

Analysis of Water Property Rights and Responsibilities of Rights Holders in Tigum-Aganan Watershed, Philippines

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The fragmentation of rights between water permit holders who exercise authority to access, exclude, and withdraw and other institutions with only shared responsibility over watershed management inhibits effective water-related decision making, resulting in conflicts that may lead to unsustainable water supply. This paper analyzes the nature and type of property rights that govern the surface water in the Philippines employing the property rights and responsibility nexus framework – using the Tigum-Aganan watershed (TAW) as a case. It explains the failure in addressing the sedimentation problem as a representation of the weak link among institutions which has adversely affected surface water supply. In addressing sustainability challenges, water property rights and the corresponding responsibilities should be clarified across the institutional hierarchy and coordinated among actors.

Keywords: institutions, Philippines, property rights, surface water, Tigum-Aganan Watershed, watershed

INTRODUCTION

Water decisions and actions are products of complex competition and collaboration among institutions and their stake holding constituencies in different hierarchies of governance (Malayang 2004). As demands for water rise for household use, agriculture, and industry, coordination of water use becomes more complex as well as more crucial (Bruns *et al.* 2005). Water property rights as a policy tool is a potentially powerful instrument in water

resource management. The lack of effective water right systems can create major problems in the management of increasingly scarce water supply. The development of such systems can be made more effective through a better understanding of existing right-holders and claimants, and of practical problems involved in implementing an effective water right system (Bruns *et al.* 2005).

Ostrom (1976), as cited in Schlager and Ostrom (1992), referred to property rights as particular actions that are authorized. Furubotn and Pejovich (1972), as cited in Bruns and Meinzen-Dick (2005), described property

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rights as “claims, entitlements, and related obligations among people regarding the use and disposition of a scarce resource.” They are social relationships among people, individuals, or organizations in relation to property that inherently bring about duties and responsibilities. Thus, when there is greater competition for scarce resources, property rights are a policy tool that can clarify expectations and thereby reduce conflict among resource users and providers (Bruns and Meinzen-Dick 2005).

This conflict phenomenon is now observed in the TAW. TAW – located in Panay Island central Philippines – is a 29,700-ha watershed that touches the province of Antique, merging with the forest ecosystem in the mountainous area of the province of Iloilo (Figure 1). Its natural topography ranges from mountains to floodplains and coastal areas. It is composed of the Tigum River and Aganan River sub-watersheds and covers eight municipalities and one city of Iloilo province. There are 309 barangays (villages) within the watershed area.

The TAW surface water is utilized for agriculture, servicing about 7,500 ha of agricultural land – and for domestic water use, servicing around 25% of the population of Iloilo City and five municipalities of Iloilo province (Mercado 2012). As of the 2015 census, Iloilo City has a total population of 448,000 (PSA 2015).

Within the larger TAW is the smaller Maasin Watershed Forest Reserve (MWFR), which is the headwater source of the Metro Iloilo Water District (MIWD) that supplies the water requirements of Iloilo City (Francisco and Salas 2004). The MWFR, administered by the regional branch of the Department of Environment and Natural Resources (DENR), is part of TAW designated as a protected area under Republic Act 7586 (National Integrated Protected Area System Act of 1992).

The Tigum and Aganan rivers are also designated as a water quality management area (WQMA) by the DENR under Republic Act 9275 (Clean Water Act).

