Technical Committee
LandTenure&Development

# SUMMARY PAPERS

Number 27 ● November 2018

*These papers summarise the presentations and debates at the study days organised by the French Cooperation 'Land Tenure and Development' Technical Committee.*

# Land systems and mechanisms for soil carbon sequestration

*This paper develops the themes discussed at a high-level meeting organised by the '4 for 1000' Initiative and French Cooperation 'Land Tenure and Development' Technical Committee.[1] It was held for experts from different disciplines and continents to explore the nexus between land issues and mechanisms that encourage soil carbon sequestration, and to make recommendations to ensure that greater account is taken of land issues when these long-term mechanisms are put in place. The event was held on 13-14 December 2017 with support from AFD and the World Bank.*

*The meeting, structured around three round tables, opened with introductory speeches by Jean-Luc François (Director of Ecological Transition and Natural Resources at AFD) and Paul Luu (Executive Secretary of the 4 for 1000 Initiative). It ended with a closing speech by Stéphane Le Foll (former French Minister for Agriculture and vice-president of the 4 for 1000 Initiative). The first round table, moderated by Alain Karsenty (Cirad), considered the different instruments that help or hinder long-term changes in practices to increase soil carbon sequestration (techniques, tools, scale) and the types of land rights on which these instruments are based. These discussions were informed by presentations by Jean-François Soussana (Inra), Jean-Luc Chotte (IRD), Céline Dutilly (Cirad), Marc Daubrey (Impactum) and Elizabeth Mwiyeria (Vi Agroforestry).*

*A second round table, moderated by Camilla Toulmin (IIED), identified the constraints and difficulties encountered when introducing these carbon sequestration mechanisms into the diverse land tenure regimes found in different countries. Discussions opened with contributions by Jean-Pierre Chauveau (IRD), Ina Porras (IIED), Pauline Nantongo (Ecotrust), Iba Mar Faye (GRET) and Claude R. Heimo (CSEND).*

*The third and final round table, moderated by Michel Merlet (Agter), discussed the coherence of public policies on territorial development, agriculture, demography, land, taxation, etc., and their ability to sustain mechanisms and practices that encourage better soil carbon sequestration. This followed contributions by Mamadou Cissokho (Roppa), Sébastien Treyer (IDDRI), Geneviève Michon (IRD), Olivier Ducourtieux (Agro-Paristech) and Marie Mellac (CNRS).*

## > EXPLORING THE NEXUS BETWEEN LAND TENURE AND CARBON SEQUESTRATION

### An initiative to put agriculture back at the heart of efforts to combat climate change and improve food security

The 4 for 1000 Initiative, launched at COP 21 in 2015, includes an action plan and an international research programme which aims to show that, through the adapted management of organic soil carbons, agriculture can play a crucial role in both improving food security and combatting climate change. The Initiative aims to identify and define farming practices that encourage soil carbon sequestration, and provide a favourable environment for their long-term deployment via research. It also promotes them, mainly by helping coordinate

1. With the support of a steering committee composed of Paul Luu (Executive Secretariat of 4 for 1000), Sébastien Treyer (Iddri), Mathieu Boche (AFD), Murielle Trouillet (MAA) and Claire Weill (Inra).

*>>> The 'Land Tenure and Development' Technical Committee is an informal think tank composed of experts, researchers and senior members of the French Cooperation. It was set up in 1996 to provide strategic support to the French Cooperation and guide land tenure initiatives.*

actions by the different partners working within the framework of an action plan. The aspirational objective of the 4 for 1000 Initiative is to increase soil carbon stocks by 0.4% per year, which would theoretically compensate for annual greenhouse gas emissions (GGE) released into the atmosphere as a result of human activities.

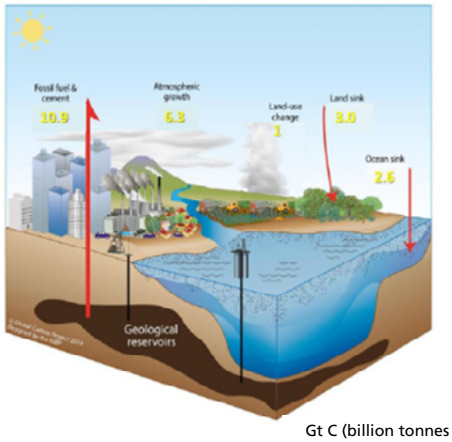
The Initiative is led by an executive secretariat based in the CGIAR's head office in Montpellier. It mobilizes a wide range of experts in environmental sciences, agronomy, forestry, soil science, etc. While there is no dedicated funding for projects nor a labelling mechanism at present, the Initiative provides a space for actors involved in efforts to tackle climate change and improve food security to discuss and share knowledge. It marks a shift in paradigm from other international initiatives (such as the 3A Initiative, the 'Land Degradation Neutrality' Fund, European Union R&D Finance, etc.) by building an approach that takes account of ecosystems and the 'commons' aspect of land, including agricultural lands.

Because land tenure is central to the relationships that humans develop around land and its resources, property rights are a strategic issue for reflections led by the 4 for 1000 Initiative, and more broadly for the international community to consider about how to reduce greenhouse gas emissions and combat climate change.

## What the 4 for 1000 approach aims to deliver

### Global carbon cycle in 2030-2050

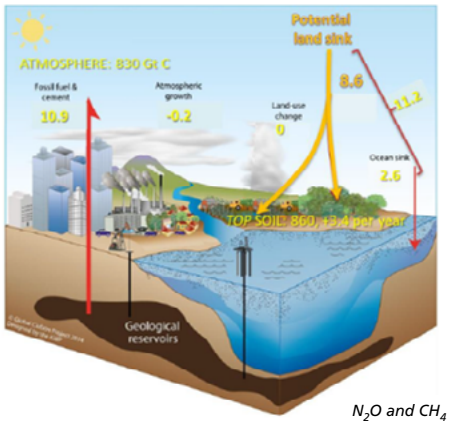
(based on States' commitments outside the land sector for the Paris Agreement)




Gt C (billion tonnes of carbon)

### Global carbon cycle in 2030-2050

With full implementation of the 4 for 1000 Initiative




MEASURES:

- Agriculture (crops, pastures)
- Salinised and desertified soils
- Halt deforestation and degradation of tropical forests
- Reforestation and agro-forestry
- Total soil carbon sequestration of 3.5 Gt C/yr
- 0.4% of carbon stored at a depth of 0-40cm (860 $GtC_2$)

*$N_2O$ and $CH_4$ emissions not offset in this scenario*

*Source: © Jean-François Soussana*

## A community of thought to support land policies that secure family farmers' access to resources

The 'Land Tenure and Development' Technical Committee (CTFD in French) is a working group composed of experts, researchers, professionals in the sector and actors from the French Cooperation. Over the last 20 years it has supported the French Cooperation with its strategy and position, and guided land tenure initiatives in partnership with numerous French and international actors.

