CHAPTER 10

The socio-cultural benefits of emerging market-based instruments for carbon in Timor-Leste

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Abstract

Climate change mitigation and adaptation are pressing societal challenges necessitating new approaches to the management and governance of nature-society relations. Market-based instruments under the ecosystem services framework have emerged as innovations in conservation policy and practice. Yet the ways in which these neoliberal projects intersect with, build on or disrupt a range of other diverse economic projects and logics are underexplored. This chapter examines the entangled market and non-market interactions and values of a reforestation program in the Matebian mountain range of the Baucau Municipality, a project financed by a voluntary carbon offset program. It highlights the opportunities and tensions faced by farmers and their extended kin networks in relation to the carbon values of their fields and forests.

Keywords: Carbon offsets; community forestry; ecosystem services; markets; customary governance

Climate change mitigation and adaptation, biodiversity conservation and water management are pressing societal challenges necessitating new approaches to the management and governance of nature-society relations. Market-based instruments under the ecosystem services framework have emerged as innovations in conservation policy and practice. Yet the ways in which these neoliberal projects intersect with, build on or disrupt a range of other diverse economic projects and logics are underexplored. Through a brief engagement with selected literature and preliminary empirical work, this paper begins the task of examining the entangled market and non-market interactions and values of a reforestation program in the Matebian mountain range of the Baucau Municipality, a project financed by a voluntary carbon offset program (WithOneSeed/CarbonSocial). Program documentation asserts that it provides viable and environmentally sustainable livelihoods by restoring watershed services, enhancing farm productivity, improving access to cultural resources, and contributing to more diversified local economic markets, skills and participation.[1] The long-term objective is to leverage the ongoing sale

of the country's carbon offsets and ultimately assist Timor-Leste in becoming carbon neutral. In this paper we inquire into the ways in which the CarbonSocial reafforestation program is framed and understood locally, as well as the ways in which it may or may not be intersecting with localised processes of customary environmental governance.

The paper is part of a broader comparative project which is studying the diverse social relations bound up in the production of two emerging 'commodities', namely carbon and water (Tsing 2013; Bakker and Bridge 2006; Bakker 2009).[2] Drawing on longstanding geographical and anthropological critiques of the conception of markets as apolitical or non-cultural (Appadurai 1988; Gibson-Graham 2006), we are exploring, in an open-ended way, the points of social and political change emerging in new water and carbon commodity contexts, examining the factors driving their generation and any sociocultural benefits. Throughout we are paying particular attention to two factors: how people shape the "commoditisation, and sometimes decommoditisation and recommoditisation, of things" (Langton et al. 2006) and the ways in which, especially across cultural units, "what is apparently transacted or communicated is not necessarily what is received or understood" (Kapferer 1976, 11). As geographers we are particularly attuned to the socio-spatial dynamics that drive global exchanges of carbon credits in voluntary markets, creating spaces through which carbon and their local valuations travel. Our aim is to explore how these differing cultural logics exceed (or not) the influence and rationality of the neoliberal policy measures which are ostensibly enabling these new markets and are, in much of the critical literature, considered to always and inevitably inflict harm on unwilling recipients (Upton 2019) and reinforce the cycle of poverty and environmental degradation. The implications of this coexistence of cultural and economic logics (see Chapters 1, 5, and 8, this volume) for emerging environmental markets in the diverse economic context of contemporary Timor-Leste will then be considered.

Carbon trading: 'cultures of carbon'

Now considered as mainstream climate mitigation options, carbon emissions trading and offsetting have created new forms of exchangeable property which become commodities when traded (Corbera and Martin 2015). According to Corbera and Brown (2010, 1792) carbon becomes a commodity "when property rights over [forest] offsets are defined and the results are economically valuable and tradable through an institutional market-based framework, as well as alienable from its ecological context as a standardized good".

This largely voluntary offsetting market is governed by the private sector and NGOs. Proponents of such projects often advance the claim that they are reducing

poverty as well as carbon emissions. Since 2005, hundreds of companies have employed a range of approaches and practices to source projects, generate carbon credits and sell them (Lovell 2010). Many of these projects fall within the remit of payment for ecosystem services (PES), which is an increasingly dominant global model for environmental policy and management. Ecosystem services include provisioning services such as food, water, timber, and fibre; regulating services that affect climate, floods, disease, wastes, and water quality; cultural services that provide recreational, aesthetic, and spiritual benefits; and supporting services such as soil formation, photosynthesis, and nutrient cycling (MEA 2005, v). Through these PES processes, the 'stock' of nature and its value are comprehensively measured and the services that 'nature' provides to humans are commodified, appropriated and commercialised under the rubric of ecosystem services.