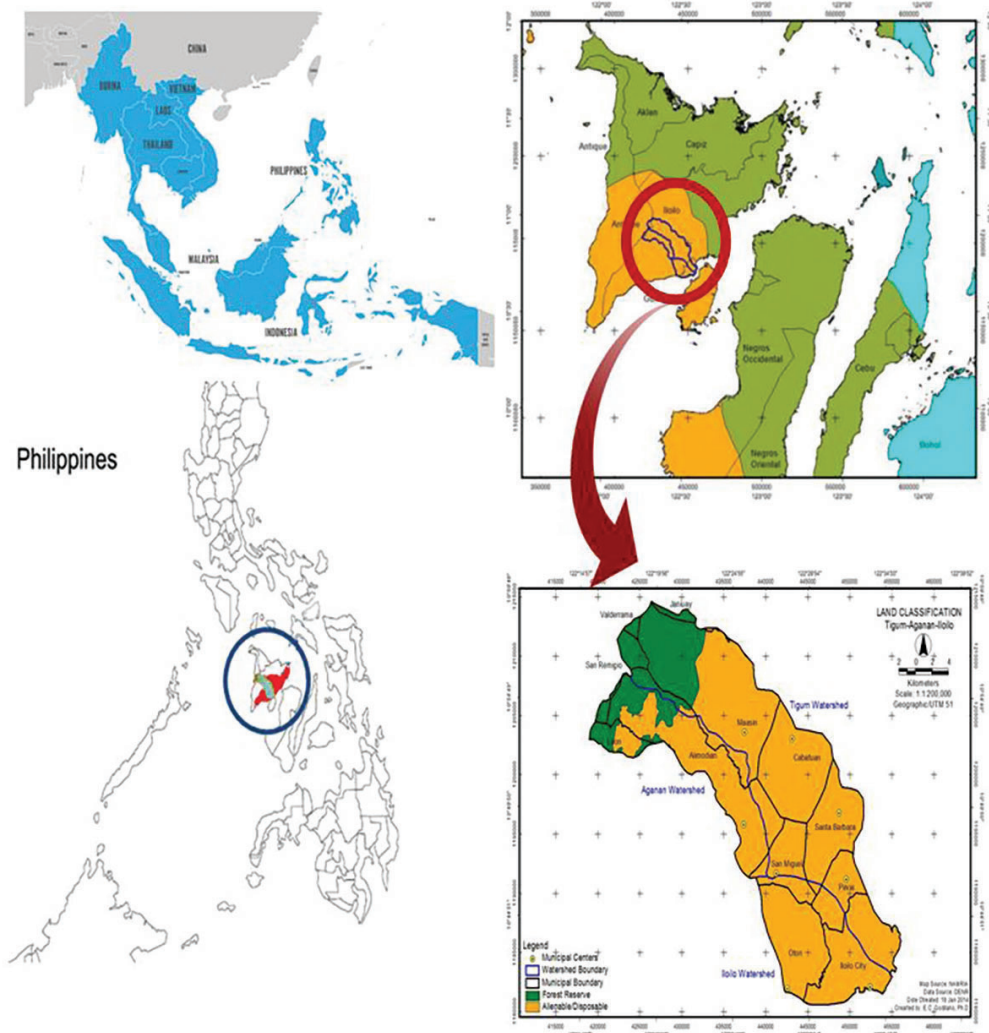


Figure 1. Location of Tigum-Aganan watershed (source: Godillano 2012).

The central problem seems to be the disconnect between the type of rights by the users of the water (which are the agriculture and the household sectors) and those of the various institutions assigned to manage the supply of water, specifically the DENR. This disconnect can lead to environmental problems including sedimentation, which affects the flow of irrigation water and the quality of the domestic water supply.

This paper analyzes the nature and type of property rights that govern the surface water in the Philippines employing the property rights and responsibility nexus framework – using the TAW as a case.

The next section presents the framework of analysis; the third section describes the methodology of the study. The fourth section covers results and discussion. This section describes the various property right holders of surface water plus the bundles of rights and the responsibilities that these actors hold in the TAW, and analyzes the impact of current property right assignment on the state of the watershed. The last section contains the conclusions and recommendations.

Nature and Type of Surface Water Property Rights and Corresponding Responsibilities: Framework of Analysis

Relationships among diverse actors in water settings are based on property rights (Schlager 2005). As water flows through a basin, it may be governed by a whole range of institutions – from open access public property to agency-controlled state property to common property to private property – resulting in water flowing through diverse, overlapping sets of rules (Bruns and Meinzen-Dick 2005). Different people, groups, or agencies may hold different and overlapping bundles of rights, which inherently bring duties and responsibilities. Accordingly, there are also stakeholders outside water rights-holding institutions, such as farmers and household water consumers excluded from organizations that provide collective rules.

Property right regimes can be classified into public, private, and common property based on who holds the rights. In public property, the state holds the rights; in private property, it is the individuals (or legal individuals such as corporations) who have the rights. As to common property, the rights are held by a group of people (Bruns and Meinzen-Dick 2005).

Challen (2001) posited that “property right regime describes the nature of an entity holding rights of decision-making as to the use of a resource, with ‘private property’ corresponding to a single decision-making entity such as an individual person or firm; ‘common property’ to a finite collective entity such as a cooperative group; ‘state property’ to a government entity; and ‘open access’ to

the absence of any entity with decision-making power of a resource.” Thus, for any resource, there are multiple levels of property rights represented as a hierarchy within which the parties with rights have their own peculiar duties, responsibilities, and objectives. Each party makes fundamentally different types of decisions and ultimately produced a pattern of resource use. Furthermore, institutions or individuals may hold in different ways bundles of rights to a resource such as surface water. Schlager and Ostrom (1992) developed a conceptual schema for arraying property right regimes that distinguish among diverse bundles of rights that may be held by users of a resource system. For a common-pool resource like surface water, the authors underscored the importance of the distinction between rights at a collective-choice level and rights at an operational level. The collective-choice rights include management, exclusion, and alienation. The rights at an operational level include access and withdrawal, which are undertaken within a set of collective-choice rules.

