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Planting Trees for Sustainability? A Climate Justice Perspective on Green Agriculture in Thailand

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Abstract

Tree carbon sequestration offers a potential to address climate justice between the global North and South by tackling unfair inequalities of responsibility, vulnerability and capability. This potential, however, has been tempered by concerns that tree carbon sequestration programs would jeopardize existing social inequalities and provoke tensions and conflicts at the local level. This dilemma arises as the principles of climate justice underlying these sequestration programs encounter the pragmatic demands for justice at the local level. In Thailand, recent years has witnessed new phenomenon of tree planting initiatives to accommodate these local justice concerns. This paper presents a multi-sited ethnography of climate-related inequalities surrounding the tree planting schemes from multiple perspectives. This ethnographic research reveals that the schemes have not only failed to address existing inequalities, but also led to new types of inequalities in the distribution of costs and benefits pertaining to climate change adaptation and mitigation. These inequalities have been neutralized or legitimized through the conceptualization and institutionalization of multiple notions of justice in the tree planting schemes. This finding signifies both intellectual and political urgency in the development of a situated theory of justice and its practical application to address climate-related inequalities at the local level.

Introduction

Although climate change does not discriminate among social class or economic status, it can aggravate existing inequalities between developed and developing countries, as well as within each country. It becomes clear that the impacts of climate change will disproportionately burden developing countries, and especially poor farmers in the rural area. Farmers are highly exposed and sensitive to the effects of climate change, since they have exclusively relied on natural resources for agricultural production (Thomas and Twyman 2005). Farmers' vulnerability to risks associated with these changes could exacerbate ongoing social and economic challenges, particularly of those with limited adaptive capacity (Adger et al. 2003). On the other side, these challenges could as well make farmers even more difficult to respond and less resilience to environmental change (Silva et al. 2010).

Existing inequalities have not only opened up new dimensions of vulnerability, but also have given rise to justice concerns over perceived inequalities with regard to the distribution of climate change impacts across nations. These concerns of climate justice have reflected in the United Nations Framework Convention on Climate Change (UNFCCC) that called for nations to "…protect the climate system for the benefit basis of present and future generations of humankind, on the basis of equity and in accordance with their common but differentiated responsibility and respective capabilities (Art. 3.1)." While the language of the treaty endorses equity as a principle, the lack of specificity in its definition has allowed scholars and policy makers to apply different conceptions of justice to advance their competing interests in the negotiation of global climate regimes.

The presence of alternative interpretations of climate justice results in different claims to achieve equity in climate governance (Müller 2001; Klinsky and Dowlatabadi 2009). First and foremost, the argument of historical responsibility states that rich nations should not only compensate the least advantaged nations, but also bear the burden of greenhouse gas emissions reduction (Shue 1999). The interpretation of Rawls' (1971) theory of justice as fairness implies that climate policies should pay attention to the need of the least advantaged (Shukla 1999). Examples of such policies include mechanisms to transfer resources to developing countries, as well as to give developing countries historical rights to pursue an energy-intensive growth. The equal *per capita* emissions approach, on the contrary, follows from the assumption that every person has an equal entitlement to the atmosphere's absorptive capacities (Baer et al. 2000; Helm and Simonis 2001; Moellendorf 2001). In the middle ground is a Rawlsian modification of the equal *per capita* principle (Vanderheiden 2008). This line of argument proposes both equal *per capita* allocation and historical responsibility for 'survival' and 'luxury' emissions respectively. Therefore, a fair distribution from one perspective could end up being unjust from another viewpoint (Starkey 2011). On the one side, global climate change has challenged the conventional wisdom and forged a rethinking of social justice theoretical framework that could capture most of climate-related inequalities (Ikeme 2003; Grasso 2007). Political philosophers, on the other side, have considered the lack of convergence in climate justice principles as perpetuating highly divergent ways of thinking, and have promoted hybrid, particularistic notions of fairness (Parks and Roberts 2010). Attempts to locate a 'perfect' notion of climate justice may exemplify dominant paradigms and unequal power relations in a climate bargain between rich and poor countries.

Added to this theoretical complexity is that several proposals fall on diverse, even conflicting, discourses of equity across global and local scales. This 'composite' notion of justice is increasingly evident in various mitigation schemes in forest and rural sectors of developing countries (Bäckstrand and Lövbrand 2006; Okereke and Dooley 2010). These schemes could range from forest conservation, reforestation, to most recently agroforestation, which is perceived as extra-sectoral causes of forest degradation (Richards 2000). The primary aims of these mitigation projects are generally to promote green economy and/or improved land use decisions among poor people, while enabling high-carbon producers and affluent consumers to offset their greenhouse gas emissions in a less costly manner. These issues are of highly prominent from a climate justice perspective, since they implicate more than one notion of justice across different geographies and scales of governance.

In avoiding theoretical dilemmas of transcendental theories of justice, this paper employs a comparative, consequentialist perspective to addresses questions of justice. The comparative viewpoint focuses on the inclusion of all of the values of the people involved in the context of empirical research in deriving a better, not a perfect, notion of justice (Sen 2010). This paper represents an attempt to develop a grounded theory of climate justice by examining how social actors perceives and responds to factual inequalities as a result of different tree planting projects in the rural area of Thailand. This finding would add local dimensions of climate justice to a wider development of climate justice theories that predominantly concern international inequalities, particularly between the global North and South.

