

Recognising Land Rights For Conservation? Tenure Reforms In The Northern Sierra Madre, The Philippines

Jan van der Ploeg^{a,#}, Dante M. Aquino^b, Tessa Minter^c, and Merlijn van Weerd^d

^aWorldFish, Auki, Solomon Islands

^bCollege of Forestry and Environmental Management, Isabela State University, Cabagan, The Philippines

^cInstitute of Cultural Anthropology and Development Sociology, Leiden University, Leiden, The Netherlands

^dMabuwaya Foundation, Cabagan, The Philippines

#Corresponding author. E-mail: j.vanderploeg@cgiar.org

Abstract

The legalisation of the customary land rights of rural communities is currently actively promoted as a strategy for conserving biodiversity. There is, however, little empirical information on the conservation outcomes of these tenure reforms. In this paper, we describe four conservation projects that specifically aimed to formalise land rights in the Philippines, a country widely seen as a model for the devolution of control over natural resources to rural communities. We demonstrate that these legalistic interventions are based on flawed assumptions, on: 1) the capacity of the state to enforce tenure; 2) the characteristics of customary land rights; and 3) the causal links between legal entitlements and sustainable natural resource management. As a result, these state-led tenure reforms actually aggravate tenure insecurity on the ground, and ultimately fail to improve natural resource management.

Keywords: community-based natural resource management, land tenure, biodiversity conservation, tenure reforms, territorialisation, legal surrealism, Philippines

INTRODUCTION

The legalisation of the customary land rights of rural communities is currently actively promoted as a strategy for conserving biodiversity (Stevens 1997; Eaton 2005; Nelson 2010). It is argued that conservation organisations have a moral responsibility to respect the rights and livelihoods of people living in or adjacent to protected areas (Alcorn and Royo 2007; Campese et al. 2009). Besides these ethical concerns, it is claimed that the formalisation of land tenure can also actually improve natural resource management

(Larson et al. 2010a; Sikor and Stahl 2012). The underlying premise is that statutory property rights are a precondition for community-based natural resource management; people are only willing to protect natural resources if their rights to use these resources are recognised and secured by the state (Lynch and Talbott 1995).

This reasoning has stimulated conservation organisations around the world to invest in the legal recognition of the land rights of rural communities. In practice, this takes the form of an agreement between the state and groups of people, which legalises informal user rights and, at the same time, specifies obligations to protect biodiversity (Snelder and Persoon 2005; Borrini-Feyerabend et al. 2007). Non-governmental organisations (NGOs) usually play a facilitating role in these instrumental co-management arrangements. Well-known examples are indigenous reserves in Brazil (Schwartzman and Zimmerman 2005), community-based forestry in Mexico (Johnson and Nelson 2004), wildlife conservancies in southern Africa (Lindsey et al. 2009), and forest restoration in China (Yi et al. 2014).¹

Access this article online

Quick Response Code:



Website:
www.conservationandsociety.org

DOI:
10.4103/0972-4923.186336

However, the causal links between formalising land rights and biodiversity conservation are poorly understood (Walters 2012; Ojanen et al. 2014). The scientific literature on co-management remains highly polarised. On the one hand, there are advocates who idealise local communities as the stewards of the environment; on the other hand, are opponents who, by definition, consider the devolution of control over natural resources as a deviation from the protectionist agenda (Brechtin et al. 2003; Borgerhoff Mulder and Coppolillo 2005). These ideological positions, and the often inconsistent use of terminology, hinder a critical assessment of the effectiveness of interventions that aim to legalise customary land rights in order to protect biodiversity (Robinson et al. 2013).² There is, in fact, little empirical information on the conservation outcomes of such tenure reforms (Ojanen et al. 2014). In this paper, we describe four cases where conservation organisations aimed to protect biodiversity by improving tenure security of people in and around the Northern Sierra Madre Natural Park, the largest protected area of the Philippines.

The Philippines is widely regarded as a model for the recognition of the customary land rights of rural communities (Poffenberger et al. 2006; Larson and Pulhin 2012). The country has implemented several policy reforms that devolve control over natural resources from the state to communities. International donors have subsequently invested substantial amount of money to improve the tenure security of poor farmers and fishers in ecologically valuable areas (Guiang 2004).³ Following a few successful and widely publicised cases, most notably the recognition of the ancestral domains of the Ikalahan in Nueva Vizcaya (Rice and Pindog 2005) and of the Tagbanua in the Calamian Islands (Zingapan and de Vera 1999), most conservation organisations in the archipelago now actively promote the legal recognition of customary land rights of people living in and around protected areas (Bryant 2002; Austin and Eder 2007). On Luzon, for example, Conservation International facilitated the release of tenure instruments to rural communities on the forest frontier (Antolin 2003: 12). On Mindanao, a consortium of environmental NGOs aimed to strengthen the protection of the Mount Kitanglad Range Natural Park by reconciling conflicting land claims (Goldoftas 2006). On Palawan, the Haribon Foundation prepared an application for the legal recognition of indigenous land rights in the Puerto Princesa Subterranean River National Park (Novellino 2000). And on Sibuyan, WWF-Philippines tried to legalise the customary land rights of indigenous people in the Mount Guiting-Guiting Natural Park (Tongson and McShane 2006).

This paper is organised as follows; the next section provides details on the research methodology. The third section, based on a review of the existing scientific and juridical literature, describes the formal institutions that regulate the use of, access to, and control over land in the Philippines. We then present four case studies, based on our fieldwork in the northern Sierra Madre on Luzon, which highlight the fundamental mismatch between *de jure* and *de facto* tenure, or what Vandergeest and

Peluso (1995: 389) called the “lack of fit between abstract space and lived space”.⁴ We argue that ‘state-led’ tenure reforms (Sikor and Müller 2009: 1307) are often based on naïve, and sometimes even erroneous, notions of communal land ownership and rural livelihoods, and tend to underestimate the bureaucratic and political obstacles to tenure reforms. In practice, the Department of Environment and Natural Resources (DENR) and Local Government Units (LGUs), the mandated government agencies for managing natural resources in the Philippines, are incapable to grant and enforce land rights. As a result, efforts to facilitate the legislation of land rights of rural communities often aggravate tenure insecurity, and ultimately fail to improve natural resource management.

METHODOLOGY

This paper is based on longitudinal action research in four sites in the northern Sierra Madre on Luzon (Figure 1). These four sites present a variety of formal tenure arrangements ranging from strict protected public lands to privately-owned lands. What they have in common is the presence of a NGO that aims to facilitate the provision of formal land ownership to local resource users with the explicit objective to conserve biodiversity. In the municipality of San Mariano, the Northern Sierra Madre Natural Park Conservation Project (NSMNP-CP), an integrated conservation and development project implemented by Plan International, assisted farmers to secure government certification of land ownership in the buffer zone of the Northern Sierra Madre Natural Park (section 4.1). The Mabuwaya Foundation, a local environmental organisation dedicated to the protection of the Philippine crocodile in the wild, tried to formalise the land claims of farmers living adjacent to the Philippine crocodile habitat (section 4.2). In the municipality of Divilacan, WWF-Philippines planned to improve park management by harmonising the land use plans of the DENR, the LGU, and individual landowners and users (section 4.3). And in the municipality of Palanan, the Nordic Agency for Development

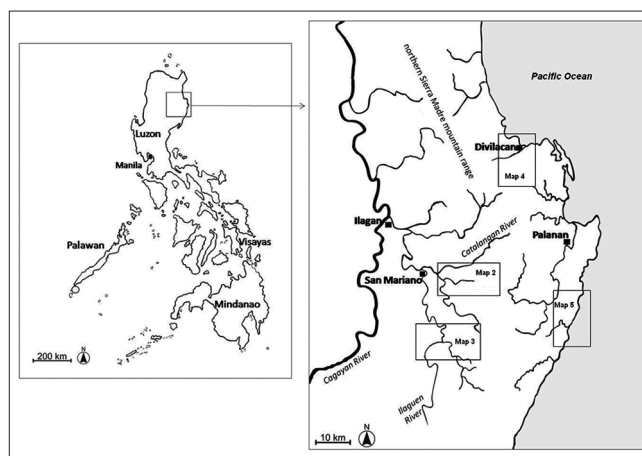


Figure 1
The northern Sierra Madre mountain range on Luzon

and Ecology (NORDECO), a Danish consultancy firm, provided technical assistance to the DENR to proclaim an ancestral domain for the Agta, the indigenous people of the northern Sierra Madre (section 4.4).

We have been involved in several research and conservation projects at these four sites and have made regular field trips since 1999.⁵ This long-term engagement enables us to better understand changes in land tenure and land use over time in these four sites, and to assess the conservation outcomes of project interventions (Sayer and Campbell 2004; Larson et al. 2010b). To understand changes in land use and land tenure, we adapt a ‘causal historical’ analytical lens as advocated by Walters and Vayda (2009: 540). This pragmatic interdisciplinary research method aims to explain human-environment interactions through a process of eliminative inference and logical reasoning from effects to causes. Specific information on land tenure was gathered during semi-structured interviews and informal conversations with DENR staff, local government officials, *barangay* (the smallest administrative unit in the Philippines) leaders and farmers during field trips to Didadungan in March 2006, Divilacan in July 2010, and the Ilaguen and Disulap River Valleys in July 2013 and January 2014. We tried to assure the accuracy and validity of the information obtained in these interviews through triangulation (Stake 2005). We complemented our data with information from the grey literature on the region (NGO project proposals and reports, government plans, and unpublished scientific papers). We obtained official land classification maps from the office of the Protected Area Superintendent of the Northern Sierra Madre Natural Park, and the Municipal Planning and Development Offices of the municipalities of San Mariano, Divilacan, and Palanan. The

community profiles prepared by the NSMNP-CP provided additional secondary information on formal land tenure in the study sites. We compiled all available information and produced sketch maps of four sites to illustrate the fundamental disconnection between *de jure* and *de facto* tenure in the northern Sierra Madre (Figures 2-5).⁶

DE JURE LAND TENURE IN THE PHILIPPINES

In 1521, Ferdinand Magellan claimed all lands in the Philippines for the Spanish Crown. In theory, Spanish law required respect for pre-existing communal property rights; the Spanish colonial government could only claim and distribute land that was not used by the indigenous population (Lynch and Talbott 1995). In practice, however, the feudal principle of the Regalian Doctrine prevailed; namely, that private land ownership could only be granted by the Crown (Pulhin 2002). The doctrine, reaffirmed by the US Congress in 1902, still forms the cornerstone of Philippine land law. The Public Land Act of 1903 specified that only land classified by the state as Alienable and Disposable (A&D) can be privately owned; everything else remains the property of the state.