In the context of its own work[2] and French support for the Voluntary Guidelines on Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (VGGT),[3] the CTFD promotes more inclusive land policies that secure access to land and resources for the most vulnerable actors, especially family farmers. Because standard procedures for formalising rights can lead to exclusion, in situations where land appropriation operates on the basis of family land holdings or common resources, the CTFD recommends alternative procedures that:

- recognise existing rights, regardless of their nature (use/management, individual/collective) or origin;
- organise broader debates and build consensus between all the actors concerned (governments, land administrations, local authorities, civil society, professionals in the sector, customary authorities) on the opportunities and means of formalising these rights;
- define a realistic implementation strategy, recognising that the key issue is building long-term governance and effective and transparent local administration of local land rights;
- specifying from the outset the viability and means of financing basic land services.

2. French Cooperation White Paper on land policies, Analysis of large-scale land appropriations, Guide to due diligence of agri-business projects that affect land and property rights, Land formalisation policies, The Commons approach.

3. See French position paper on the application of the VGGT.

A key factor that the CTFD identified as determining the success of such initiatives is consistency with other sectoral policies. One of the main problems with current alternative land policies is that they are not in line with the policies to support agricultural, urban, territorial and other forms of development promoted at different levels (national, regional, continental, international), and sometimes weaken the protection of local rights. Developing environmental policies that will help address the challenges involved in combatting climate change raises fundamental questions about land policies. One crucial issue for the CTFD is that climate policies should not undermine ongoing reform processes to secure family farmers' rights.

## Study days to clarify the connections between land issues and mechanisms that encourage changes in farming practices

Heads of State attending COP23 in Bonn and the 2017 One Planet Summit expressed alarm about the speed at which measures are being taken to achieve the objectives set at COP 21. In its annual report, UNEP spoke of the catastrophic gap between the commitments countries have made and the reductions they will need to achieve to keep global warming below 2°C. The challenges to be addressed are as weighty as the issues at stake: it is not only a matter of avoiding further degradation of the planet's soils, resources and biodiversity, but also of reversing the degradation process by increasing the amount of carbon stored in soils. The principle of the universality of the SDGs to be achieved by 2030 underlines the joint responsibility and need for solidarity between States: every country is affected, and the measures to be taken concern nations both North and South.

The French Development Agency has joined several initiatives to help France and its partners meet their commitments to contribute to the global effort to combat climate change. AFD participates in the Land Degradation Neutrality fund (LDN) and the United Nations initiative to encourage the introduction of public-private partnerships to combat desertification (UNCCD). AFD helps establish projects to support agro-ecological practices and measure their effects, and it encourages actors to share their experience in order to build common reference points with civil society in different regions of the North and the South, especially West Africa. It is also a founding member of the 4 for 1000 Initiative.

The idea that discussion of climate adaptation policies should take account of land matters is not completely new. The introduction of Payments for Environmental Services (PES) and REDD+ measures, implemented by several international organisations, highlighted the need to clarify land regimes as a key pre-requisite for effective initiatives.[4]

4. See in particular Ann-Kristin Rothea and Paul Munro-Faure, 2016, Tenure and REDD+. Developing enabling tenure conditions for REDD+, UN-REDD, FAO, UNDP, UNEP Policy Brief no 6.

Guinea © GRET

Despite these initial reflections, soil carbon sequestration experts still regard land tenure as a complex issue that could hamper the introduction of incentive mechanisms to support land uses and practices that help maintain or even increase soil carbon storage. Land regimes in many countries in the global South often make control over and access to land conditional upon its productive use, which can encourage practices that lead to deforestation or make it hard to put land to fallow. There are few examples of efforts to integrate the two issues of soil carbon sequestration and land tenure. Hence, interventions may worsen land conflicts and weaken the most vulnerable people's access to resources, especially family farmers and local communities whose livelihoods depend upon these resources. Even in countries, such as France, where certain actors have a long history of working in one of the two sectors, the links between them still need to be established on the ground.

The 4 for 1000 Initiative and CTFD invited their members and expert associates to two days of debate and discussion to review how best to articulate these two dimensions and ongoing efforts to do so. The specific aims of this event were to:

- **Review different incentive mechanisms and arrangements (direct/indirect, individual/ collective, financial/non-financial, local/ global) and the lessons learned from them.** Case studies from different continents were used to determine:
  - whether these mechanisms function, and under what conditions;
  - the specificities of these instruments with regard to the types of land use (agricultural, pastoral);
  - the expected impacts of changing practices in terms of limiting global warming and contributing to local economic development;
  - how these impacts can be measured (ex-ante and ex-post);
  - and how to ensure that the proposed mechanisms and changes in practice that they support are sustainable.
- **Better understand the setting in which these instruments and mechanisms operate, which rights they are based on, and the risks and opportunities associated with them**: What are the key characteristics of current land tenure regimes in Southern countries? What types of rights-holders, arrangements and organisations can the arrangements and mechanisms arising from the '4 for 1000' Initiative be based on, to encourage soil carbon sequestration practices which are effective and sustainable? Can these mechanisms become tools to secure certain rights-holders and, if so, under what conditions? Or do they pose risks for certain categories of rights-holders' security of tenure, and access to land and resources by certain categories of land users? If they do, how can these risks be limited?
- **Start a process of reflection on how better to integrate land issues into efforts to manage carbon and combat climate change**, and consider the changes of paradigm this might entail. At which level should work be prioritised in order to catalyse these changes (international or territorial)? How should public policies be changed? And how to ensure that these policies are inclusive, especially for the family farmers who are the lynchpin of food security in these countries?

