Communicating climate change, REDD and political ecology: A global land question and prospects for agroecology

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Abstract: *Approaches to Reducing Emissions from Deforestation and Forest Degradation (REDD) occupy a prime place among political proposals for mitigating climate change. This paper maps interconnections among four crucial dynamics associated with forestry and climate change that interface with REDD proposals: changes in agricultural needs, energy transitions, dynamics of communicating climate change at different levels and scales, and, livelihoods of forest dependent people. The paper places such dynamics within a political ecology framework with a focus on an emerging global land question. Finally, the paper argues that agroecology has important potential as a farming alternative within the politics of climate change.*

Keywords: *Climate Change, Communication, REDD, Political Ecology, Agroecology*

Introduction

The need to tackle deforestation and forest degradation as a global response to human-induced climate change has been consistently highlighted in local and global political spaces. Yet the question of how remains problematic. Since the definition of the Bali action plan,the goal of Reducing Emissions from Deforestation and Forest Degradation in Developing Countries (REDD) has reached a prime place among proposals to mitigate climate change. In fact, REDD is a point over which agreement in the COP 15 was reached and the Copenhagen accord establishes the following: "We recognize the crucial role of reducing emission from deforestation and forest degradation and the need to enhance removals of greenhouse gas emission by forests and agree on the need to provide positive incentives to such actions through the immediate establishment of a mechanism including REDD-plus, to enable the mobilization of financial resources from developed countries". (Available at: http://unfccc.int/resource/docs/2009/cop15/eng/l07.pdf)

This agreement is partly based on the assumption that REDD schemes are one of the cheapest ways of facing climate change, an assumption stated in the Stern Review (Stern Report 2006: 537-551).Also the British government-sponsored Eliash review supported this assumption, estimating: "the finance required to halve emissions from the forest sector to 2030 could be around $17-33 billion per year if included in global carbon trading" (p.19). But this review also points out that REDD projects should face questions of profitability emerging from competing economic activities in forested areas, e.g. food production. However, and putting aside the question of whether REDD is an appropriate mechanism to really face climate change properly or not, any attempt to fix REDD within a climate change regime faces a number of problematic factors. In this context, and throughout the making of a new global politics of the environment, the position of peoples fully or partly sustaining their livelihoods on the appropriation of the production of forest ecosystems is crucial. Thus communication flows with position statements about REDD within climate change negotiations is increasing. The whole idea of REDD has been associated with a contested discourse field from its inception within climate change politics. The reports *Carbon Sunk? the Potential Impacts Of Avoided Deforestation Credits On Emissions Trading Mechanisms* and *Carbon Scam: Noel Kempff Climate Action Project and the Push for Sub-national Forest Offsets* (sponsored by well-known NGOs), exemplify literature directing attention to not only failures within REDD, but also damaging consequences for local communities that REDD proposals should benefit. These communication flows centered on REDD and climate change have contributed to awareness of the local impact of

REDD projects. By contrasting such claims with the claims of REDD defenders, the contradictory features of communication flows based on REDD become increasingly apparent. Thus links between communication practices and climate change represent contradicting interests of the social forces at work in the world today. As REDD proposals contribute to discourse on the climate change-agriculture-energy connection, they imply questions involving farming systems directly or indirectly. This paper aims to contribute a systematic understanding of how REDD proposals imply new situations and communicative contexts interfacing with a large number of farming systems in the world. To accomplish this goal the paper focuses on REDD schemes as they link to agricultural needs, energy transitions and peoples' livelihoods depending on forests. From a farming systems perspective, the paper argues that some forms of agroecology developed within the South American context could contribute new communicative potential that may enable an alternative politics of climate change.

Forest, Climate Change and Reducing Emissions from Deforestation and Forest Degradation (REDD) schemes