The management of all supposedly uninhabited, uncultivated, and unclaimed lands became the responsibility of the Insular Bureau of Forestry (Pulhin 2002; Bankoff 2013).⁷ The colonial administrators set up a Torrens system to register private ‘possessions’; but as this procedure was voluntary and involved considerable costs, few people actually applied for these so-called Homestead Patents (McDiarmid 1953: 864). Ever since, the ‘forestland question’ has haunted Philippine policymakers.⁸ It is estimated that more than 25

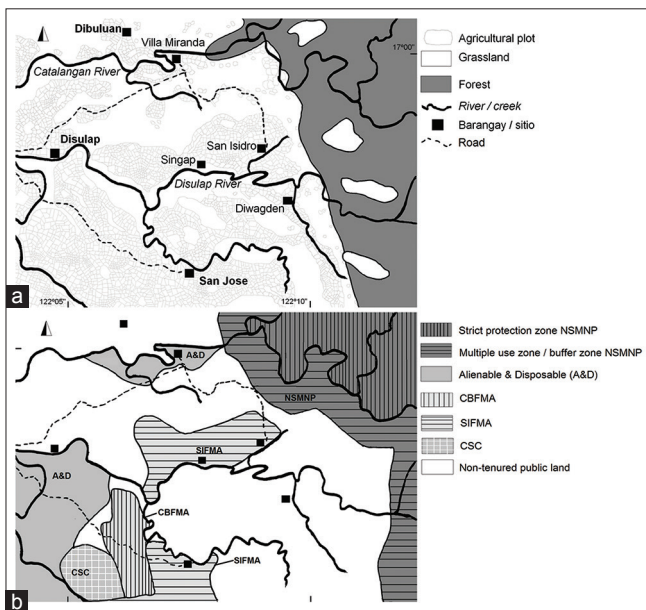


Figure 2

(a) *De facto* land use in the Disulap River Valley (b) *De jure* land classification in the Disulap River Valley

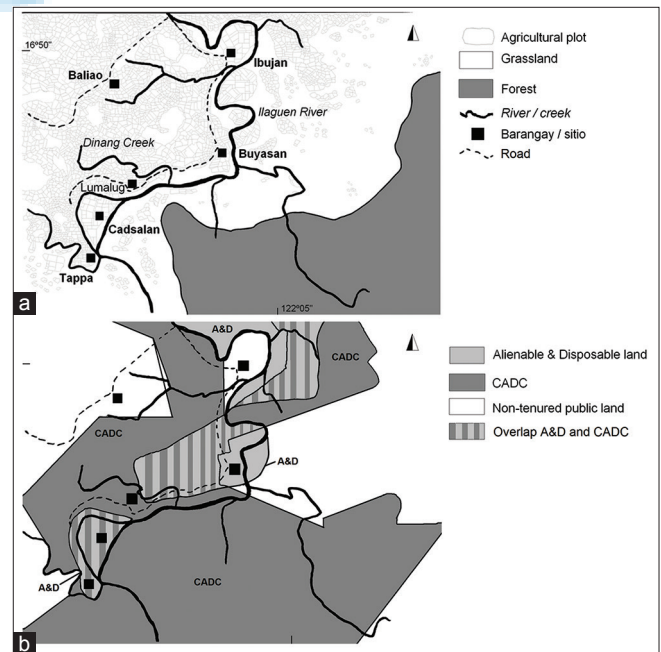


Figure 3

(a) *De facto* land use in the Ilaguen River Valley (b) *De jure* land classification in the Ilaguen River Valley

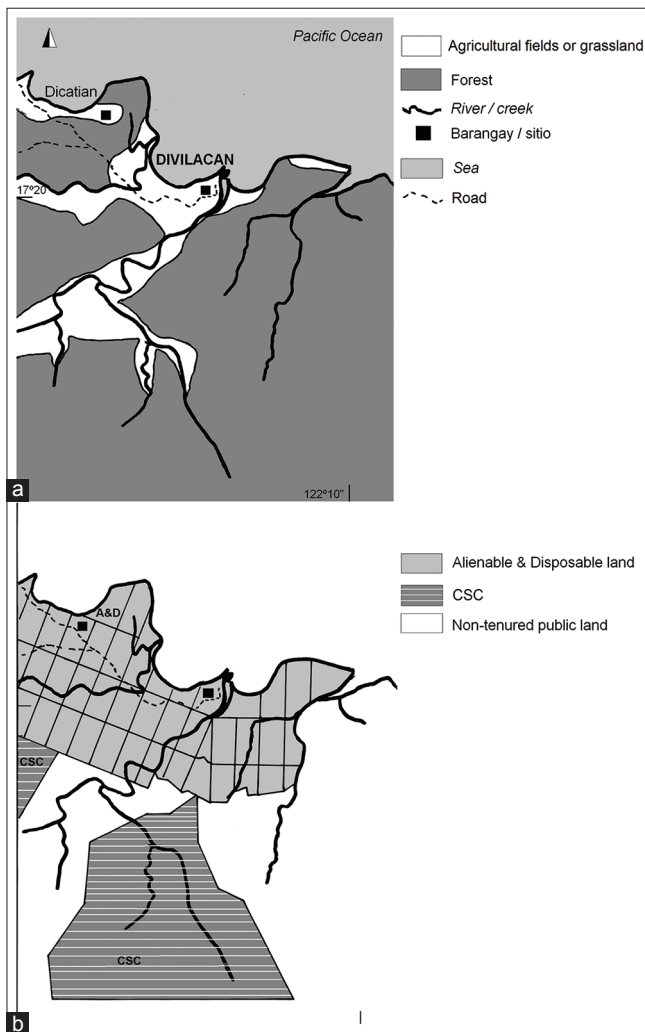


Figure 4

(a) *De facto* land use in Divilacan (b) *De jure* land classification in Divilacan

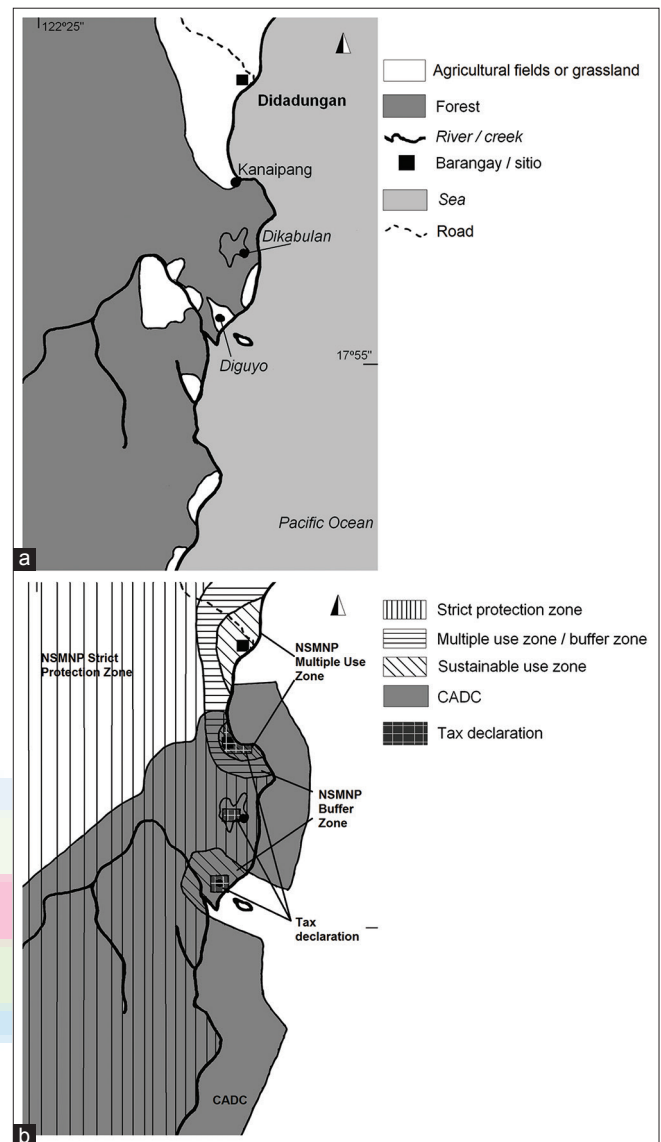


Figure 5

(a) *De facto* land use in Didadungan (b) *De jure* land classification in Didadungan

million people currently reside in and cultivate public lands without formal land rights (Guiang 2004; Pulhin et al. 2007). The resulting tenure insecurity is widely seen as a barrier to rural development and the root cause of the on-going civil insurgency in the country (Goldoftas 2006; USAID 2011).

Since the 1950s, statutory tenure reforms have been a political priority, giving rise to a variety of government policies that aim to reclassify and redistribute public land (Table 1). The Marcos regime (1965-1986), for example, initiated a land reform programme that provided possibilities for farmers on public lands to gain provisional land rights (Magno 2001). The Revised Forestry Code of 1975 (Presidential Decree 705) marked a policy shift from ejecting farmers on public land towards regulating their presence. It stipulated that:

[K]aingineros, squatters, cultural minorities and other occupants who entered into forest lands [...] shall not be prosecuted: provided that they do not increase their clearings [and] that they undertake [...] activities to be imposed upon them by the Bureau in accordance

with the management plan calculated to conserve and protect the forest resources.

Farmers could conditionally use public land, with the exception of steep slopes and riparian buffer zones. In 1982, the Integrated Social Forestry (ISF) programme was initiated to “democratise the use of public forests and to promote more equitable distribution of the forest bounty” (Pulhin 2002: 33). Farmers could apply for a Certificate of Stewardship Contract (CSC), allowing them to continue cultivating public lands.