Management is the right authorizing its holders to devise operational-level withdrawal rights governing the use patterns and transformation of the resource by making improvements on it. Schlager and Ostrom (1992) further note that individuals or institutions who hold the rights of management have the authority to determine how, when, and where harvesting from a resource may occur, and whether and how the structure of a resource may be changed. Exclusion is the right authorizing its holders to devise operational-level rights of access and how that right may be transferred. Hence, individuals or institutions who hold the rights of exclusion have the authority to determine who will have access, to define the qualifications that individuals must meet in order to access a resource, and to establish how that right may be transferred. The authors also state that the right of alienation is another collective-choice right permitting its holder to transfer by selling or leasing the collective-choice rights of management, exclusion, or both.

On the other hand, operational-level property rights of “access” is the right to enter a defined physical property or a resource, and “withdrawal” is the right to obtain the ‘product’ of a resource such as usable water (*e.g.*, potable water for domestic use) to sell or lease or both (Schlager and Ostrom 1992).

This paper combines the nature of rights as framed by Challen (2001) and the type of rights as proposed by Schlager and Ostrom (1992) to clarify the rights and responsibilities nexus framework by the various actors within the watershed (see Figure 2). To have a more complete description of property rights to water, there is a need to unbundle these into rights to access, withdraw, manage, exclude, and alienate/transfer

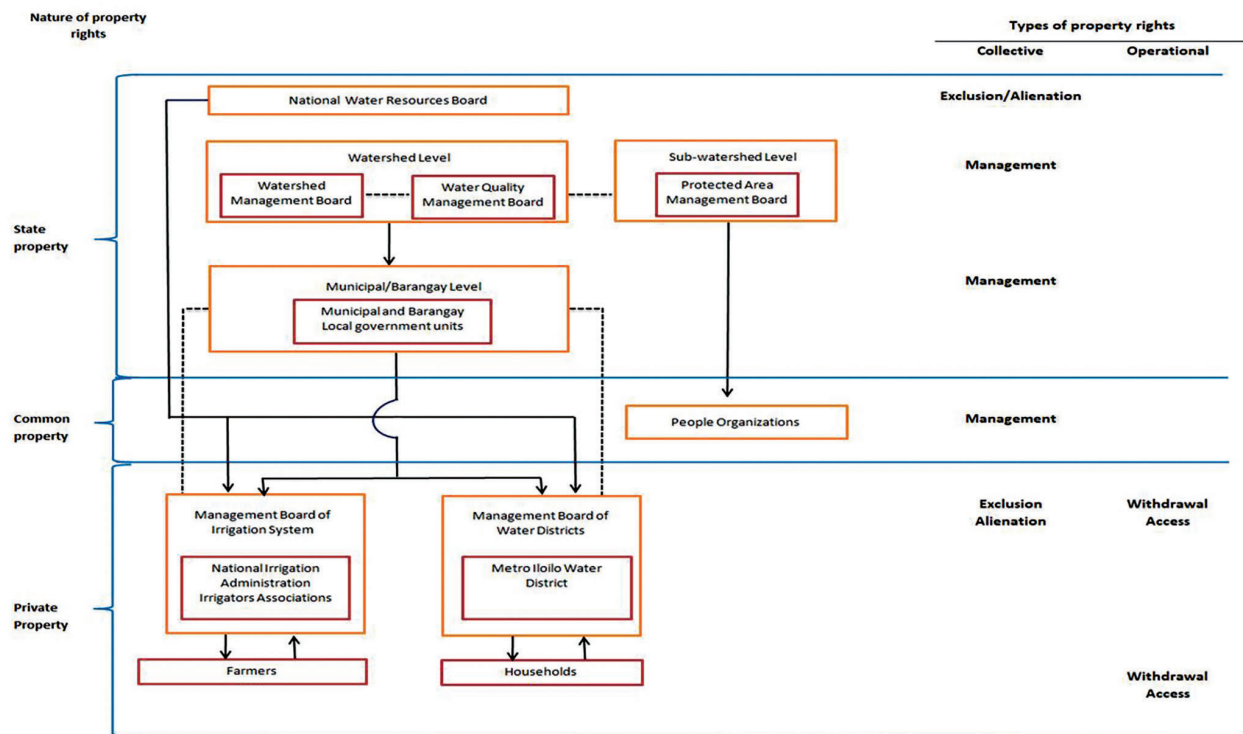


Figure 2. Framework of analysis: Water property rights and responsibilities of rights holders nexus.