REDD proposals are about land use in a very basic and material way: as forests are crucial factors in the global carbon cycle, their preservation and management could increase net GHG absorption and avoid GHG emissions. That principle leads much of the discussion on REDD. Within this context, agriculture becomes a crucial factor to be addressed (See for example the Eliash report 2009). As mentioned earlier, Stern and his collaborators presented REDD as one of the cheapest alternatives for mitigating climate change (Stern Report 2006: 537-551). The Stern review has however been criticized from different angles. One critique notes that Stern's assessment of reasonable limits for GHG concentrations is significantly higher than estimates from climate science. Another critique notes that although the review considers climate change as the market's greatest failure ever, Stern's proposals nonetheless rely on market mechanisms. I highlight another critique here: Stern's assumption about the cost of REDD initiatives is inherently transient and depends on forces acting at the global political economical level, forces that within a capitalist global economy can change cost variables from one day to another. Grieg-Gran's (2008) update of the Stern Review demonstrates this problem when noting that the original report's estimates failed to account for market complexities when it states "Costs in a more realistic scenario which takes account of legal, practical and market restrictions on logging are somewhat less at US$6.5 billion per year. These estimates are roughly US$ 1.5 billion higher than the corresponding estimates presented in the original report" (Grieg-Gran, 2008:11).

Another factor in this already complex panorama is the assessment contained in the chapter on Forestry of the IPCC report (2007) which also attributes a crucial and wide role to forest resources in mitigating climate change: "In the long term, sustainable forest management strategy aimed at maintaining or increasing forest carbon stocks, while producing an annual yield of timber, fibre, or energy from the forest, will generate the largest sustained mitigation benefit" (IPCC 2007, Nabuurs et al 2007:549). But the hopes of obtaining such a list of products from trees and forests should be contrasted with increasingly conflicted objectives for forestry in a context of climate change. For example, increasing competition and the emergence of new uses for forest biomass (e.g. biofuels) cause more conflicts and struggles for land. When scaling up to the level of realizing REDD proposals, there exist mainly two proposed mechanisms. Both intend to "provide financial benefits to developing countries to reduce emissions from deforestation and degradation. . . . The provision of financial rewards could be based on a market mechanism which would set the price of carbon – with the benefits equivalent to the volume of avoided carbon emissions multiplied by the price of carbon, i.e. rewards are based on 'outputs' – or through compensation for the forgone benefits of deforestation and degradation (and for the costs incurred in implementing policies and activities to reduce emissions) through a fund established with contributions from developed countries" (Taconi, 2009). Today there are a number of proposals to accomplish these goals and the "technical" barriers for REDD systems is said to be overcome. But implementation remains problematic. A recent report from the World Resources Institute argues, "a system that relies wholly on carbon markets to finance

REDD would greatly sacrifice accuracy and/or inclusiveness among countries. Parties should implement a range of means for financing REDD. This should include a fund to finance activities that cannot be precisely accounted for. In some cases changing the definition of deforestation in order to capture significant land conversion activities may address some of the accuracy issues".

How do agriculture and energy transitions, and their impacts on forests, enter into this context? Most basically, REDD should ensure that incomes from REDD projects can compete with incomes from other agricultural practices and energy demands. So, for example, REDD projects should compete with other possible uses of forest biomass. In other words, a concrete REDD project should oppose two main driving forces of forest degradation and deforestation: the possibility, or already present situation, of pressure from energy transitions e.g. from fossil fuels to bio fuels and the motivation of forest users to preserve the carbon storage capacity of a forest rather than clearing the forest for cultivation of food crops. Those two aspects of REDD direct our attention to those being denominated forest dependent people, or people that have a direct relation to forest resources and have livelihoods that interface directly with the forest biomass. To encourage full engagement of those people in REDD projects would then be inextricably linked to their positions relative to energy use and agricultural development. For example, energy may need to be provided from other sources and food may need to be provided from other locales. Some of the REDD literature has acknowledged the importance of these issues (see for example, Angelsen, 2008; Bone et al, 2009; Jindal et al, 2008; Karky and Skutsch, 2009).