Elsewhere we have analysed these emerging trends toward PES and have argued that it may indeed be better to value instead actual human and non-human interrelations and practices associated with these 'services', especially in the context of indigenous and local peoples (Jackson and Palmer 2015). In this way, we argued, we might usefully reconfigure not the reified 'stock of nature' or things but diverse socio-cultural *relations* between people and nature as the valued 'stock'. Drawing insights from the trajectory of indigenous environmental management experience in Australia and elsewhere we explored how valuing 'nature' may be reconfigured as a way of enabling the valuation of alternative or non-capitalocentric (Gibson-Graham 2006) ways of being in, knowing and doing nature. The challenge of reconfiguration we argued is to think through the ways in which these PES value fields can make visible the significance and worth of communicative reciprocity within and across human and non-human realms (Jackson et al. 2017). In understanding the value of ecosystem services in this way, we prioritised attention to the efforts of indigenous groups and others to preserve, extend, adapt and benefit their lifeways in rapidly changing global and local contexts. By opening up spaces to explore the pragmatic possibilities emerging from this now dominant form of environmental governance, we resisted the urge to only see the conceptual alienation of relationships between humans and nature through these processes. We also highlighted the ways the 'local' is always actively engaged in creating the 'global' (Nielson and Serjesen 2013; Head and Gibson 2012).

In a subsequent paper focussed on carbon, carbon offset trading and what we termed 'carbon cultures' (Jackson et al. 2017), we further argued that "[c]limate change and the associated need to decarbonise poses not just risks to cultures but potential opportunities for cultural experimentation, renewal and economic dynamism [… and that for indigenous peoples this often involves] a very distinct conceptualization of payment for ecosystem services, one that values the labour and reciprocal relationships and logic of care required to abate or sequester carbon" (2017, 878).

In their attempts to carry out a diverse range of often novel carbon projects, we argued that indigenous and local peoples, their advocates, policy-makers and NGOs in Australia are exploring and discursively shaping both carbon policy initiatives and private willingness to pay for indigenous carbon abatement and sequestration schemes. We argued that such 'carbon work', including the work done to define, promote and market carbon products and attendant services, also acts to reconfigure relations between people and nature. Rather than alienating and abstracting human-nature relations, this reconfiguration we argued might also enable a cross-scalar deepening of relations imbuing the local with the global as well as vice versa. For this reason, we suggested that such emerging 'cultures of carbon' might be considered for their potential to enrich human life including people's place-based connections to 'nature' and each other. These arguments are supported by similar research carried out in indigenous contexts elsewhere (Shapiro-Gaza 2013; Osborne 2015; see more recently Shapiro-Garza et al. 2019; Upton 2019).

At the same time, we reviewed the torrent of academic and popular criticism against offsets, including global schemes such as REDD+ (Reduced Emissions Through Avoided Deforestation and Forest Degradation) (see Roth and Dressler 2012; Fletcher et al. 2016). We stated that:

> "[a] body of literature on the process of carbon commodification has developed in parallel with interventions from transnational activists and civil society organizations […] A key conclusion from this critical literature is that carbon offsetting is implicated in commodification and financialisation processes that in places dispossess and de-territorialises vulnerable groups from carbon rights and/or land resource (by producing a standard fungible commodity that infuses spaces of carbon in the global South with flows of capital) (Corbera and Martin 2015; Wang and Corson 2015)" (Jackson et al. 2017, 4).

Alongside this critique, we noted that other scholars of market-based conservation have shown how social movements and local communities have (sometimes) been able to beneficially "hybridise" the market-based ideal type of payments for ecosystem services, including carbon mitigation (Shapiro-Garza 2013, 5; Singh 2015; Jackson and Palmer 2015; Diaz et al. 2018). We argued that incorporating community perspectives and investigating the potential for qualitative data found in narrative accounts to contribute to carbon offset monitoring, evaluation and verification functions is essential to a more nuanced understanding of the emerging nature-society relationships. It contributes to a more rounded understanding of the wider processes enrolled in and shaping the commodification. These often expansive and locally generated qualitative accounts, or 'back stories', are, we argued, also often attractive to those investors interested in supporting and potentially sustaining the socio-cultural benefits associated with particular forms of carbon offsetting (Jackson et al. 2017).