(Schlager and Ostrom 1992) and corresponding duties and responsibilities brought about by these rights have to be stipulated.

In the Philippines, state-assigned water rights are administered by the National Water Resource Board (NWRB). However, there are customary rules on water rights as common property, which are more dominant and are practiced especially in rural upland areas. Downstream, the right to access and withdraw water is awarded by the water board to the National Irrigation Administration (NIA) for irrigation and domestic water providers (*e.g.*, water districts) are given the rights to water geared for household use.

While the aforementioned institutions are holders of property rights to water, their rights are not clearly stipulated. For instance, while the irrigation agency has the private property right to water flowing downstream, it is not assigned to protect its water source upstream. Those assigned to do so do not also have the mandate to work with property right holders downstream. Thus, any mismanagement of the upstream water source can result in scarcity of irrigation water downstream. The solution to this physical water scarcity is beyond the control of the irrigation sector. In general, the water sector in the Philippines has been beset by various issues because of the weakness of institutions charged with assignation

of rights (Rola *et al.* 2016) and clear delineation of duties and responsibilities. Property rights to water in the form of permits and franchises are contested and poorly understood at the community level where informal mechanisms and rules pertaining to water access, withdrawal, and management are more readily observed (Hall *et al.* 2015, 2018).

METHODOLOGY

This study used both secondary and primary data in the analysis. Secondary data includes the following documents: Iloilo Province Resolution 265 and 285 (1979) creating the MIWD; Iloilo Provincial Ordinance 2000-041 creating the Iloilo Watershed Management Council; and 2003 Memorandum of Agreement among local government units (LGUs) creating the Tigum-Aganan Watershed Management Board (TAWMB). Said documents establish the legal basis of various coordination platforms for watershed management and water provisioning among government and non-government players. Reports on Tigum-Aganan management were also secured from Iloilo City and Provincial Planning and Development Offices, Iloilo Provincial Environmental and Natural Resources Office (PENRO), Region VI DENR Environmental Management Bureau (EMB), and

Region VI NIA. Three key reports – The State of the Tigum-Aganan Watershed Report (2013), An Assessment of Water Security Development and Climate Change in Iloilo (2013), and Assistance to Metro Iloilo Water District in Exploring Options for the Provision of Water Supply and Sanitation Services (2009) – were examined for identification of issues and challenges by water actors.

Primary data were generated from seven roundtable discussions (RTDs) and seven key informant interviews conducted from Oct 2014 to Apr 2016, as part of UP Visayas' project on adaptive collaborative water governance. The RTDs involved representatives from Region VI DENR-EMB; NIA; NEDA; DILG; LGUs covered by TAWMB (Pavia, Leon, San Miguel, Oton, Alimodian, and Santa Barbara); MIWD; academe (Central Philippines University and West Visayas College of Science and Technology – Leon); and several NGOs (BOENAS Water Cooperative, Ecoforum, Green Forum, and Aganan Federation of Irrigators Association). The RTDs followed three phases: 1) assessment and collaboration with partners involving institutional stakeholders mapping, a series of fora, and assessment of existing laws that govern activities within TAW; 2) prioritization of problems and identifying strategies to address water problems; and 3) identification of management strategies to address identified problem. The RTDs covered discussions on privatization options for the MIWD, institutional plans and activities on TAW, national initiatives on management of river basins, and the legal bases for the coordination platforms. Seven key informant interviews were conducted in May 2016 with the TAWMB Technical Working Group chair and members from select LGUs, representatives from the academe, NIA Regional Director, and Protected Area Supervisor. The interviews featured questions on their past experiences and perceptions of TAWMB as a coordinating body, and perception and attitudes about the meetings and RTDs undertaken by UP Visayas in terms of participation, institutional design, and process.

Transcriptions of RTDs, key informant interviews, as well as the reports, policies, and legal documents were content-analyzed *vis-à-vis* variables of right holders.