The restoration of democracy in 1986 initiated further people-centred tenure reforms that emphasised poverty alleviation, social justice, and equitable access to land. The Local Government Code of 1991 (Republic Act 7160) devolved national government powers to provinces and municipalities, including the responsibility of the ISF

Table 1
Overview of legal land tenure instruments in the Philippines

Tenure instrument	Legal basis	Remarks
Alienable and Disposable (A&D)	Philippine Public Land Act 962 of 1903	Individual land ownership limited to 16 ha. Voluntary survey and registration of land titles (Homestead Patent)
Emancipation Patents (EP)	Presidential Decree 27 of 1972	Under 'Operation Land Transfer' rice and corn fields were transferred to tenants. Tenants received a Certificate of Land Transfer, and after completing payments an EP
Certificate of Stewardship Contract (CSC)	Integrated Social Forestry (ISF) programme of 1982 (Letter of Instruction 1260)	The ISF programme provided a CSC for 7 ha to upland farmers for 25 years, renewable for another 25 years, on the condition that 20% of the area should be under permanent forest cover (since 1995 under CBFM programme-see below)
Certificate of Land Ownership Awards (CLOA)	Comprehensive Agrarian Reform Law (CARL) of 1988 (Republic Act 6657)	The CARL aims to improve the equity and productivity of agricultural lands. A CLOA is issued to individual farmers. It can be inherited, but not sold or used as collateral
Protected Area Community-Based Resource Management Agreement (PACBRMA)	National Integrated Protected Area System (NIPAS) Act of 1992 (Republic Act 7586)	A PACBRMA is a tenure instrument awarded to a People's Organisation whose members are 'tenured migrants' or indigenous people living in a protected area
Community-Based Forest Management Agreements (CBFMA); Certificate of Ancestral Domain Claim (CADC)	DENR Department Administrative Order 2 of 1993; Executive Order 263 of 1995	A CBFMA is an agreement between a migrant community and the DENR to develop, utilize and conserve a forest area, awarded to a People's Organisation for 25 years. A CADC is issued by DENR to an indigenous cultural community in recognition of a communal claim to ancestral lands occupied since time immemorial, awarded to an People's Organisation
Socialised Industrial Forest Management Agreement (SIFMA)	DENR Department Administrative Order 24 of 1996	A SIFMA is an agreement for 25 years between the DENR and individual farmers or cooperatives to produce forest products (max. 10 ha for individuals and 500 ha for cooperatives)
Industrial Forest Management Agreement (IFMA)	DENR Department Administrative Order 4 of 1997	An IFMA is a 25-year production sharing agreement between DENR and an individual or corporation to utilize public land to grow and harvest timber
Certificate of Ancestral Domain Title (CADT)	Indigenous Peoples' Rights Act (IPRA) of 1997 (Republic Act 8371)	A CADT is a land title awarded by the NCIP to an indigenous community

Source: Guiang 2004; Harrison et al. 2004; DENR 2008

programme, the enforcement of environmental legislation and the right to collect taxes on real property. President Corazon Aquino (1986-1992) made agrarian reform a priority for her administration (Goldoftas 2006). The Department of Agrarian Reform became responsible for the acquisition and redistribution of private agricultural lands to poor landless farmers under the Comprehensive Agrarian Reform Law (CARL). Public lands, however, remained under the control of the DENR. The Community-based Forest Management (CBFM) programme became "the national strategy to ensure social justice and the sustainable development of the country's forest resources" (Magno 2001). The CBFM programme fundamentally transformed the rights of rural communities and the responsibilities of government—rural communities were granted long-term access and user rights through a Community-based Forest Management Agreement (CBFMA) or a Certificate of Ancestral Domain Claim (CADC). In 1992, the National Integrated Protected Area System (NIPAS) Act was passed through Congress (Republic Act 7586). This provided a regulatory framework for the declaration and participatory management of protected areas and specifically recognised the rights of indigenous communities. Communities in protected areas can now harvest forest resources under a so-called Protected Area Community-based Resource Management Agreement (PACBRMA).

State-led tenure reforms continued under President Ramos (1992-1998). The Indigenous People's Rights Act (IPRA) of

1997 (Republic Act 8371) recognised the customary rights of indigenous people on public lands. The newly created National Commission on Indigenous People (NCIP) was tasked to legalise these rights, in the form of a Certificate of Ancestral Domain Title (CADT).

Table 1 recapitulates the most common legal tenure instruments issued by the state to farmers in the Philippines. In theory, these govern the use, access and control of natural resources in remote, rural areas such as the northern Sierra Madre. But in practice, as we will see below, these land rights are seldom enforced by government, and local resource users informally define and enforce land rights among themselves.

DE FACTO LAND TENURE IN THE NORTHERN SIERRA MADRE

In the pre-colonial societies of the northern Philippines land was held in usufruct—after securing the permission of the elders, households could open a swidden and cultivate crops until the soil was exhausted (Scott 1994). More permanent user rights existed for fields that required substantial labour investments: irrigated rice fields, for example, could be inherited (Barton 1919; Prill-Brett 1994). Common property, tenancy arrangements, slavery, debt-bondage and tribute in the form of goods and labour resulted in a variety of tenure systems that varied from village to village (Wiber 1991; Vargas 2003).

During Spanish colonial rule large tracts of land in the Cagayan Valley were appropriated by religious orders, colonial officers and indigenous elites, mainly for the production of tobacco (De Jesus 1980). The Spanish colonisers depended on native leaders to control the population, extract taxes and labour. In the seventeenth and eighteenth centuries, these local chiefs used their new powers and privileges to acquire large landholdings, either by falsifying ownership documents or by acting as pawnbrokers.⁹ In the lowlands of Cagayan Valley, most farmers were, in effect, reduced to tenants working on the *haciendas* controlled by this new dominant class in society. People who resisted compulsory labour and conversion fled to the forested valleys of the northern Sierra Madre; their descendants are today referred to as the Kalinga (Keesing 1962).

Corporate logging in the Sierra Madre boomed after the construction of the Maharlika Highway in 1965 (Van den Top 1998). Remote towns such as San Mariano grew rapidly; five logging companies and 10 sawmills operated in the municipality in the 1970s (Persoon and Van der Ploeg 2003). Along the Pacific coast, several towns developed around the barracks and sawmills of logging companies; Divilacan and Didadungan were new settlements centred on logging. During these ‘years of plunder’ the Marcos administration issued forest concessions to political cronies (Broad and Cavanagh 1993). In most cases, these concessions were illegally sub-contracted to local entrepreneurs who organised the harvesting and processing of the wood. Rapid population growth, land scarcity, and the construction of logging roads led to a massive influx of Ilocano farmers from west and central Luzon to the forests of the northern Sierra Madre. A new wave of migrants, mainly from Ifugao Province, settled in the northern Sierra Madre in the late 1990s (Van der Ploeg et al. 2007).

At present, claims to land are still mainly secured by clearing forest and making the land productive. Most households cultivate 3 to 4 ha. Farmers practice slash-and-burn techniques (*kaingin*) to clear vegetation. Fences are rarely used; corners of agricultural plots are marked with stones or trees. Creeks, cliffs, and ridges also function as boundaries. Both men and women informally own specific plots, but there are major differences between ethnic groups.¹⁰ Ilocano custom, for example, prescribes equal inheritance of property. By contrast, among the Ifugao agricultural plots are, ideally, not divided and land is given by the parents to the eldest son upon marriage; consequently, younger siblings rarely inherit any land.

Farmers know that they do not formally own the land, but informal land claims, so-called ‘possessions’, are generally respected, also on fallow land. Possessions are sold, mortgaged or temporarily leased to other farmers. Such transactions—‘agreements’—are recorded by the *Sangguniang Barangay*, the elected village council. There is a variety of such agreements between land owners and tenants—most tenants pay a fixed share of the harvest, ranging between 10 and 50%. Conflicts over land are usually ‘amicably settled’, but occasionally disputes result in violence. Farmers generally

do not trust the legal system and try to avoid costly and lengthy judicial procedures (Franco 2008). Many farmers have secured a ‘tax declaration’ from the LGU, which is widely regarded as a first step towards gaining an official land title.¹¹

San Mariano, Divilacan and Palanan are among the poorest municipalities of the Philippines: 60% of the people live on less than one USD per day (NSCB 2010). A few prominent families rule the countryside through patronage networks and control the local economy. In recent years, farmers have become increasingly dependent on traders who supply credit for seeds, fertiliser and pesticides and, in return, demand exclusive procurement rights. Many farmers have become indebted as a result of harvest failures and excessive interest rates—20% interest, locally called ‘five-six’, over a cropping period is not uncommon. Traders accept land as collateral and some have acquired large land holdings in this way. The New People’s Army (NPA) provides some form of protection for rural communities against land grabbing, but the Maoist insurgents also levy ‘revolutionary taxes’ or ask for a ‘voluntary contribution’ from farmers. As in many other rural areas in the Philippines, clientism and the threat of violence characterise tenure (Kerkvliet 1990; Borrás 2001). The rule of law remains an abstract concept on the forest frontier of the northern Sierra Madre.

Disulap River Valley

The Disulap River rises in the mountains of the Sierra Madre and flows westwards to San Mariano town, where several *sitios* (*sitios*=hamlets) are located along a forest frontier (Figure 2a). To the east are the forests of the Sierra Madre, to the west land use intensifies. Approximately 4,250 people live in this area (NSCB 2010) that was deforested in the 1980s by commercial logging companies and slash-and-burn farmers. San Isidro is the largest *sitio*) and most people in the valley belong to the Ilocano ethnic group, but several Agta communities also live along the forest frontier.¹² Immigrant farmers bought large tracts land from Agta families for a nominal fee, sometimes literally for ‘three bottles of gin and a radio with batteries’. Other immigrants have purchased land from these pioneers, or cultivate the land under various sharecropping arrangements. Farmers cultivate multiple and widely dispersed plots and in the valleys, they have constructed irrigated rice paddies. The vegetation on exposed hills is dominated by *Imperata cylindrica*. In the dry season, these unclaimed marginal grasslands are burned to facilitate hunting and grazing. Accessibility is a major constraint for rural development, particularly in the rainy season when the roads become impassable.

Most land in the Disulap Valley is officially classified as non-tenured public land (Figure 2b). Only the flat areas south of Disulap and around the *sitio* of Villa Miranda are classified as A&D lands. These areas are owned by local politicians from San Mariano town and cultivated by tenants. The area east of San Jose was classified as an ISF target area in the 1980s and a number of farmers here have CSCs. Later, a CBFMA was

issued to a cooperative in San Jose. The upper Catalangan River forms the boundary of the strict protection zone of the Northern Sierra Madre Natural Park.¹³ A one kilometre buffer zone extends eastwards. Most farmers in the Disulap River Valley, however, are ignorant of the boundaries, zones or regulations relating to the protected area.

From 1997 to 2002, the NSMNP-CP assisted farmers in the Disulap Valley to apply for a SIFMA in an effort to rehabilitate degraded forests, prevent agricultural encroachment and improve rural livelihoods in the buffer zone of the Northern Sierra Madre Natural Park. The idea was to facilitate a transition to sustainable agriculture by providing “security of land tenure to landless residents” (General 2005: 197). After extensive consultations, land surveys and lobbying activities, the DENR issued SIFMAs to 81 farmers in San Isidro (Mangabat et al. 2009).¹⁴ The NSMNP-CP provided seedlings, fertiliser and technical assistance to the farmers to establish fruit and timber tree plantations.

