidences et de pratiques agricoles constituent un défi foncier. La majorité de la population réside dans la zone côtière et les opportunités potentielles, en cas d'élévation du niveau de la mer, de migration de ces populations vers des propriétés situées sur les hauteurs de l'île, doivent être explorées. Tout wallisien a accès à différentes parcelles de terres, réparties à travers le territoire de l'île.

gracias a su linaje. Este sistema tradicional debe ser materia de análisis, ya que es necesario determinar su eficacia y sus respuestas ante los nuevos desafíos ambientales y políticos. El uso de los recursos locales, y las cambiantes pautas de residencia de los individuos y las formas de la explotación agrícola constituyen dificultades que suponen un desafío para la situación de la tenencia. Se hace pues necesario investigar cuáles serían, en caso de un aumento del nivel del mar, las posibilidades de migración de una población, en su mayor parte afincada en zonas de la línea de costa, hacia sus propias parcelas situadas en las tierras altas del interior. Todo wallisiense puede acceder a varias parcelas, y estas se distribuyen por todo el territorio de la isla.

INTRODUCTION

Land is a scarce resource in the Pacific. Thousands of islands are scattered over a vast ocean, mere dots in an overwhelming mass of water. When humankind migrated to this region of the world the precious land surfaces – consisting of coral sand, volcanoes, rocks, a thin layer of fertile soil, and varied vegetation – became a new homeland to the settlers who survived long, hard journeys across the seemingly endless Pacific Ocean. This land has become an integral part of the identity of Pacific people. In the past, wars, famines, tsunamis, cyclones and colonialism brought challenges to the inhabitants of these islands, and gave them lessons that were learnt the hard way. These lessons brought them the opportunity to learn, adapt, and develop.

Today, globalization is the challenge of our time. With globalization comes a phenomenon that is impalpable in everyday life, a concept that is expressed primarily through complex scientific theories and calculations. Yet it will have a palpable impact on all of us in the longer term: that phenomenon is climate change. Mainstream science (Mimura *et al.*, 2007) agrees that climate change is factual, and that we need to face up to significant changes to the world we thought we knew so well. Of the several consequences that are expected from climate change, rising sea levels are a major issue. (Other implications, such as scarcity of fresh water or global warming, are consciously left out of this article in order to concentrate on this one aspect.) Given that most of the Pacific islands are already small in surface area terms, rising sea levels could literally eliminate some of these islands completely.

In academia, the social sciences have started to contribute to the human dimension of climate change and its impact on the South Pacific (see, for example: Barnett (2001), Daly (2010), Gero (2010), Lefale (2010) for Samoa; Rasmussen (2009) for the Solomon Islands; Lazrus (2009) for Tuvalu; Campbell (2005), Gero (2010) and Mataki (2006) for Fiji. Others occupy themselves with the impact and the consequences on the whole Pacific region, like Garnaut (2008) or Kelman (2011)). Yet some islands have escaped international attention. There is a lack of knowledge about climate change implications for the local populations in the francophone Pacific – French Polynesia, New Caledonia and Wallis and Futuna. Some of their islands have a reasonable size

There is a lack of knowledge about climate change implications for the local populations in the francophone Pacific. Some of the islands have a reasonable size and elevation and therefore offer inland migration opportunities; meanwhile the populations of some atolls will have to leave their island of origin

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Wallis Island has an area of 78 km² and a population of just 9 000 inhabitants (Institut d'Emission Outre Mer, 2009). It is part of the French Overseas Collectivity of Wallis and Futuna, and is located in the South Pacific Ocean between Fiji and Samoa (Figure 1). The island is of volcanic origin, and the highest elevation in the central plateau is 151 metres above sea level. Its reasonable size and internal elevation therefore offer local inland migration opportunities in the case of a sea level rise. From the locals' point of view, the island has not felt the direct, visible impact of climate change so far. But changes are expected, and they will challenge the traditional system of land tenure if a large proportion of the population that inhabits the coastline would need to relocate to the higher interior of the island. This raises questions about the distribution and redistribution of land – both within families and in the public sector.

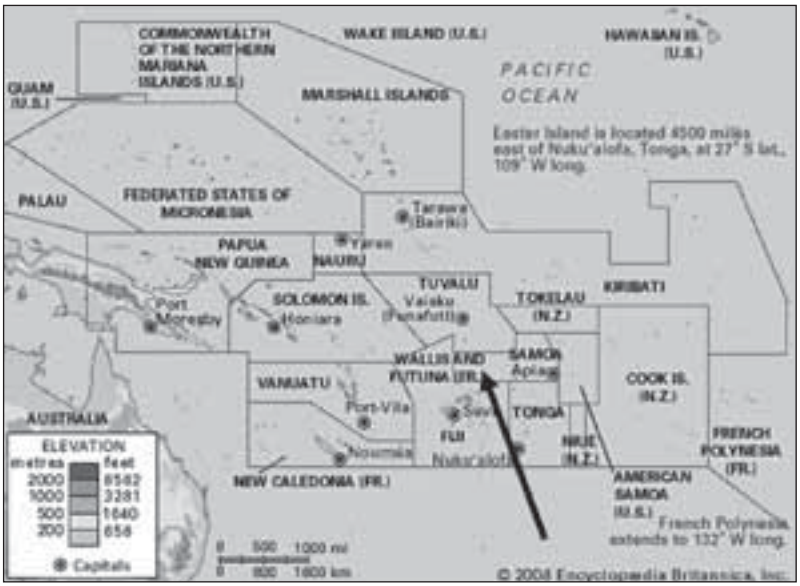

Figure 1
Wallis' location in the South Pacific

Land tenure is a significant issue in the endeavour to adapt to climate change, and on a number of Pacific islands, land disputes are already a major source of conflict (Wilson, 2009). This tendency can be expected to increase when the available fertile, usable land decreases. It is therefore important to anticipate the changes that will come in order to prepare for them, and find an equitable and sustainable land tenure solution that will meet the needs of the population, before land disputes escalate.

Land disputes are already a major source of conflict. This tendency can be expected to increase when the available fertile, usable land decreases

This paper focuses on possible land tenure scenarios in the case of permanent sea level rises on Wallis Island, taking into account the local societal structure. Unless indicated otherwise, the analysis of the situation on Wallis is based on two extended research stays undertaken by the author in 2009 and 2010, in the context of her doctoral research. The information was acquired through numerous qualitative interviews with different stakeholders and the general population. At the time of writing, most of the issues have not been covered in previous published articles and are therefore new contributions to the current situation on the island.

THE ROLE OF TENURE IN WALLIS' SOCIETY

The coming challenges need to be considered in the context of a particular local political situation on Wallis Island: the current customary authorities in Wallis are not united. There are two groups, one of which represents the royalist section of the population, loyal to the *lavelua* ('king of Wallis'), and the other of which is a reformist movement that has nominated its own customary authorities, and urges innovation in the system. There are also tensions between the customary authorities and the French administration, which is supposed to manage the island's public sector. All of this creates tensions within the population, and a power vacuum at the highest levels of power: decisions taken by the authorities are hard to implement, or simply ignored by parts of the populace. Respect for 'rules' is based on respect for local customary authorities and their associated personalities – i.e. their 'role model' function – rather than on written laws and penalties coming from elsewhere.

Given these circumstances, there is a need to review how the system of land tenure actually works, the rules that are inherent in the culture, and potential problems that could prevent the development of adapted land tenure in times of climate change.

Land tenure on Wallis is a very complex system based on lines of descent. It is clearly identified who is 'part of' a certain land parcel, because land belongs to a family (*kutuga*). Nevertheless, land disputes are the most common reason for conflicts on the island. The customary system, which manages land issues, offers flexible opportunities but needs to be analysed for its effectiveness and its ability to respond to new environmental and political challenges. A solution should be feasible, given that every Wallisian has access to more than one land parcel, and these parcels are distributed across the island.

The customary chiefs maintain a strong position in the Wallisian power pyramid. The *lavelua* is on top of this pyramid, followed by six *fa'u* ('ministers'), three *faipule* ('district chiefs'), and on a lower level, the *pulekolo* ('village chiefs'). Within families, the hierarchy continues, based on principles of seniority and age, with a male representative for each extended family. Parallel to this traditional power structure there is the French administration, with a deputy, a prefect, a senator, a territorial assembly and administrative services. These two power structures have complementary competences, whereby land issues are exclusively the domain of the customary authorities and the administration does not have the right to interfere with any regulations.

No land register exists, and the majority of the properties (and their boundaries) are regulated through oral tradition, such that even today deeds of ownership are rare. Palm trees border the properties but it is the specifics of the boundaries that are often the reason for land disputes. The customary chiefs play a particular role when such disputes arise. If a dispute cannot be settled by the two parties involved (who are often part of the same family) the customary authorities are consulted – first the village chief, then the council on a district level, the *fa'u*, and lastly if still no solution is found, the *lavelua* has the last say. Their decision is usually respected, but the same question can be raised again later. The dimension of time is crucial; a decision is always adapted to the current situation and can be revised later on – it then runs again through the same decision-making process as just

described. Presently, most of the chiefs see themselves as consultants rather than decision-makers. Traditionally the decision of a chief is respected by the population, but given the current political conflict, whether his opinion is respected or not largely depends on the charisma and the integrity of the particular chief in question.

In times of sea level rise, this system offers two opportunities that may actually be quite positive: first, the fact that decision-making is based on contextual need, and second, the fact that the right to use land is not obtained through economic wealth but through ancestry. The concept of contextual need is crucial in land tenure, because regulations can be used very flexibly – the definition of a need is therefore adaptable to the actual situation. Meanwhile the right obtained through ancestry corresponds to the redistribution of land within a family. This should offer a chance for a fair distribution of land and conditions, and equal access for everyone.

In this system it is expected that a chief, if consulted, will make a selfless decision in the interest of the population, although sometimes the integrity of certain chiefs may be questionable. Furthermore, Wallisian society tends to individualize: a number of Wallisians these days want to own their own piece of land instead of sharing it with other family members.

Current land distribution and its uses

The properties close to the coast (especially the east and south coasts) are generally used for housing and small gardens, whereas the properties in the interior and in the west are mostly agricultural land. Each of these properties are bequeathed within families, usually for several generations – each Wallisian (male or female) who descends from a designated ancestor has the right to use that particular piece of land. The consequence is that there are sometimes a few hundred people who are 'part of' a certain land parcel. At the same time, one person may claim access to numerous land parcels by tracing back their roots to different families over many generations. Some people estimate that they have the right to use up to 50 different properties, which are distributed all over the island, over the three districts, the island interior and the coast. Islanders usually construct their house on one of these premises, and use another (or two or three) for agriculture. A land claim in

this context is defined through the current needs of a person to construct a house or to raise crops. The final decision-making process is very complex and drawn out and is discussed with the whole extended family, respecting particular rules of seniority and hierarchy. The decision that is arrived at through this process is binding for the whole family.

Dividing family properties to give parts of the land to individuals is not in line with the idea of the coherence of the extended family, nor the logic of contextual need. Nevertheless, this practice is normally applied after a few generations to avoid unnecessary conflict and to establish clear land claims. Despite this system, land disputes are ingrained in Wallisian society. Modernization brings in additional ideas like deeds of ownership, the creation of a land register, fences around properties and individual land claims.

Historically, extended families possessed properties that stretched from the coast into the interior (Burrows, 1937:68). Over time, these extensive land surfaces became smaller and smaller, resulting from splitting and distributing the land to branches within the family. This continuing division of land parcels has led to a situation in which properties have become very small, especially those right next to the sea. In certain places one can almost touch the neighbouring house at arm's length. The population density is very high on the coast, whereas the land surfaces used for planting crops in the interior tend to be rather large, and are sometimes not in use over years.