## > INSTRUMENTS TO ENCOURAGE PERMANENT CHANGES IN PRACTICES THAT INTERACT WITH LOCAL LAND REGIMES[5]

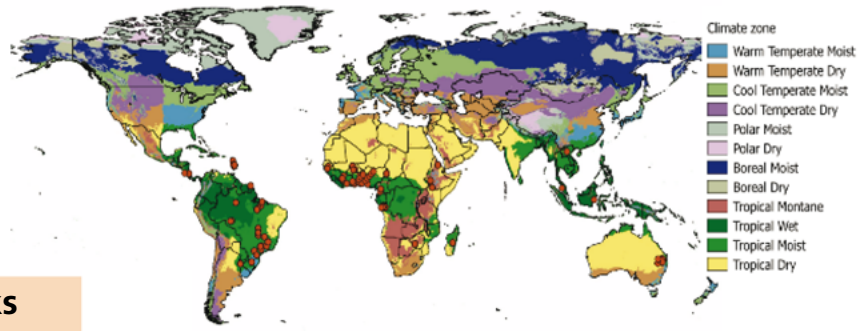
### Soil carbon sequestration: scenarios that play out in finite spaces over long periods of time

The working hypothesis behind the 4 for 1000 Initiative is that the world's soils contain two to three times as much carbon as the atmosphere, and could recapture some of the carbon that has been emitted as a result of human activities. Various studies (214 comparisons, 48 studies, 13 countries) analysing annual storage rates according to soil types and practices show that soils have a finite storage capacity. This varies according to their characteristics (clay, sandy, etc.) and above all how they are used (forest, agriculture, pasture, etc.). Climate conditions (rainfall, aridity index, etc.) have little impact on storage rates; the crucial factor is the input of organic matter over the long term (on average, soils store 8.2% of the carbon they receive), knowing that at this rate it will take at least 30-50 years to re-establish an acceptable balance. Because soils have a finite storage capacity, it is not possible to compensate indefinitely for an increase in GGE. Combined with a drastic reduction in GGE by all sectors, carbon storage could be a way of 'winning time' to make the necessary transitions in energy and consumption patterns, to avoid crossing dangerous thresholds in atmospheric concentrations.

5. This section is based on contributions and discussions at Round Table no 1 moderated by Alain Karsenty.

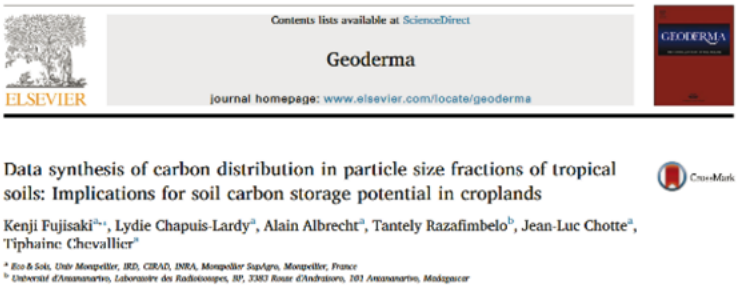
**Infinite storage capacity?**

## Potential soil organic carbon storage?




**– Carbon Stocks**
**– F < 20 µm**

*Fujisaki et al, 2018. Geoderma*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Data synthesis of carbon distribution in particle size fractions of tropical soils: Implications for soil carbon storage potential in croplands
Kenji Fujisaki[a,*], Lydie Chapuis-Lardy[a], Alain Albrecht[a], Tantely Razafimbelo[b], Jean-Luc Chotte[a], Tiphaine Chevallier[a]

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© Jean-Luc Chotte

While the priority for carbon storage is maintaining forests and protected areas, a recent re-evaluation of the potential of agricultural lands confirms that they are strategic spaces for efforts to recapture carbon and move towards the objective of limiting global warming to 2°C.

Several agro-ecological practices could be useful in this respect, although their efficacy varies according to local conditions (level of soil degradation, availability of water resources, photosynthesis, etc.):

- zero tillage with sowing under plant cover and crop rotation;
- intercropping with legumes, growing grass strips and hedges;
- improved pasture management;
- agroforestry and certain types of reforestation;
- using methods such as assisted natural regeneration and/or planting nitrogen-fixing plants to restore degraded land.

For a long time, these types of management system were side-lined in favour of production-oriented agriculture that depends on chemical inputs, including mineral fertilisers containing nitrates, which generate significant amounts of greenhouse gases. This means that many current practices will need to be changed. However, these changes to farming will not necessarily reduce risks or increase farm incomes (at least in the short term), and could even reduce incomes in the first few years.

This raises the question of how to ensure that these practices are adopted and sustained so that carbon is permanently stored in the soil.

### Different kinds of incentives with variable effects on the climate and producers' incomes

Different instruments and procedures already exist or could be envisaged to encourage the uptake and retention of practices that contribute to soil carbon sequestration.

## Agricultural practices for soil carbon sequestration

Conservation tillage

Integrated soil fertility management

Rangeland Management

Water management

Agroecology

Agroforestry

Organic fertilizers

© Jean-François Soussana

These include:

- **Procedures to strengthen collective action** to change practices at the landscape level. These aim to *make environmental quality a public good*, which necessarily entails a set of practices that encourage soil carbon sequestration. This kind of dynamic could lead to *territorial labels* attesting to the collective effort invested in building environmental quality. Making environmental quality a collective objective through sustainable landscape projects requires a certain level of collective action (capacity to decide on and implement rules). But this collective action can come under pressure from what could be called 'institutional tinkering' (actors using different opportunities to secure their rights, according to context), especially in settings where the stakes are high, due to the presence of newly arrived or longstanding migrants, pressure from investors and urban elites, etc. In this respect, the situation in Latin America seems more favourable than in Asia or (especially) Africa, because private land ownership[6] is much more widespread in Latin America for both individual and collective holdings.

- **Financial and non-financial incentives to adopt and maintain certain practices on a contractual basis:**

➤ These incentives may take the form of **tax measures** (lower land and production taxes, exemption from inheritance tax, and tax exemptions on what could be regarded as '4 for 1000' investments). These types of measure are easier to put in place where titled land ownership already exists and where land taxes are implemented effectively.