The link between REDD proposals and improved livelihoods for poor people also remains controversial. Chukwumerije and Dooley's (2010) assessment of justice criteria within different REDD proposals, for example, indicates that REDD has poor performance regarding sustainable development impacts. Another aspect linked to justice criteria has to do with the incomes that local forest communities would finally earn from REDD projects. Some authors argue that even if 90% of the total monetary value of the credits went to actors others than local communities, REDD would still represent a financial gain for forest dependent people. According to Skutsch et al (2010), "even if only 10% of the financial value of the carbon were to be returned to the communities, this still represents a considerable earning for them, given the low returns on agriculture and the lack of alternative employment opportunities. It might even be sufficient to encourage many more communities to involve themselves in forest management. The balance might be sufficient to incentivize the state to expand its efforts as regards implementation of community forest management activities". (Skutsch et al. 2010: 5). The controversial analyses of REDD motivates two main observations based on the previous approach to REDD issues: 1) Reducing Emissions from Deforestation and Forest Degradation is not something that we should denote as bad "in itself". On the contrary, serious attempts to tackle deforestation and forest degradation are needed and there are even indigenous groups and groups in the South that support similar ideas under certain premises (See for example the working session on forest at the World People's Conference on Climate Change and the Rights of Mother Earth (Available at http://pwccc.wordpress.com/2010/02/02/885/#more-885). As recently as April 22nd 2010, the World People's Conference on Climate Change rejected REDD as a market mechanism to face climate change and instead it proposes among other measures that governments "create a global program to restore native forests and jungles, managed and administered by the peoples, implementing forest seeds, fruit trees, and native flora". (See: http://pwccc.wordpress.com/2010/04/28/peoples-agreement/#more-1584). 2) The link between agricultural needs, energy transitions and consequences of forest dependent peoples' livelihoods obliges us to reconsider the assumption of REDD as a low cost solution to climate change mitigation. These observations direct attention to the interconnection between the sort of mechanisms used to achieve REDD and the relations between such mechanisms and their consequences on livelihoods of people doing both forestry and other farming system activities e.g. subsistence agriculture. This has implications for communication systems, specifically for communicating climate change.

Communicating climate change and REDD

Within mainstream REDD frameworks e.g. market oriented mechanisms, the goal of engaging forest dependent people in REDD implies a number of stages: from making them aware of climate change as an issue to the transmission of some knowledge about carbon storage, from informing them possibilities for forestry carbon credits to ensuring carbon forestry outcomes. In doing so, climate change communication takes place. We can start specifics of communicating climate change regarding REDD by observing a climate change communication proposal made during the international conference on climate change communication held in Ontario Canada in 2000. The plenary paper highlights a vision of some principles of climate change communication (Andrey and Mortsch, 2000). "Generic Communication Guidelines" suggested included "carefully define communication goals," "identify and characterize the intended audiences," "have those working on the front lines well informed and committed," "develop communication partnerships," "ensure that communication is not just one way," and "learn from other fields, [especially] risk communication efforts." One overall problem that arises from this framework for communicating climate change has to do with the local-global interface of climate change and the worldwide divide between countries and between social groups within countries. We observe today a situation where the audiences or actors for climate change communication, especially mitigation proposals, now include forest dependent people, local farmers and peasants, because of the interests they have in proposals for mitigating climate change.

One can contrast those communicative principles with some key findings of a recent literature review on climate change communication (Nerlich et al, 2010). The review points out that, "thinking about how climate change is communicated also invites us to consider important questions about how societies work and the kinds of relationship which exist between the various actors in these complex systems" (p.98), and "there is no direct correlation between communication and behavior change. There is no one-size fits all solution. What is needed is a mix of measures of which communication is only one, and it will only work when it is embedded in other approaches which are more directly linked to practical behavior in social life" (p.101). Although Nerlich et al respond more directly to the politics of climate change than do Andrey and Mortsch, neither of these formulations target power relationships in a way that incorporates a recognition that climate change communication has been limited by conflictive and antagonistic interests rooted in a very polarized world and an international political economy and ecology that powerful actors have a stake in preserving.

Within this context, communication about REDD becomes associated with a conflictive framework for communication where content is instrumentally decided on levels far from the localities where the forest resources are placed. In this regard, we should frame the communication problem within social constraints. Moreover communicating REDD rests heavily upon authoritarian and instrumental communication. In fact, this authority and instrumentality finds its sources in the capacity of more powerful actors to manage climate change issues discursively and then to impose that discourse on local people. How many of the forest dependent people that could be involved in a REDD project know about climate change and related concepts as carbon storage and carbon forestry? In this context there exist many attempts to educate local people on REDD issues but it is dubious that this creates a process of communicating climate change that responds to issues of power.