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Land is inherited through the male and female lineage with no priority given to either side. If a family member needs a place to live, the family examines its properties – the properties that they are 'part of', together with other branches of the family – to see if there is an appropriate empty piece of land available, or sometimes an empty house that is already constructed and that can be occupied. The ideal scenario would involve the whole family coming together in a meeting, but these discussions can take a long time, sometimes requiring repeated meetings. A decision may not be reached until a consensus is arrived at that everyone agrees with. (For more details on land distribution and land use, see also: Malau, 2004; Pechberty and Toa, 2004)

The toafa

The *toafa* is the central plateau in the northern part of the island. For a long time the *toafa* had the reputation of being a barren place consisting of unfertile scrubland and offering nothing to the population. Archaeological findings in this area are rare (Sand, 1998:95). It is a place that has been avoided throughout history, as opposed to the southern part of the island which at times was quite populated (Sand, 1998:115).

Traditionally, the *toafa* was administered by the customary chiefs – it belonged to no one and was considered the *lavelua*'s domain. It was only in recent decades that almost the whole *toafa* was split into pieces and distributed to the population. In the 1970s the population on the east coast became very dense; the customary chiefs wanted to encourage the population to move into the interior of the island in order to relieve the population pressure on the coast. The population in the *toafa* has been growing ever since, and for other reasons too: the extended family structure and living arrangements are changing, the trend now is toward the core family and hence the need for 'individual' housing is rising. Furthermore, the population pressure on the coast remains high. A combination of demographic factors, changes in lifestyle and an elevated conscience for natural hazards, have created an atmosphere in which moving from the coast to the *toafa* has become a viable option. Even if climate change is not the main decisive factor, it is part of a series of decisions and situations that makes a formerly unthinkable option now viable and 'liveable with'.

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THE ISSUE OF CLIMATE CHANGE

So how does this detailed explanation of the Wallisian land tenure system pertain to climate change? According to current mainstream scientific estimates, the sea level will rise in the near future and thus have a considerable impact on the coasts of the Pacific islands (Mimura *et al.*, 2007:694). Even though Wallis is not one of the islands that are immediately threatened in their existence, major changes in the environment are expected. Calculations show that with a sea level rise of up to 200 cm by 2100 (McMullen & Jabbour, 2009:28), major populated areas will become uninhabitable. Numbers and

calculations vary according to different sources. Jens Hesselbjerg Christensen, for example, assumes a 60–100 cm rise by 2100 (Hesselbjerg Christensen, 2011). Looking to the future it is important to establish a trend, regardless of the exact numbers that may be involved, since these can only be estimated and not predicted with 100 percent accuracy.

A shift in population and residency patterns is one consequence of expected sea level rises. Most of the heavily-populated areas are in low-lying zones. Figure 2 (Couturier (a), unpublished) shows a model of the projected sea level rise of 200 cm, with a supplementary 100 cm rise as a consequence of potential additional soil erosion and reflux of the tide. The black areas indicate future flooded areas; the frame at the bottom of the island shown in Figure 3 (Couturier (b), unpublished) indicates that these areas are densely populated. In these two figures, approximate parameters are used for a better visibility on the map, using the maximum projections that in reality are more likely to be attained in the next centuries if current trends continue.

Figure 2
Approximate 300 cm sea level rise projection

Source: Couturier (a), unpublished

Figure 3
Probable tide limits with an approximate 300 cm sea level rise projection in the populated south of Wallis

Source: Couturier (b), unpublished

Wallis is an excellent opportunity for investigating this issue, since it is not one of the islands that are exposed to immediate life-threatening change. As such developments on the island can be observed in the mid-term, and solutions can be found within an expanded and reasonable time frame. This allows reviewing of different potential scenarios and models and is an opportunity to anticipate necessary actions.

It is crucial to investigate which major factors play a role in the preparation for this change in lifestyle – and if there is any preparation at all. As a result of her research, the author has come to the conclusion that climate change in Wallis is not considered a pressing issue in the everyday lives of many islanders, at least for a substantial part of the local population. The threat is not perceived as immediate and significant personal consequences are considered unlikely (see Worliczek, 2010). Clearly there is a lack of information at all levels of the population; local everyday issues have a higher and more immediate priority. Anticipating the impact of climate change, such as the necessity to leave the coast, is not something that is on the agenda for many Wallisians– a phenomenon that is not uncommon (Barnett, 2001).

Subsistence economy and local resource use

Wallis' food consumption is based on subsistence economy. Almost every family raises its own pigs, grows taro, yams and manioc, and goes fishing. There is a noticeable shift toward the consumption of imported food, but the core activity for most households is still the local production of food. This is especially important given that two-thirds of the population have no income (Institut d'Emission Outre Mer, 2009) and life depends on the success of agriculture and stock.

Under Wallis' current land distribution, different zones are linked to different purposes: generally taro plantations and gardens tend to be located in the populated areas on the northeastern and southeastern coasts; taro fields are in immediate proximity to the sea and gardens are usually a bit more inland. Plantations for yams and manioc tend to be distributed all over the island, but with a lower density in the *toafa*.

With rising sea levels it can be expected that the taro plantations will not be useable anymore, and family gardens would have to shift together with family housing. This would very likely be followed by a change in consumption patterns, as was the case in Rangiroa, French Polynesia, in 1948: after a tidal wave destroyed the entire harvest except coconut trees, a shift in agriculture took place. With newly introduced money economy people started to neglect their plantations and relied more and more on imported food. This kind of development, whose beginnings can already be felt in Wallis, is likely to accelerate with the loss or the more complicated cultivation of local staple foods. The shift to imported food therefore assumes a high dependence on the exterior world, and changes the structure of society with widening gaps between those who can and those who cannot afford to live on imported goods.

But agriculture is not the only domain of local resources that will be affected in this case. Presently, one of the pressing issues in Wallis is coastal sand mining, which contributes to the erosion of the island's coast. Beach sand is used in the construction of public and private buildings on the island and therefore has private and commercial use. It is the only resource which can be sold. Even though solutions involving alternative materials are actively being sought, the mining of beach sand is not a problem that is likely to

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be solved soon. Personal gain, a lack of alternative resources that can be monetized and an emphasis on short-term interests all complicate the issue.

As a consequence, most of Wallis' beaches in the populated areas have disappeared (Worliczek, 2010a). Beach erosion continues and the customary definition of how far to the beach or into the lagoon one's personal property reaches is not clearly defined. A rising sea level combined with accelerated beach erosion will diminish properties substantially. This raises another issue: if ever there should be claims made to substitute lost land, to what extent can the owner of a property be made responsible for this loss if he or she had previously extracted a lot of sand from the beach that is part of the property? Would a rising sea level have eroded this very piece of land at the same pace without these extractions? And what if the owner did not extract the sand, but rather it was their neighbour who built an embankment that caused erosion and land loss on this owner's property? Coastal space layout is a determining element here, since there is no overall administration of the coastal area and everyone is free to decide what to do with their own land. Sand mining sometimes took place on a large scale in recent decades, therefore a change in the morphology of Wallis' beaches is not only traceable back to climate change, but also to local human activity in significant degree. This is an ongoing problem, and it will be a major challenge to decide how big the locals' responsibility in this issue is.

Beach erosion continues and the customary definition of how far to the beach or into the lagoon one's personal property reaches is not clearly defined

The Environmental Service in Wallis has mandated scientific studies about the impact of and alternatives to sand mining (Allenbach, 1999; Bantos, 2011), but politics and customary authorities try to ignore the issue. A solution seems to be out of reach at present; measures against sand mining are very unpopular on Wallis and hard to implement because of the instable power structure.

Internal migration and demographic development

Most of Wallis' chiefs agree that there would be enough space in the interior of the island to accommodate comfortably all of the people living on the island, assuming that the emigrated Wallisians from New Caledonia, metropolitan France and elsewhere do not return home. This is a practical question that does at least need to be asked, given that the right to use a piece of land comes from family lineage and does not expire with absence from the territory.

However, at present there is no evidence to suggest such a repatriation – on the contrary, the emigration rate of –8 percent is extremely high (Institut d'Outre Mer, 2009), and a change in the direction of this net outward migration seems rather unlikely.

After having analysed the political, customary, demographic, economic and cultural context, the author has come to the conclusion that there are issues that need to be addressed when proposing a migration to the interior of the island that is not random, but controlled and directed:

- **Can the traditional land tenure system keep pace with these changes?** One would estimate that the flexibility of the traditional system allows an adaptation to new challenges – given that this system actually works and is respected by the majority of the population, which is currently not the case. The future development of the two lines of tension mentioned earlier will be a determining factor in the next few years, since negotiations about the management of land tenure and the question about the creation of a land register are pointing the way ahead.
- **How can land distribution work within extended families?** Wallisian society is based on solidarity; sharing and support are essential values, especially within families. Decisions concerning land questions take into account the contextual need – an involuntary displacement caused by climate change meets the criteria for 'need'. Having said that, there should be clear instructions coming from the customary authorities to help the families' heads to take the right criteria into account. This would help to avoid land disputes or discrimination against family members that are underrepresented.
- **Which discrepancy creates the growing difference in economic prosperity of the population?** In theory, land should be redistributed within the family. But since land can be sold to other Wallisians (but not to foreigners), will there be a shift in property distribution? Will money even play a role in land distribution within families? Again, clear indications from customary authorities and the *lavelua* (having the support of the population) are necessary.
- **Will France finance these displacements?** The infrastructure on the east coast is far better developed than in the interior, and the west coast does not have any infrastructure at all, apart from a few dirt roads. Electricity

Decisions concerning land questions take into account the contextual need – an involuntary displacement caused by climate change meets the criteria for 'need'

and water are commodities that people would not want to leave behind. There is also the question of who would pay for the construction of new houses. The majority of the population has abandoned the traditional *fale* and lives in concrete buildings, depending heavily on imported materials. These houses are expensive to construct, especially for the two-thirds of the population that do not have a regular income (Institut d'Outre Mer, 2009). If islanders need to leave their current houses, supplementary funding for new homes will be necessary.

It should be possible to adapt the traditional land tenure system to the challenges of climate change, to put the emphasis on its flexibility and its inherent character of contextual need – this is exactly what is required for the coming redistribution of land. Whatever option Wallis adopts, it is absolutely critical that the leaders of the island speak with a united voice and define a common strategy, otherwise they will not be able to unite the population behind them.

Scenarios and options

As a result of the author's discussions with different customary authorities and members of the population, three different internal migration scenarios are considered to be realistic:

- **Villages affected by sea level rise are dissolved.** Inhabitants assimilate in other villages where they are genealogically linked through their land. Families should be able to find properties and space for everyone; if they do not, they can consult the customary mechanism. With the exception of two villages (Mala'e and Lotoalahi), all villages are on the coast, with some lying lower than others. That is why this migration movement is more likely to be realized as a shift in population towards the interior rather than a complete displacement.
- **Relocation of an entire village to the interior: the creation of new villages.** Since there is hardly any customary land left that is not in the possession of families or individuals, this option would be difficult to realize. It would require the expropriation of land parcels located in the interior to make space for an entire village; it is highly questionable if all

the parties involved would agree with this. Such a scenario could only take place at the village level, and a compensation scheme would have to be developed. If this option were to be followed, the value of land would change considerably because it would become more monetized. This runs contrary to present Wallisian land tenure principles, where land is seen as the basis of the livelihood of future generations in each family.

→ **Increased emigration to nearby New Caledonia, metropolitan France and other destinations**. The trend toward emigration, which is already strong, is likely to accelerate with sea level rise. Climate change could be the decisive factor among a set of factors that are taken into consideration when thinking about emigration. Wallis already has a very high emigration rate and it is not in the interest of the island to lose an even bigger part of the population. Furthermore, it is questionable if New Caledonia would be willing to absorb a high rate of Wallisian immigrants, given that elevated immigration from Wallis has already been an essential element of political tensions in the past (Angleviel, 2004:86). As for metropolitan France, this seems a possible option but would have to be negotiated. Emigration should only be considered as a last resort, as the aim is to establish a liveable long-term scenario on Wallis Island itself.