In the remainder of this paper we seek, in a preliminary way, to build on this alternate body of scholarship and provide an initial account of some of the (potential) socio-cultural benefits associated with carbon commodification and governance in Timor-Leste. Our aim here, as before (Jackson and Palmer 2015; Jackson et al. 2017), is not to refute the critique of these neoliberal processes, but to begin an alternate reading, which, while acknowledging the dangers of (capitalist) domination, reification and alienation (Dunlap and Sullivan 2019), is attuned to alternative possibilities present or latent within capitalist social formations and relations (cf. Gibson-Graham 2012). Inspired by the work of Gibson et al. (2018) we are also attuned to the ways in which practices of caring might be woven through this carbon program, how a diversity of understandings of labour and property might be deployed, and the ways in which these things and relations are being recognised and exchanged as they are continuously brought into being through these new arrangements.

In the following section we provide an overview of the WithOneSeed Program and offer some preliminary thoughts on the way in which the Program is received and construed locally, as well as briefly elaborating on some of the Program's challenges and opportunities. We then turn to an examination of the way a range of customary processes are subtly implicated in the production of carbon offsets under the Program.

WithOneSeed: Program overview

The WithOneSeed carbon offset program involves over 800 small-holder farmers in the Baguia sub-district in the Municipality of Baucau, Timor-Leste. In this region, remote highland forests have been decimated during decades of conflict with Indonesia and through subsequent land clearing activities. The Indonesian military settled permanently in the region around 1978 and, concerned about potential attacks from Timorese resistance forces, ordered the local population to clear the forest. The felled timber was then taken by the Indonesian forces and sold on for use in construction. Since national independence was achieved in 1999, population growth (mainly from an increased post-war birth rate) has led to further forest felling for house construction, swidden gardens and timber sales.

The WithOneSeed Program is asserted to provide viable and environmentally sustainable livelihoods by restoring watershed services (through the establishment of an interconnected mosaic of forests from the mountains to the coast), enhancing farm productivity (e.g., via increased soil fertility and crop yields), improving access to cultural resources and wellbeing (i.e., through the reforestation of particular trees, associated forest products, restoration of the forest canopy and locally significant springs, as well as forest and indigenous knowledge based school educational programs), and contributing to more diversified local economic markets, skills and

Figure 10.1. Baguia forestscape. Image Credit: Lisa Palmer

participation. The latter is to be realised through annual cash benefits accruing to each participating farmer from carbon offset sales, increased local sales of the agricultural surplus resulting from enhanced soil productivity, and associated livelihood initiatives including 13 plant nurseries and a community-based tourism and trekking program.

One of Timor-Leste's most prominent politicians states that "[t]he program is helping to build the local economy, boost education and training, and increase social and economic participation [adding that] while it is a small program today, we aim for its expansion nationwide" (Horta 2018). The Program is Timor-Leste's first (and currently only) Gold Standard certified community forestry program (https://carbonsocial.global).[3] Actors involved in the program include small landholder farmers, NGOs, government and international donors and agencies, consumers of social carbon credits (marketed and sold to a range of Australian and other international corporations and individuals with ethical commitments to the new nation of Timor-Leste) and scientific experts.

Preliminary field research

In May 2018, Palmer made a preliminary visit to Baguia to meet with WithOneSeed program staff. She was hosted during this time by Leopoldina Guterres, a local Baguia woman and the Country Program Director for WithOneSeed. WithOneSeed (Tetum: *Ho Musan Ida*) has been an entity in Baguia since 2010. It was founded by Australian Andrew Mahar representing the xpand Foundation (an Australian based social enterprise funded by philanthropic organisations) who worked to set up the initiative in Baguia in collaboration with Leopoldina and her late husband, Joao. The program now employs eight full-time staff and five assistants. Their work revolves around the management of three main seed nurseries (all propagating with the use of local manures) and the co-ordination of more than 800 farmers who have planted over 150,000 trees. Some of these farmers have had trees in production for nearly 10 years. Each farmer receives 50 cents per year for each tree they have planted (after the tree has survived the first year of planting). Many of these farmers have now planted around 800 trees, some have up to 1200 or more trees. Hence farmers are able to earn around US$600 per year from their tree plantations, a significant sum of money in this region where most farm production is for household consumption. Most will use this money to assist with the long distance educational expenses of their children and grandchildren. The maximum number of trees each farmer can plant under the program is normally 1200 (so as to allow resources to be shared, or 'tree justice' as the Program calls it, allowing new farmers to join). To accommodate early adopter farmers who have already reached plantings of 1200 trees, farmers with 1200 trees may now augment their crop by planting an additional 100 trees per year. A key aim of the Program is to distribute wealth rather than see it concentrated (Andrew Mahar, pers. comm.).