6. A natural or legal person who holds all or some of the existing rights to a piece of land or other good is legally regarded as the owner of a private property, over which they are free to exercise or assign their rights. The composition of existing rights over land and associated resources may also be modified by laws or regulations, especially with regard to clearance, cropping, development and construction. Different owners may have different rights to the same piece of land (rights of way, hunting rights, seasonal grazing rights, separate ownership of the land and the buildings on it, sub-surface resources, etc.). Leaseholds are also ownership rights if the taker can assign the lease. These rights may be individual or collective, and may be formalised by a title, certificate or attestation, depending on the continent concerned and its history. Rights to between 40% and 95% of land are not currently formalised, especially in Africa.

## Are collective economic incentives possible? Experience from Mexico[7]

In 2003 Mexico launched a Hydrological Environmental Services (HES) programme which was partly funded by water taxes. This programme provided a way of introducing PES to combat deforestation and poverty, with four main types of surface payments anticipated, according to the type of forest concerned. They are mainly allocated to *ejidos*, which manage 80% of forests in Mexico according to a hybrid land system that combines private and collective parcels. Members fall into three distinct groups (those with collective and individual access and voting rights, those with access to individual lands only, and those with no land and no vote), each with specific forms of governance. Members of the *ejido* vote on whether a PES will be contractually agreed or not and how the amounts allocated will be distributed within the group. In this framework, they can redefine the initial rules for national targets. The amounts received by producers are mainly determined by the number of hectares covered by the contract and the number of beneficiaries in the *ejido*, not the opportunity costs of maintaining or changing practices. The programme has had mixed results. On the one hand, it has not affected its original targets ('deforesters', 'poor people', etc.), who therefore question its effectiveness in terms of conservation and the sustainability of agro-ecosystems. On the other hand, there has been a resurgence of collective action that could help consolidate the "commons" nature of certain resources.

7. Based on written and oral contributions from Céline Dutilly.

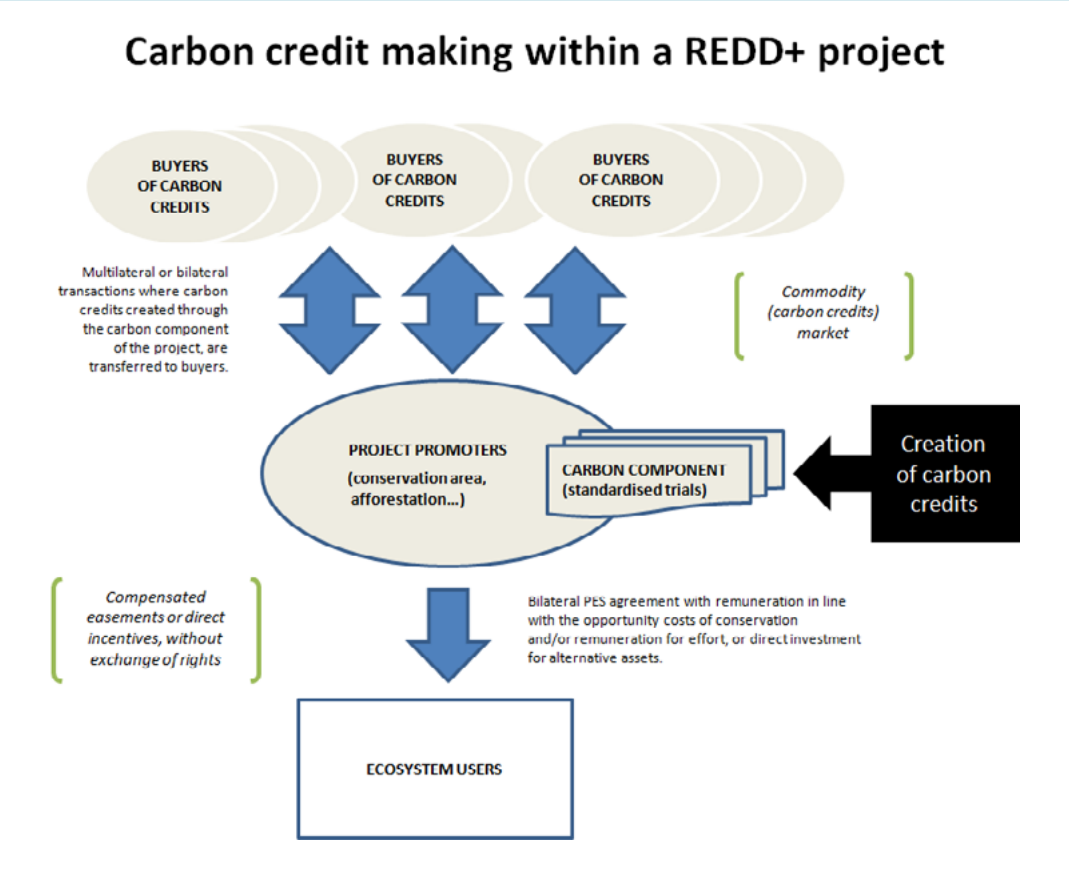
- There could also be different types of registered **environmental easements** eassociated with the land (for example, an owner who decides to introduce or accepts the introduction of a permanent easement may receive financial compensation or enjoy more favourable tax arrangements). Here too, it is hard to envisage this without clear ownership rights as, in principle, easements remain attached to the land when there is a change of ownership.
- The principle of **payments for environmental services (PES)** is similar to that of environmental easements, but PES are more flexible and come in different forms. They are financial or non-financial, contingent and recurrent (usually annual). These payments *remunerate practices* (with results based on a 'proxy', the practices adopted), are conditional (quid pro quo contracts) and may evolve with changes in context. Their duration varies according to the type of contract proposed (they usually last for 5 years in Costa Rica, where PES are one of the public policy ins-

Eijidos de San Gregorio Atlapulco, Mexico © GRET

## PES and the carbon market: possible but not systematic links[8]

It is immaterial whether PES are financed by trading 'carbon credits' on the voluntary market or by a REDD+ national fund. Using carbon finance brings its own constraints, with high transaction costs (carbon measurements, counterfactual scenarios, taking account of the effects of leakage and the changing number of credits purchased, certification of credits by a specialist auditor, etc.) that are not incurred with PES, despite the substantial costs of monitoring compliance with the conditions for PES. The main thing with PES is the conditional 'results-based' financial incentive, where the results are the practices that are adopted rather than the amount of carbon sequestered.