The author's analysis shows that the first option represents the most likely workable scenario. This would surely be the reason for land disputes: thus the need for a strong, functioning, customary power structure that is able to deal with these tensions and place an emphasis on the need for solidarity. To this end, it may not even be necessary to make major changes in the land tenure system even as it is. An assessment will need to be carried out in order to establish who is really implicated and to what extent, an issue that raises questions about the predictability of sea level rise and the variables used for calculations. Resources will need to be made available, and a time span established, that allows each family to solve this issue individually. Supplementary funding from the administration needs to be channelled so that it can be used reasonably, such as for spatial planning in coastal areas (e.g. assistance for the technically-correct construction of sea walls) and the reinforcement of infrastructure in the higher areas of the island.

There is a need for a strong, functioning, customary power structure that is able to deal with these tensions and place an emphasis on the need for solidarity

Actors and stakeholders

A change in policy is definitely necessary from a climate change development point of view. But, according to some locals, similar examples in the past did not work out in a satisfactory manner. Foreign policy-makers came to Wallis in order to establish environmental protection schemes, without taking into account the needs of a population that is not involved in scientific discourse in everyday life. (By outlining this example, the author is suggesting that environmental issues can be taken as an illustration of the distribution and perception of new ideas among Wallisians.) The foreigners' approach was sometimes perceived as invasive, and the message was not accepted by the population. The majority of Wallisians lacks higher education – only 35 percent of the women and 38 percent of men have obtained their A-levels (see Hadj, 2008) – and do not have a regular income. For them, scientific ideas and theories about environmental protection are a luxury that contradicts an established set of life-sustaining practices on the island.

The most difficult step in fomenting long-term climate change awareness is surely the first one: to raise the level of consciousness about an issue that is not palpable in everyday life. Stakeholders in the administration and the customary authorities need to be better informed. Information passes through personal communication, discussions and setting an example for new ideas, not through written policy. Hence the need to review communication channels and how information is communicated: policy-making at the administration level is difficult to implement, the information does not usually reach the population in an appropriate way, and because of this it is not considered important enough. The population first needs an understanding of the necessity for action, and second tends to follow local role models.

A hierarchic communication model (Figure 4) shows that the local *pulekolo*, the village chief, is the pivotal element in the transmission of information. He is the customary authority that is closest to the population, and has the necessary credibility for implementing and integrating new information. The two stakeholders that are not part of the customary structure, but that are nevertheless influential – the administration and associations – have encountered problems in the past when attempting to communicate through the customary structure. These problems were often caused by personal rivalries

or political affiliation. Additionally, there were attempts to bypass the customary authorities, an approach that is doomed to fail in a society where the power pyramid has developed over generations: it is an integral part of the Wallisian culture and it would be more efficient to use it than to ignore it.

The *pulekolo* is the key to successful communication. He should be the target audience (with the approval of the *fa'u* / *faipule*) and needs to be convinced of the importance of the issue, something that can only occur through oral communication and devoting time to discussion and explanation. As soon as he has profoundly integrated instructions and principles, this will generate a trickle-down effect into the population, especially the part of the population that is not part of the privileged few who have other ways of obtaining information (e.g. TV or higher education) and who are not driven by economic daily needs because they have salaries. In order to reach the entire population, it will also be essential to talk to both the royalist and the reformist authorities, since they are role models for different segments of the islanders.

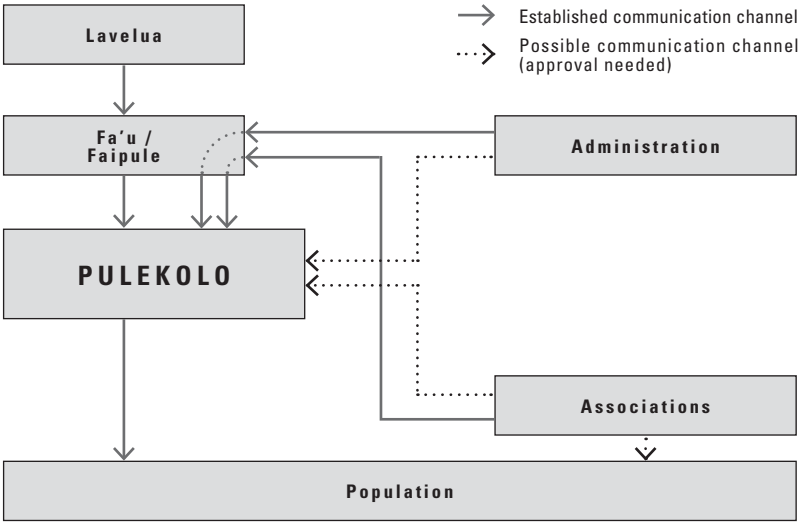

Figure 4
Hierarchic communication model

The administration will need to supply the technical information, whereas the customary authorities are the only ones that are able to communicate this information to the population. This two-step process has proven to be difficult in the past, since the two institutions work with a completely different logic, and money tends to curb efforts on both sides.

Associations (grouped around a village or a certain interest group such as women or the environment) start to become important actors in Wallisian society. They tend to address issues in modern society (such as the need for collecting rubbish in the village) that have developed recently and that are not rooted in the customary structure. They should not be neglected in this future problem-solving scenario: they can help to bridge the gap between science and the population, although they will need to work with the approval of the customary authorities to have the necessary credibility.

CONCLUSION

Wallisian society is not static: new influences, developments and ideas are taking root in a modernizing society. It will take time, together with targeted information and education, for the concept of climate change and its threats to take root in the local mindset. The steps required do not necessarily call for new institutions because existing structures can be used. This possibility should also be explored on other Pacific islands. Customary power structures exist on these islands as well and have been partially integrated into their governing structures (e.g. Samoa, Tonga); in some places they have even been 'reinvented' (see e.g. Lazrus (2009) re Tuvalu). They should be called upon to deal with this important long-term issue.

It will take time, together with targeted information and education, for the concept of climate change and its threats to take root in the local mindset. The steps required do not necessarily call for new institutions because existing structures can be used

Existing structures that have provided a certain degree of efficiency in the past have the greatest potential to implement new concepts and instructions successfully, since their chances of being accepted by the population are high. The degree of resilience to climate change needs to be explored separately on each Pacific island; countries like Tuvalu or Kiribati, for example, seem to be in a situation where there will be no escape from the need to relocate the population to new lands. But this is not the case on all Pacific islands –

different factors come into play, and the physical environment and availability of land is a major factor (Worliczek, 2011). Rasmussen *et al.*, (2009:1) state for some of the Solomon Islands (Ontong, Java, Bellona, Tikopia): "It is concluded that the capacity to cope with and adapt to climate variability and extreme weather events is well developed, and the social resilience of island communities appears to be high."

Wallis is in the fortunate position of having a well-adapted geomorphology. The challenge will be to balance out the desire of a part of the population for a revision of the land tenure system, keeping this in line with customary definitions and the need to eradicate possibilities for arbitrariness at the same time. The issue of sand mining is an ongoing problem that definitely needs to be solved soon, since it is intimately linked with a rising sea level. If there are future compensation schemes, they would have to take into account the role that local populaces have played in commercial sand mining.

On Wallis island, there is also one central land tenure issue that needs to be taken into account that has no direct link to climate change: the fact that there is no general agreement about how land should be managed. The customary chiefs on one side want to keep their power but are split into two groups. This brings with it a loss of credibility, and therefore power. The French administration on the other side is more in favour of a formalized land tenure system that would approach the French model and be easier to manage. To this end a land register would be necessary, but this would be anathema to a part of the Wallis population, who would not readily accept it. Wallis jealously guards its traditions; an attempt to renovate the system would be regarded as a voluntary step toward destroying the culture and traditions. Nevertheless, Wallis does need to face new challenges: without the willingness to allow at least some modifications to certain legal procedures and responsibilities, it will be difficult to offer a suitably forthright response to a potentially disastrous long-term situation.

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Step by step, a migration movement can be mastered with tools that to a large extent already exist. First, a technical assessment is necessary to find out who is really affected and would have to move away from the coast. Only then can the extent of the required actions be established. Second, each of the core families concerned will need to discuss the issue with their extended

family across the island, in order to find properties that can be occupied. It is likely that a large number of families would be able to find a solution within the extended family, the social unit that works with a relatively high degree of autarchy and does not require much assistance from the public sector. If usable land is found within the family – very likely in the *toafa* – then the remaining aspect that needs to be negotiated is potential financial support from the government for the construction of houses, an issue that the administration would have to settle. (If no solution is found within the family, the village chief will need to examine whether there is really no appropriate land available or if personal issues have prevailed. This is certainly the case in some families where personal enrichment is a driving factor.)

It is very likely that a large number of cases can be solved using this family-centred approach. It is the most logical approach, and also the most Wallisian approach, given that the extended family usually looks after the well-being of all family members. For the remaining cases that cannot be solved, the few land parcels that are still under customary authority will need to be reviewed and it might be necessary to distribute these. But this last step is rather unlikely, given the low population density on some parts of the island.

The ideal condition for meeting the challenge of rising sea levels is the early development of a collective conscience that anticipates and accepts the likelihood of the changes to come. At present it is not clear whether climate-induced change will catch the population of Wallis unaware, or if the island's people will consciously become aware of the issue in time (Giddens, 2009; Rudiak-Gould, 2011 (in press)). However, thanks to the flexibility of the Wallisian land tenure system and its logic of contextual need, the islanders may be able to react quickly enough, once a clear decision to do so is taken. They have an advantage compared with other Pacific islands where land tenure is managed by official administrational systems: these systems work slowly and find it more difficult to produce quick responses; the author observed this in her research around French Polynesia in 2009 and 2011. It is absolutely crucial to take into account the nature of the local land tenure system and its power mechanism: even if we understand much about the technical aspects of climate change and its consequences, there will be no possibility of adapting to the coming changes if the key actors themselves are not convinced of the necessity to act.

The ideal condition for meeting the challenge of rising sea levels is the early development of a collective conscience that anticipates and accepts the likelihood of the changes to come

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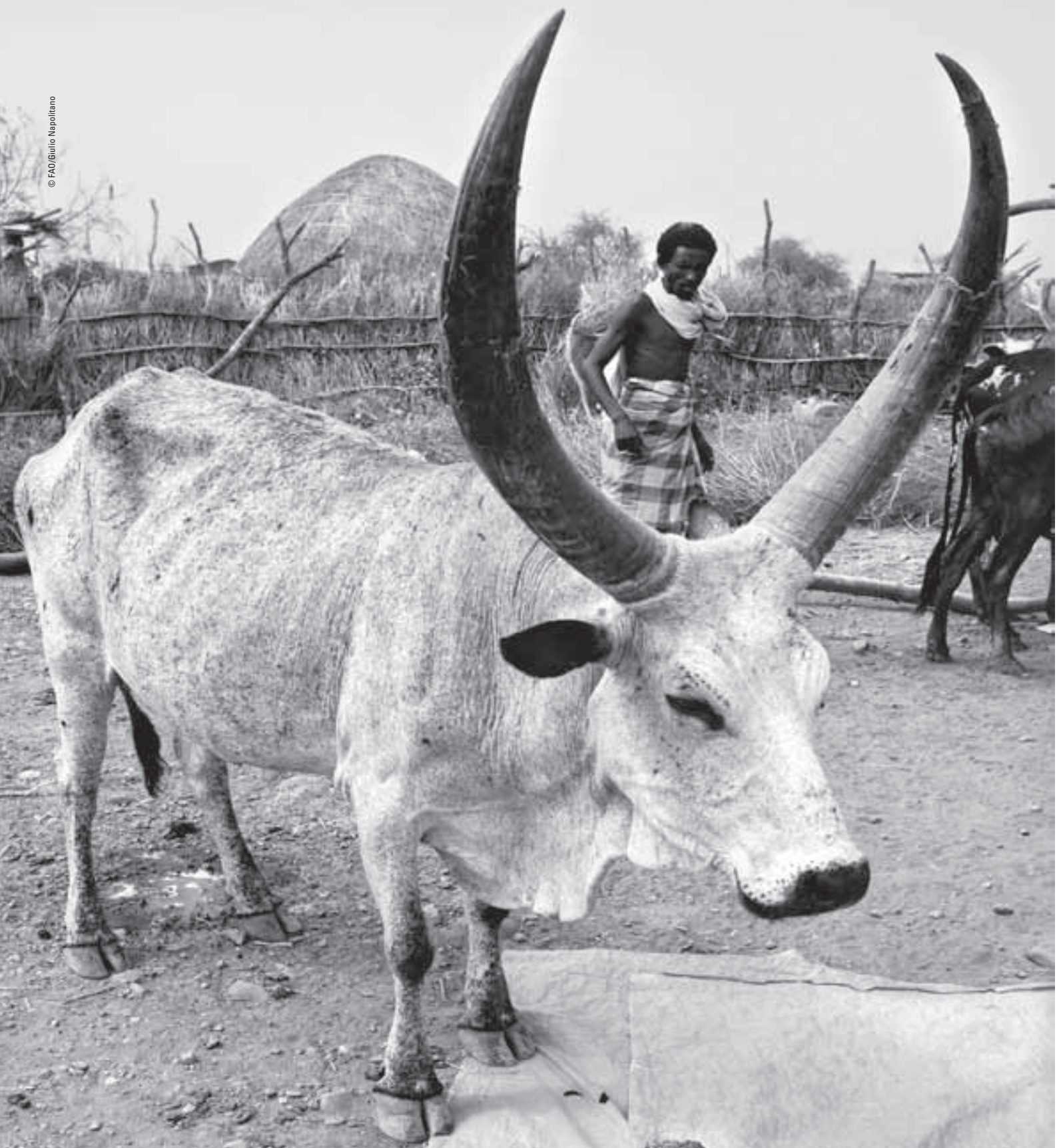