Aside from these restrictions, the number of trees each participating farmer has planted depends on the length of time they have been participating in the

Program and/or on the amount of land they have available for planting. The trees are planted on individually (or family) owned land. Ownership of this land is recognised through customary processes. In common with much of rural Timor-Leste, there are no formal land titles issued by the state for farmland in the Baguia region. Customary landowners formalise an agreement with the Program, receive (for free) their trees and register them as soon as they are planted. The agreement is that the trees must be grown to sequester carbon for 30 years. At the end of this period, tree owners can do as they wish with them. It is hoped that any felling of mature stands at that point will be offset by ongoing plantings.

In 2010 the Program began by focussing exclusively on mahogany (*ai-mahoni*) production (*Swietenia macrophylla* is a naturalised tree in Timor-Leste and international studies had identified that this tree sequesters a high amount of carbon). However, over the years it has become clear that mahogany will not grow well at the higher altitudes in the region and, in 2016, the program diversified the type of trees which can be propagated and included. Additional species currently endorsed are eucalyptus (*ai-bubur*), casuarina (*ai-kakeu*), rosewood (*ai-naa*), sandalwood (*ai-kameli*) and wild almond (*ai-nitas*). Cacao is also now propagated under the program (although for its fruit resources, not for carbon sequestration).

In 2018 the program had sequestered over 40,000 tonnes of carbon and the investor price paid per tonne for carbon offsetting was US$10 (https://carbonsocial.global/about/).[4] In order to explain the rationale behind the global trade in carbon credits, WithOneSeed Program staff have developed their own ways of explaining the idea of payment for carbon offsets to farmers. They frame the Program's external economic rationale and appeal to investors about the need to counter the global problem of *ar foer* (dirty air). These explanations, adapted to people's experiences of the local economy, focus on Baguia forests' potential contribution to decreasing the polluting effects of the smoke from household fires, electricity use, land-use burning, car exhausts and tobacco smoke. While some farmers want to know more about the specific details of the Program (such as the price paid per tonne of carbon sequestered etc), most appear happy with only a basic explanation of the complex Program mechanics. Program staff are now trained in basic GPS (Global Position System) data collection and annually collect data on the area and extent of plantings as well as tree diameters (the latter used as an indicator of the amount of carbon being sequestered by each tree) so as to validate the Program's carbon reductions.

The program has four main objectives:

1. To improve the local environment including increasing the stock and quality of forest, water, and agricultural plants.
2. To diversify the local economy.
3. Education.

4. Collaboration and networking to build beneficial linkages locally, nationally and internationally.

While the promotion of a tree monoculture at the expense of a diversity of food crops is an often expressed concern for similar carbon offsetting initiatives (Spash 2010), in this Timor-Leste case agroforestry diversification is central to the program's grow/eat/buy local initiative. Program staff have identified at least 41 food types which can be planted alongside tree stands, depending on the age and type of trees in the stand. A lot of these food types are no longer cultivated by farmers due to the widespread availability of cheap imported rice and noodles. In the understorey of young mahogany trees, people are encouraged to grow corn and many other of these 41 foods. Even older shady stands of mahogany can also still host a range of food crops. Additional crops planted include turmeric, ginger, sweet potato, kidney beans, wild beans (*lehe*), *kontas*, wild yams, wild banana, and pineapple. Such diversity contrasts markedly with teak plantations (encouraged during Portuguese colonial times) that can only host wild yams. In many cases, farmers elect to plant Program trees around the edges of existing fields.

At least once a year, Program staff gather together at one site with all the local school children from the Baguia region's ten or so schools. They invite the children's parents and elders (most of whom are farmers) to come and talk about the benefits of the forest. Discussion during these gatherings frequently revolves around the medicinal use of forest products (something local farmers know a lot about) and the benefits of forest conservation (a priority for the WithOneSeed program). The latter discussions around forest conservation are an attempt by the NGO to address a perceived local tendency to consider that the 'forest grows itself', that it does not need active cultivation or care (Leopoldina Guterres, pers. comm.).

The Program is also opening up fresh conversations about trees that were once used frequently by local people but which are now no longer widely available. For example, a tree known in the Makassae language as *kokoreli* is favoured by both colonies of wild bees and by local people who prize it for its suitability for coffins. Its moist wood enables the body of the deceased to be embalmed in coffins and laid in the home for the often long periods of time needed for people to gather and negotiate complicated funerary proceedings. This tree is now scarce and the potential for it to be a part of the WithOneSeed program is an idea that at least some people are considering (Abel Guterres, pers. comm.).