A global land question, political ecology, farming systems and REDD

Along with REDD proposals there exist increasing pressures over land globally which are created by converging dynamic of energy sources scarcity, food production and forest biomass multiple uses. We can frame this reality as a land question that is placed within the structures of a global political ecology. A global political ecology can be considered as the way in which the distribution and the material flow of resources is defined by social power and production-consumption relations within the global economy. And under climate change scenarios those relations organize human-ecosystems relations worldwide. Thus agricultural needs and energy transitions are crucial elements within this global land question. Under this circumstance carbon forestry reflects differentiated

positions regarding ownership and the capacity to impose management regimes over the carbon cycle. An example that illustrates it at its most extreme dimensions comes from New Zealand where an attempt to establish carbon rights resultedin considerable political problems and it finally failed. According to Peskett & Harkin (2007) "in 2002, the Government of new Zealand decided to retain ownership over credits or debits for carbon from plantations on public and private land. This decision, among other market factors, contributed to a significant decline in plantation establishment and also a net reduction in New Zealand's forest production area. The policy was strongly opposed by the forest industry, which argued that landowners should hold the rights to forest carbon in their forests. In 2007 the policy was eventually reversed with credits and associated liabilities devolved to forest owners as part of a new emissions trading scheme. (Peskett and Harkin, 2007). This case would clearly show that "removal of carbon rights from landowners is always likely to prove inflammatory, and that it will be increasingly important for carbon rights to be defined in national regulations" (Cotula and Mayers, 2009).The point here is that similar conflicts can happen in any other country and the economic interests at stake can easily prevail over governmental initiatives.

Besides REDD-market mechanisms imply the imposition of land use and land changes for reasons others than social or environmental justice, because it is precisely the question of poverty what finally defines the local communities targeted with REDD initiatives. Here we can contrast the situation of forest dependent people in developing countries with the situation of forest owners in countries within the European Union. As a matter of fact, climate change and energy transitions are creating a situation in which forest owners declare to be witnessing good prospects in terms of incomes. For example, at the XIII World Forestry Congress, Christer Segersteen, President of the Confederation of European Forest Owners discussed bioenergy developments from the perspective of family forest owners. Noting that over 60% of forests in Europe are owned by families in mostly small-scale holdings, he said the EU's decision to increase renewable energy use to 20% by 2020 from the current 8.5% represents a significant opportunity for forest owners, provided they increase forest production in a sustainable way, balancing forest production and biodiversity" (Available at: http://www.iisd.ca/download/pdf/sd/ymbvol10num18e.pdf). This applies specially to Sweden, where competition for forest biomass between the bioenergy and the pulp sector is already levelling up prices of forest raw material. Though this trend goes against pulp producers, the already long term strategy of moving pulp capacity to Southern countries provides them with a spatial fix to face such competition. On the other hand, for forest dependent people in other parts of the world such opportunities can be blocked by certain REDD schemes. In other words, there is manifestation of unequal exchange implied in market-oriented REDD proposals today.

A crucial link between these issues and farming systems is the following: REDD proposals imply a decision on the future of forests accessed by large number of people living within the margins of their farming systems. Thus important goals of farming system research are challenged by this question and this context. In fact, REDD proposals imply institutions, public goods, markets, and information, factors that are considered exogenous (external) factors which influence the development of farming systems (FAO 2001: 16). In what follows, I will suggest and argue for the communicative potential of agroecology as a farming system alternative that can play an important and decisive role in all this discussion. The focus will be on some Latin American meanings of agroecology.

Politics of climate change and agroecology as a prospect for farming systems

In the Latin American context, agroecology can widely be conceived in the following terms: "Agroecology is an approach to farming that responds to the agronomic inefficiencies and social failures of conventional agriculture. Agroecological principles and practices combine time-proven farming methods, new ecological science, and local farmer knowledge to enhance the yields, sustainability, and social benefits of farming. Agroecology has been applied mainly but not exclusively by small-scale and resource-poor farmers, making their farming more productive, affordable, and reliable". (Cohn et al., 2006). An integration of agroecology in contesting mainstream politics of climate change, and also rejecting REDD as a market-oriented mechanism can be found in

the declaration of a number of social movement and NGOs gathered in Brazil before the COP 15. A part of the declaration states as follows: "For Brazil, international climate negotiations should not be focused on discussing REDD and other market-based mechanisms, but rather on the transition to a new production, distribution and consumption model based on agroecology, on a solidarity-based economic approach, and on a diversified and decentralized energy matrix capable of ensuring food security and sovereignty. The main challenge for addressing deforestation in the Amazon and in other biomes in Brazil lies in solving the serious land ownership problems facing the country, which are at the roots of its socio-environmental conflicts. Deforestation - resulting from the advance of monoculture and of policies that favour agribusiness and a development model based on the predatory exploitation and export of natural resources - can only be avoided if the land issue is appropriately addressed through a Land Reform and sustainable territorial reorganization measures, and if territories occupied by traditional peoples and communities and by native peoples are legally recognized." (Available at: http://www.attac.org/en/groups/copenhagen-2009/redds-market-mechanisms-rejected-brazilian-social-movements).