8. Based on written contributions by Alain Karsenty.




truments that have contributed to national reforestation efforts), but there is nothing to stop contracts being renewed if their promoter (the State, a court or an organisation) has put in place permanent funding, budgetary or extra-budgetary mechanisms. Costa Rica and Mexico use fees to feed dedicated funds for the long-term financing of PES (fees on fuel in Costa Rica, and on water supplies in both countries).

➤ **Production certification** systems (such as the 'forest-friendly' sustainable cocoa slogan used in Côte d'Ivoire) could also provide incentives for producers to adopt practices that contribute to 4 for 1000 objectives. The certification mechanism differs from PES in two respects:

– in certification, the level of the price 'premium' (when it exists) does not directly depend on the environmental service provided (certification is not a quid pro quo contract, i.e. an exchange of goods);

– with certification, the incentive is the purchase price of the product, while with PES, remuneration for the service takes the form of a subsidy that is independent of the price or the production of a good.

## Tax incentives for certified production?[9]

Certain certification systems favour practices that contribute to 4 for 1000 objectives. For example, some forms of certification can only be obtained with 'zero deforestation' agricultural production. If the 4 for 1000 process expands, corresponding labels could be proposed, with certification led by market demand for such products. The incentive with this kind of certification is a higher price, as it is known that consumers are ready to pay more for certified products. An increasing number of public authorities are taking account of the 'public good' aspect of certification (a private instrument), and putting in place measures to encourage certified production. One possible measure is taxation. The principle would be to introduce tax advantages for certified production (provided the content of the certification is in line with public objectives and the authorities regard the label as credible), especially for import taxes. For example, differentiated taxes favouring certified goods imported into the European Union would help make them more competitive and encourage producers to adopt practices that would qualify them for this label.

9. Based on written contributions by Alain Karsenty.

Experience has shown that strictly financial incentives are not enough to ensure that practices are permanent. They will only have a long-term effect if they contribute to every aspect of local development, so a combination of instruments is needed if there is to be any hope of generating real leverage on climate change and improving living conditions and food security in the countries concerned.

This raises serious questions about the nature of certain mechanisms (public vs. private), their accessibility for family farmers, and their sustainability. Land tenure is not always a determining factor, but land regimes can help or hinder certain procedures, depending on whether they are based on formal law (sets of laws and regulations regarding lands and forests) or customary rights and practices.

## Combining sectoral and territorial approaches[10]

In countries in the global South, the adoption and maintenance of 4 for 1000 practices (including conserving ecosystems that store large quantities of carbon) will probably combine a territorial approach (which involves financing collective goods that could be the focus of collective action, such as 'sustainable landscape projects') and a producer/supply chain approach (finance for changes in practice that could come from firms which have made social and environmental commitments within particular supply chains). The cocoa supply chain is a good example of this dynamic. Many multi-national agri-food businesses have made 'zero deforestation' commitments (the whole supply chain is monitored to ensure that the production of raw materials does not cause deforestation), and chocolate companies have developed social and environmental programmes, some of them wide-ranging, that are helping develop shade-grown cocoa in agro-forestry systems. In this context, some firms have used PES (with proportional payments for the number of trees planted or retained on cocoa plots) to encourage producers who supply them directly or indirectly to reintroduce trees on their cocoa plots and create (or recreate) agro-forestry systems.

The sectoral approach is crucial in promoting production systems that encourage soil carbon storage. It may be led by specific social organisations, by government institutions or, in certain cases, by the companies themselves. In the latter case it will be up to the company to provide private finance, otherwise public finance will be required. But such efforts need to extend beyond supply chains as many factors contribute to soil degradation, often outside the formal framework for supply chains (artisanal charcoal production, burning stubble, stray livestock, etc.). The displacement effects of pressure caused by degraded soils and deforestation could also lead to the deployment of instruments that aim to promote the adoption and maintenance of 4 for 1000 practices in other parts of the territory.

It is unlikely – but not entirely impossible – that the large companies which are working to improve production and traceability in their supply chain are also investing in the quality of the landscapes concerned. Therefore, public finance will be needed to help develop 'sustainable landscape' projects with indicators that can be easily verified by members of local communities in these areas. Whether these projects follow the 'jurisdictional' boundaries of communal, district or provincial territories is a secondary issue. *[to be continued]*

10. *Ibid.*

The possible gains in efficiency from putting such projects on an administrative footing could be offset by poor ownership of the process if the jurisdiction seems too far removed from the users and managers of the space, who may find it easier to manage initiatives undertaken at the landscape level. However, it is worth noting that as the World Bank supports finance for 'programmes under the jurisdiction of REDD+', whose objectives potentially converge with those of the 4 for 1000 Initiative, these programmes could be a way of financing sustainable landscape projects.

## > LAND TENURE: A LEVER OR CONSTRAINT FOR CARBON SEQUESTRATION?[11]

### Local land regimes take precedence, ensuring the continuation of families and their farms[12]

In Southern countries, the access, control and transmission of land resources through the generations has historically been organised by local land regimes (described as 'customary' or 'neo-customary'). Certain estimates13 calculate that at least 65% of land around the world is held under customary and community land tenure systems, with only a small fraction of these rights legally recognised and protected in the country concerned. In sub-Saharan Africa, for example, only 2% to 10% of rural land is officially registered today, despite the fact that policies for the large-scale formalisation of so-called 'customary' rights have been in place since the 1990s. The daily reality for farming populations and local administrations in Southern countries, in most areas, is that local land regimes continue to be prevalent, and co-exist alongside the formal legal regime.

The resilience of local land tenure systems is due to their capacity to adapt – often as a last resort – to changes in the political, social and environmental setting. Their logic is to keep access to the

11. This section is based on contributions and debates at Round Table no 1 moderated by Camilla Toulmin.

12. Based on written and oral contributions from Jean-Pierre Chauveau.

13. Rights and Resources Initiative, 2015.

Terria Project, Senegal © GRET

## Local land tenure systems in Senegal, in the Region of Thiès[14]

Due to its geographic and economic situation, Senegal is one of the countries that is most vulnerable to climate change. Its groundnut basin is particularly vulnerable because land in the area is highly degraded, as a consequence of many years of monocropping. In recent years, family farms in the area have started using more agro-ecological practices based on local farming knowledge. The Terria project, which is supported by AFD with NGO innovation funding and implemented in partnership with Fongs and GRET, is working to strengthen these practices. Terria works with farmers to develop and implement plans for agro-ecological transition, so that they use more organic manure and compost, plant trees that are natural fertilisers, incorporate legumes into crop rotations, and restore pastures and recuperate degraded land that can be used by women.