Alongside their medicinal and other local uses, trees are quite simply valuable property. Trees which are planted (and hence owned) are frequently gifted by parents to their children as a part of their inheritance (and these rights may or may not be linked to property rights in the land where they are grown). Hence under the Program, farmers value the trees they are planting both for the current

annual payment they receive, and for the economic windfall that will be available to them (or their descendants) once they are harvested. For this reason, farmers often choose to plant their tree stands in areas accessible to vehicles, so that when they are eventually felled the trees can be more easily transported.

Across Timor-Leste, trees are both property and markers of property (and property boundaries). Communally and even individually owned land can be at least partially alienated by tree plantings, and people pay close attention to the tree planting histories and activities on particular lands. While in Baguia all farmers participating in the Program claim ownership of *both* the land and their planted trees, it is important to recognise that these claims are social tenures, recognised through local customary processes and activated in-common with other farmers. Given this localised and socially embedded recognition of tenure (and the social fact that tree plantings can open the path to later claims over land) there was some concern about the implications of outsiders providing trees for the farmers to plant. Indeed, when the Program first began in Baguia, many farmers were concerned that by planting these trees the organisation supplying the trees would become the de facto owners of the trees and so (partially) alienate the landowners from their own land. It was not until a Memorandum of Understanding (MOU) was signed between WithOneSeed and the Timorese Government that these farmers felt secure enough to participate in the program. This MOU was also one way of meeting the Gold Standard international certification process requirement that the Program guarantee the legitimacy of tenure arrangements of all participating tree farmers and secure their free and prior informed consent to participate in the Program. The Program also has a range of agreements with farmers that are based on western legal frameworks. Yet in a context where social tenures and resource management practices are negotiated in-common as always to be determined by social facts and outcomes, the efficacy of these western frameworks for meeting Program objectives is uncertain.

Intersection with customary practices

In this study, we are also interested in the potential for the CarbonSocial and reafforestation program to intersect with the concomitant renewed Timorese focus on cultural and customary environmental governance. In particular, we are interested in the relevance (or not) for the program of a geographically widespread form of ritual resource prohibition known in Tetum as *tara bandu*. These ostensibly similar, but always locally enacted customary practices of ritualised prohibitions, are given their moral force through forms of human communication and negotiation with the ancestral realm. Across the country, this comprises a suite of highly locally contextualised practices that regulate a range of social and environmental

relationships. Since early in the independence era, a resurgence of such customary practices has been linked to community initiatives aimed at controlling natural resource exploitation, enabling and controlling resource access for housing reconstruction and restoring social cohesion (D'Andrea et al. 2003; Carvalho and Correa 2011; Meitzner Yoder 2007; Palmer 2016). As an agglomeration of practices used to regulate place-based *social and environmental* relationships, it is as practice with obvious resonance and relevance to the new environmental and social interactions, as well as local governance processes, which comprise the WithOneSeed initiative.

While susceptible to state and development industry co-option (Meitzner Yoder 2007; McWilliam et al. 2014; Silva 2016), such *tara bandu* like processes also have their own logics. It is our conjecture that such logics are capable of both building on and exceeding the influence and rationality of the neoliberal policy measures being rolled out to enable these new carbon markets. Based on research carried out elsewhere in the country, it is clear that customary communities in Timor-Leste are well aware that they must draw together and pull apart these kinds of often divergent and conflicting logics (Palmer and McWilliam 2019). Over time we hope to explore the intersection of these diverse economic processes in Baguia, drawing out the range of understandings, strategies, disbenefits and benefits with which the various Program participants engage and respond.

In contrast to other major crops (such as rice and corn), there are no rituals required when the trees under the Program are planted, rather they are treated in the same way as crops of other types of commonly grown fruits and vegetables.[5] The oldest trees counted under the Program (all of which are mahogany) are now 10 years old. The trees have been planted under the volition of individual farmers and are grown largely outside of the influence of more communal customary regulation. However, the need for some kind of communal regulation is now a topic of local discussion. There are a number of reasons for this. Within the next five years these older trees will become valuable, fungible timber resources (mahogany is particularly good for furniture), and it is anticipated that farmers may start to feel the urge to monetise the value of these trees and abandon the program. The 50 cents per year per tree offered through the sequestration program will start to seem somewhat less attractive than the windfall available to farmers from a wholesale harvest of the now valuable timber. A further complication for the Program is that mahogany tree stands, although good for co-planting with food crops, are known by farmers to be less fire resistant. As such they are susceptible to escaped burns from nearby swidden fields or even incendiary attacks from jealous passers-by (in contrast to teak which is largely fire resistant). For this reason, some farmers worry about investing in this crop over large areas of land and for long periods.