The long-term impact of the project has, however, been limited. A few farmers successfully integrated coconut, gmelina, citrus and coffee into their farms, but the poor condition of the roads inhibits the marketing of these fruits. Land use has rapidly intensified over the past years; in 2002, the hilly landscape around San Isidro was characterised by regenerating swiddens, grasslands, and bamboo groves, interspersed with banana plantations and upland rice fields. Today, most farmers cultivate hybrid yellow corn and cassava. Meanwhile, illegal logging and agricultural encroachment continue unabated in the protected area (Van der Ploeg et al. 2011a). There is persistent uncertainty about the legal status of the SIFMA plots. The DENR issued a series of administrative orders in 2006 cancelling all SIFMAs in the country following widespread non-compliance with the terms of the agreements, but SIFMA holders in San Mariano have never been informed about the implications. More recently, the SIFMA plots in the Disulap Valley have been targeted for the contract-growing of sugar cane by a large bioethanol distillery plant in San Mariano, which became operational in San Mariano in 2012 (Borras and Franco 2012). Many farmers have leased their land to the company and sugar cane is planted on an increasingly larger scale in the Disulap River Valley. Overall, the efforts of the NSMNP-CP to facilitate the issuance of SIFMAs to farmers in the buffer zone of the Northern Sierra Madre Natural Park has not improved security of tenure, livelihoods or protected area management.

Ilaguen River Valley

The Ilaguen River is a major tributary of the Cagayan River. Land use along the upper Ilaguen River is characterised by irrigated rice fields in the valleys, banana plantations on the steep slopes, and upland rice, cassava and corn on the hill tops (Figure 3a). The forests in this area were clear-cut by commercial logging companies in the 1970s. Around 3,500 people live in this remote area with the Kalinga ethnic group forming a majority in Cadsalan, Ibojan, Buyasan and Tappa,

which are all located on the west bank of the river. Over the years, Ilocano and Ibanag immigrants have bought or mortgaged land from the Kalinga, who now often work on these lands as tenants. The grasslands and secondary forests south of Buyasan remain a NPA stronghold and there are frequent violent clashes between the army and the rebels.

The lowland areas around Cadsalan are classified as A&D (Figure 3b). When the land was released in 1976, the titles were allegedly seized by a teacher from the local elementary school. Illiterate Kalinga farmers signed papers, under the impression that the teacher would assist them in acquiring land ownership. However, these tillers do not pay any shares to the formal landowner—‘he may own the paper, but we own the land!’ The DENR also released the lands around Buyasan in the 1980s. Allegedly, the survey was based on existing maps and did not include an on-site verification. The A&D lands, therefore, not only encompass the flat areas around the village but also cover the surrounding hills. The farmers who cultivate these A&D lands do not have formal land titles. In 1998, the DENR aimed to issue a CADC covering almost the entire upper Ilaguen River Valley to the Agta of San Mariano.¹⁵ The proposed CADC (13,591 ha) covered Cadsalan and Tappa, and includes large parts of Ibojan and Buyasan. The ancestral domain overlaps significantly with the A&D lands, but the NCIP refused to recognise the CADC, and now aims to issue a CADT to the Kalinga. As a result, the current legal status of the land remains non-tenure public land (Local Government of San Mariano 2014).

In 2004, the Mabuwaya Foundation tried to formalise the land claims of 35 households living adjacent to Dinang Creek. This shallow creek is prime habitat for the critically endangered Philippine Crocodile. To protect the species in the wild, the foundation aimed to proclaim the creek as a protected area (Van der Ploeg and Van Weerd 2004). After several community consultations in *sitio* Lumalug, local inhabitants consented to the creation of a crocodile sanctuary, on condition that their customary land rights were formalised. The DENR subsequently conducted a land survey and advised the farmers to apply for a CBFMA. On the official land classification maps, however, a large part of the creek appeared as A&D land, which prevented several farmers from applying for a tenure instrument on the land they were tilling. Other farmers refused to apply for a communal, temporal and conditional agreement, and demanded individual land titles. This brought the entire application process to a halt and led to friction between farmers, and between the farmers and DENR, LGU, and the Mabuwaya Foundation. Indeed, rumours spread that the efforts to protect crocodiles were actually a conspiracy to grab the land and develop large-scale tourism facilities (Van der Ploeg and Van Weerd 2005).

In 2005, the *barangay* council declared Dinang Creek as a crocodile sanctuary with a five metre buffer zone. Most farmers, however, disregard the ordinance and continue to cultivate their fields right up to the waterfront. The number of households in Lumalug has increased in recent years, from 20 households in 2003 to 54 in 2011. Land use is intensifying,

wetlands are converted into rice fields and riparian vegetation is cleared. Nonetheless, Dinang Creek remains an important breeding area for the Philippine Crocodile. This positive conservation outcome can certainly not be attributed to the efforts of the Mabuwaya Foundation to legalise land rights. Indeed, the failed attempt to provide a CBFMA to farmers living adjacent to Dinang Creek fuelled feelings of mistrust and insecurity, which impeded in-situ conservation efforts.

Divilacan

Divilacan is a relatively small municipality in the coastal area of Isabela with around 5,000 inhabitants (NSCB 2010). Large parts of Divilacan remain forested (Figure 4a). Artisanal fishing is an important livelihood activity along the Pacific coast, and copra and rice are the main agricultural products. In addition, people cultivate swiddens with cassava, taro and other crops for subsistence. These agricultural areas are mainly located along the coast and in the river valleys. Accessibility is a major problem in the coastal area of Isabela as there is no road crossing the Sierra Madre. Rice shortages often occur during the rainy season (September to January), when rough weather makes sea travel impossible. Approximately 550 Agta live in the municipality and hunting, fishing, and gathering forest products form an important part of their livelihood. Many Agta households also work as tenants on the land of Ilocano farmers.

In 1954, the land around Divilacan was released by the Magsaysay administration. The Bureau of Lands divided the land into squares of 16 ha (Figure 4b) and distributed these A&D lands to 'rebel returnees' and veterans. Most of these plots have never been cleared of their forest vegetation. Indeed, many settlers left after a few months discouraged by the difficult conditions and lack of healthcare and education. The few settlers that stayed in Divilacan built their houses along the coast and cultivate the land adjacent to their homes. Divilacan officially became a municipality in 1969. By that time the entire area was covered under a Timber License Agreement issued to the ACME Plywood and Veneer Company. In 1979, all public lands in Divilacan were included in the Palanan Wilderness Area. In 1983, CSCs were issued to most households in *barangay* Dicitian under the ISF programme. Today, the entire municipality of Divilacan falls within the Northern Sierra Madre Natural Park. In the management plan of the park, all inhabited areas are classified as multiple-use zones (for clarity, purposes not shown in Figure 4b).

The Northern Sierra Madre Natural Park Act classified the forested A&D lands as strict protection zones (DENR 2001a), but in practice land clearing continues; DENR officials say they cannot prohibit private landowners from making their land productive. In fact, land conversion is actively encouraged by municipal governments. The LGU of Divilacan, for example, subsidises rice production to prevent food shortages, which is leading to the reclamation of freshwater wetlands. Furthermore, conflicts between government agencies hamper effective park management. For example, the NCIP plans to proclaim the entire Northern Sierra Madre Natural

Park as an ancestral domain, which is causing considerable friction with DENR and LGUs (Minter et al. 2014). In order to address these discrepancies, WWF-Philippines aimed to "elucidate, harmonise and strengthen land tenure in the park" (WWF-Philippines 2004). This included integrating the management plan of the park in the Comprehensive Land Use Plans of the LGUs, and allocating legal tenure instruments to local communities.

For a variety of reasons, WWF-Philippines failed to facilitate the legalisation of people's land rights, but the project managed to rewrite the municipality's Comprehensive Land Use Plans. The LGU, however, continues to develop plans that potentially conflict with the regulations of the protected area and increasingly sees the protected area as a barrier to development. The planned construction of a road from Ilagan to Divilacan, crossing the Sierra Madre, is illustrative in this regard. This major infrastructural project is promoted by the LGU, the provincial government and DENR to 'boost tourism and economic opportunities in Divilacan' (Visaya 2014). If the road is constructed, it will fundamentally transform land tenure in Divilacan, and have a major impact on the protected area. In anticipation of the construction of the road, several politicians and businessmen have recently started to buy large tracts of lands along the coast, and several Agta families in *barangay* Dimasalansan have been chased from their campsites on the beach. Clearly, the efforts of WWF-Philippines to strengthen customary land rights have not improved tenure security or park management.

Didadungan

The southern coastline of the municipality of Palanan is a rugged and sparsely populated area (Figure 5a). Accessibility is difficult as cliffs, coral reefs, and strong waves prevent boats from anchoring in most places. In 1965, the Bello logging company constructed a sawmill in Didadungan, but this concession was closed in 1978. Today, Didadungan is a small fishing village and functions as a loading point for illegal logging operations along the Pacific Coast. Around 900 people inhabit this remote coastal area. Agta households camp on the beaches to fish, harvest lobster, collect rattan and swiftlet nests, and hunt for wild pig and deer.

The Northern Sierra Madre Natural Park covers the entire municipality of Palanan. The DENR classified the southern coast as a strict protection zone, with the exception of the agricultural areas around Didadungan, Kanaipang and Diguayo, which are classified as multiple and sustainable use zones (Figure 5b). Here, the Agta cultivate swiddens. But former local government employees from Palanan use tax declarations to attest *de jure* ownership of these fields and beaches.

In 1996, the DENR issued a CADC to the Agta inhabiting the coastal area of the municipality of Palanan, but Agta leaders and local government officials raised concerns about the ancestral domain claim, which did not include important fishing grounds and, in some areas, overlapped with land claims of migrants (NORDECO and DENR 1998; Magana 2003). Therefore,

the claim was revised with the technical and financial support of NORDECO. After a lengthy process, the Agta, LGU, and DENR endorsed the revised Ancestral Domain Sustainable Development and Protection Plan in 2001. However, the NCIP, who had by that time taken over the responsibility of the issuance of ancestral domains, did not accept the ancestral domain and the whole process started again from scratch. After a first tumultuous meeting in Didadungan in 2007 the LGU refused to work with the NCIP any longer and actually denied NCIP staff access to the municipality. The negotiations have strained relations between Agta and migrants (Minter 2010). After almost 20 years of community consultations and participatory mapping exercises, the Agta still do not have any formal recognition of their ancestral land and have become deeply frustrated with the entire process. Illegal logging, dynamite fishing, and the use of snare traps continue to threaten biodiversity and the livelihoods of the Agta on the Palanan Coast. Despite the good intentions, the efforts of NORDECO have made little difference in tenure and resource use in Didadungan.