Efforts to establish and disseminate these practices have been beset by recurrent problems with access to land and natural resources. Law no 64-46 on national lands and the laws of 1972 and 1996, introducing local government envisaged the creation of national lands. These would include all unregistered lands and land where members of rural communities have non-transferable use rights allocated by rural councils on condition that the land is used productively. In practice, however, rights are still managed through local land systems and little land is allocated by the local authorities. In the areas covered by the Terria project, land management and appropriation are collectively overseen, mainly by family and lineage groups. The eldest male in the group has the authority to redistribute access to the family land holding every year. The three main types of land arrangement within and between families in this region are:

- *bay séddo* (land loans), where the harvest is shared three ways between the grower, the owner of the horse used for ploughing, and the person who controls the land, who can take it back at the end of the growing season;
- *bay wathie* (rental for a growing season) which enables a farmer to cultivate the land in return for a sum of money. The land returns to the owner after the harvest;
- *taylé* (pledge) which allows a producer to use the land for several years in return for a sum of money, which is repaid in full when the land returns to the person who assigned the right to use it.

Introducing agro-ecological practices into this setting can be complicated. For example, fallow is socially frowned upon, due to increasing pressure on land from demographic growth, while the legal conditions for productive use mean that users are liable to lose their land if it is not cultivated each year.

Certain agro-ecological practices could also be constrained by common grazing practices. Every year the start date for common grazing is set by prefectoral order after stakeholder consultation. Every field is then open to all animals, which have free access to the crop residues after the harvest. This means that livestock belonging to farmers who practice integrated crop and livestock production cannot make the most of their fodder resources, and large amounts of organic matter are consequently not returned to the soil.

Tree planting and more general investments in regenerating biodiversity are also hampered by the precarious nature of certain clauses in local arrangements (which often last for a year, meaning that users do not see a return on their investments) and by the law, which allows the State to reclaim land "in the public interest" without compensation if it was not allocated by the rural council.

In order to remove these obstacles, and while waiting for the land reform to come to fruition, the Terria project is working with families and communities to clarify and secure arrangements so that they are more conducive to agro-ecological practices, and to get these arrangements registered by the relevant authorities.

It is hard to see how carbon sequestration initiatives could work in a context like this, where land tenure is not clarified and farmers' access to land remains precarious.

14. Based on written and oral contributions by Iba Mar Faye.

family land holding as fluid as possible for successive generations, while ensuring that people's individual ownership and rights to enjoy the fruits of their labour are recognised. The blurred boundaries between individual ownership and the farming family's life cycle illustrate "both the concern to enable farmers to produce in a secure context and the desire to ensure that they are still obliged to redistribute part of their agricultural activities for the benefit of the group to which they belong."[15] The fluidity of land tenure within and between families is necessary for local production systems (including fallow lands), the internal management of family farms and their reproduction. Having family networks with members working in different places at different times gives rural actors

15. Jacob, 2017.

the mobility they need to 'leave in order to stay'[16] (using short-term absences to secure their long-term future).

The specificities of local land management systems have led specialists in matters such as environmental policies to highlight the risks that carbon sequestration incentive mechanisms pose for the persistence of family farms. This would be the case if these mechanisms overly restrict the fluidity of local systems, for example, by freezing the number of rights holders and land uses and ignoring intra-family and intra-generational cycles.

## Local land regimes that limit the choice of carbon sequestration instruments[17]

Tax incentives could be an interesting solution for privately-owned titled land and effective property taxes, but currently seem impracticable in most situations in Southern countries. The same could be said of environmental easements, which require well-established property (and transfer) rights. On the other hand, PES, labels and certification are used at both the collective and individual levels. The key point with PES is that there are effective rights of exclusion over spaces that are identified through some form of demarcation. PES are contractual instruments that recognise rights but also require fairly precise geographic identification of the space to which the undertakings will apply.

In Africa it is not unusual for rights of exclusion and control to be held not by direct land users but by actors who are generally known as 'customary owners' – lineage groups and families that control local land management. They sometimes use some of the land, but also assign, loan or rent other parts of it to 'rights holders' to ensure the reproduction of farms and continuation of social links. Rights holders are often not permitted to establish perennial crops or plant trees to avoid the taker subsequently claiming ownership of the land. This makes it hard for them to follow PES practices based on agro-forestry. But sequestering carbon through annual cropping systems that involve sowing under plant cover, intercropping with legumes and growing grass strips and hedges could be practicable options for these rights holders in the context of PES contracts. For certain traditional contracts to 'lend' land (which are often a mixture of rental and sharecropping) where planting trees or perennial species is prohibited, programmes to secure land tenure need to be envisaged, targeting both customary owners who fear that they will be dispossessed of their land, and takers who want to be able to transfer land to their children. These could include processes that recognise exclusive forms of land management by the customary rights holder, provided they grant occupants long-term leases so that they can make long-term investments in the land.

Indirect forms of land use, such as sharecropping, can also be problematic for conservation-oriented PES contracts or systems that reduce agricultural production. These systems are based on shared benefits for the landowner and user, so smaller harvests will adversely affect the landowner's income while the sharecropper receives financial compensation for lower yields. In such cases both parties must have a stake in the contract and be compensated for any losses sustained due to a fall in production.