This paper is structured into four parts. The following section sets out a conceptual framework for research into the rising inequality within a developing country. The second section presents some background information of social inequalities and tree planting initiatives in Thailand's agricultural sector. Then it proceeds to describe factual inequalities as well as perceived (in)justice across three case studies. The third part elaborates on the paper's main arguments, based on evidence from the case studies. It explains how climate-related inequalities have developed and persisted locally through the conceptualization and institutionalization of justice. Finally, the forth section of the paper proposes a situated theory of justice and its practical applications to address climate-related inequalities at the local level.

Tree carbon sequestration and rising inequality

Tree carbon sequestration has garnered particular attention in both academic and policy debates for its promises in sequestering carbon with co-benefits to developing countries and the poor. However, existing literature has growingly acknowledged that tree carbon sequestration could produce and reinforce existing inequalities in a rural society. This section pays attention to available literature on these inequalities, and also includes concerns of climate justice that have emerged with several tree sequestration schemes. In the lack of current literature from a local justice perspective, this section will draw on available, relevant research on international justice. The purpose of this literature review is to develop a conceptual framework for aspects of the rising inequalities within a developing country.

Despite a long history of theoretical debates, most tree carbon sequestration programs have mostly been implemented as pilot projects. These pilot tree carbon initiatives in Latin America, Africa and Asia employ varying approaches, including carbon trading

between developed and developing counties through clean development mechanism (CDM), carbon offsets through voluntary carbon markets (VCM), and various forms of payments for ecological services (PES). According to the findings of existing research, these different approaches not only achieve varying degree of success, but different forms of inequalities and conflicts.

Evidence of inequalities arising from tree carbon sequestration is often associated with existing social inequalities at the local level. Empirical research on these pilot projects has also demonstrated that CDM projects could potentially affect social inequalities (Wittman and Caron 2009). Most farmers in rural communities, especially indigenous peoples, may not obtain full benefits derived from carbon property, in the lack of clear and appropriate definition of carbon entitlements (Saunders et al. 2002; Corbera and Brown 2010). Less monetary benefits, high costs of tree planting, and especially huge transaction costs, could render many projects become unsustainable (Lasco et al. 2010).

The success of tree sequestration schemes in the long run does not suggest absence of inequalities, but perceived justice in the distribution of costs and benefits (Sommerville et al. 2010). Key determinants of fairness include ability to sell carbon individually or collectively, selection of trees with benefits beyond carbon income, and practice that corresponds to local livelihood systems (Jindal et al. 2008). Additionally, the perception of justice may derive from local management techniques with high cost effectiveness (Brown et al. 2011) and local empowerment and participation (Wong-Parodi and Ray 2009). Key questions of justice in climate change mitigation include how the emission reduction costs and the reduction incentive benefits should be shared across and within countries in order to achieve both cost effectiveness and equity goals (Cattaneo et al. 2010).

Apart from fundamental ethical issues concerning climate change mitigation, concerns of justice at the local level could relate to their impact burdens and/or assistance benefits. Existing research revealed that people suffer disproportionate damage from climate change not only because of bad geography or management, but also because of their unequal power relations with others in the society (Parks and Roberts 2006). Adaptation itself involves several political processes that could lead to collective actions as well as produce uneven individual outcomes (Adger 2003; Eriksen and Lind 2009). Key justice questions in adaptation include who should be responsible for climate change impacts, how the burden should be shared among the responsible agents, how the assistance should be allocated among the vulnerable and adaptation measures, and what procedures are fair in making decisions on adaptation (Paavola and Adger 2006; Grasso 2010). An effective and just system for climate change adaptation is associated with a high degree of consistency between the principles applied internationally and locally (Harris and Symons 2010).

This paper conceptualizes the rising climate-related inequality into three aspects: i) the distribution of costs associated with adaptation, including compensation and support, ii) the distribution of costs associated with reduction of greenhouse gases, and iii) the distribution of benefits derived from greenhouse gas reduction through various incentive mechanisms. Drawing on comparative case studies of tree carbon schemes, the study will respond to such questions as how local actors perceived inequality and justice differently, and given these various notions of justice, how they reacted to the rising inequalities. This approach allows this study to look at both conceptual and institutional mechanisms through which these inequalities have emerged, operated and persisted at the local level.

Recent ‘tree’ initiatives in Thailand

Throughout the history of Thailand, there are always disparities that exist between the poor and the rich, between rural and urban areas, and structurally, between agriculture and other economic sectors. Although decades of economic growth could continually reduce the poverty rate from 42.2 per cent in 1998 to 8.9 per cent in 2008, inequality measured by the income distribution ratio of the top to the bottom tenths in 2009 is still as high as 22.8 (Office of the National Economic and Social Development Board 2011: 11). During the same time, rural agriculture employs 44.2 per cent of the total population (Department of Agricultural Extension 2009). Additionally, this average income is lower in rural than urban areas, and is especially lowest in the North and Northeastern regions. These income disparities have significantly contributed to other social inequalities, including those related to climate change.