To address such possible threats to the Program's viability and individual returns, Program staff have initiated community level discussions about ways in which the

Baguia community might work to diversify and protect tree stands and ensure compliance with the agreement to not harvest for 30 years. Discussions have included the idea of fines to dissuade early harvesting and a regime whereby any early harvested trees must be replaced with two new saplings. Other ideas have centred on the reinvigoration of *tara bandu*, the customary domain of ritual resource regulation discussed above. However, the latter is especially complicated. As discussed below, it would involve bringing together and finding common agreement between all the various ritual leaders, village heads and farmers of Baguia's ten villages.

Tara bandu was carried out regularly, and widely upheld, in Baguia in Portuguese times, mainly to protect valuable tree plantations such as teak. It was not done at all in Indonesian times, nor in contrast to other areas of the country has it been done since independence. In contrast to some other areas of Timor-Leste where a large amount of conflict and post-conflict related in-migration has occurred, outside of Baguia township itself there is little dispute over land ownership or issues with people stealing each other's crops and other resources. In these small mountain villages everyone knows one another and the histories and stories which connect people to land and other property. People do carry out their own individual rituals, known in Tetum as *tara horok* (hanging the talisman) to protect particularly valuable fruit trees from the interest of passing foot traffic. Ignoring such ritual signage is a serious misdemeanour, the spiritual repercussions of which can include illness and eventual death. While *tara bandu* is in many ways a community level extension of this individualised *tara horok* practice (see Palmer and McWilliam 2019), a recent *tara bandu* (not specifically related to forest products) in a more distant village has not been successful. This was due, it is said, to the fact that the process was driven by outside actors rather than originating as an idea and process from within the community.

In contrast, in Baguia, the idea of a *tara bandu* like process has been under discussion with Program farmers for four years now. Program staff are adamant that the community needs to have ownership of any process which transpires. This means the conversations and initiatives must start from within the community and include the various ritual and political leaders from each of the 10 villages, along with, eventually, the sub-district head, local clergy and police. Ensuring all these actors are mobilised and working together towards the same goal would take considerable time, economic, social and cultural capital. In addition, each village would need to carry out their own specific *tara bandu* ritual to draw on and respect their own specific ancestral traditions. While, as noted above, in contrast to some other areas of the country, issues of land and resource disputes are not a driving force behind the desire to reinstate communal customary processes, there are other areas of community governance which the community do consider are in urgent need of addressing. These include a high incidence of adultery and divorce, domestic violence, and youth related violence. Any proposal to use *tara bandu* to

ritually protect the tree plantings would need also to address and include these other community concerns.

While background discussions around the efficacy and need for *tara bandu* continue at the Program level, other factors which regulate and enable social tenures and exchanges are already present in the region's quotidian customary economies. When Palmer visited the region in 2018, Leopoldina Guterres took her to several of the tree planting areas in the region. Along with trees, the food crops growing in a given area's fields and in the understorey of its newly emerging canopy was a focus of our attention. As we walked the muddy tracks up and down the valleys, Leopoldina pointed out each food source we came across and explained its use in careful detail. She took great pride in identifying the ones that had slipped out of local diets, but which the Program was working to bring back into dietary 'fashion'. '*Kontas*' a red lily like plant with a long white tuber and which grew seemingly wild, was explained as "something that kept us alive when we were hiding out in the jungle during the early years of the invasion. It is good food. We need to keep using it". During the early years of the Indonesian occupation, Leopoldina who was still a child had sheltered for years in these remote mountain terrains. It was during these terrible years that her family and much of the regional population who had fled to the mountains, learnt how to live from the forest. Even as people were continually on the run from Indonesian guns and encirclement, they also somehow managed to clear and tend to remote forest gardens. Likewise, they learnt to survive by encouraging the more random cultivation of wild tubers and fruits. They learnt too about using the bark of particular trees for clothing and to rely on forest foliage for bedding and shelter. Given the hardships of their new forest lives, they built too on the medicinal knowledge handed down from their forebears. Many became medical specialists, trialling and testing a range of forest medicines on themselves and their families and then spreading these plants and knowledge to others. When it was possible these plants were cultivated, expanding their ecological range through careful, if deliberately opaque, processes of human attention. This knowledge, which kept people alive in desperate circumstances, remains deeply embedded and valued in rural Timorese households into the present (Palmer 2020).