16. Losch *et al.*, 2016.
17. Based on written and oral contributions by Alain Karsenty.

## Experiments with multiparty PES contracts in Côte d'Ivoire[18]

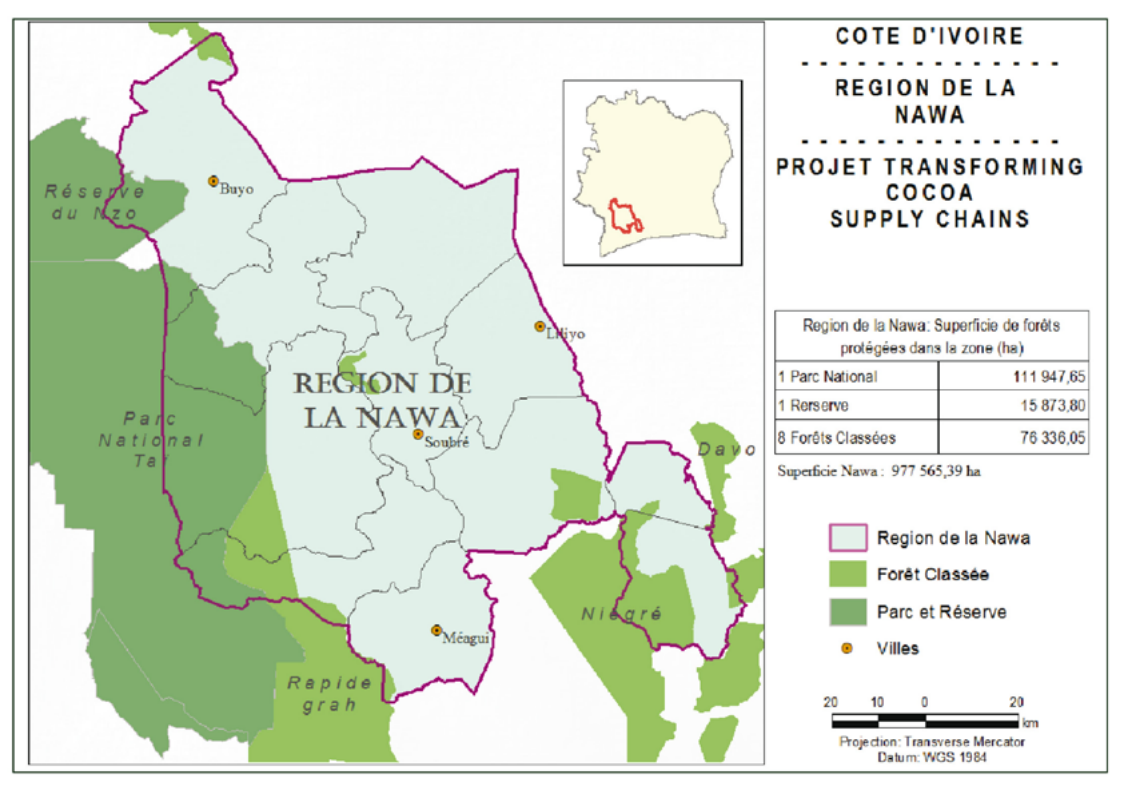
The pilot PES project in Nawa Region in Côte d'Ivoire is being implemented through a partnership between the Ivorian government, the US group Mondelez International, the European Union and Impactum. It is driven by the Government's strong political drive to transform Ivorian cocoa production into a zero-deforestation system, and the Cocoalife sustainability programme run by the chocolate producer Mondelez, which aims to improve agricultural productivity, food security and planters' living conditions while safeguarding the remaining forests and conserving biodiversity in the group's supply basins. The expected results of this ambitious project are to sensitize and inform 3,000 producers, produce 700,000 multi-purpose forest trees, establish at least 5,100 hectares of cocoa-based agro-forestry for 2,550 planters, replant at least 600 hectares of forest with fuelwood and lumber species, and contribute to the conservation of at least 300 hectares of natural community forests in at least 10 villages. To do this, incentive mechanisms to encourage tree planting are being put in place in zones with high carbon storage capacity.

The plan is to:

– formalise tripartite contracts between landowners, land users and the project so that each party will be remunerated for the results they achieve, and their rights and investments will be protected; *[to be continued]*

18. Based on written and oral contributions by Marc Daubrey.

– provide inputs (seeds, plant nurseries, plants, etc.);
– and advise on production. While this approach should generate comparable financial advantages for all communities in the target areas, the project will still have to contend with difficult relations between indigenous groups, migrants and incomers, and disputed village boundaries, which can complicate the contract formalisation phase.




At the community level, financial and non-financial incentives can help strengthen mechanisms that exclude third parties and mechanisms for collective land management through social pressure on individuals, whose failure to respect commitments would result in a loss of benefits for the whole community.

With activities such as assisted natural regeneration, leaving land to regenerate naturally could be interpreted as signalling a lack of rights to the land, and result in it being taken over by squatters. Land also needs to be protected from livestock, in order to regenerate. What is needed is strong local capacity for collective action jointly to manage the landscape, and changes in the law so that land appropriation is no longer conditional upon 'productive use'. Much of 'modern' law and customary rights still revolves around this concept, which encourages actors to convert natural ecosystems that store a lot of carbon into agricultural spaces.

## Negotiating mechanisms at landscape level to support effective ecological intensification

It is unrealistic to assume that legal action will be enough to get family farmers to accept land practices focused on carbon sequestration. It is also important to consider the land aspects of these mechanisms and recognise the past and present capacity of customary regimes to sidestep or 'absorb' the official legal framework and use their own practices to secure rights.

The literature on formalising and securing customary rights through land titles has shown that in West Africa, for example, "constraints to the rigorous formalisation of rights make it preferable to recognise and consolidate extra-legal practices that actors already use to secure rights, even if this involves solutions that are legally 'flawed'."[19]

19. Colin J.-P., 2017, *Securing market land transaction in West Africa*, CTFD Briefing Notes, Paris.

This is especially true when securing land transactions between indigenous actors and migrants, which often cause socio-political problems, rather than land disputes. Extra-legal procedures could also be used to identify the legitimate interlocutors for contracts drawn up in the context of carbon sequestration projects on family or community lands. Although family councils have no legal status, one solution in these situations might be to require written minutes of a family council meeting authorising the land assignment and giving someone an explicit mandate to engage in the transaction, according to certain stipulated conditions.

Extra-legal written formalisation should also be encouraged for long-term leases, with contracts established around local arrangements (and key clauses such as a migrant land user's duty of 'social recognition' to customary landowners), to deal with the many cases of secondary land use that might be revealed when carbon sequestration mechanisms are introduced in West Africa.

A transitional pre-contract phase for agreements between the carbon sequestration mechanism and family farmers, or their collective, seems necessary in order to consolidate their land rights according to local norms on the one hand, and on the other ensure that farmers have given their informed consent to an agreement that is compatible with the viability of their holding.