In 2005, agriculture constitutes about 25 per cent of all emissions or 88.8 million metric tons of carbon dioxide equivalent (Office of Natural Resources and Environmental Policy and Planning 2009: 21). This number amounts to one third of total greenhouse gas emissions from power generation and industrial production. Despite such relatively lower contribution, these socially marginal people living on agriculture have disproportionately suffered more from the impacts of climate change. Increased temperatures, droughts, floods, and other severe weather conditions have push these farmers with less adaptive capacity at risk. Additionally, direct support for proper adaptation to climate change is often restricted, partly because Thailand is not listed among least developed countries in the global climate regimes. In the event of natural disasters, these farmers usually obtain minimal compensation from the government for their losses and damages. Nevertheless, given its potential in carbon sequestration, rural agriculture constitutes a potential site for climate change mitigation interventions and poverty reduction, as well as the main source of income and food security (Office of the National Economic and Social Development Board 2011).

In recent years, Thai government, corporations, and grassroots organizations have initiated a number of tree planting projects. These tree planting initiatives emerge as an important movement to address these issues of national climate justice. In these tree planting discourses, trees can both help farmers adapt to climate variations, while providing farmers with potential carbon benefits. However, to local farmers, these trees constitute a means of production to improve their economy and livelihoods, as well as symbolic connections to their land and nature. In Thailand, as well as other Southeast Asian nations, the economy of marginal agriculture also contributed to climate change. Existing research has witnessed gradual conversion of complex agroforests and fallows into intensive monocultures, including annual field crops and tree plantation (Pfund et al. 2011). The choices of monocultures have different implications for carbon loss as well as among farmers. Loss of aboveground carbon from continuous annual cropping is as high as 95 to 99 per cent, while the loss from rubber plantation could range from -10 to 40 per cent depending on how intensive is the plantation management (Bruun et al., 2009, pp. 381 - 383). Recent studies in northern Thailand have found that tree planting has served as a strategy among fortunate farmers in adapting to climate variations (Srang-iam 2011). Less fortunate farmers, on the contrary, have persisted in field cropping that provides them with annual income, because they lack capitals for investment.

The following topics present a multi-sited ethnography of three tree planting projects in rural agriculture of Thailand. Ranging from rubber plantation, agroforestry carbon

offsetting, to tree banking, these projects encourage farmers to plant trees in their farmland through various incentive mechanisms. This ethnographic research gathers information about the tree planting phenomena from multiple perspectives, through direct observation, documentary studies and interview of key informants, including farmers, leaders of community organizations, scientists and officials responsible for implementing the projects. A majority of field visits were carried out in 2011 on two provinces in northern and northeastern Thailand, respectively. This does not include the interview of a variety of key informants in the central Bangkok and the South.

Rubber trees as a carbon economy

The global carbon trading market has allowed several businesses in the industrial sector generate revenues from their greenhouse gas reduction projects. But, many rural farmers whose practice also contributes to greenhouse gas reduction by sinks cannot do so, because they often lack resources, expertise and technology. The idea of promoting rubber cultivation in carbon trading represents a government attempt to redress this disparity in the country's distribution of benefits from greenhouse gas mitigation through CDM. This attempt reflects not only the potential of rubber trees as carbon sequestration, but also the rise of rubber plantation as a new livelihood strategy among small-scale farmers.

Thailand with at least 2,674,000 hectares under rubber cultivation has been the world's largest natural rubber producer since 1992. The rubber economy involves over a million of rubber smallholders in the country. The majority of rubber plantation is still in the South and the East. The production of natural rubber in these traditional rubber growing areas is still far from meeting the demand in the world's market. In response to growing demand and high price for natural rubber, rubber cultivation has expanded in the non-traditional areas of the North and especially the Northeast, despite expectations of falling yields. In North-eastern Thailand, nevertheless, the expansion of rubber cultivation proceeds steadily, but since 2004 occurs at a more rapid pace. Since then, Thai government had largely promoted a total of 320,000 hectares of rubber cultivation in new areas. This government support has allowed smallholders to make investment that previously the exclusive domain of capitalists or large holders. However, the total increase in land under rubber cultivation far outweighs that promoted by the government. This data suggests that such increase is mainly due to investment from rubber capitalists themselves. Under climate variability and declining soil fertility due to repeated cultivation of annual crops, rubber plantation appears the most productive options that supplied a permanent and steady income for rubber holders as well as tapping labour.

Recently in 2010, Thai government has launched another nation-wide rubber plantation project that would cover 128,000 hectares of which as much as 80,000 hectares are specifically allocated for smallholders in the Northeast. This project is implemented by Office of the Rubber Replanting Aid Fund (ORRAF). As its name suggests, ORRAF is primarily responsible for providing existing rubber farmers with support in replanting old rubber holdings, usually with new more productive varieties. As a non-profit state enterprise, ORRAF has mainly drawn on a cess levied on rubber exports to administer and implement rubber replanting schemes. Beginning in 1995, the government has amended the Rubber Replanting Aid Fund Act that enables ORRAF to support new planters by using government budget subventions. Similar to other rubber planting projects in the past 15 years, this current project aims at providing new individual planters with rubber seedlings, fertilizer and technical assistance for up to 2.40 hectares

of land each. After three years of project support, these farmers are expected to bear the remaining cost until the trees come into production, normally for 2 to 4 years. Just in its first year, this project has attracted a tremendous number of new planters to join this rubber planting economy.