These stories of people's dynamic connections to their forest and each other, resonate with the work in other indigenous contexts. In Northern Brazil, Manuela Carneiro Da Cunha (2012) has documented the ways in which the huge diversity of plants are cultivated and brought into being. Focussing on cassava seedlings and their cultivation as prized objects of gift exchange, Cunha argues that these exchanges are facilitated primarily between women (mothers and their daughters-in-law) in the context of rotational swidden farming. She notes however that these seedlings are also frequently exchanged between more geographically dispersed groups of people as they come together for cultural and religious events. These

exchanges, she argues, are highly dynamic, producing extraordinary biological diversity that is embedded and activated through nuanced cultural and communicative processes involving people, plants and soil. This biodiversity is made visible through the naming practices attached to each new cassava seedling type (in some cases numbering in the hundreds). The pride of the often female cultivators of these cassava types ensures pride and careful attention to the history and necessity of ongoing exchanges. It also encourages constant seedling type innovation.

Likewise, in Baguia it is fruitful to think further about the ways in which food and tree plantings are embedded in histories and exchange networks which activate and enable botanical flourishing, as much as they link as well to people's ideas of property, of sharing and of interconnection. Such intergenerational processes of botanical exchange are discernible in the highland valley farmed by Leopoldina's parents. Leopoldina's father is a farmer and early adopter in the WithOneSeed program. While he and his wife once tended many gardens and rice fields, they now have only two swidden fields active in the valley at any one time. Leo's mother's ill health means she is no longer able to be as active in the fields and the couple's terraced rice fields have been dysfunctional since the 1980s (due to landslides damaging the irrigation canals). These terraces and retired swidden fields have now been turned by Leopoldina's father and brother into sites for various tree plantings (mahogany, casuarina and wild almond). In recent years, Leopoldina's father has been able to make up to US$1000 a year from these trees. He makes another US$1000 a year or so from the local sale of betel leaf and areca nut sourced from his spring groves. He might also make up to US$1000 from the sale of the peanuts which he cultivates in his active swidden fields. He also receives a biannual retirement pension of US$180 from the government which he uses to purchase rice, oil and other basic items. The range of other food crops he grows in his mixed-use fields, foods like pineapple, long beans, cassava and corn, are for his extended family to consume. Indeed, Leo's large household of twenty or so mainly adopted children rely on the weekly harvest of these foodstuffs. The money the old man makes is also a 'bank' for Leo and her other siblings who would otherwise struggle to meet the needs of their households for items such as children's schooling expenses.

Many of Leo's household, including her daughter Enny who is the WithOneSeed Program secretary, trek the long journey from their house to this forested valley each Saturday. They collect the food growing in the fields and in the understorey of the valley's newly planted forest, along with any fallen wood for their cooking fires. Returning home with all they can carry on their backs, these items they collect will be enough to feed their own large household for the week. This kind of embodied knowledge about tree plantings and the possibility for understorey and adjacent crop plantings are then exchanged through Program meetings which bring together households from across the region's 10 remote villages. In this account too, we can

see that women, their knowledge and cultivation of foodstuffs and firewood, are critical to this emerging biodiversity and the carbon it stores.

Conclusion

These emerging entanglements between farmers, their extended kin networks and their fields and forests are clearly an important facet of Baguia's emergent post-conflict local economy. Clearly as well, the market-driven underpinnings of the Program are having effects on both the commons and practices of communing. Many questions arise and need to be investigated further. How are these new practices intersecting with and/or challenging local understandings of communal and private agro-forestry resources? Are these new approaches to tree planting creating the risk of a narrowing of both agricultural practices and the values embedded within these practices? What tensions will emerge between customary land managed in-private, or in-common, as ancestral bequeath? What changes will occur as these new forest resources are increasingly standardised and co-produced with outside actors? We do not yet know the answers to these questions. Below we summarise what we do know.

In Baguia, as well as elsewhere in Timor-Leste, the planting of trees is linked to the establishment and maintenance of property and property rights. The WithOneSeed program encourages farmers to plant trees on their own land and hence affirms and augments their claims to particular areas. As with other tree plantings, these trees are valued primarily for their (always diverse) economic values including the co-production of agro-diversity and wellbeing. Contrary to the critical literature on the dangers of environmental market-based instruments commodifying 'nature' and alienating people from its production, in this setting 'nature' to some extent already has a 'price' (although its value is always contextually determined). In this way, the WithOneSeed program fits within, rather than creates anew, already existing property rights within an existing agro-forestry logic. However, potential problems might arise if the aims of the program (a 30 year sequestration of carbon per tree) contradicts desires on the part of the farmers to benefit more quickly from this 'stock of nature' in other more lucrative ways.