## > REGULATORY AND GOVERNANCE MECHANISMS TO SUPPORT CARBON SEQUESTRATION[20]

### Managing path-dependence at every level

Public policies that support long-term carbon sequestration and link into land issues are part of the overall global, ecological, economic and social setting. The fact that they are rooted in much wider institutional arrangements and public policies means that these specific policies need to be consistent with a whole range of other policies at different levels. Another question that needs to be addressed is whether different forms of agriculture and natural resource management are compatible with the climate objectives set at COP 21. While it is hard to avoid some inconsistencies between public policies, it is important to recognise that certain policies have completely irreversible effects in the medium term.

20. This section is based on the contributions and discussions at Round Table no 1 moderated by Michel Merlet.

The inability or unwillingness of many governments to put in place the trade and sectoral regulations needed to secure agrarian structures with the greatest ability to store more carbon – i.e. those based on family farming systems – shows the need to work at regional and global scales as well as national. Even in Europe, the first pillar of the Common Agricultural Policy has encouraged an increase in physical capital on farms with subsidies paid per-hectare. Incentives change with indebtedness, and knock-on consequences for land rents. In Denmark, for example, changes in land regulations disrupted the structure of the land market, and the price of a hectare of farmland rocketed when other financial actors were allowed to enter agricultural land markets. Farmers who want to transfer their farm now find it hard to do so, and face problems when they want to retire.

Debates in this session showed that while State governance mechanisms are far from perfect, the issues associated with carbon sequestration and food security cannot be addressed by the private sector alone. The market will never be able to resolve problems around common goods, so national governments need to take responsibility for addressing these challenges. They will need to put in place regulatory frameworks and rules to facilitate successful ecological transitions, while safeguarding territorial development and improving the living standards and food security of the most vulnerable populations.

### Could tax-based development policies be a serious alternative?

The conversion of agricultural land to other uses is having a considerable impact on carbon sequestration. Take France, for example, where two-thirds of former farmland in the country was previously used for agriculture or livestock, but only half of the national territory is classified as agricultural land. It is important to take account of the spatial dimension of development by working at different levels – towns and cities, small regions, countries, etc. Territorial development policies produce results but also have their limitations, such as inability to address issues of scale, focusing on quantity rather than quality, having significant negative effects on land rent, etc.

A comparison of the situations in Cambodia and Vietnam shows the impact of different planning and land systems (weak spatial management, titled private ownership and concessions in Cambodia, and strong spatial management, certified use rights and family farming prioritised until 2000 in Vietnam). Forest farming has been destroyed on both sides of the border between the two countries. The question is now how they can put in place an agrarian system

with a current population density of 5 inhabitants/km² in Cambodia and around 100 inhabitants/km² in Vietnam. In the latter case, the government has used land markets to enable the State to capitalise on the uplift in land values generated by changes of land use in peri-urban areas.

The loss of agricultural land (from the hands of small-scale farmers) could be controlled by territorial development and by using the tax system to introduce bonuses for urban intensification and penalties for the conversion of agricultural land. Such taxation on development could be effective, and be managed at the territorial or the national level.

It is also often important to create or strengthen intermediate territorial governance bodies, and restore the legitimacy of collective management by recognising and strengthening local collective institutions, where there are checks and balances that reduce the risk of opportunistic behaviours.

## Designing evaluation processes that consider land as another externality

The evaluation of projects and policies to increase soil carbon sequestration is a key issue, especially for the 4 for 1000 Initiative, which wants to identify the determining factors in soil carbon sequestration so that those responsible for these policies can deploy them more effectively.

Existing protocols include certain requirements for signatories to respect human rights and UN voluntary guidelines on land governance as red lines that must not be crossed in order to qualify for international payments. Some also include detailed analysis of changes in land situations and public land policies, so that it is possible to anticipate evictions that may be called for in order to combat climate change.

These debates also showed that it is not possible to measure all land, social, environmental and economic externalities at the parcel or farm level (whatever their size and nature). Instead, evaluation mechanisms need to take account of all the actors in supply chains upstream and downstream of the farm. For example, an irrigated agriculture project in Morocco that aimed to store soil carbon in steppe-type vegetation and landscapes criss-crossed by livestock corridors resulted in herders living upstream from water points migrating towards shanty towns. Evaluation methods should consider the opportunity costs for all the resources mobilized by projects (land, water, labour, etc.), and thus the carbon both gained and lost as a result of indirect effects.

Another pitfall that evaluation methods need to avoid is comparative analyses based only on the difference between the situation 'before the project' and 'after the project'. 'Counterfactual' situations that try to simulate changes that might have happened if the project hadn't taken place should be modelled with the same care as the situation 'before the project', and included in the analysis of project outcomes. These situations are based on hypotheses designed to stimulate discussions about

Cambodia © Germain Priour

different options rather than envisage a single possibility where the project is executed. Finally, evaluations and strategic reflection by governments and international partners should pay more attention to qualitative data on "what producers say" rather than relying solely on "what the experts say", so that local actors' consent or resistance feeds into decisions that are taken upstream.

## > TOWARDS A CHANGE OF PARADIGM?

Because of its capacity to store carbon, soil can be a vector of biodiversity as well as fulfil agricultural functions. It is a common good around which shared rules are shaped at different levels by the organisations and actors involved in its management. The debates at this event showed that agrarian structures and land management systems are central to the analysis of soil storage capacity and the identification of measures likely to affect the adoption and perpetuation of 4 for 1000 practices. Family farmers have been reaffirmed as the main sequestrators of carbon and, as such, should be supported by public policies (including trade policies) to encourage the continuation of family farming and the development of 4 for 1000 practices. With 'REDD+ projects' in crisis because there is insufficient demand for them to market the carbon credits they have generated, it should not be assumed that 4 for 1000 projects can be funded through the sale of carbon credits. Low- and high-income countries alike need new financial revenues from sustainable sources that operate at low rates but cover a very broad base. ●

This paper was produced by **Alain Karsenty** (Cirad), **Camilla Toulmin** (IIED), **Michel Merlet** (Agter), **Jean-Pierre Chauveau** (IRD) and the scientific secretariat of the 'Land Tenure and Development' Technical Committee (**Sandrine Vaumourin** and **Aurore Mansion**, GRET), based on participants' contributions and written and oral input over the two days, and the debates prompted by their contributions.

## For further information

- Concept notes and written contributions for these days are freely available here on the Land Tenure and Development portal.

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