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GOVERNANCE OF PASTORAL TENURE AND CLIMATE CHANGE IN THE SAHEL

Reinforce capacities of actors to secure mobility and fair access to pastoral resources

GOUVERNANCE DU FONCIER PASTORAL ET CHANGEMENT CLIMATIQUE AU SAHEL

Renforcer les capacités des acteurs du foncier dans la sécurisation de la mobilité et de l'accès équitable aux ressources pastorales

GOBERNANZA DE LAS TIERRAS AGROPASTORILES Y CAMBIO CLIMÁTICO EN EL SAHEL

Refuerzo de las capacidades de los agentes que intervienen en la tenencia para asegurar la movilidad y el acceso igualitario a los recursos

ABSTRACT

PASTORAL MOBILITY

TENURE CONFLICTS

DECENTRALISATION AND TENURE INSTITUTIONS

PLANNED MANAGEMENT OF COMMON RESOURCES

In the Sahel, livestock farming holds first place in agricultural production ahead of agriculture that is over-exposed to hazards. Through their capacity to adapt to the unforeseen, the pastoral societies are undoubtedly vulnerable, but also resilient. Often little supported by public policies, the pastoralists have constantly modernised their systems of mobility by adapting to new constraints encountered and by integrating a number of innovations. Despite such an advantage, these modes of exploitation based on mobility have, for a long time, been considered inappropriate, the priority being given to settlements and intensification of practices.

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MOBILITÉ PASTORALE

CONFLITS FONCIERS

DÉCENTRALISATION ET INSTITUTIONS FONCIÈRES

GESTION CONCERTÉE DES RESSOURCES COMMUNES

Dans les zones sahéliennes, l'élevage occupe la première place des productions agricoles, devant une agriculture très exposée aux aléas. Par leur adaptabilité aux incertitudes, les sociétés pastorales apparaissent certes vulnérables, mais également résilientes. Souvent peu soutenus par les politiques publiques, les pasteurs ont su sans cesse moderniser leurs systèmes de mobilité, s'adaptant aux contraintes nouvelles rencontrées et intégrant de nombreuses innovations. Malgré de tels atouts, ces modes d'exploitation nécessairement mobiles pour vivre en milieux en non-équilibre, ont longtemps été perçus comme

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En el Sahel, la ganadería ocupa el primer lugar entre las actividades de una agricultura muy expuesta a riesgos. Debido a su capacidad para adaptarse a las situaciones de incertidumbre, las sociedades pastoriles se conciben por cierto como grupos vulnerables que, no obstante, están dotados de aptitud de resiliencia. Si bien han gozado de escaso apoyo en las políticas de gobierno, los pastores han sabido modernizar ininterrumpidamente sus sistemas de trashumancia. Ellos han adaptado su comportamiento a las restricciones, y han ido incorporando a sus prácticas numerosas innovaciones. Sin embargo, las particularidades de una explotación necesariamente móvil, que permite a los pastores vivir en un

When the principal climatic models in the Sahel are in harmony with increased exceptional climatic conditions there is a convergence of public policies in favour of securing the tenure systems and the pastoralists' rights. However, in Niger where the legal framework is one of the most favourable, it is still little applied. Therefore, approaches to secure pastoral tenure at communal and intercommunal levels have been developed by mobilising actors of governance of tenure in the implementation of a strategy to secure transhumance and to manage pastoral wells in equitable manner. Securing pastoral tenure thus reinforces the dynamics of pastoral societies facing the challenges of climate change and demographic pressure. It also raises the question of limitations and other issues.

inadaptés, la priorité étant accordée à la sédentarisation et à l'intensification.

A l'heure où les principaux modèles climatiques au Sahel s'accordent sur l'augmentation des risques d'événements exceptionnels, une convergence des politiques publiques se fait jour en faveur de la sécurisation des systèmes et droits pastoraux. Cependant, au Niger où le cadre juridique est l'un des plus propices, il reste encore peu appliqué. Ainsi des démarches de sécurisation du foncier pastoral à l'échelle communale et intercommunale ont été développées en mobilisant les acteurs de la gouvernance du foncier dans la mise en œuvre d'une stratégie de sécurisation de la transhumance et de gestion équitable des puits pastoraux. La sécurisation du foncier pastoral ainsi développée met en évidence le renforcement des dynamiques des sociétés pastorales face aux enjeux du changement climatique et de la pression démographique. Elle soulève aussi différentes limites et interrogations.

medio carente de estabilidad, han sido por mucho tiempo consideradas poco apropiadas, porque se ha preferido conferir a la sedentarización y a la intensificación agrícola la categoría de patrones prioritarios.

En un momento en que, en el Sahel, los principales modelos climáticos indican un aumento del riesgo de acontecimientos excepcionales, se constata que las políticas tienden a converger hacia la seguridad de los sistemas y derechos pastoriles. Pero pese a que el marco jurídico nigeriano cuenta entre los más favorables, la aplicabilidad de sus contenidos normativos sigue siendo aún insuficiente. Por consiguiente, se han puesto en marcha medidas destinadas a aumentar la seguridad de la tenencia en el plano comunal e intercomunal. A este efecto, los encargados de la gobernanza de las tierras han lanzado una estrategia que garantiza la trashumancia y la gestión equitativa de los pozos utilizados por los pastores. Esta actuación ha puesto de manifiesto que la dinámica de las sociedades pastoriles se ha reforzado para hacer frente al cambio climático y a la presión demográfica. Con todo, también se han observado limitaciones que conducen a formular diversas interrogantes.

INTRODUCTION

Alors qu'elle a longtemps été stigmatisée comme une survivance du passé, la mobilité pastorale pratiquée par nombre de sociétés pastorales du Sahel, apparaît sous des angles de vues beaucoup plus pertinents autant d'un point de vue économique qu'écologique. Les tendances au changement climatique annoncées insistent sur l'augmentation des risques de variabilité des pluies dans les zones sahéliennes et la mobilité des sociétés pastorales constitue une des premières parades permettant une adaptation à ces évolutions.

Après avoir mis en évidence les adaptations mises au point par les sociétés pastorales du Sahel, nous verrons en quoi dans un pays comme le Niger les politiques publiques se sont progressivement adaptées à une meilleure reconnaissance des droits à la mobilité pastorale.

Mais bien que les textes juridiques soutiennent plus ouvertement de tels systèmes d'élevage mobile, une des contraintes majeure demeure pour de nombreux acteurs institutionnels, dans la mise en pratique effective de ces textes.

C'est ainsi que des expériences ont été mises en œuvre visant à accompagner les acteurs institutionnels (État et Collectivités), la société civile, et les leaders des transhumants dans la sécurisation du foncier pastoral et l'aménagement des territoires pour intégrer la mobilité des hommes et de leurs troupeaux. A partir du cas précis de l'expérience récente conduite au Niger cet article mettra en lumière la spécificité de la démarche de concertation et de renforcement des capacités des acteurs. Il développera ensuite une lecture critique des acquis et des limites rencontrés en soulignant ce qui constitue des premiers effets observés par les concernés, autant du point de vue des impacts sociaux qu'institutionnels renforçant les capacités de gouvernance des ressources communes et d'adaptation des sociétés locales au changement climatique.

UN MODE D'EXPLOITATION DES RESSOURCES NATURELLES LONGTEMPS SOUS-ESTIMÉ, VOIRE MARGINALISÉ MALGRÉ SON ADAPTATION AUX VARIABILITÉS CLIMATIQUES

La transhumance était considérée, et l'est encore dans les esprits de nombreux décideurs et techniciens, comme *« la modalité simpliste qui permet à l'indigène d'une façon normale, de résoudre le problème de l'eau et de l'alimentation des troupeaux dans les régions où le sol est trop pauvre pour être cultivé et où la sécheresse interrompt périodiquement la végétation [...] »* (Velu, cité par Doutressoulle, 1947). Fondées sur de telles analyses, les politiques ont longtemps promu la modernisation de l'élevage par la fixation des troupeaux et la maîtrise de la charge animale, l'aménagement de ranchs et de périmètres pastoraux. La reconnaissance des droits des pasteurs à la mobilité a tardé à être inscrite dans les réglementations foncières. Ainsi, malgré les capacités d'adaptation des sociétés pastorales, l'insécurité pastorale s'accroît. Elle est causée par les évolutions de l'occupation de l'espace, mais aussi plus profondément par le développement de pratiques inéquitables de contrôle des ressources (Marty et Bonnet, 2006).

Les politiques ont longtemps promu la modernisation de l'élevage par la fixation des troupeaux

La plupart des politiques de développement de l'élevage depuis les indépendances ont considéré les systèmes d'élevage mobiles ou nomades comme voués à disparaître au profit de modes d'élevage sédentarisés et intensifs qui répondraient mieux aux enjeux de saturation des espaces agricoles et de la demande sans cesse croissante en produits animaux. Ces systèmes d'élevage pastoraux ont longtemps été considérés comme une survivance de pratiques héritées du passé, peu performantes du point de vue économique, souvent associées à la désertification et au surpâturage.

Contre toute attente, et en contrepoint de telles visions, force est de reconnaître que dans bien des régions sahéliennes, les systèmes pastoraux mobiles se sont maintenus, se relevant des grandes sécheresses de 1973 et de 1984 et faisant face remarquablement à l'augmentation de la pression accrue de l'agriculture sur les ressources pastorales (Marty, 2011). Construits sur une organisation sociale de la mobilité, ces systèmes font preuve d'une remarquable vitalité et constituent le principal fournisseur des marchés à bétail des zones sahéliennes et soudaniennes.

A la faveur des réflexions conduites depuis une dizaine d'années sur le changement climatique au Sahel (CNEDD, 2006), il apparaît ainsi de plus en plus que ces savoir-faire acquis par l'expérience des sociétés pastorales constituent un capital social et technique essentiel à prendre en compte et même à renforcer. L'histoire du Sahel est ponctuée d'années de sécheresses à l'origine d'une forte mortalité du bétail (1914, 1973, 1984 et 2005), engendrant souvent des famines. Plus récemment, 2009 a encore été qualifiée de sécheresse exceptionnelle au Niger, Tchad, Mali et Burkina Faso. Les modèles climatiques expérimentés au Sahel manquent de précision et mettent en évidence des tendances possibles contrastées. Certains prédisent une augmentation des pluies, d'autres au contraire une tendance à l'aridification. En revanche les quatre modèles développés s'accordent tous sur l'augmentation de la fréquence des phénomènes exceptionnels : sécheresses et inondations. De ce point de vue, la succession des hivernages 2009 (sec) et 2010 (très pluvieux) est bien illustrative des conséquences induites par le changement climatique et des adaptations développées par les populations sahéliennes.