DISCUSSION

These four cases demonstrate the incongruence between *de jure* and *de facto* tenure in the northern Sierra Madre, and highlight several flawed assumptions underlying the idea that legalising the customary land rights of communities will protect biodiversity. First, advocates tend to underestimate the bureaucratic and political obstacles to tenure reforms (Neumann 1997; Ribot et al. 2006). Second, the idea to grant conditional rights to groups of people often misrepresents *de facto* tenure in these remote rural areas (Naughton-Treves 1999; Li 2002). Third, the supposed link between *de jure* land rights and sustainable resource management is highly tenuous (Zerner 2000; Gibson et al. 2002). These flaws make state-led tenure reforms a problematic strategy for conserving biodiversity.

Weak governance

The devolution of property rights to local communities is dependent on effective, accountable and legitimate government institutions (Pomeroy and Berkes 1997). But the DENR, NCIP, and LGUs lack the resources, technical capacity, and political support to implement these tenure reforms (Utting 2000; World Bank 2003).

The registration and issuance of land rights is, as we have seen above, surrounded by perpetual confusion and chaos. The bureaucratic procedures relating to obtaining a legal claim on land are “inaccessible, incomprehensible, and expensive” (Prill-Brett 1994: 696). Farmers are confronted with “complex paperwork” (Mangabat et al. 2009: 467), and “long delays in the bureaucratic processing” (Romero 2006: 145). Cadastral information is inaccurate and not easily accessible (USAID 2011). Land classification maps are notoriously unreliable, and often do not reflect the physical conditions on the ground (Kummer 1992; Aquino 2005). This red tape forms an almost unsurmountable obstacle to formalising land rights. The

application for a CBFMA in Dinang Creek, for example, took 30 months and cost more than PHP 100,000 (USD 2,000), a prohibitive sum for most farmers in this remote rural area, and ultimately led to nothing.

In part, this chaos is caused by an overly complex and inconsistent legal framework. Frank Hirtz (1998: 251-252) aptly describes the ‘administrative nightmares’ of tenure reforms in the Philippines:

“Legislative institutions come up with innumerable laws and letters of instruction, hosts of presidential decrees and executive orders, constantly revised implementation handbooks for every imaginable situation, finely-tuned administrative guidelines, sophisticated court proceedings and precedents, repeals, annulments, and exceptions.”

Overlapping mandates and institutional conflicts within the DENR, between the DENR and LGUs and between the DENR and the NCIP further complicate the legislation of customary land rights in relation to public lands. In the Disulap River Valley, for example, confusion about the jurisdiction of two DENR district offices and inaccurate maps obstructed the issuance of a CBFMA to a farmer’s cooperative in San Isidro.¹⁶ In Palanan, the LGU issued tax declarations for plots located in the strict protection zone of the Northern Sierra Madre Natural Park; and in the Ilaguen River Valley, the NCIP disregarded earlier efforts by DENR to declare an ancestral domain.

This administrative and institutional complexity is also often used as a pretext for incompetence, corruption, or political interference (Grainger and Malayang 2006; Van der Ploeg et al. 2011a). Many DENR, LGU, and NCIP officials do not fully understand the procedures and requirements of the different tenure instruments. Low morale and a bureaucratic culture that belittles fieldwork hinder the implementation of people-centred policies (Van den Top 1998). The numerous inaccuracies in official land classification maps are largely caused by so-called ‘table-top surveys’, in which cadastral maps are prepared without groundtruthing. Government officials rarely visit remote locations and, when they do, limit their stay as much as possible. Heat, rain, accessibility, and excessive alcohol consumption often inhibit comprehensive fieldwork. Moreover, petty corruption has become a ‘standard operational procedure’ in the DENR bureaucracy; without informal payments, official approval of tenure applications is indefinitely delayed (Van den Top 1998: 231). In addition, laws and regulations are selectively interpreted or simply ignored to accommodate elite interests (Pulhin and Dressler 2009; Larson and Pulhin 2012). In San Mariano, for example, the DENR and LGU identified the SIFMA areas—which, in principle, are meant to encourage smallholders to produce forest products and cannot be transferred—as potential areas for the production of sugar cane and actively encouraged farmers to lease their land (Philippine Daily Inquirer 2011). The confusion over land tenure is thus, at least to a certain extent, deliberately created and maintained by government officials (Garrity et al. 2001).

Without effective and accountable government institutions, attempts to secure tenure and thereby improve natural resource management will fail. But despite numerous policy reforms and significant donor investments over the past 25 years, the capacity of DENR, NCIP and LGUs to devolve and enforce property rights remains weak (World Bank 2003; Guiang 2004; La Viña et al. 2010; Minter et al. 2012). These bureaucratic problems form a major, but often overlooked, hindrance for tenure reforms.

Imagined communities

Efforts to formalise customary land rights in order to protect biodiversity are often based on idealised notions of local communities. Policies such as CBFM, NIPAS, and IPRA fail to recognise the divisions within rural communities and the influence of external actors and institutions on tenure (Li 2002).

Most people in the northern Sierra Madre are immigrants who settled in the area in the 1970s. The indigenous peoples of the Sierra Madre, the Agta, and the Kalinga, nowadays form small minorities. Traditional property systems that regulated access to swiddens, hunting areas, and fishing grounds have disappeared. Communal working parties have been replaced by paid labour. On the western side of the Sierra Madre, large areas have been cleared of forest vegetation. People in the Disulap and Ilaguen River Valleys are no longer dependent of forest resources, although logging remains an important source of cash for many communities along the forest frontier (Van der Ploeg et al. 2011a). Most farmers produce cash crops for urban markets and desire modern consumer goods. Today, tenure is largely based on private land ownership. Conflicts about land are common between family members, neighbors, families or villages and occasionally lead to violence. Land use in these rural areas is, to a large extent, determined by outside political and economic influences, such as credit systems, transportation networks, government subsidies and market prices. Traders play an important role in agricultural intensification by providing inputs for corn cultivation and procuring harvests.

Only the Palanan Coast, where a few Agta communities hunt and fish, might be compatible with the image of isolated, traditional, indigenous and forest-dependent communities that features so prominently in the co-management discourse. But here, too, the local reality is at odds with the assumptions of these people-centred policies. Kinship relations between the Agta and the Ilocano, for example, make differentiation between indigenous and non-indigenous people problematic. In many instances, the Agta have sold land to farmers, which complicates the proclamation of an ancestral domain. The extraction of lobster, swiftlet nests, bushmeat, and timber by the Agta is not sustainable and largely controlled by traders who market these products. Indeed, by making land rights conditional on specific forms of social organisation and sustainable outcomes, tenure reforms such as the IPRA impose unrealistic and unenforceable restrictions on local resource users. Under the NIPAS Act, for example, indigenous people

are only allowed to practice ‘subsistence’ agriculture and use ‘traditional’ hunting techniques, after prior DENR approval (DENR 2001a: 19). Moreover, in most policies that devolve control over land to communities people are required to form cooperatives or associations, but efforts to create such groups fail in most cases (Hirtz 1998; Van der Ploeg et al. 2015).

Much has been written on the dangers of oversimplifying land tenure in the Philippine public lands (Wiber 1991; Bryant 2000; Dressler et al. 2006). Of importance for our argument is that policies to grant land rights to communities misrepresent political and socioeconomic realities on the ground, and therefore, do not have the intended outcomes when they are implemented.

Tenuous links

Government interventions that aim to conserve natural resources by legalising tenure, such as the CBFM programme, are based on the premise that local users will only manage natural resources sustainably if they have formal ownership. There is increasing evidence, however, that formalising customary land rights does not necessarily lead to positive conservation outcomes (Sayer et al. 2008; Robinson et al. 2013).

In the Disulap River Valley, the only case described in this article where land claims were successfully legalised, the SIFMAs did not promote a transition to sustainable land use and failed to counter agricultural encroachment in the Northern Sierra Madre Natural Park. Land use in the valley is rapidly intensifying and farmers continue clearing forest vegetation. Many beneficiaries are unaware of the specific conditions of the SIFMA programme, such as maintaining 90% forest cover. Others do not think these obligations are in their interest and simply ignore these rules (Mangabat et al. 2009). The SIFMAs stimulated some farmers to establish gmelina tree plantations and orchards, but these initiatives are hampered by low timber prices and transport problems. Most SIFMA holders are now cultivating hybrid yellow corn or leasing their land for the production of sugar cane, exactly the industrial-scale schemes that forest tenure reforms aim to counter. Clearly, the legal recognition of property rights by the state is, in itself, not sufficient to promote sustainable land use and prevent deforestation (Zerner 2000).

Many conservationists envision a more ‘intricate’ link between formalising land rights and conservation; the idea is that efforts to secure land rights will increase local support for conservation (Ipara et al. 2005: 644). The Mabuwaya Foundation, for example, assisted farmers in the Ilaguen River Valley in applying for a tenure instrument in exchange for their consent to create a crocodile sanctuary. And the NSMNP-CP facilitated the issuance of SIFMAs in the Disulap River Valley primarily to ease hostile attitudes towards conservation. But the effectiveness of this indirect logic often remains uncertain and efforts to formalise user rights frequently create, rather than reduce, uncertainty and conflicts over land, thereby impeding conservation action (Sjaastad and Cousins 2008; Ubink 2009). In Dinang Creek, for example, the difficulties

surrounding the issuance of a CBFMA strained relations between farmers and the Mabuwaya Foundation. Discussions about crocodiles suddenly became dominated by allegations of land grabbing and corruption, disputes over land between neighbours and incomprehension about why the DENR could not issue land titles. Such ‘surrogate’ conflicts (Nie 2001: 1) can aggravate tenure insecurity and erode trust between local people, conservationists and government agencies.

CONCLUSION

The legal recognition of customary rights by the central state is currently widely regarded as a precondition for community-based natural resource management. In this paper, we demonstrated that the conservation outcomes of these statutory tenure reforms are often elusive.¹⁷ Granting conditional land rights to rural communities only leads to improved natural resource management under specific social, ecological, and institutional conditions (Sayer et al. 2008; Larson et al. 2010b; Robinson et al. 2013). In forest frontiers such as the northern Sierra Madre, characterised by unprecedented land use transitions, poverty, rapid social change, chaotic and unaccountable governance and a history of state-sponsored resource plunder, this is not the case.