Although the recent rubber subsidy project aims at encouraging new rubber planters, several farm households with existing rubber plantation could still get access to rubber subsidies. As reported by an ORRAF official, these farmers could do this by dividing and/or giving land ownership rights to their children, most of which work outside the agricultural sector. Since the project rule realizes them as separate households, there is no wrong to give support to them separately.

In the advent of climate change, planting rubber could serve as a strategy for farmers' adaptation and simultaneously for climate change mitigation, while providing them with multiple economic and social co-benefits. Therefore, ORRAF has proposed the rubber plantation extension program as a CDM project that would allow new rubber smallholders to participate in new economic ventures like planting trees for carbon trading. According to ORRAF's supporting document, rubber is an excellent plant species in sequestering carbon dioxide from atmosphere. More importantly, rubber-based reforestation could be the only possible CDM reforestation program in the agricultural sector. The CDM rubber proposal is also part of their strategic plan to promote environmentally sustainable rubber management, along with measures of reducing chemical uses and increasing agrobiodiversity through a variety of mixed cultivation systems. According to ORRAF, the project would include new planters in the Northeast, who have registered for the support through this extension program. At the first step, ORRAF has sought a potential technical consultant to conduct a project feasibility study, the core of which is to identify plots of land eligible using the approved protocol for Afforestation/Reforestation (A/R) CDM projects.

At the first glance, the feasibility of the proposed CDM-rubber project hinges on several technical considerations. First, ORRAF has intended to develop a small-scale CDM A/R project with less complex methodologies for rubber smallholders. To be eligible as a small-scale A/R project, the project has to restrict its capacity of carbon sinks to less than 16,000 tons of CO_2 per year, or to about 400 – 800 hectares (Seeberg-Elverfeldt, 2010, p. 8). This means less than 10 per cent of new rubber planting areas would be included in the CDM rubber project. Second, the potential CDM sites must not be forested in 1990. Evidence such as aerial photographs and satellite images would be required to demonstrate that rubber cultivation is indeed reforestation. Third, the treatment of project additionality requires that the production of natural rubber, in its complete life cycle, would lead to an additional sink of greenhouse gas emissions. It also needs a proof that the project would not be possible without carbon finance through CDM. The proposal needs to demonstrate i) that there exist opportunity costs that prevent farmers' conversion to rubber, and ii) that the costs are not too high for carbon financing to induce their conversion.

These technical considerations have determined farmers' eligibility that is highly separated from several realities. Given these technical requirements, the project would make a selection of potential CDM sites that minimize the opportunity costs of switching to rubber, but maximizing net carbon sequestration benefits. Differences between pre-existing land use and rubber cultivation therefore matter in the identification of potential sites. Potential sites may exclude lands existing with high

economic values and high carbon sequestration potentials. In reality, the project sites for rubber cultivation are mostly of these characteristics.

The establishment of rubber cultivation in the past has ironically led to degradation of forest areas rather than regenerating them. The current rubber project is not without exception. Forest plots with high carbon sequestration potentials would be among the first to be converted. Normally, each farm household has maintained as part of farmland a forest plot that serves both subsistence and spiritual purposes. Farmers in the project areas have obtained timber and non-timber product such as foods, medicines, firewood from the forests. The old trees in these forests, as farmers believe, also contain spirits which bless and protect their health and property in the event of natural disasters. Field crops with high economic values would be the next. Several farmers reported that they would switch from cassava to rubber, once they obtained government support for rubber planting. Rubber cultivation would allow them to better adapt to climate variations, given that cassava has been increasingly exposed to biotic and non-biotic stresses.

While government rubber extension program have enabled a rubber planting economy for relatively poor farmers, the proposal of claiming carbon credits through this program could marginalize these farmers. Technical considerations have imposed eligibility conditions that could conflict with those in reality. The project's feasibility study, however, has followed several principles and methodologies, including restriction of small-scale CDM A/R project, identification of eligible sites and treatment of additionality. Some technically favorable conditions could potentially exclude many new rubber planters. The new CDM rubber project, even at the feasibility study stage, has created some 'technical' inequalities among new rubber smallholders in the project. More importantly, these new inequalities in the distribution of CDM-derived benefits are legitimated under the CDM A/R protocol.

Agroforest trees as carbon offsets

In February 2011, a network of farmers in Thailand formally received $8707.81 for offsetting 2,048.90 tons of CO_2 from Michigan State University (MSU). This is the first time in the country that carbon offsets could successfully be sold as a commodity. In-Paeng network farmers, whose trees have become commodified in the voluntary carbon market, become renowned for their offsetting service. So do the project developers, Mahasarakham University (MU), National Research Council of Thailand (NRCT) and MSU that is also the buyer. The small-scale carbon offsetting from agroforestry project has started in 1994, as collaboration between NRCT/MU and MSU. The primary aim of this project was to promote carbon offsets from agroforestry systems in developing countries, including Thailand. The project developers had identified In-Paeng network as their local partner, given its extensive farmer network, previous coincide activities, as well as a close personal connection. According to the project developers, the voluntary carbon market has opened up the possibility of retroactive claim for most small-scale farmers to enjoy benefit derived from agroforestry practices.