ADAPTABILITÉ AUX INCERTITUDES CLIMATIQUES, SOCIO-ÉCONOMIQUES ET POLITIQUES

L'analyse des sociétés pastorales au Niger montre que ces dernières ont su s'adapter remarquablement en particulier au cours des vingt dernières années pour préserver leur mode de vie et leurs systèmes de mobilité face aux contraintes croissantes.

Faire face et intégrer des risques multiples pour garantir la viabilité de leurs systèmes

Les incertitudes auxquelles s'exposent les sociétés pastorales sont nombreuses (Toutain, 2001 ; Thébaud, 2006 ; Sambo *et al.*, 2008 ; Marty *et al.*, 2006). Elles sont d'abord largement liées depuis des siècles à la très grande variabilité des ressources pastorales offertes par les milieux naturels. Cette variabilité est à la base de l'organisation de la mobilité à grande échelle par les sociétés pastorales. Le changement climatique, difficilement prévisible

La variabilité est à la base de l'organisation de la mobilité à grande échelle par les sociétés pastorales

au Sahel, accentuerait cette variabilité et augmenterait la fréquence des phénomènes exceptionnels (sécheresses ou fortes pluies), un autre facteur étant l'augmentation de la température moyenne déjà très élevée dans la bande saharo-sahélienne (Bolwig *et al.*, 2007).

Mais les incertitudes auxquelles les pasteurs ont à faire face sont également économiques, en lien avec les dynamiques des marchés pour l'écoulement des produits pastoraux. La valorisation des produits de leur élevage se fait sur les marchés pour acheter des céréales et des produits de consommation de plus en plus nombreux. Suivant la qualité de la saison des pluies, les termes de l'échange entre céréales et bétail sont plus ou moins favorables aux éleveurs. Ce facteur intervient fortement lors des sécheresses et contribue à la décapitalisation des troupeaux (vente des femelles), en plus de l'exploitation normale des mâles. Le prix des céréales s'envole lors des pénuries quand le prix des animaux s'effondre, obligeant les éleveurs à vendre davantage de têtes pour s'approvisionner au marché (Guibert *et al.,* 2009).

Les risques liés à l'activité pastorale sont également socio-fonciers et politiques, chaque fois que des conflits viennent remettre en cause l'accès aux ressources pastorales. La monétarisation et la privatisation des ressources communes ont des conséquences directes sur l'espace pastoral commun à tous les éleveurs qui s'amenuise et l'accès aux ressources pastorales vitales qui devient incertain. Les faits sont très nombreux et se répètent aux yeux des pasteurs : insuffisance, voire inaccessibilité ou monétarisation de l'accès à l'eau en saison sèche ; progression du front agricole et amenuisement continu des aires de pâturage ; obstruction, rétrécissement ou destruction des couloirs et pistes de transhumance ; disparition des aires de repos ; ramassage systématique des résidus agricoles en zone agricole ; dynamiques de territorialisation de certains groupes vis-à-vis des ressources pastorales communes, etc. Enfin, le parc des infrastructures pastorales (puits pastoraux, aires de pâturage, couloirs de transhumance) mis en place à la colonisation et au début de l'Indépendance a considérablement vieilli, faute d'investissement.

La définition et la mise en œuvre plus ou moins cohérente des politiques publiques participent à l'augmentation de risques pour les activités pastorales. On citera par exemple la décentralisation qui a pu induire des pratiques prédatrices de la part de certaines communes (Djerma *et al*, 2009). C'est aussi

le cas chaque fois que les droits des citoyens et les droits fonciers pastoraux ne sont pas respectés ou reconnus par les acteurs institutionnels chargés de l'application du droit et des politiques (Arzika *et al.*, 2007). L'incertitude et l'injustice sont également fréquentes dans le traitement de nombreux litiges agropastoraux, d'abus d'autorité des forces de l'ordre et des douanes (Bonnet et *al.,* 2010). Les droits à la mobilité sont aussi négligés dès que sont mis en culture des couloirs de passage, que se ferment les accès aux mares et que des champs envahissent les aires de pâturage et de repos.

L'intégration des pasteurs transhumants dans les décisions et les instances de régulation devient également un élément critique. On relève des pratiques de sur taxation des pasteurs, par les autorités communales en lien avec la décentralisation. On observe aussi une inacceptable disproportion entre dégâts causés aux cultures par les animaux et mesures appliquées par les autorités administratives, ainsi que des taxations abusives par les services forestiers par rapport à l'élagage des arbres en saison sèche. D'une manière générale, on constate l'exclusion des transhumants des processus de prise de décisions locales et, plus grave encore, le mépris répété des droits des pasteurs lors des traitements des litiges agropastoraux (Arzika *et al.,* 2007).

Adaptation et construction des alliances nécessaires à la sécurisation de la mobilité

Face aux multiples risques ci-dessus relevés, les sociétés pastorales sahéliennes ont mis en place des stratégies et des tactiques d'adaptation qui reposent très largement sur la mobilité et le développement des alliances socio-foncières et intercommunautaires. Ces deux éléments, profondément inscrits dans la structuration sociale des communautés d'éleveurs, sont déterminants dans la résilience des familles d'éleveurs mise à l'épreuve par les sécheresses récurrentes (Bonnet *et al.,* 2010).

Les sociétés pastorales sahéliennes ont mis en place des stratégies et des tactiques d'adaptation qui reposent très largement sur la mobilité et le développement des alliances socio-foncières et intercommunautaires

L'histoire de l'élevage sahélien montre que des réponses concrètes, souvent ingénieuses, ont été trouvées dans le passé permettant à de nombreuses sociétés de se reproduire au cours des siècles. La transhumance, cette forme particulière de mobilité, capable de valoriser les complémentarités interzonales, sur des espaces souvent très vastes, loin d'être une simple habitude, correspond, en fait, à une véritable construction sociale, politique,

économique, sans cesse renouvelée et réadaptée. Par-delà l'existence de calamités naturelles et de rapports de force inégaux, des formes d'organisation ont réussi à se faire reconnaître comme légitimes pendant de longues périodes (Marty *et al.*, 2009).

Ceci explique que, malgré des contraintes de plus en plus fortes sur l'espace et l'accès aux ressources et la pression humaine, l'élevage mobile fait preuve d'une extraordinaire vitalité, révélatrice de la capacité d'adaptation des pasteurs. La flexibilité des modes d'existence et la mobilité demeurent des exigences-clés pour parvenir à une utilisation durable des terres de parcours des régions sahéliennes ; c'est ce qu'ont depuis longtemps intégré les pasteurs du Sahel. Au Niger les pasteurs ont su sans cesse moderniser leurs systèmes de mobilité en s'adaptant aux contraintes nouvelles rencontrées tout en intégrant de nombreuses innovations utiles à la transhumance : innovations techniques pour l'exhaure et l'habitat, introduction de nouveaux moyens de communication, stratégies socio-économiques, renforcement des alliances sociales et politiques, organisation collective comme les *dongol* (boycott de certains marchés à bétail en représailles à une trop forte pression fiscale des communes, et à leur désintérêt vis-à-vis des pasteurs, notamment lors de l'aide alimentaire de 2004, lobbying et organisation d'événements, etc.).

Malgré des contraintes de plus en plus fortes l'élevage mobile fait preuve d'une extraordinaire vitalité

La grande diversité de systèmes de mobilité utilisant de manière alternative et complémentaire les espaces agropastoraux, pastoraux et sahariens de la région de Zinder au Niger témoigne de cette vitalité et de l'inventivité des pasteurs. Plus de quinze grands systèmes de mobilité sont identifiés et caractérisent cette diversité : systèmes pendulaires Nord-Sud de moyenne et grande amplitude développés par les pasteurs touareg, wodaabe et toubou, systèmes pivotants de faible mobilité centrés sur un point fixe (le puits) pour certains groupes touareg éleveurs de petits ruminants et agro-pasteurs dagra, systèmes caravaniers développés par certains groupes de pasteurs touareg à vocation commerciale entre le massif de l'Aïr et Lagos la capitale côtière du Nigeria, systèmes transfrontaliers des pasteurs oudah, etc. Perpétuellement ajustés, adaptés et modernisés face aux événements et aux évolutions, trois grands facteurs entrent prioritairement en jeu dans la construction de ces systèmes de mobilité : l'ancrage foncier plus ou moins sécurisé suivant les communautés, les relations sociales dont les alliances avec les autres

communautés ou les autorités, et l'accès au marché en rapport avec le prix des céréales. De manière plus tactique, interviennent ensuite, quasiment au quotidien, les questions liées à l'accès à l'eau, en lien avec la qualité et la quantité de pâturage (Djerma *et al.,* 2009).

L'AVÈNEMENT DE POLITIQUES PUBLIQUES QUI INTÈGRENT FONCIER PASTORAL ET MOBILITÉ

Les enjeux liés à la sécurisation de la mobilité pastorale

La sécurisation de la mobilité pastorale dans ces régions sahéliennes s'attache à quatre grands enjeux :

1. **Gestion durable des ressources naturelles.** La gestion des ressources naturelles des zones sahéliennes passe par une adaptation de la charge animale à des ressources en pâturage qui varient. La mobilité des troupeaux constitue ainsi le facteur d'ajustement et de gestion durable des pâturages par les pasteurs face aux opportunités et aux variations saisonnières. L'élevage sédentaire, par la pression continue exercée, dégrade beaucoup plus l'environnement parce qu'il ne réussit pas à s'intensifier par l'introduction de productions fourragères dont le développement demeure extrêmement marginal au Sahel (Hiernaux et Bagoudou, 2006).
2. **Développement de l'économie pastorale.** Contrairement à la qualification trop répandue « d'élevage contemplatif » ou de « prestige » qui leur a longtemps été associée, l'intérêt économique des systèmes pastoraux est réel. Le suivi comparatif de troupeaux en zone sahélienne nigérienne a montré que la productivité des systèmes d'élevage sédentaire est inférieure de 20 pourcent à celle des troupeaux les plus mobiles. L'enjeu est donc de préserver et de renforcer la mobilité pastorale de manière à mieux valoriser durablement les ressources primaires de ces espaces sahéliens. La mobilité joue aussi un rôle-clé face aux aléas : au cours des sécheresses récurrentes, les troupeaux les plus mobiles ont généralement été les moins vulnérables (Colin de Verdière, 1995 ; Hesse et Mac Gregor, 2006 ; Bonnet *et al.,* 2010).

3. **Préservation de la paix sociale et prévention des conflits.** La croissance démographique conduit à une occupation de plus en plus grande des espaces vitaux pour les troupeaux transhumants : implantations de cultures le long des berges de points d'eau naturels et installation de vastes zones de champs. Les abords des villes sahéliennes et les zones agricoles deviennent de plus en plus délicats d'accès pour les éleveurs mobiles. Assez souvent des différends se terminent par des actes tragiques entre agriculteurs et éleveurs. Face à cette dégradation des liens sociaux entre communautés, l'enjeu est d'accompagner la mise en place d'un processus d'usage, voire de gestion concertée, de l'espace et des ressources.
4. **Adaptation des processus de décentralisation aux milieux pastoraux.** Plus particulièrement au Niger, mais aussi au Mali et en Mauritanie, la politique nationale de décentralisation, avec la mise en place des collectivités territoriales décentralisées doit s'adapter aux zones pastorales sahéliennes. Le découpage des territoires communaux, la délimitation du foncier communal, les modalités de représentation des groupes sociaux au sein des instances communales, la fiscalité, etc. constituent autant de défis auxquels ces politiques ont à faire face en milieu pastoral. L'enjeu est de réussir la mise en place de collectivités locales actives au niveau intercommunal, afin de mettre en œuvre une politique adaptée de gestion de l'espace et des ressources pastorales.