This paper highlights the radical discontinuity between *de jure* and *de facto* tenure in the northern Sierra Madre. It documents how the state systematically neglects actual land use and tenure, but is at the same time incapable of enforcing the legal entitlements it is projecting onto rural areas. As a result, the discourse on people-centred tenure reforms is painfully at odds with social realities. The problem is that in order to facilitate the legalisation of tenure by the state, conservation organisations have to adopt and adhere to this ‘legal surrealism’ (Erie 2012: 38). The dangers of this bureaucratic capture are evident—it reinforces government power and authority over marginal areas and people (Bryant 2002), erodes credibility of and local support for conservation organisations (Jepson & Canney 2003), and deviates attention and resources from alternative solutions that can effectively defend local people’s rights and protect biodiversity (Sayer et al. 2008).

The recognition that the state is, in effect, not the exclusive source of regulatory action in society opens up possibilities to move beyond top-down tenure reforms (Rangan 1997; Sikor and Lund 2009). One promising bottom-up approach emerging from field experiences throughout the Philippines is the participatory development of community-based land use plans (Posa et al. 2008; Weeks et al. 2010). In the Disulap River Valley, for example, the Mabuwaya Foundation supports *barangay* councils in the design and enforcement of ordinances protecting wetlands and watersheds. These locally-defined rules successfully banned the use of destructive fishing practices and stimulated farmers to maintain riparian buffer zones (Van der Ploeg and Van Weerd 2004; Van der Ploeg et al. 2011b). By taking *de facto* tenure on the ground as a starting point, instead of imaginary *de jure* rights, and by reflecting local knowledge, values and concerns, these ordinances

empower rural communities to exercise their rights over natural resources. The long-term outcomes of such a transformative community-based conservation approach are, as yet, unclear and important questions remain, but it presents an alternative strategy for conservation organisations to secure people’s rights over natural resources and thereby conserve biodiversity (Lele et al. 2010; Bawa et al. 2011).

ACKNOWLEDGEMENTS

This research was carried out in the framework of the academic partnership between Isabela State University and Leiden University. J.D. van der Ploeg, S. de Rooij, G.A. Persoon, Anna Yeadell-Moore and two anonymous reviewers provided valuable comments on the manuscript. We are grateful for the patience and support of the editorial team of *Conservation & Society*, particularly Hetal Hariya and Haripriya Rangan.

NOTES

1. These initiatives reflect the convergence of the conservation agenda with global policy discourse on participatory development, decentralisation and indigenous peoples’ rights in the 1990s (Roe 2008; Larson et al. 2010). Since then, securing the customary land rights of local communities has been used as an instrument to link biodiversity conservation to goals as diverse as poverty alleviation, gender equity, and climate change mitigation.
2. To avoid the ‘conceptual muddiness’ that often characterises the discourse on tenure reforms, it is essential to define some key concepts (Naughton-Treves 1999: 312). Land rights refer to a bundle of rights guiding the access, use, control or transfer of land (Schlager and Ostrom 1992). This bundle can include rights that are defined by law, *de jure*, and rights that are defined locally, *de facto*. Tenure consists of the social relations and institutions that enforce these rights. Tenure security is the degree to which people perceive their land rights are safe. Tenure reform is the legalisation of tenure, usually by granting conditional rights to people already using the land (Larson et al. 2010b).
3. USAID, for example, has invested more than USD 110 million since 1990 in projects to formalise the rights of rural communities in order to improve environmental management (Guiang and Castillo 2007). In 1994, The World Bank provided USD 20 million to a project that aimed, among other things, to recognise the land rights of indigenous people and settlers in newly proclaimed protected areas (The World Bank 2004). More recently, UNDP initiated the USD 11 million New Conservation Areas in the Philippines Project that aims to expand the existing protected area system by ‘recognising ancestral domain lands, which are associated with the traditional territories of upland culture peoples and which typically coincide with areas of greatest surviving endemism’ (NewCAPP 2012: 2).
4. Aswani (1999: 422) likewise describes the gap between ‘cognised entitlements’, the perceptions of property rights, and ‘effective entitlements’, the actual enforcement of those rights.
5. MvW worked as wildlife biologist for the NSMNP-CP from 1999 to 2003, and conducted biological fieldwork in Divilacan and the Disulap River Valley. In 2003, JvdP and MvW set up the Mabuwaya Foundation and, since then, have worked with

DENR, LGUs and rural communities in these four sites to protect the Philippine Crocodile in the wild (Van Weerd and Van der Ploeg 2012). TM conducted ethnographic fieldwork in Divilacan and Didadungan for her Ph.D. dissertation from 2003 to 2005 and, since then, has made repeated field visits to these areas (Minter 2010: 2014). DA has served as resource person for the NSMNP-CP, WWF-Philippines and the Mabuwaya Foundation and, in this capacity, has made frequent visits to the municipalities of Divilacan, Palanan, and San Mariano.

6. These sketch maps clearly cannot be used in any way to validate or contest individual land claims.
7. In practice, the Bureau of Forestry was mainly focused on facilitating the exploitation of forest resources by logging corporations. The American foresters generally regarded slash-and-burn farmers (*kaingineros*) in the forests as destructive squatters that should be expelled (Klock 1995; Villamor 2006). After independence, the forestry sector continued to receive preferential treatment in government decisions on the allocation of public lands: Timber License Agreements (TLA) were issued to logging corporations for a nominal fee, while forest-dwelling people and upland farmers were criminalised (Magno 2001).
8. Policymakers in the Philippines usually equate 'public land' with 'forest land' or 'upland'. Public lands are areas held in trust by the state. Forest lands are areas that are classified by the state as forest. Public lands are assumed to be uninhabited and uncultivated, and thus forested (Borras 2006). Over the past 100 years, large tracts of public land have been deforested; but that does not automatically imply that the legal classification of the land changed. Hence, the paradox in official statistics on land classification and forest cover in the Philippines; over 50% of the total land area is classified as public land, whereas forest cover amounts to less than 17%. Land classified by the government as forest land is by definition public land, but not all forests are on public land; timber plantations, coconut groves and orchards are usually privately owned. The term 'upland' is used to refer to hilly or mountainous areas, in contrast to 'lowlands.' By law, all upland is defined as areas 'with slopes steeper than 18% and above 100 m', and classified as public lands (Walpole 2010).
9. Through a so-called *pacto de retrovendendo*, land was pawned to raise cash. This informal credit system, effectively still in place in many remote rural areas in the archipelago, was subject to much abuse. Moneylenders charged excessive interest rates and used these contracts to grab land from farmers (Larkin 1993).
10. By law men and women have equal property rights in the Philippines. However, patriarchal attitudes and stereotypes regarding the role of women persist in society. The CARL and the IPRA, for example, award land titles or certificates to the head of the household, in most cases a man.
11. Legally, local governments cannot collect tax on informal claims on public lands, but there have been precedents in which courts upheld land ownership based on such tax declarations (USAID 2011).
12. The Agta, the indigenous hunter-gatherers in the forests on Luzon, have loose notions of communal ownership of land based on cognatic kinship relations and reciprocal sharing arrangements: relatives can fish, hunt, and farm in a watershed after securing permission from the resident group (Minter 2010).
13. In 2001, Congress passed the Northern Sierra Madre Natural Park Act (Republic Act 9125), proclaiming a large part of the remaining forests of Isabela Province as a protected area. A complex zoning system regulates access to and use of forest resources in the park. All uninhabited areas were labeled as strict protection zones, and areas that were 'actually and continuously occupied such areas for five years prior to March 10, 1997' were classified as multiple-use zones and their inhabitants labeled as 'tenured migrants' (DENR 2001b: 6). A buffer zone was created around the park, initially five kilometres wide but later revised to one kilometre, to provide 'an extra layer of protection around the protected area' (DENR 2001b: 10).
14. Most beneficiaries are from Disulap. In San Jose many households did not participate in the SIFMA programme as they feared that the staff of the NSMNP-CP would grab their lands (General 2005: 201).
15. Most people who live in the CADC are, in fact, Kalinga; a few Agta communities live along the forest frontier near *barangay* Buyasan. In fact, none of the CADC holders were Agta, nor people living along the Ilaguen River; of the identified 'communal leaders' nine were Ilocano and four Kalinga, who all lived in *barangay* Dibuluan and do not remember what they actually have signed (Magana 2003). It seems that this omission of the DENR was primarily caused by the need of DENR personnel to meet specific targets and quotas.
16. In 2004, the San Isidro Agroforestry Multipurpose Development Cooperative applied for a SIFMA at the Community Environment and Natural Resources Office of the DENR in Naguilian. After a survey the Naguilian office concluded that a SIFMA could not be issued, as the reforestation site was located in the buffer zone of the Northern Sierra Madre Natural Park, and advised the cooperative to apply for a CBFMA at the office of the protected area superintendent in Palanan. The office of the superintendent subsequently endorsed the application for a CBFMA to the Provincial Environment and Natural Resource Office. Unfortunately, the provincial office could not approve the application because on its maps the plantation was located in the strict protection zone of the park. It acknowledged that this was solely due to inaccurate maps. By the time this problem was solved, the DENR suspended the issuance of all CBFMA in the country because of persistent allegations of fraud and mismanagement. The process led to much frustration among the members of the cooperative.
17. This suggests a significant bias in the scientific literature, as most published case studies from the Philippines depict success stories.