In-Paeng is a network of farmers in the Northeast of Thailand, established in 1987 during the farm debt crisis. The network has focused on helping each other toward the goal of self-sufficiency economy. The founders of the network had sought to revive a model of indigenous agricultural practice as a solution to the problem. This initiative supported farmers in planting native forest trees within their territories, which could be farmers' sources of food, timber and medicine. The establishment of In-Paeng was intended for distribution of trees seedling among farmers in nearby communities. The

network maintains a hierarchical organization, with the central board of leaders managing its network fund. The network was initially local in the scope, but the success of their activities has extended its scope to regional, encompassing farmers in at least four surrounding provinces in the Northeast.

The first phase of the project involved several meetings and a call for farmer participants. The meetings were aimed at raising farmers' awareness on global climate change, as well as providing knowledge on what causes change of the climate and how farmers could help reduce the impact of climate change. Most farmers understood that they were to sell the air from which they could earn some money. To their perspective, they had better selling it than giving it for free, since their trees would anyhow produce the air. Responses to the call for participants were thus welcome among farmers in the network.

In the next step, the project agents conducted field studies on farmers' plots to identify baselines in order to assess the additionality property. Unlike CDM protocol, the additionality of carbon offsets was primarily based on pre-existing carbon stock. The agents thus measured tree height, circumference, and crown cover in randomized 25m x 30m plots. However, in the second year of the project, the agents began to get stuck with different types of trees, including lack of allometric equations. Due to these obstacles, the project managers decided to look at only one tree species, i.e. teaks, as it was technically feasible. The technical orientation in the design of the project has resulted in focusing on a "fraction" of the agroforestry systems, thereby excluding carbon offsetting potentials from the whole complex systems.

In reality, teak plantation among the In-Paeng network is rare. The introduction of teak to northeastern Thailand started in the early 1990s, under the nation-wide reforestation program. A small number of farmers, mostly large landholders, opted to plant teaks in their underutilized land. Getting to the identification of potential sites was difficult, resulting in a much smaller number of participants than compared to the previous call. Fieldwork to determine carbon baselines was even more problematic and inefficient. A field staff recalled that he had to travel more than 40 km. in order to find only a plot. Moreover, it seems that teaks grown in the Northeast region could grow at a slow pace. As approaching their 15^{th} year, most teak trees were still too small to sell. Compared to those of the same age in the North region, several farmers could be able to sell teaks as timber. After all, the project included 52 participants in the In-Paeng network, resulting in a total of 96.46 hectares.

Given low carbon price and high market fees, the project manager decided not to enter the Chicago Carbon Exchange (CCX) market. After a year of entering the online marketplace, the project was still unable to obtain potential buyers. Fortunately, MSU had decided to use its institutional funds to buy offsets from farmers in the In-Paeng network, through MU as a broker institution. The amount of grant was then calculated backward to the price of carbon offsets for the 2010 – 2011 years. This made the offset price $4.25 more attractive than $0.50 at the time. Of the money, 10 per cent was deducted to MU and further 20 per cent to the In-Paeng network fund. Therefore, money obtained from carbon sale, after transaction cost deductions, is much lower than the actual opportunity cost. Annually, a farmer would earn a net profit of at least $200 per hectare if he chose to utilize this parcel of land for cassava, compared to carbon revenues of $45.14 per hectare. In fact, some farmers had already had their teaks cut as they converted to rubber plantation, which could generate high annual income.

Although the carbon offset scheme has failed to provide a monetary incentive to farmers for tree conservation, it was farmers' own determination to maintain these trees on their land, for at least two reasons. First, farmers regarded this benefit as "free money", with minimal investment. When they first planted teaks, they received support from government and did not expect to receive this money in addition to timber sale. Second, these trees were still insufficiently large for timber sale. Earning some money while waiting 15 years for teaks to grow may not too bad. To these farmers, the transactions, regardless of how less the money is, were just. Even some have expressed full of pride that they could help mitigate the world's crisis.

However, this contract was considered unfair to some In-Paeng network leaders. According to a leader, many farmers did not notice that the contract required them to maintain the trees for 15 years, while getting only 2 years worth of carbon offsets. But, they did not want to negotiate. He also mentioned other cases where farmers are often the losers and forced to accept whatsoever already provided to them. In the other perspective, the project brokers also expressed their obligation to seek funds to cover the rest of unpaid years. Realizing that MSU may not be able to purchase carbon offsets for the whole contract period, they have sought potential corporations to bear the burden. This task may not be easy. A project manager has mentioned that Thai airways opted to purchase carbon offsets from aboard because the offsets are verified from "credible" foreign institutions.

The rise of voluntary carbon offset service in rural Thailand reflects a struggle to obtain benefit sharing from farmers' ecological services that are excluded by the bureaucratic carbon trading through CDM. While the flexibility of these voluntary systems has opened up a space for benefiting from existing farmers' practice, it has established a new type of social relationship that has resulted in inequalities among buyers, brokers and sellers of carbon offsets. Though enabling the brokers to successfully make the project feasible to the market, the relaxation of additionality criteria itself has rendered the credibility problem to the brokers in attracting buyers to buy the offsets. Yet, the established relationships among brokers and sellers have potentially reduced perceived monetary benefits to farmers. As a result, such benefits could not compensate with costs that are accrued to farmers. However, farmers' perception of additional benefits, together with their inattention to tree planting costs, has encouraged farmers to regard the rising inequalities as just.