Une relative convergence des politiques publiques en faveur de la mobilité

Prenant conscience de la montée des entraves à la mobilité, au vu des situations très conflictuelles qu'elles génèrent, et interpellé par des acteurs de plus en plus nombreux de la société civile, l'État du Niger a pris un certain nombre de mesures courageuses et novatrices pour tenter de sécuriser la mobilité de l'élevage pastoral. Depuis les années 1990, un travail important a été accompli pour rénover la politique foncière en milieu rural. Il a abouti à la production d'un Code rural qui intègre des éléments spécifiques des régimes fonciers pastoraux existants dans le pays : hiérarchie des droits (droits prioritaires/ droits des tiers, réciprocité, terroirs d'attache des éleveurs mobiles) et inventaire des ressources pastorales communes dans les schémas d'aménagement foncier.

Le Niger a pris un certain nombre de mesures courageuses et novatrices pour tenter de sécuriser la mobilité de l'élevage pastoral

Dans le cadre de la réforme de l'État et des accords de Paris, la Stratégie de développement rural a fait une place remarquable à la mobilité en inscrivant « l'aménagement pastoral et la sécurisation des systèmes pastoraux » comme programme prioritaire. Elle a déterminé également la mise en place d'instances foncières particulièrement utiles à l'enregistrement des droits et aux arbitrages fonciers au niveau communal, départemental et régional. Un long travail de concertation nationale avec les différents acteurs du foncier pastoral a été entrepris par le Code rural nigérien pour élaborer un texte plus spécifique au pastoralisme : la loi pastorale adoptée en février 2010. Depuis 2009, le ministère de l'Hydraulique s'est également engagé dans une large consultation nationale pour élaborer une politique nationale rénovée d'hydraulique pastorale.

Les démarches d'appui à la mobilité pastorale : l'expérience du PSSP dans la région de Zinder

L'Agence Française de Développement (AFD) a soutenu une initiative très importante de sécurisation des systèmes pastoraux dans le centre-est nigérien à travers le financement du Projet de Sécurisation des Systèmes Pastoraux dans la région de Zinder (PSSP). Notons que l'AFD développe, depuis une dizaine d'années, au Tchad et au Niger, des actions d'appui à la sécurisation des systèmes pastoraux qui se fondent sur la reconnaissance de la transhumance comme pilier central des systèmes pastoraux, autant d'un point de vue écologique qu'économique et social.

Ces actions ont permis d'expérimenter des démarches innovantes. Elles reposent sur une compréhension fine des stratégies de mobilité des différentes communautés et une implication des leaders de la mobilité dans les débats au sein des institutions publiques, communales, départementales et régionales pour l'aménagement et la gestion des ressources et des infrastructures pastorales (Photo 1).

Ces actions ont été structurées autour d'objectifs, de mode et de stratégies d'intervention ainsi que d'une démarche opérationnelle qu'il convient de présenter.

Les actions d'appui à la sécurisation des systèmes pastoraux reposent sur une compréhension fine des stratégies de mobilité des différentes communautés et une implication des leaders de la mobilité

Objectifs et mode d'intervention

L'objectif de ce projet est que les acteurs de la gestion des ressources naturelles et du foncier de la région considérée intègrent des mesures de régulation équitable et durable de l'accès aux ressources pastorales. Par ce biais, ils veulent apporter une contribution à la cohésion sociale et à la gestion durable des ressources naturelles par la sécurisation de la mobilité pastorale.

Cette intervention s'est appuyée sur une équipe légère de mise en œuvre articulant une composante axée sur la concertation et l'appui à la gestion des ressources pastorales et une composante chargée de la réalisation des infrastructures pastorales (puits pastoraux publics, mares temporaires, balisage des axes de transhumance et aires de pâturage et cela concerne une centaine d'ouvrages (69 puits neufs, 33 réhabilitations et plus de 2 000 km de balisage des aires de pâturage et de couloirs de transhumance réalisés entre août 2005 et fin 2010)).

La stratégie d'intervention

La stratégie d'intervention reprend et adapte les grands principes de sécurisation de la mobilité pastorale au Sahel (Marty *et al.*, 2006) (Encadré 1).

Encadré 1
Les principes de sécurisation de la mobilité pastorale

Intégration des leaders des transhumants et des autorités locales au choix des priorités et au suivi des réalisations. Un travail de repérage et d'implication des véritables leaders de la transhumance dans les différentes communautés a ainsi visé à mieux comprendre les logiques de mobilité et à accompagner un véritable rapprochement entre ces leaders et les différents acteurs institutionnels au niveau communal, départemental et régional (communes, commissions foncières). Un patient travail de contact des éleveurs sur les marchés à bétail permet d'identifier les leaders reconnus des principaux groupes de pasteurs. Des relations de confiance, qui se tissent sur un processus qui se déroule sur deux à trois ans, permettent une compréhension fine des différentes logiques de mobilité ainsi que des contraintes spécifiques.

Construction d'une stratégie d'aménagement pastoral à l'échelle de l'élevage mobile. Les leaders des transhumants et les membres des conseils municipaux commencent par échanger leur vision des enjeux de sécurisation de la mobilité

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pastorale sur le territoire communal. Les priorités communales qui font consensus entre ces deux groupes sont portées au niveau départemental et mises en cohérence pour construire une vision intercommunale des priorités d'aménagement et de sécurisation de la transhumance. En même temps sont débattus, validés et affirmés les grands principes qui régissent le foncier pastoral de ces différents aménagements, en mettant l'accent sur l'accès et la gestion équitable des espaces, des ressources et des infrastructures publiques d'intérêt pastoral.

Accompagnement patient, site par site, des concertations, des négociations qui permettent d'aboutir à des accords sociaux sur l'implantation de nouveaux puits pastoraux, la délimitation des espaces pastoraux stratégiques menacés, mais aussi sur la gestion équitable des aménagements et des espaces pastoraux desservis.

Précaution environnementale, en procédant à une analyse des dynamiques des pâturages, en repérant les zones éventuellement trop fragiles et en dimensionnant les ouvrages de manière à limiter de trop fortes concentrations des troupeaux (pas de forage équipé, priorité aux puits en béton armé, exhaure seulement à la traction animale et à la force humaine, etc.).

Diversification des appuis à la mobilité pastorale: l'intervention prend diverses formes de réalisation autant physiques qu'organisationnelles: réhabilitation des infrastructures existantes (puits pastoraux et couloirs de transhumance), négociations pour l'implantation de nouveaux ouvrages d'hydraulique pastorale, délimitation des aires de pâturage menacées par les champs, délimitation des accès aux mares, enregistrement des droits collectifs et du fonds pastoral par les commissions foncières et contribution à l'élaboration du dossier communal et du schéma d'aménagement foncier régional, etc.

Renforcement des capacités locales de gestion des espaces et des infrastructures pastorales: en lien avec les textes, Code de l'eau et Loi de décentralisation, un travail important est fait pour mettre en œuvre les principes de sécurisation des usages pastoraux, impliquant différentes catégories d'usagers permanents et temporaires, élus communaux et institutions foncières. Une stratégie de gestion équitable des points d'eau pastoraux a été élaborée et validée progressivement au niveau communal, départemental et régional.

La démarche opérationnelle

La démarche opérationnelle mise en œuvre au Niger repose sur un processus de concertation qui sort du cadre restreint habituel des approches trop sédentaires et localisées de l'aménagement. Elle s'inscrit pleinement aux échelles adaptées pour la conception d'une stratégie de sécurisation de la mobilité. Elles s'appuient largement sur les pratiques sociales de négociation entre communautés pour une exploitation de ressources partagées fluctuantes dans l'espace et dans le temps. Les enjeux des accords sociaux sont renforcés par les investissements que de tels projets sont susceptibles de financer : une centaine de puits pastoraux construits ou réhabilités et plus de 2 000 km d'itinéraires de transhumance et d'aires de pâturage balisées. Notons qu'il ne s'agit pas de baliser « en continu » les axes de transhumance, mais de favoriser des accords sociaux de délimitation sur les tronçons jugés conflictuels ou à risque. Au terme du processus de négociation les accords sociaux formalisent les engagements des différents groupes sociaux détenteurs de droits différenciés (maîtrises foncières et droits d'usage des transhumants) (carte 1).

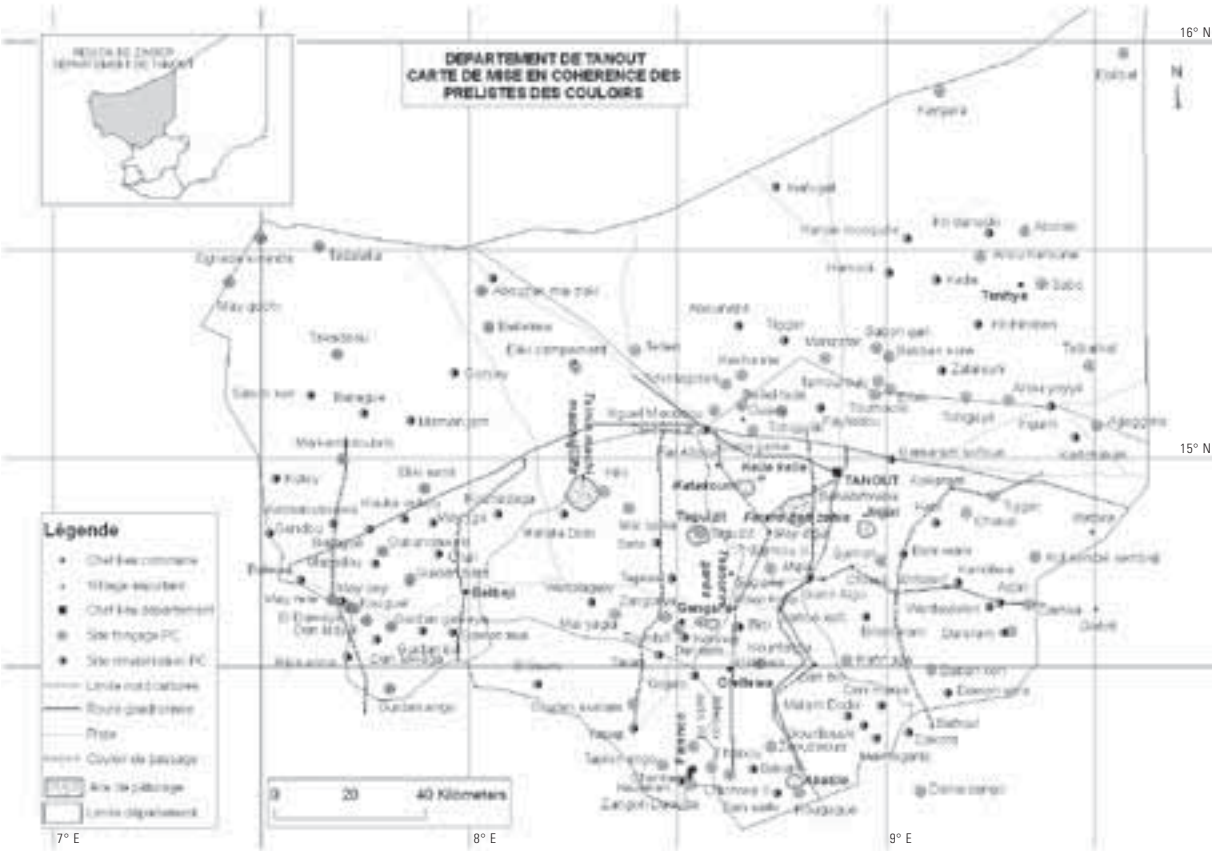
Favoriser des accords sociaux de délimitation sur les tronçons jugés conflictuels ou à risque

La démarche suivie au Niger est résumée ci-dessous telle qu'elle a été accompagnée depuis août 2005, dans un contexte institutionnel local marqué par la décentralisation et le dispositif du Code Rural (Encadré 2).