SUPPLEMENTARY PHOTOGRAPHS

- Photo 1: SIFMA plots in the Disulap River Valley (photo by J. van der Ploeg 2007)
- Photo 2: CADC in the Ilaguen River Valley (photo by J. van der Ploeg 2012)
- Photo 3: A&D lands in Divilacan (photo by J. van der Ploeg 2008)
- Photo 4: CADC in Didadungan (photo by J. van der Ploeg 2004)

REFERENCES

- Alcorn, J.B. and A.G. Royo. 2007. Conservation's engagement with human-rights: "traction", "slippage" or avoidance? *Policy matters* 15: 115–139.
- Antolin, A.T. 2003. Saving the hottest of the hotspots: the Sierra Madre biodiversity corridor strategy. In: *The Sierra Madre Mountain Range: global relevance, local realities* (eds. Van der Ploeg, J., A.B. Masipiqueña and E.B. Bernardo). Pp.3-16. Cabagan: CVPED.
- Aquino, D.M. 2005. Resource management in ancestral lands: the Bugkalots in northeastern Luzon. Ph.D. thesis. Leiden, the Netherlands: Leiden University.
- Aswani, S. 1999. Common property models of sea tenure: a case study from the Roviana and Vonavona Lagoons, New Georgia, Solomon Islands. *Human Ecology* 27(3): 417–453.
- Austin, R.L. and J.F. Eder. 2007. Environmentalism, development, and participation on Palawan Island, Philippines. *Society and Natural Resources* 20(4): 363–371.
- Bankoff, G. 2013. "Deep forestry": shapers of the Philippine forests. *Environmental History* 18: 523–556.
- Barton, R.F. 1919. Ifugao law. *American Archaeology and Ethnology* 15(1): 1–186.
- Bawa, K.S., N.D. Rai and N.S. Sodhi. 2011. Rights, governance, and conservation of biological diversity. *Conservation Biology* 25(3), 639–641.
- Borgerhoff Mulder, M. and P. Coppolillo. 2005. *Conservation: linking ecology, economics, and culture*. Princeton, NJ: Princeton University Press.
- Borras, S.M. 2001. State-society relations in land reform implementation in the Philippines. *Development and Change* 32: 545–575.
- Borras, S.M. 2006. Redistributive land reform in 'public' (forest) lands? Lessons from the Philippines and implications for land reform theory and practice. *Progress in Development Studies* 6(2): 123–145.
- Borras, S.M. and J.C. Franco. 2012. Global land grabbing and trajectories of agrarian change: a preliminary analysis. *Journal of Agrarian Change* 12(1): 34–59.
- Borrini-Feyerabend, G., M. Pimbert, M.T. Farver, A. Kothari and Y. Renard. 2007. *Sharing power; a global guide to collaborative management of natural resources*. London: Earthscan.
- Brechin, S.R., P.R. Wilhusen, C.L. Fortwangler and P.C. West (eds). 2003. *Contested nature; promoting international biodiversity with social justice in the twenty-first century*. New York, NY: SUNY.
- Broad, R. and J. Cavanagh. 1993. *Plundering paradise; the struggle for the environment in the Philippines*. Berkeley, CA: University of California Press.
- Bryant, R.L. 2000. Politicized moral geographies: debating biodiversity conservation and ancestral domain in the Philippines. *Political Geography* 19(6): 673–705.
- Bryant, R.L. 2002. Non-governmental organizations and governmentality: consuming biodiversity and indigenous people in the Philippines. *Political Studies* 50: 286–292.
- Campese, J., T. Sunderland, T. Greiber and G. Oviedo. 2009. *Exploring issues and opportunities in rights based approaches to conservation*. Bogor: CIFOR, IUCN and CEESP.
- De Jesus, E.C. 1980. *The tobacco monopoly in the Philippines: bureaucratic enterprise and social change, 1766-1880*. Quezon City: Ateneo de Manila University Press.
- DENR (Department of Environment and Natural Resources). 2001a. *Republic Act 9125*. Palanan: DENR.
- DENR. 2001b. *Management plan Northern Sierra Madre Natural Park*. Palanan: DENR.
- DENR. 2008. *Philippine forestry statistics*. <http://forestry.denr.gov.ph/stat2008.htm>. Accessed on June 10, 2015.
- Dressler, W.H., C.A. Kull and T.C. Meredith. 2006. The politics of decentralizing national parks management in the Philippines. *Political Geography* 25(7): 789–816.
- Eaton, P. 2005. *Land tenure, conservation and development in Southeast Asia*. London: Curzon.
- Erie, M.S. 2012. Property rights, legal consciousness, and the new media in China: the hard case of the 'toughest nail-house in history'. *China Information* 26(1): 35-59.
- Franco, J.C. 2008. Peripheral justice? Rethinking justice sector reform in the Philippines. *World Development* 36(10): 1858–1873.
- Garrity, D.P., V.B. Amoroso, S. Koffia and D. Catacutan. 2001. Innovations in participatory watershed resource management to conserve tropical biodiversity. In: *Seeking sustainability: challenges of agricultural development and environmental management in a Philippine watershed* (eds. Coxhead, I. and G. Buenavista). Pp.112–37. Laguna: PCARRD.
- General, A. 2005. Co-management of the environment through the Socialized Industrial Forest Management Agreement: the San Mariano experience. In: *Comanagement in practice; the challenges and complexities of implementation in the Northern Sierra Madre Mountain Region* (eds. Snelder, D.J. and E.C. Bernardo). Pp.195–210. Quezon: Ateneo de Manila University Press.
- Gibson, C.C., F.E. Lehoucq and J.T. Williams. 2002. Does privatization protect natural resources? Property rights and forests in Guatemala. *Social Science Quarterly* 83(1): 206–225.
- Goldoftas, B. 2006. *The green tiger: The costs of ecological decline in the Philippines*. Oxford: Oxford University Press.
- Grainger, A. and B. Malayang III. 2006. A model of policy changes to secure sustainable forest management and control of deforestation in the Philippines. *Forest Policy and Economics* 8: 67–80.
- Guiang, E.S. 2004. *Environmental analysis USAID/Philippines strategy for 2005-2009. Assessment of conservation initiatives of tropical forests and biological diversity in the Philippines*. Manila: DENR and USAID.
- Guiang, E.S., and G. Castillo. 2007. Trends in forest ownership, forest resources, tenure and institutional arrangements in the Philippines: are they contributing to better forest management and poverty reduction? In: *Understanding forest tenure in South and Southeast Asia*. Forestry Policy and Institutions Working Paper No. 14. Rome: FAO.
- Harrison, S.R., N.F. Emtage and B.E. Nasayao. 2004. Past and present forestry support programs in the Philippines, and lessons for the future. *Small-scale Forest Economics, Management and Policy* 3(3): 303–317.
- Hirtz, F. 1998. The discourse that silences: beneficiaries' ambivalence towards redistributive land reform in the Philippines. *Development and Change* 29(2): 247–275.
- Ipara, H.I., J.J. Akonga and J.S. Akama. 2005. The tenure factor in wildlife conservation. *International Journal of Environmental Studies* 62(6): 643–653.
- Jepson, P. and S. Canney. 2003. Values-led conservation. *Global Ecology and Biogeography* 12: 271–274.
- Johnson, K. A. and K.C. Nelson. 2004. Common property and conservation: the potential for effective communal forest management within a national park in Mexico. *Human Ecology* 32(6): 703–733.
- Keesing, F.M. 1962. *The ethnohistory of northern Luzon*. Stanford, CA: Stanford University Press.
- Kerkvliet, B. 1990. *Everyday politics in the Philippines: class and status relations in a Central Luzon village*. Berkeley, CA: University of California Press.
- Klock, J.S. 1995. Agricultural and forest policies of the American colonial regime in Ifugao territory, Luzon, Philippines, 1901-1945. *Philippine Quarterly of Culture and Society* 23: 3–19.
- Kummer, D.M. 1992. *Deforestation in the postwar Philippines*. Manila: Ateneo de Manila University Press.
- Larkin, J.A. 1993. *Sugar and the origins of modern Philippine society*. Berkeley, CA: University of California Press.
- Larson, A.M., D. Barry, G.R. Dahal and C.J.P. Colfer (eds). 2010a. *Forest for*