Timber trees as a 'standing' capital

Standing living trees could be realized by tree banks as a capital that has immediate monetary values. These tree banks are part of the tree banking initiative, the very first PES scheme in Thailand to encourage farmers to plant trees in their own land. The idea of tree banking was first established among community leaders in southern Thailand since 2006, and once got into the national agenda—"Plant Trees, Pay Debt"—of two former Prime Ministers. But as of 2011, the status of the project is just provisional. Failing to obtain government support, the leaders has decided to support 984 potential branches of tree banks as a pilot project, as securing limited financial support from corporations in the country. In parallel, a different line of tree banking scheme emerges as a corporate social responsibility (CSR) initiative.

The tree banking initiative proposes that government acknowledges monetary values of standing trees as a type of capital. In this scheme, farmers can either use trees as security for low-interest loans or deposit them into high-interest savings accounts at tree banks. In the latter case, farmers could earn interests based on their trees' values. The

monetary values of trees, however, could derive from either accumulated costs or anticipated benefits, depending on the age of trees. During the first to tenth year that most trees cannot be sold, the values of trees are equal to the approximate sum of investments incurred in planting trees. But after ten years, tree values could be determined by timber market prices. According to the tree banking proposal, government would never reimburse the full monetary values of trees, but only subsidize the interest payments. Every farmer is entitled for up to 1,000 trees. The initiative is to provide financial incentives that encourage farmers to plant and keep trees on their farmlands. While several reforestation projects have failed in terms of tree survival rate, government would redirect the budget to support this initiative that could ensure the survival of trees.

The organization of the tree bank network is hierarchical, including at the top, the head office, the provincial office, and all other bank branches at the community level. The head office and the provincial offices are composed of few leaders and thinkers responsible for policy making. The implementation of the tree banking scheme occurs in two steps. The first step focusing on raising farmers' awareness of tree planting is literarily called "planting trees in farmers' heart". In this stage, the head office organized a community forum discussing multiple co-benefits of tree planting, for instance, a stock of construction materials, an assurance against crop failure, and long-term savings for their children. The second step is the establishment of provincial office and tree bank branches as part of the project network. Each branch of tree bank comprises at least 50 initial members of which a working committee of 9 – 15 members operates the bank. This working committee usually set up among community leaders is responsible for all bank operations, ranging from promoting, registering, reporting, and monitoring all registered trees.

The tree banking initiative places an importance on the values of agro-biodiversity in tree planting. In order to reflect this value, the head office allows each provincial office to identify a list of eligible types of trees that can be deposited. Ideally, the list would include indigenous timber species in the areas and exclude most of highly commercial species, such as fruit and rubber. This suggests that the project intends not to provide incentives for business-as-usual production. However, the modification of this list is at the discretion of the regional office. In fact, the provincial office has already decided to add some commercial species to the list, as many members have requested.

Unlike other PES schemes, the institutionalization of tree banking project has not included technical components, such as calculation of carbon sequestration and values of other ecological services. For one thing, this is because this project emerges from grassroots community organizations. For another, this means farmers themselves could carry out the tree banking project, without reliance on technical experts. This exclusion of the technical aspect has, on the one side, led the project to derive credentials from community self-governance. But as these pilot tree banks were implemented, this may not be the case. Activities to promote new tree planting, such as provision of cheap seedlings, are hardly possible without financial support. Although some branches have collected one-time fees from members, these fees could hardly cover even normal operation costs. In reality, farmers have born most of the operating costs themselves. As farmers indicated, the owners of trees have done most of registration works, including counting, measuring, and reporting trees individually. On the other side, lack of technical credentials has established a unique social relation between the community and corporations.

As a project leader revealed, several corporations have opted to sponsor tree banks with some characteristics relevant to their environmentally damaging behaviors. For example, Nestlé choose to support branches that plant trees within the coffee agroforestry system, in order to show their customers that the company has enhanced rather than destroy agrobiodiversity in coffee plantation. Similarly, Electricity Generating Authority of Thailand (EGAT) would sponsor only tree banks in power plant locations.

Tree banking has also emerged as a CSR project. In 2009, Bank for Agriculture and Agricultural Co-operatives (BAAC), a profitable state enterprise with an extensive network in rural area, has officially announced the tree bank project as its CSR initiative. The key function of BAAC is to provide loans at low interest rates to farmers, their associations or agricultural co-operatives. As a CSR project, the BAAC tree banking project departs from the mainstream that it would only recognize trees as security for loans, not as savings. The project aims at establishing 84 branches in celebration of His Majesty the King's 84th birthday anniversary in 2011. Each branch has received as high as 50,000 baht to cover operation costs.