The ways to address this latter issue are as yet unresolved. What is clear is that a fully indigenous regime of *private* property—not common property—in planted trees has provided the basis for a successful reforestation program to date. Farmers may one day be tempted to sell for timber the trees they have planted under the thirty-year reforestation scheme. Whether this should be prevented by coercive means, whether farmers should be provided with new monetary incentives not to do it, or to plant new trees in the place of the ones they fell is a matter still under

discussion. In this suite of discussions, recourse to customary ritual regulations such as *tara bandu* is another possibility to add to the WithOneSeed program response. While post-independence *tara bandu* processes have not been successful in other parts of the Baguia valley, they are successful as a community governance mechanism in some other parts of the country (see Palmer and McWilliam 2019).

Along with a diversity of understandings of labour and property in Baguia, we have glimpsed how a range of practices of care are already woven through this carbon program and the ways in which these things and relations are being exchanged and brought into being.[6] What is being actively reworked in such contexts are the ways in which particular relations between people and nature and between people and people are recognised, enabled and valued. Customary processes repurposed in this way to include the aims of a carbon trading scheme could, as we have seen above, trigger a range of other social and cultural benefits as well as biodiversity exchanges. Program leaders are aware that there is also the potential (un-explored in this chapter) for these additional 'co-benefits' to be recognised in the carbon tonnage price offered to investors/consumers in the voluntary carbon market. These important human-nature social relations and practices of care may well become a valued quality of the carbon credits produced for the global market from Baguia.

People in Timor-Leste are adept at reworking external logics to fit in with their own. In this case, what we can see is that a number of externally derived conceptual frameworks, namely sustainability, poverty reduction, and climate mitigation, are actively infusing local people's concerns and practices. Yet from a preliminary analysis of local framings and understandings of this Program, it is clear that a number of key endogenous principles underpin the ways in which these external frameworks are being reworked. These principles (which are broadly similar across the country) include a commitment to locally instantiated inheritable land and property rights, including those concerning the cultivation of land and planting of trees, and a commitment to intergenerational wellbeing and exchange. The idea of ameliorating *ar foer* (dirty air) and generating Carbon-social credits are simply an added bonus for this already established set of land use practices (one that is also contributing to the diversity of trees/crops being planted). As we have seen above, Program staff are focussed on carrying out GPS data collection of trees stands, tree diameters and sequestration rates. Farmers in Baguia do not necessarily understand the details or the need for this data collection, but they are happy to enable and support this process if this is what is needed to be known and measured, even if the staff show a stronger desire to participate directly in calculation and evaluation exercises.

Planted trees are property with or without the WithOneSeed program. This is a basic fact of life in Timor-Leste—trees are linked to a range of property rights and exchange processes all of which are contextually activated by the histories and stories of who, when and why these trees were planted, and what is known about their use. In the West, where the investors in carbon offsets largely live, people are hungry for stories that, in meaningful ways, link people with place and nature. Stories like the need to reafforest the *kokoreli* 'coffin' tree or the potential for a tree planting program to reinvigorate local diets, medicinal knowledge and customary governance are just the sort of 'back stories' that investors in carbon social credits desire (see Jackson et al. 2017). In Baguia, and Timor-Leste more broadly, where there are so many such stories, the idea that they might be beneficially framed, of interest and capitalised to external others is still taking hold.

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Notes

1 See https://carbonsocial.global/about/ Accessed 9 April 2020.

2 A collaboration with geographers Lesley Head, Noel Castree, Morgan Robertson, and Marie Stenseke.

3 "Gold Standard was established in 2003 by World Wildlife Fund and other international NGOs to ensure projects that reduced carbon emissions featured the highest levels of environmental integrity and also contributed to sustainable development. With the adoption of the Paris Climate Agreement and the Sustainable Development Goals, we launched a best practice standard for climate and sustainable development interventions, Gold Standard for the Global Goals, to maximise impact, creating value for people around the world and the planet we share". See: https://www.goldstandard.org/about-us/vision-and-mission, Website Accessed 9 April, 2020).

4 By October 2021 the *Ho Musan Ida* program in Baguia had increased to 1000 participating farmers, 20 full time staff, four central plant nurseries, 250,000 trees sequestering 106.000tCO_2 with the investor price paid per tonne US$30.

5 As well as the cosmological context in which staples such as rice and corn are grown and exchanged with the ancestral realm, a further reason for the close and often communal ritual attention to planting and harvesting periods is the higher susceptibility of these crops to pests (Palmer 2015).

6 The ways in which these exchanges might be understood relationally by carbon credit consumers is beyond the scope of this chapter.

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