- people: community rights and forest tenure reform. London: Earthscan.
- Larson, A.M., D. Barry and G.R. Dahal. 2010b. New rights for forest-based communities? Understanding processes of forest tenure reform. *International Forestry Review* 12(1): 78–96.
- Larson, A.M. and J.M. Pulhin. 2012. Enhancing forest tenure reforms through more responsive regulations. *Conservation and Society* 10(2):103–113.
- La Viña, A.G.M., J.L. Kho and M.J. Caleda. 2010. *Legal framework for protected areas: Philippines*. IUCN-EPLP 81. Gland: IUCN.
- Lele, S., P. Wilshusen, D. Brockington, R. Seidler and K. Bawa. 2010. Beyond exclusion: alternative approaches to biodiversity conservation in the developing tropics. *Current Opinion in Environmental Sustainability* 2(1): 94–100.
- Li, T.M. 2002. Engaging simplification: community-based resource management, market processes and state agendas in upland Southeast Asia. *World Development* 30(2): 265–283.
- Lindsey, P.A., S.S. Romanach and H.T. Davies-Mostert. 2009. The importance of conservancies for enhancing the value of game ranch land for large mammal conservation in southern Africa. *Journal of Zoology* 277(2): 99–105.
- Local Government of San Mariano. 2014. *Municipal forest land use plan*. San Mariano: Municipal Planning and Development Office.
- Lynch, O. and K. Talbot. 1995. *Balancing acts: community based forest management and national law in Asia and the Pacific*. Washington, DC: World Resources Institute.
- Magana, D.S. 2003. The Agta foragers in the Northern Sierra Madre Natural Park: ancestral domains in theory and practice. In: *The Sierra Madre Mountain Range: global relevance, local realities* (eds. Van der Ploeg, J., A.B. Masipiqueña and E.C. Bernardo). Pp.241-257. Cabagan: CVPED.
- Magno, F. 2001. Forest devolution and social capital; state-civil society relations in the Philippines. *Environmental History* 6(2): 264–286.
- Mangabat, C.B., D.J. Snelder and W.T. de Groot. 2009. Tree adoption in the North-East Philippines uplands: analysis of a GO-NGO partnership. *Small-Scale Forestry* 8: 463–478.
- McDiarmid, A. M. 1953. Agricultural public land policy in the Philippines during the American period. *Philippine Law Journal* 28: 851–888.
- Minter, T. 2010. The Agta of the northern Sierra Madre; livelihood strategies and resilience among Philippine hunter-gatherers. Ph.D. thesis. Leiden, the Netherlands: Leiden University.
- Minter, T., V. de Brabander, J. van der Ploeg, G.A. Persoon and T. Sunderland. 2012. Whose consent? Hunter-gatherers and extractive industries in the northeastern Philippines. *Society & Natural Resources* 25(12): 1241-1257.
- Minter, T., J. van der Ploeg, M. Pedrablanca, T. Sunderland and G.A. Persoon. 2014. Limits to indigenous participation: the Agta and the Northern Sierra Madre Natural Park, the Philippines. *Human Ecology* 42(5): 769–778.
- Naughton-Treves, L. 1999. Whose animals? A history of property rights to wildlife in Toro, western Uganda. *Land Degradation and Development* 10: 31–328.
- Nelson, F. 2010. *Community rights, conservation and contested land. The politics of natural resource governance in Africa*. London: Earthscan.
- Neumann, R.P. 1997. Primitive ideas: protected area buffer zones and the politics of land in Africa. *Development and Change* 28: 559–582.
- NewCAPP (New Conservation Areas in the Philippines Project). 2012. *Long-term solutions for biodiversity conservation in the Philippines*. Manila: UNDP-GEF-DENR.
- Nie, M.A. 2001. The sociopolitical dimensions of wolf management and restoration in the United States. *Human Ecology Review* 8(1): 1–12.
- NORDECO (Nordic Agency for Development and Ecology) and DENR. 1998. *Integrating conservation and development in protected area management: Northern Sierra Madre Natural Park, the Philippines*. Manila: NORDECO and DENR.
- Novellino, D. 2000. Recognition of Ancestral Domain Claims on Palawan Island, the Philippines: Is there a future? *Land reform: land settlement and cooperatives* 1: 56–72.
- NSCB (National Statistical Coordination Board). 2010. *2010 Philippine statistical yearbook*. Makati: NSCB.
- Ojanen, M., D.C. Miller, W. Zhou, B. Mshale, E. Mwangi and G. Petrokofsky. 2014. What are the environmental impacts of property rights regimes in forests, fisheries and rangelands? A systematic review protocol. *Environmental Evidence* 3(1): 19.
- Persoon, G.A. and J. van der Ploeg. 2003. Reviewing the projected future of San Mariano, a boomtown at the Sierra Madre forest fringe. *Philippine Studies* 51(3): 451–473.
- Philippine Daily Inquirer. 2011. *Isabela farmers protest bioethanol project*. February 06, 2011. <http://newsinfo.inquirer.net/inquirerheadlines/regions/view/20110206-318832/Isabela-farmers-protest-bioethanol-project>. Accessed on May 20, 2015.
- Poffenberger, M., R. Soriaga and P. Walpole. 2006. *Communities and forest stewardship; regional transitions in Southeast Asia*. Tagbilaran: Asia Forest Network.
- Pomeroy, R.S. and F. Berkes. 1997. Two to tango: the role of government in fisheries co-management. *Marine Policy* 21(5): 465–480.
- Posa, M.R.C., A.C. Diesmos, N.S. Sodhi and T.M. Brooks. 2008. Hope for threatened tropical biodiversity: lessons from the Philippines. *Bioscience* 58(3): 231–240.
- Prill-Brett, J. 1994. Indigenous land rights and legal pluralism among Philippine highlanders. *Law and Society Review* 28(3): 687–697.
- Pulhin, J.M. 2002. Trends in forest policy of the Philippines. *Policy Trend Report*: 29–41.
- Pulhin, J.M., M. Inoue and T. Enters. 2007. Three decades of community-based forest management in the Philippines: emerging lessons for sustainable and equitable forest management. *International Forestry Review* 9(4): 865–883.
- Pulhin, J.M., and W.H. Dressler. 2009. People, power and timber: the politics of community-based forest management. *Journal of Environmental Management* 91(1): 206–214.
- Rangan, H. 1997. Property vs. control: the state and forest management in the Indian Himalaya. *Development and Change* 28: 71–94.
- Ribot, J.C., A. Agrawal and A.M. Larson. 2006. Recentralizing while decentralizing: how national governments reappropriate forest resources. *World Development* 34(11): 1864–1886.
- Rice, D. and M.O. Pindog. 2005. The Ikalahan in northern Luzon. In: *The future of the Sierra Madre: responding to social and ecological changes* (eds. Van der Ploeg, J. and A.B. Masipiqueña). Pp.333-338. Tuguegarao: CVPED.
- Robinson, B.E., M.B. Holland and L. Naughton-Treves. 2013. Does secure land tenure save forests? A meta-analysis of the relationship between land tenure and tropical deforestation. *Global Environmental Change* 29: 281–293.
- Roe, D. 2008. The origins and evolution of the conservation-poverty debate: a review of key literature, events and policy processes. *Oryx* 42(4): 491–503.
- Romero, M.R. 2006. Investing in the land: agricultural transition towards sustainable land use in the Philippines forest fringe. Ph.D. thesis. Leiden: Leiden University.
- Sayer, J. and B. Campbell. 2004. *The science of sustainable development; local livelihoods and the global environment*. Cambridge: Cambridge University Press.
- Sayer, J., J. McNeely, S. Maginnis, I. Boedihartono, G. Shepherd and B. Fisher. 2008. *Local rights and tenure for forests: opportunity or threat for conservation?* Washington, DC: Rights and Resources Initiative.
- Schlager, E. and E. Ostrom. 1992. Property-rights regimes and natural resources: a conceptual analysis. *Land Economics* 68(3): 249–262.
- Schwartzman, S. and B. Zimmerman. 2005. Conservation alliances with indigenous peoples of the Amazon. *Conservation Biology* 19(3): 721–727.

- Scott, W.H. 1994. *Barangay: Sixteenth-century Philippine culture and society*. Quezon City: Ateneo de Manila University Press.
- Sikor, T. and C. Lund. 2009. Access and property: a question of power and authority. *Development and Change* 40(1): 1–22.
- Sikor, T. and D. Müller. 2009. The limits of state-led land reform: an introduction. *World Development* 37(8): 1307–1316.
- Sikor, T. and J. Stahl (eds). 2012. *Forests and people: property, governance, and human rights*. London: Routledge.
- Sjaastad, E. and B. Cousins. 2008. Formalisation of land rights in the South: an overview. *Land Use Policy* 26: 1–9.
- Snelder, D.J. and G.A. Persoon. 2005. Co-management of natural resources: introduction. In: *Co-management in practice; the challenges and complexities of implementation in the Northern Sierra Madre Mountain Region* (eds. Snelder, D.J. and E.C. Bernardo). Pp. 3–36, Quezon City: Ateneo de Manila University Press.
- Stake, R.E. 2005. Qualitative case studies. In: *The SAGE handbook of qualitative research* (eds. Denzin, N.K. and Y.S. Lincoln). Pp.443–466. London: Sage.
- Stevens, S. (ed). 1997. *Conservation through cultural survival: indigenous peoples and protected areas*. Washington, DC: Island Press.
- Tongson, E. and T. McShane. 2006. *Securing land tenure for biodiversity conservation in Sibuyan Island, Romblon, Philippines*. *Policy Matters* 14: 286–296.
- Ubink, J.M. 2009. Legalising land rights in Africa, Asia and Latin America: an introduction. In: *Legalising land rights; local practices, state responses and tenure security in Africa, Asia and Latin America* (eds. Ubink, J.M., A.J. Hoekema and W.J. Assies). Pp.7–31. Leiden: Leiden University Press.
- USAID (United States Agency for International Development). 2011. *Philippines; property rights and resource governance*. Manila: USAID.
- Utting, P. 2000. An overview of the potential and pitfalls of participatory conservation. In: *Forest policy and politics in the Philippines: the dynamics of participatory conservation* (ed. Utting, P.). Pp. 171–215. Quezon City: Ateneo de Manila University Press, UNRISD.
- Vandergest, P. and N. Peluso. 1995. Territorialization and state power in Thailand. *Theory and Society* 24(3): 385–426.
- Van den Top, G.M. 1998. The social dynamics of deforestation in the Sierra Madre, Philippines. Ph.D. thesis. Leiden: Leiden University.
- Van der Ploeg, J. and M. van Weerd. 2004. Devolution of natural resource management and crocodile conservation: the case of San Mariano, Isabela. *Philippine Studies* 52(3): 345–382.
- Van der Ploeg, J. and M. van Weerd. 2005. Contested crocodiles? Philippine crocodile conservation and indigenous peoples' rights in the northern Sierra Madre. In: *The future of the Sierra Madre: responding to social and ecological changes* (eds. Van der Ploeg, J. and A.B. Masipiqueña). Pp.339–362. Tuguegarao: CVPED.
- Van der Ploeg, J., G.A. Persoon and M.D. Masipiqueña (eds). 2007. *Ifugao migrants in and around the Northern Sierra Madre Natural Park*. Cabagan: CVPED.
- Van der Ploeg, J., A.B. Masipiqueña, M. van Weerd and G.A. Persoon. 2011a. Illegal logging in the Northern Sierra Madre Natural Park. *Conservation and Society* 9(3): 202–215.
- Van der Ploeg, J., M. Cauilan-Cureg, M. van Weerd and W.T. de Groot. 2011b. Assessing the effectiveness of environmental education: mobilizing public support for Philippine crocodile conservation. *Conservation Letters* 4(4): 313–323.
- Van der Ploeg, J., M. Balbas and M. van Weerd. 2015. Reforestation and producer organizations in the Philippines. *ETFRN News* 57: 84–90.
- Van Weerd, M. and J. van der Ploeg. 2012. *The Philippine crocodile: ecology, culture and conservation*. Cabagan: Mabuwaya Foundation.
- Vargas, A. 2003. *The Philippines country brief property and land markets*. Madison: Land Tenure Center.
- Villamor, G.B. 2006. The rise of protected area policy in the Philippine forest policy: an analysis from the perspective of Advocacy Coalition Framework. *Forest Policy and Economics* 9(2): 162–178.
- Visaya Jr., V. 2014. Former log road to get 2.9-B loan for repair. *Philippine Daily Inquirer*. <http://newsinfo.inquirer.net/645429/former-log-road-to-get-p2-9-b-loan-for-repair>. Accessed on July 18, 2015.
- Walpole, P. 2010. *Figuring forest figures*. Manila: ESSC.
- Walters, B.B. 2012. Do property rights matter for conservation? family land, forest and trees in Saint Lucia, West Indies. *Human Ecology* 40: 863–878.
- Walters, B.B. and A.P. Vayda. 2009. Event ecology, causal historical analysis, and human-environment research. *Annals of the Association of American Geographers* 99(3): 534–553.
- Weeks, R., G.R. Russ, A.A. Bucol and A.C. Alcala. 2010. Incorporating local tenure in the systematic design of marine protected area networks. *Conservation Letters* 3(6): 445–453.
- Wiber, M.G. 1991. Levels of property rights, levels of law: a case study from the Northern Philippines. *Man* 26(3): 469–492.
- World Bank 2003. *Governance of natural resources in the Philippines: lessons from the past, directions for the future*. Washington, DC: Rural Development and Natural Resources Sector Unit.
- World Bank. 2004. *Philippines. Conservation of Priority Protected Areas Project. Implementation completion report*. Washington, DC: The World Bank.WWF-Philippines. 2004. *Northern Sierra Madre Natural Park Conservation and Development Project (NSMNP/CDP) Phase 2*. Manila: WWF-Philippines.
- Yi, Y., G. Köhlin, and J. Xu. 2014. Property rights, tenure security and forest investment incentives: evidence from China's collective forest tenure reform. *Environment and Development Economics* 19(1): 48–73.
- Zerner, C. 2000. *People, plants and justice: the politics of nature conservation*. New York, NY: Columbia University Press.
- Zingapan, K. and D. de Vera. 1999. *Mapping the ancestral lands and waters of the Calamian Tagbanwa of Coron, Northern Palawan*. Manila: PAFID.