L'innovation que constituent de telles démarches conduites depuis plus d'une dizaine d'années au Tchad et plus récemment au Niger réside dans le fait d'avoir su mobiliser l'ensemble des acteurs institutionnels (leaders des transhumants, autorités foncières locales, préfets, services techniques déconcentrés de l'Élevage et de l'Hydraulique, communes et commissions foncières au Niger) dans l'élaboration et la mise en œuvre d'une stratégie régionale de sécurisation de la transhumance et de gestion équitable des puits pastoraux publics. La démarche prend aussi en compte la diversité et la réciprocité des droits (droits prioritaires, droits des tiers, équité dans l'accès à l'eau). Au plan de la gestion des ouvrages pastoraux, ces expériences développées en lien avec les ministères de l'Hydraulique prennent le contre-pied des approches conventionnelles et sédentaires de la gestion des puits pastoraux (inspirés de l'hydraulique villageoise). Elles tentent de combiner modes de gestion sociale traditionnelle des puits pastoraux, responsabilisation des différents groupes signataires des accords sociaux, maîtrise d'ouvrage à l'échelle communale et accès équitable à l'eau.

Carte 1

Mise en cohérence pré liste des investissements :
puits et balisages des espaces pastoraux dans le département de Tanout



Encadré 2
La démarche opérationnelle au Niger

1 **Identification concertée des priorités d'aménagement** (puits pastoraux, sécurisation des espaces pastoraux : aires de pâturage, accès aux mares, couloirs de transhumance).
   a. **Diagnostic communal des problématiques pastorales** avec les élus, la commission foncière, les chefs coutumiers sédentaires et mobiles, les associations d'éleveurs.
   b. **Identification des leaders des transhumants et systèmes de mobilité** (entretiens sur les marchés à bétail et campements avec les éleveurs transhumants).
   c. **Journées communales de négociation entre conseil communal et représentants des transhumants sur les priorités de sécurisation de la mobilité.**
   d. **Atelier départemental de mise en cohérence des priorités communales** : mise en cohérence des priorités des communes, discussion et engagement sur les principes de gestion pastorale équitables.

2 **Facilitation des accords sociaux entre usagers détenteurs de droits différenciés sur l'implantation et la gestion des puits pastoraux et études de faisabilité technique et environnementale des puits pastoraux** à implanter ou réhabiliter.

3 **Facilitation, par les commissions foncières, des accords sociaux de principe et de délimitation des espaces pastoraux :** négociations sur les délimitations des aires de pâturage, des servitudes d'accès aux mares et des couloirs de passage des animaux.

4 **Appels d'offres, adjudication des marchés et exécution des travaux par les entreprises :** puits neufs, réhabilitations de puits et balisages.

5 **Facilitation de la mise en place de mode de gestion équitable des ouvrages** par les usagers et les collectivités (chartes de gestion entre usagers et conventions de gérance avec les communes).

PREMIERS ENSEIGNEMENTS TIRÉS DE CES EXPÉRIENCES DE SÉCURISATION DE LA MOBILITÉ AU SAHEL, À PARTIR DU CAS DU PSSP DE ZINDER

Les principaux repères de cette expérience sont fournis ici et mettent en évidence des enseignements utiles pour le soutien à l'adaptation des éleveurs aux situations d'insécurité foncière et climatique.

Pertinence de telles interventions au regard des bénéficiaires des investissements publics (usagers et collectivités) et des institutions nationales

Au terme de cinq années de mise en œuvre cette expérience présente des acquis importants. En effet, le contexte de cette région était qualifié d'extrêmement délicat au regard des conflits potentiels nombreux et de la forte concurrence spatiale entre agriculture et élevage. Au final, les accords ont été négociés et établis sur un nombre important de sites de puits et de balisages alors que des réserves étaient annoncées dans l'étude de faisabilité.

Résultats atteints et acquis à souligner

La mise en œuvre du PSSP dont les interventions ont été centrées sur la sécurisation de la mobilité, qui combine concertations, appui à la gestion locale et investissements significatifs dans des infrastructures pastorales robustes et appréciées par les éleveurs, met en évidence des acquis importants qu'il convient de relever. Ces acquis soulignés par les acteurs concernés, par les institutions locales et nationales, ont trait aux aspects suivants :

- **Compréhension des logiques de mobilité, identification et implication des leaders de la transhumance** dans les négociations au niveau communal et départemental. Si la plupart des institutions accordent une place formelle à un représentant officiel des éleveurs (dans la commune comme dans les commissions foncières), dans la pratique, les véritables représentants des transhumants ne se voient pas impliqués dans les processus de décision. La démarche a pu identifier avec finesse les logiques des différents systèmes de mobilité des pasteurs. En impliquant ces leaders de la mobilité, la

connaissance des systèmes et des logiques de mobilité a pu progresser en même temps qu'a pu être instauré un vrai rapprochement entre leaders de la transhumance et élus, autorités administratives dont le regard porté sur la transhumance évolue progressivement.

- **Émergence d'une vision communale et intercommunale de la mobilité et des enjeux de sécurisation**. Au fil des échanges au niveau communal puis départemental, en présence des élus et des leaders des éleveurs transhumants, les revendications communautaires font place peu à peu à une véritable vision communale de la problématique et des aménagements à promouvoir. Ce travail a également souvent constitué une toute première occasion pour ces communes de se projeter dans leur espace.
- **Accords socio-fonciers renforcés pour la gestion des puits pastoraux** dans un contexte de tensions fortes autour de la mobilité, grâce à l'implication de plusieurs acteurs recherchés sur les sites : gestionnaires du foncier, usagers permanents, agriculteurs riverains, leaders transhumants, etc. Au terme de plusieurs séries de réunions sur les sites, des accords sociaux sont tissés, tels celui de Rahin Mallam, dans la commune de Falenco qui engage des agropasteurs touareg kel ewey résidents ; des agropasteurs haoussa damagarawa ; des caravaniers touareg kel ewey et kel nougroub ; et des transhumants peul oudah et katsinawa dans la gestion de ce nouveau puits pastoral.
- **Sécurisation des espaces pastoraux par les structures départementales du Code rural dans les communes**. La démarche a facilité l'identification et la reconnaissance conjointe des usagers des espaces considérés, comme le tracé d'un couloir ou le périmètre d'une aire de pâturage. Un engagement de principe est pris sur la sécurisation de ces espaces par les acteurs locaux qui ont un statut socio-foncier reconnu (chefs de villages, chefs de tribus, leaders de la transhumance). Délimitation et piquetage se traduisent ensuite par la signature d'un accord social, qui implique chaque acteur : foncier, chefferie, usagers résidents ou transhumants, agriculteurs et éleveurs, acteurs institutionnels de la commune et des commissions foncières départementales et commissions foncières communales.

Principaux effets perçus par les éleveurs et les institutions locales

Plusieurs effets concrets sont soulignés par les éleveurs. Les effets qui contribuent à l'amélioration des conditions de déplacement des pasteurs, de leurs familles et de leurs troupeaux.

- Les analyses recueillies auprès des pasteurs suite à des actions de ce type plus anciennes au Tchad soulignent de manière très concrète comment la réhabilitation des points d'eau pastoraux, l'extension des puits et des mares temporaires dans certaines régions, le balisage des couloirs de passage dans les zones conflictuelles améliorent sensiblement les conditions de la mobilité (Bénard *et al.*, 2010 ; Bonnet *et al.*, 2004).
- L'augmentation raisonnée de la fréquence des points d'eau et des espaces sécurisés le long des axes de transhumance rend directement moins pénibles les étapes autant pour les familles que pour les animaux (en respectant une distance de 15 à 25 km entre points d'eau et en préservant certaines zones de pâturage).
- Les abandons et les pertes de bétail sont réduits pour des étapes qui étaient jusque-là extrêmement éprouvantes (Khamis et *al.*, 2008).
- Parmi les améliorations vécues par les pasteurs figure aussi l'accès aux marchés facilité, du fait que les troupeaux peuvent stationner dans de bonnes conditions à proximité d'un point d'eau dont la gestion est sécurisée. Au Niger, plusieurs puits mis en service sont considérés saïchï, c'est-à-dire utiles, attractifs et incontournables pour les pasteurs transhumants car ils remplissent trois critères essentiels à la mobilité : 1) qualité de l'ouvrage et de son débit pour couvrir les besoins d'abreuvement, 2) responsabilité de la gestion du puits confiée à un wakilley reconnu qui régule équitablement l'accès à l'eau et aux pâturages avoisinants, 3) paix sociale et cohésion autour du puits qui peut ainsi être utilisé en toute quiétude.

Des effets dans l'apaisement des conditions sociales de la transhumance

Tous ces travaux menés ont contribué à créer un climat social, non pas seulement plus tolérant, mais aussi plus ouvert, plus compréhensif par rapport à la nécessité de sécuriser la mobilité pastorale. Ce besoin de sécurisation est bien sûr favorable aux transhumants, mais le sera de plus en plus aussi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pour toutes les catégories d'éleveurs, notamment pour les agriculteurs qui investissent de plus en plus dans l'élevage, lequel apparaît comme la principale source de revenu pour l'ensemble du monde rural.

Une preuve de plus grande ouverture réside dans le changement d'attitude opéré dans certains villages, au départ hostiles à l'inclusion des pasteurs et qui ont évolué jusqu'à signer des accords sociaux. Des transhumants reconnaissent eux-mêmes que la mobilité est déjà facilitée. Cet infléchissement est évidemment porteur de beaucoup d'apaisement entre agriculteurs et éleveurs, et entre résidents et transhumants. Les travaux conduits sur les thèmes des droits, de même que les négociations qui aboutissent à des accords sociaux stimulent grandement la recherche de solutions pacifiques aux conflits. Le projet a été sollicité dans ce sens par les autorités locales confrontées à des tensions qui auraient pu dégénérer très gravement (aire de Babougé). Les demandes proviennent également des milieux sédentaires. Il est aussi probable qu'avec tous les travaux déjà effectués (rencontres, entretiens, ateliers) on assiste à une diminution de la surtaxation des transhumants pour l'accès à l'eau. Cette facilitation a porté ses fruits ; les maires, les chefs de cantons, les éleveurs transhumants et les associations jugent que les mouvements de transhumance de fin de saison des pluies 2008, par exemple, ont été gérés avec plus de conciliation que par le passé.

Des effets perceptibles dans l'acquisition de capacités des institutions nationales et locales dans la prise en compte de la mobilité et la sécurisation du foncier pastoral

Au niveau local, les communes, les instances foncières et d'une manière générale les acteurs institutionnels, qui sont impliqués dans la définition et la mise en œuvre des stratégies de sécurisation de la mobilité pastorale à l'échelle régionale et communale, évoluent dans leur manière d'appréhender et d'intégrer le pastoralisme. Les jeunes institutions communales qui, en zones pastorales en particulier, disposent de peu de moyens ont pu se doter d'une véritable stratégie d'aménagement et de gestion de leurs espaces et de leurs ressources pastorales. On observe aussi assez nettement les impacts de ces expériences dans le domaine des politiques nationales (élaboration d'une stratégie nationale d'hydraulique pastorale au Niger et élaboration d'un sous-programme sécurisation des systèmes pastoraux au niveau national). Les limites et interrogations soulevées par la décentralisation et du point de vue de la viabilité de certaines institutions sont discutées. La viabilité de la gestion des ouvrages ne peut objectivement reposer que très partiellement sur les organisations d'usagers. Elle pose une question stratégique de décentralisation. Les pouvoirs publics et les collectivités locales devraient mobiliser une partie des recettes sur la commercialisation du bétail au profit d'instruments de refinancement des infrastructures pastorales. Les politiques de décentralisation en zones pastorales demandent encore un accompagnement dans ce domaine.

En revanche, le bilan des expériences spécifiques conduites pour mesurer les impacts environnementaux jusqu'en 2002 n'a pas permis de dégager de méthodologie probante, cohérente et qui pourrait être financée dans la durée. Le dispositif de suivi externe confié au Niger à deux institutions nationales, au Lasdel pour les effets socio-fonciers et institutionnels et au Roselt pour les impacts environnementaux, apporte des éléments intéressants du point de vue qualitatif et des éclairages sur des situations localisées. Mais ils n'ont pas apporté d'éléments de suivi directement utilisables et utilisés pour le pilotage de l'action. Parallèlement, des travaux plus anciens au Sahel ont montré que les principaux facteurs de risque de dégradation des parcours provenaient de la sédentarisation des troupeaux et des ouvrages à grands débits tels que

les stations de pompage. Les projets se sont alors tournés vers la définition de mesures de précaution environnementales visant à identifier les sites et les types d'ouvrages à exclure dans les aménagements à réaliser (Hiernaux et Bagoudou, 2006 ; Béchir *et al,* 2004).