The declaration of social movements in Brazil highlights precisely the kind of factors we are missing in the REDD literature. First a focus on real world politics of climate change taking place on the ground. Second the very nature of conflicts for land. And third the positioning of deforestation in the middle of multilevel social struggles: in the case of Brazil at the level of relations between peasants and landowners and involving the inherently conflictive relations between a more developed world and a less developed world, where the former can in the context of climate change continue attempting to impose the flows of resources and patters of development. In this context agroecology contests mainstream agricultural policies and becomes an oppositional alternative not because of its own characteristics but because it clashes with other farming alternatives producing social power in order to keep their hegemonies in the organization of agriculture. It is important to notice that the appeal of this declaration goes in line with a global-local movement based on the current agrarian question and the positioning of peasants and small farmers in it (See Wittman, 2009). A similar positioning has been developed in southern Chile, where the efforts to develop agroecology practices confronts large scale industrial agricultural and forestry development for export. Even when experiences in agroecology farms demonstrate that the so-called land that is "preferentially apt for forestry development" can become a highly productive land in terms of food production, the fact is that large scale forestry developments have far more support from the state. The appropriation of climate change arguments to develop agroecology is an ongoing process in Southern Chile. The experience of the "V national meeting/seminar of organizations for the agroecology" in 2010, which had as theme "agroecology as a sustainable method for peasant's production within climate change scenarios" (http://jornadaagroecologia.wordpress.com/cepa/) shows how climate change is incorporated into the politics of agroecology.

From the point of view of communicating climate change, the meeting mixed the attempt to develop agroecology and the concern about how to oppose the hegemonic models of both agro-industries and industrial forestry together with a concern on climate change. Among the activities during the meeting, a visit to an agroecology-organized farm put students, peasants, farmers and "experts" in touch with a concrete demonstration of the potential of agroecology. Several peasants attended the meeting and started to see the potential of agroecolgy from a new perspective (pers. Observation during fieldwork in Chile 2009-2010). However, and analyzing the potential of agroecology from a political point of view, the question of conflicts for land became apparent. As agroecological developments need to protect land and if possible increase the land under agroecological practices, such developments compete with the expansion of forestry and agro-industry. That competition takes place at different levels: from the conscious and knowledge of peasants and small scale farmers and their decisions on land uses to professional advisers working within municipalities and engaging on the politics of agroecology (pers. Observation during fieldwork in Chile 2009-2010). Within this context the question of REDD has the potential of adding another point of struggle in the Chilean countryside. In fact, Chilean governments have firmly engaged with REDD proposals and carbon markets. This means that the arrival of REDD projects to Chile can potentially imply new barriers for the development of agroecology in parts of Southern Chile. In fact there exist carbon credits projects

in Chile that are based on tree plantations reinforcing the model of large scale industrial forestry. These and other carbon credits projects are associated with negative consequences on environments, local communities and workers (Alarcon 2009).