Field visits in two of these potential sites in northern Thailand indicated that the impact of this tree banking scheme on the increase of trees is marginal. Many farmers are reluctant to plant new trees, because they were uncertain about receiving the payments. Farmers have planted new trees along borders and within homegardens, but not with their economic crops. This is because, as farmers reported, planting new trees in-between their annual crop rows could potentially reduce the crop productivity. Most of these new trees are the ones that have high timber values. The selection of tree species has also helped increase farmers' anticipated benefits. Yet, some farmers decided to participate in anticipation of improving the status of their land tenure, after their trees get recognized by the bank. However in the research sites, most farmers have rather enrolled pre-existing trees than new trees. In the North region where teak is common, farmers have registered these trees in large plantation in expectation of future additional revenues. Given the limit in the number of enrolled trees, many farmers reported that they would reserve matured trees that would be cut down in the near future and register only small trees.

The emergence of tree banking scheme represents an attempt to close income disparities between rural farmers and others by recognizing the monetary values of standing trees as another form of farmers' capital. Failing to receive support from government, this tree banking scheme has transformed into a form of corporate social responsibility activities, and simultaneously established a new social relation between farmers and corporations. This unequal relation has reproduced and reinforced new types of inequalities among them. In this new relationship, farmers and the community have born most of tree planting and bank operation expenses in anticipation of future payments. Not to mention that farmers carry additional risk of reduced crop productivity from planting trees. On the other side, corporations pay only an interest portion of mitigation costs, but get full CSR benefit. Evidently, this distribution of these costs and benefits among these social actors is unfair from the climate justice perspective. In the eyes of farmers, however, the tree banking scheme could fairly benefit them in addition to other co-benefits that they learned from the "planting trees in farmers' heart" program.

A climate justice perspective on 'tree' initiatives

The cases of tree planting schemes represent the increasing presence of the "tree" initiatives that reflects, to some extent, unequal relations of power among these social actors in Thailand. In fact, these initiatives have emerged as a struggle in the climate domain to accommodate climate justice concerns at the local level. But the alteration of social relations and structures as a result of the project implementation have instead reinforced and reproduced new types of inequalities related to climate change. These inequalities are evident in terms of distribution of costs and benefits concerning adaptation and mitigation of climate change among social actors. These social actors, however, expressed and reacted to most of these unequal relationships and impacts as just. Unlike other social inequalities, the resulting climate-related inequalities were likely to provide self-validation and were not likely to be prone to conflict.

This finding highlights the key role of justice that itself could facilitate particular types of inequalities in the project processes and outcomes. This section will thus not elaborate on how the new social relations shaped and mediated unequal distributional impacts of climate change, as the previous section and other studies have already suggested. Instead, it moves from investigating these inequalities to discussing claims of climate justice imposed by social actors on these rising inequalities. Specifically, this section looks at the conceptualization and institutionalization of climate justice at the local level as possible causal mechanisms underlying these inequalities.

Fair allocation of costs and benefits could mean differently to social actors. In all case studies, these social actors hold different perceptions of fairness, given different positions that each occupied in the system. Government, project developers, corporations and farmers possess their own conceptions of justice, as reflected in how they express or react on tree planting projects. Government and project developers see the distribution of unequal treatment as a just means to compensate for, if not reward, pre-existing inequalities. This notion of justice corresponds to Rawls' theory of "justice as fairness" that gives particular attention to the need of the least advantaged. Since poor farmers have been marginalized in the carbon market, the tree planting projects have provided financial and/or technical support specifically to them. This support would enable poor farmers to benefit the same from carbon trading as rich corporations do. With this justice conceptualization, government is likely to prevent farmer-capitalists from exploiting the schemes, for example, by imposing the upper limit to which each individual can obtain the support. On the contrary, this conception of fairness still holds, even though some farm households have trickily manipulated the rules to get more than others.

For corporations that are usually regarded as the polluters, climate justice is largely associated with the notion of fair responsibility. This notion suggests that unequal compensation may be acceptable, if it corresponds to the costs of damage. In the timber tree case, large corporations opt to selectively support communities whose problems can be traced back to their environmentally damaging behaviors. Nevertheless, the compensation does not necessarily match the costs of damage, but refer to the actual costs of climate change mitigation. In this case, the amount of payments for tree services reflects farmers' direct opportunity costs for planting or maintaining instead of cutting down the trees. Depending on the age of trees, calculated payments are proportional either to accumulated tree planting expenses or to increased timber market prices.

Farmers, on the other side, take the narrower notion of justice as equal opportunity for project participation. Attention to project participation suggests that farmers value equity over means to achieve benefits, rather than the benefits themselves. Farmers' notion of fair procedure, however, stands in contrast with global climate justice that mainly concerns the redistribution of environmental goods and services between farmers and the polluters. In this case, farmers have differentiated only among themselves in the same community, rather than between the farmer community and other communities. Additionally, farmers have attended to particular types of inequalities, while excluding other inequalities that rise from tree planting schemes. Across case studies, farmers express less concern over disproportionate costs that they bear than over project benefits. These costs also apply both to the case of climate change mitigation and to compensation and adaptation. Yet, while farmers are quite inattentive to the cost side, they believe that they fairly benefit from the tree planting schemes, even though the real costs they burden far outweigh the project benefits.