Insuffisances et améliorations à apporter dans l'extension de telles approches

De telles démarches ne sont pour autant pas exemptes de points de fragilité et un certain nombre d'éléments doivent encore faire l'objet de renforcement et d'appuis spécifiques.

Le temps de maturation des accords sociaux est parfois jugé long par des acteurs qui espèrent des investissements aussi rapides que dans les programmes d'hydraulique villageoise. La durée du processus liée à la recherche action (connaissances, méthodologie, démarche et outils) aura permis de faire émerger un grand nombre de sites dans lesquels les usagers se sont accordés pour qu'un investissement d'intérêt pastoral public puisse être mis en œuvre sans provoquer de conflits fonciers, tout en conservant une utilisation ouverte à tous les éleveurs.

Le rôle de médiation pour une sécurisation de la mobilité a été porté directement par l'acteur projet, mais aussi par les institutions foncières. Instruments de la mise en œuvre de la politique pastorale nationale et contribuant à sa définition, le projet a mobilisé l'ensemble des acteurs institutionnels et associatifs autour de la gestion des ressources pastorales. Mais dans quelle mesure ces acteurs et institutions seront demain eux-mêmes porteurs de démarches équitables de sécurisation de la mobilité ? Les associations pastorales peuvent-elles jouer ce rôle pour que les éleveurs transhumants puissent mieux faire valoir leurs droits chaque fois que des accords sociaux ne sont pas respectés ? Ceci devrait aussi induire un dispositif d'assistance juridique au service des éleveurs transhumants et des agriculteurs.

La pérennité du travail de sécurisation du foncier pastoral et des infrastructures pastorales est facilitée par la présence des institutions pérennes du Code rural, comme les commissions foncières départementales. Néanmoins, le renforcement de ces jeunes structures dans leur travail d'enregistrement des délimitations et des aménagements hydrauliques demande un appui plus important dans la durée. Il importe que les commissions foncières puissent

effectivement procéder à l'enregistrement des droits fonciers pastoraux collectifs dans le cadre du schéma d'aménagement foncier qui est engagé au niveau départemental, mais dont les procédures de capitalisation au niveau régional sont encore en cours de définition.

L'entretien des puits pastoraux n'est pas totalement résolu. Si l'entretien courant des ouvrages est généralement pris en charge par les structures de gestion locales intégrant usagers résidents et transhumants, les dépenses importantes de réparation plus exceptionnelles ne peuvent de manière réaliste être assurées par les populations locales. C'est ici tout le champ du développement de mécanismes de financement public assurant l'entretien et le renouvellement des infrastructures pastorales qui est en question. Ce champ appelle à innover par la mise en place de dispositifs de fiscalité locale attendus dans le sillage des politiques de décentralisation. Les États sont peu enclins à décentraliser les ressources financières au bénéfice des collectivités locales responsabilisées pour la maîtrise d'ouvrage des puits pastoraux publics. L'enjeu est d'accompagner l'acquisition par les collectivités de capacités à mieux intégrer les atouts économiques de la mobilité et à développer de véritables stratégies d'aménagement et de gestion attractives pour les éleveurs transhumants.

CONCLUSION

Les approches développées et les premiers enseignements que l'on en tire maintenant sur un pas de temps de plus de dix ans au Sahel montrent en définitive que des actions contribuant significativement à la réduction des risques pour les pasteurs des zones sahéliennes réputées difficiles sont possibles. Les démarches développées s'inscrivent pleinement dans les orientations suggérées par Toutain (2001) : la gestion des risques en économie pastorale doit être abordée de façon solidaire et se coordonner, sur la base du dialogue et de la concertation, depuis l'unité de production jusqu'à la société toute entière dans laquelle s'inscrit l'activité pastorale.

En définitive, les facteurs de réussite de ces projets montrent la nécessité de combiner étroitement trois approches :

1. C'est d'abord l'accompagnement de la gestion du foncier pastoral (en application des textes comme les codes ruraux ou pastoraux quand ils ont été adaptés et actualisés comme au Niger et au Mali) en renforçant les capacités des institutions foncières locales à s'engager dans la mise en œuvre d'actions de sécurisation foncière des espaces pastoraux et des aires de pâturage, pour favoriser l'accès aux mares et aux puits pastoraux, l'aménagement et la sécurisation des axes de transhumance.
2. L'approche qui consiste à renforcer et développer les capacités des acteurs publics à intégrer la mobilité dans leur vision de l'aménagement du territoire aux différentes échelles : communales, départementales et régionales (voire transnationales). Cette orientation est fondamentale là où les collectivités locales issues des politiques récentes de décentralisation sont fortement démunies en matière de stratégie d'aménagement de leur territoire et de gestion des infrastructures pastorales dont elles ont souvent en charge la gestion (gestion des puits pastoraux publics, gestion des marchés à bétail). C'est aussi une ouverture essentielle pour l'aménagement du territoire à l'échelle supra communale, départementale et régionale qui est vitale pour la sécurisation de la transhumance entre zones pastorales septentrionales et zones agricoles méridionales.
3. Enfin, l'approche spécifique de l'hydraulique pastorale qui vient alimenter et concrétiser les concertations sur le foncier pastoral et l'aménagement du territoire avec un important travail d'élaboration des accords sociaux d'implantation et de gestion des points d'eau, l'adaptation des infrastructures d'hydraulique aux conditions hydrogéologiques (puits pastoraux, forages et contre-puits, mares temporaires, abreuvoirs, etc.). Toujours dans le domaine de l'hydraulique pastorale, l'enjeu est enfin de faciliter la mise en place de systèmes de gestion adaptés, garantissant la vocation pastorale de ces ouvrages et l'accès équitable à l'eau pour les pasteurs transhumants. Pour cela, au vu des enseignements tirés des échecs très nombreux de mise en place de comités de gestion, de points d'eau modernes et des dérives d'appropriation exclusive et inéquitable des points d'eau modernes, il importe de développer des démarches qui articulent mieux les savoir-faire propres aux organisations locales en matière de gestion quotidienne des puits pastoraux, intégrant

Développer des démarches qui articulent mieux les savoir-faire propres aux organisations locales en matière de gestion quotidienne des puits pastoraux

généralement l'essentielle diversité des droits en milieu pastoral : droits prioritaires des maîtrises foncières locales, droits négociés des tiers, droits prioritaires en cas d'assoiffement critique, etc.

Autant au Niger qu'au Tchad, les programmes de sécurisation des systèmes pastoraux ont combiné des actions permettant de renforcer les capacités de gestion sociale de la mobilité en s'appuyant essentiellement sur les organisations et le savoir-faire essentiel et sans cesse modernisé des sociétés pastorales. Ils ont fourni un appui conséquent en matière d'infrastructures publiques complémentaires et essentielles à la mobilité au travers de puits pastoraux réhabilités, remplacés ou créés et de mares temporaires. La viabilité de ces aménagements dépend fortement des contextes institutionnels existants dans les États. Les politiques de décentralisation politique et administrative par la mise en place des communes et la déconcentration des dispositifs de gestion du foncier offrent des ouvertures importantes dans ce domaine. D'une manière générale, les engagements de plusieurs États, comme le Mali et le Niger, dans l'élaboration d'une stratégie nationale d'hydraulique pastorale montrent que l'on doit passer d'interventions encore ponctuelles de projets, à une mise en œuvre de programmes plus soutenus, et par conséquent prometteuse, de ces actions à l'échelle des régions pastorales et agropastorales de plusieurs pays du Sahel.

Au final l'expérience du PSSP Zinder tend à démontrer que la gouvernance sociale garantissant l'exercice de leur citoyenneté par les pasteurs mobiles reste un enjeu de fond pour une gestion équitable de l'accès aux ressources pastorales qui conditionne les capacités d'adaptation des sociétés pastorales au changement climatique, même dans un cadre de politiques nationales reconnaissant l'importance des systèmes pastoraux.

La gouvernance sociale garantissant l'exercice de leur citoyenneté par les pasteurs mobiles reste un enjeu de fond pour une gestion équitable de l'accès aux ressources pastorales qui conditionne les capacités d'adaptation des sociétés pastorales au changement climatique

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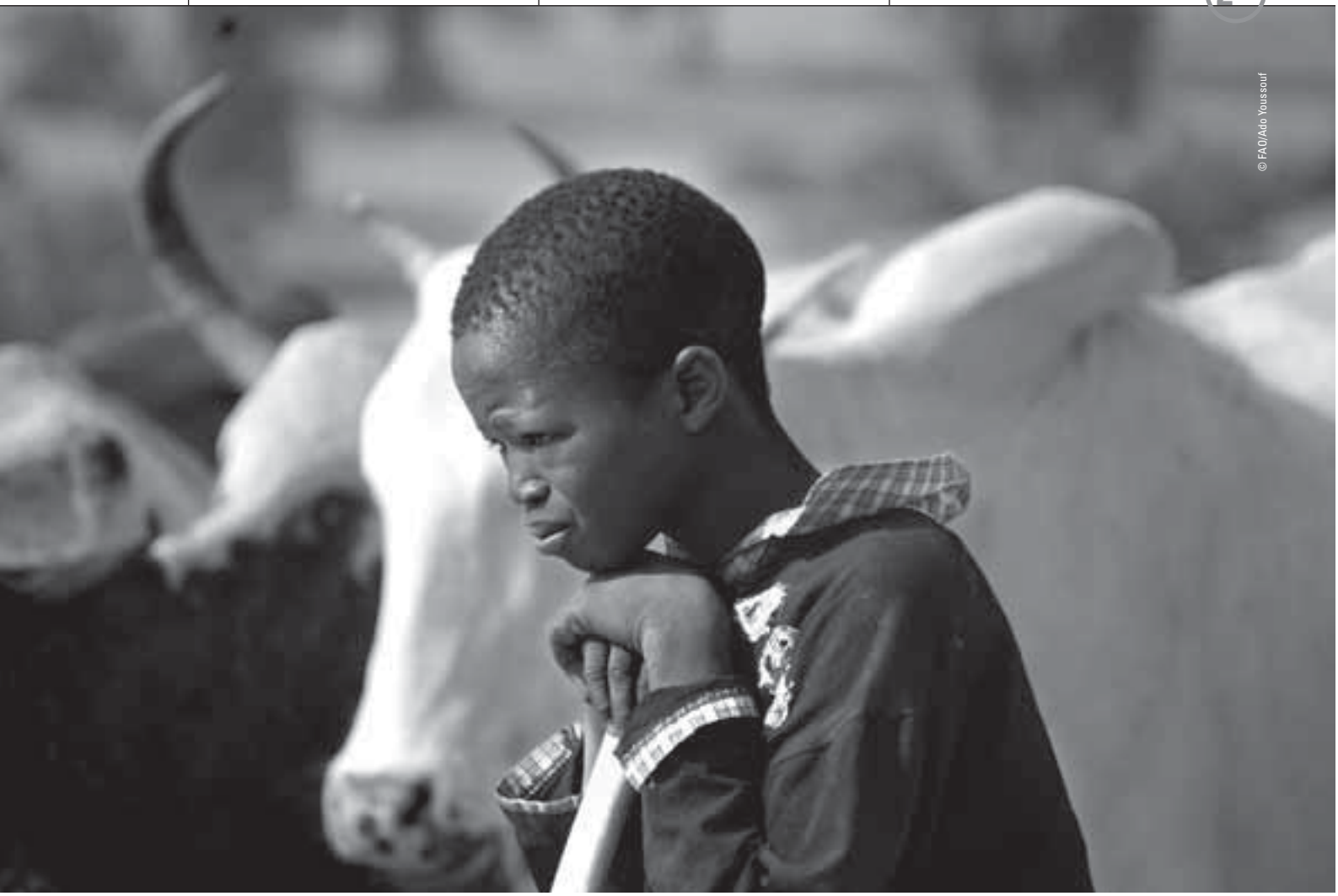

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