The previous examples illustrate how communication about climate change may be framed through linking agroecology as a farming system alternative for peasants and small farmers in South America. The meaning of agroecology is explicitly politicized within the Latin American context where it is defined by small scale farmers and peasants along with the work on agroecology developed by NGOs and other associations working in rural areas. In this regard, the work of Miguel Altieri is an important source of information. Altieri elaborates an approach to agroecology that is articulated through the following ideas: "In the search to reinstate more ecological rationale into agricultural production, scientists and developers have disregarded a key point in the development of a more self-sufficient and sustaining agriculture: a deep understanding of the nature of agroecosystems and the principles by which they function. Given this limitation, agroecology has emerged as the discipline that provides the basic ecological principles for how to study, design and manage agroecosystems that are both productive and natural resource conserving, and that are also culturally sensitive, socially just and economically viable (Altieri 1995). Altieri concludes that "Agroecology provides guidelines to develop diversified agroecosystems that take advantage of the effects of the integration of plant and animal biodiversity, such integration enhances complex interactions and synergisms and optimizes ecosystem functions and processes, such as biotic regulation of harmful organisms, nutrient recycling, and biomass production and accumulation, thus allowing agroecosystems to sponsor their own functioning. The end result of agroecological design is improved economic and ecological sustainability of the agroecosystem, with the proposed management systems specifically in tune with the local resource base and operational framework of existing environmental and socioeconomic conditions. In an agroecological strategy, management components are directed to highlight the conservation and enhancement of local agricultural resources (germ plasm, soil, beneficial fauna, plant biodiversity, etc.) by emphasizing a development methodology that encourages farmer participation, use of traditional knowledge, and adaptation of farm enterprises that fit local needs and socioeconomic and biophysical conditions". (http://www.cnr.berkeley.edu/~agroeco3/principles_and_strategies.html). Altieri visualizes political dimensions of agroecology in the following terms: "Rural social movements understand that dismantling the industrial agrifood complex and restoring local food systems must be accompanied by the construction of agroecological alternatives that suit the needs of small-scale producers and the low-income non-farming population, and that oppose corporate control over production and consumption. Given the urgency of the problems affecting agriculture, coalitions that can rapidly foster sustainable agriculture among farmers, civil society organizations (including consumers), as well as relevant and committed research organizations are needed. Moving toward a more socially just, economically viable, and environmentally sound agriculture will be the result of the coordinated action of emerging social movements in the rural sector in alliance with civil society organizations that are committed to supporting the goals of these farmers' movements. As a result of constant political pressure from organized farmers and others, politicians will, it is hoped, become more responsive to developing policies that will enhance food sovereignty, preserve the natural resource base, and ensure social equity and economic agricultural viability". (Available: http://www.monthlyreview.org/090810altieri.php).

A strategy based on agroecology displaces the emphasis of today's mainstreaming of REDD and direct the attention to other possibilities for livelihoods based on accesses to land. When social movements talk about the question of reaching distribution and consumption models based on agroecology, they are giving basis for a radical transformation of the world. Such a transformation is in line with scientific evidence pointing at the radical need of a great transformation of the current social metabolism, a social global metabolism that mainly favours the life of about 1/3 of global population (Haberl et al. 2009). These authors make the convincing argument that radical social changes are needed to get a path towards sustainability of ecosystems to provide livelihoods to human beings. All this discussion has much to do with communication and communicating climate change. To see this point I propose to critically think on the idea developed by Fischer-Kowalski and

Rotmans (2009) about the role of communication systems in social–ecological transitions. For these authors "[] communication system may be unable to generate adequate responses, responses sufficient to secure society's metabolism: then, processes in the environment, the dynamics of natural systems that society depends upon, will continue to challenge society (such as soil deterioration, climate change, epidemics) until it has changed sufficiently to be able to provide an adequate response, or until it collapses". Such a decisive role attributed to communication systems must be however displayed in conjunction with and approach to social power structures and the struggles to define such structures. In this light the place of mainstream REDD proposals e.g. REDD as imposed market-oriented mechanisms, can be exactly a kind of inadequate social response to climate change.

Concluding remarks

I have argued that mainstream REDD proposals consist mostly of instrumental ways of communicating climate change. One expression of such instrumentality is given by the narrow focus on the forest and the treatment of agricultural development and energy transitions as external sources of trade-offs. The issue at stake here is that we have to recognize the non-neutrality of climate change communication. From a discursive point of view, this implies a dialectical relation between structures and agencies where such communication takes place and discourses are articulated. A focus on the politics of agroecology opens a new framework for communicating climate change since it implies communication about something that can be seen as a way of avoiding graver climate change and as a process of generating new linkages between sustainable agricultural practices, energy use and human development. To link climate change with the potential of the politics of agroecology for farming systems offers both a framework and content for climate change communication that is being developed in concrete spaces of Latin America. This reframing of climate change can have vast consequences for many farming systems in Latin America since a new prospect for agroecology, now as a social response to climate change, can provide the framework through which a new articulation of communicating climate change can achieve political momentum. As always it is a historical possibility that must be politically constructed. Therefore the question of how agroecology can offer an alternative to forest dependent people can be decisive in the development and future of alternative politics of climate change.

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