The case studies have also revealed the construction of rules and procedures in the tree planting schemes to embrace multiple concerns of justice among social actors. This institutionalization of these notions of justice is necessary to the stability and continuity of the rising inequalities. The modification of specific rules has primarily aimed at accommodating local concerns of justice. For example, the projects have included trees that exist prior to project implementation and added highly profitable trees to the list of eligible trees. In the timber tree case, the tree bank head office has relaxed the tenure requirements of land on which trees can grow. This change of project rules thus allows all farmers in the community to claim and secure ownership of trees as separated from land. Similarly, changes in tree monitoring systems and commitment to payments in carbon contracts have met with the requirements of corporations.

Additionally, this process of institutionalization has enforced and facilitated acceptance of unfair inequalities. Not all inequalities arising from tree planting schemes have been neutralized through the conceptualization and institutionalization of justice claims. As the cases show, some farmers, among community leaders, also perceive injustice in the project's redistribution processes. These expressions of injustice is however restricted among farmers and remains silent to outsiders. For instance, there is perceived injustice among farmers regarding long commitment in return for small payments. Some farmers remain dubious about high deductions of their carbon revenues. Some also express discontent with their lack of power to make decision on and negotiate the prices or the duration of tree services. In many cases, the project institutions have minimized and even neutralized the perception of these unjust inequalities. Several technical requirements in formal and voluntary carbon markets could perform as legitimizing mechanisms themselves, as shown in the first two case studies. Some procedural requirements necessitate the inclusion of such expertise in the project, thereby legitimizing benefit sharing between farmers as the real beneficiaries and project mediators. Likewise, government subsidies and moral education programs have let farmers bear smaller costs or realize more of the project co-benefits. However, farmers in some cases attempt to minimize their costs themselves, for instance, by planting trees on unproductive land or selectively registering only trees that may be too small to be used or sold in the timber market.

In explaining the persistence of climate-related inequalities, the paper has elaborated on both conceptual and institutional mechanisms. These mechanisms are evident in the alteration of rules and procedures of tree planting schemes to accommodate multiple concerns of justice at the local level. This phenomenon, which this paper will call

"localization", has recently emerged in Thailand as an attempt to address local justice concerns in the implementation of tree planting schemes. It may occur in the implementation of globalized schemes at the local level elsewhere, particularly in developing countries. But, such a claim requires further empirical research. At this point, the "localization" of climate justice principles has inadvertently contributed to the stability and continuity of unequal relationships within local as well as global governance structure. These unequal relationships have fostered globally unjust inequalities in the face of locally just distributions of wealth, power and responsibility.

Conclusion

Tree carbon sequestration offers a win-win potential for economic development and climate change mitigation through providing incentives for protection of remaining forest resources in the developing world. This potential, however, has been tempered by recent research findings that tree carbon sequestration programs could jeopardize existing social inequalities and provoke tensions and conflicts at the local level. Existing findings have thus raised questions about the principles of climate justice underlying current climate regimes that neglect similar forms of inequalities within a nation and even within a community. In response to these questions, theorists as well as policy advocates from both transcendentalist and consequentialist perspectives have sought to identify a unified theory or principle of justice that would resolve this theoretical dilemma. Indeed, as this paper has pointed out, several social actors have altered these sequestration programs to address these inequalities at the local level. In Thailand, the emergence of various tree plantation schemes in rural agriculture represents an attempt to accommodate local concerns of climate justice. As the cases showed, these attempts have not only failed to address existing social inequalities, but have also given rise to climate-related inequalities. These new inequalities in the distribution of costs and benefits pertaining to adaptation and mitigation of climate change, however, have been maintained among social actors as just.

In explaining these "just" inequalities, this paper has made two related claims regarding the conceptualization and institutionalization of climate justice at the local level. First, the implementation of tree planting schemes embraces multiple notions of justice across social actors. Government, project developers, corporations, and farmers all have different conceptions of fairness. These conceptions have determined what and how these social actors attend to particular types of inequalities, while neglecting others. Second, the institutionalization of these multiple justice principles is necessary to the stability and continuity of these inequalities. Several cultures and systems of tree planting practices have served as legitimizing sources of inequalities. They have also neutralized some conceptually unjust inequalities within a farm community and among these social actors. These two arguments constitute a recent phenomenon to which this paper referred as "localization" of justice principles.

These findings suggest that attempts to "localize" principles of justice could lead to the reproduction and reinforcement of climate-related inequalities between and among the affluent polluters and the poor victims. While globalization of justice principles could raise potential conflicts at the local level, the localizing approach that results in inequalities without struggle is even worse. To cope with climate-related inequalities across scales, the development of climate justice theories and principles thus requires an alternative approach that addresses global as well as local justice concerns. In theoretical development, this paper proposes a situated theory of climate justice as a

possible option. As demonstrated in this paper, this approach explores the conceptualization of justice from local viewpoints, but may identify or evaluate the operationalization of justice from either global or local justice perspectives. This is comparable to the "bottom-up" approach (Heyward 2007). This proposed option differs from the conventional, either transcendental or consequential, approaches that the locus of justice reasoning is not at the analyst's discretion. A practical implication of the situated theory for climate policies could be glocalization, generally a proposed solution to mediate between global and local systems. In the context of climate justice, glocalization would ensure that the distribution within the globalized, cosmopolitan society would be just and that local practices and beliefs would be respected. An example of concrete policy includes broadening, instead of narrowing, local conceptions and institutions of climate justice to encompass global climate-related inequalities between rich polluters and poor victims.

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