RESULTS AND DISCUSSION

This section discusses the property right regime in the TAW. In TAW, there exist multiple levels of property rights with corresponding institutions that hold different bundles/types of rights to its surface water. The first level in the hierarchy is the state property right at the upstream level and municipal/village level, with government-led platforms set for managing the water resources –

especially for protecting the water source. The second level is the common property right where a collective group manages the surface water. The third level is private property right given to individual users making investment and production decisions for water harvesting and exploitation.

State Property Right Holders and the Right of Management

The Philippine Constitution provides that all waters of the Philippines belong to the State. Its utilization, exploitation, development, conservation, and protection of water resources shall be subject to the control and regulation of the government through the NWRB. Further, Article 13 of the Water Code, stipulates that no person – including government instrumentalities or government owned or controlled corporations – shall appropriate and use water without a water right, which shall be evidenced by a water permit.

At the watershed level, there are four local replicates of management bodies drawn from national mandates: the TAWMB, the Protected Area Management Board (PAMB), LGUs that have administrative jurisdiction on the watershed, and the Tigum-Aganan WQMA (Table 1).

The first three bodies plan and implement programs and projects for the conservation, development, protection, and rehabilitation of the watershed, but not specifically on water quantity and quality. Most of their initiatives are in the upstream – focusing on forest concerns such as addressing the problem of deforestation and agricultural malpractices resulting in soil erosion and, consequently, the problem of river siltation. In line with the devolved mandate for environmental protection under the Local Government Code, the Iloilo Provincial Government created a province-wide Watershed Management Council, which in turn oversees specific watershed management boards (Salas 2004).

The TAWMB's scope of management rights includes the formulation and adoption of a watershed management and development plan; monitoring of development programs and projects related to the watershed; and generation of revenues, technical, and logistical assistance as well as investment packages for watershed development and management. Meanwhile, the PAMB's scope of management rights is more substantive in that it decides on the ground delineation and demarcation of boundaries of the protected area and the buffer zone. The zoning of the watershed specifying the forest reserve, buffer zone, and multi-use area is contained in a management plan that it is tasked to produce. Likewise, there are eight municipalities and one city – with corresponding 309 villages within the bounds of the watershed – that have their own plans and strategies for managing the watershed within their area of

Table 1. State property right holders and the right of management.

Level of Hierarchy of Property Right	Holder of Property Rights	Types of Right				
		Management	Exclusion	Transfer/ Alienation	Access	Withdrawal
State Property	1) Tigum-Aganan Watershed Management Board	✓				
	2) Tigum-Aganan Watershed Water Quality Management Area	✓				
	3) Protected Area Management Board	✓				
	4) Local Government Units (8 municipalities and 1 city of the province of Iloilo and their respective barangays within Tigum-Aganan watershed)	✓				

administrative jurisdiction. Consider that these LGUs have their own sets of local government officials, headed by the municipal mayors, and legislative bodies, the *sangguniang bayan* at the municipal level and the barangay chairman/captain, and *sangguniang barangay* (barangay council) at the village level.

The WQMA Board’s management rights pertain more directly to water quality. The board is tasked to formulate strategies to coordinate policy implementation and monitor action plans of each local government unit.

It is responsible for monitoring and facilitating compliance and cooperation among LGUs and ensuring the coordination and consistency of local legislations related to water quality and pollution abatement.

Notably, there is cross membership among the three boards. Majority of the institutions are present in all three bodies (Table 2). Membership in these bodies includes the mayors of municipalities within the watershed, but only the PAMB specifies the involvement of village leaders (barangay captains). They also include members from civil society. Of the two organizations with water permits, the NIA is not a member of the WQMA, whereas the MIWD is a member of all three.

The above institutions hold the right to transform the resource by making improvements in the watershed that affect surface water supply, but they have no authority to make decisions on how, when, and where harvesting of surface water may occur. Even within the scope of its management rights, the Board’s ability to address the problem of siltation – which impinges directly on the amount and quality of surface water – is very limited. This limitation stems primarily from (1) lack of scientific data on the non-point source of sedimentation (Salas 2004); (2) change in local government leadership (local chief

executive) every three years, which result in weak policy commitment, especially among upstream municipalities (Salas 2004); and (3) lack of sustained funding for watershed management efforts (*e.g.*, tree planting, hiring of forest stewards) on the side of the local government beyond project-based interventions (Salas 2004).

Vogel *et al.* (2013) notes that the proliferation of interagency, inter-LGU entities with similar geographic focus but following related mandates carry some functional redundancies. In recent years, under a Canadian government-funded project, initial attempts were also made to link the Board with another inter-local government unit formation – the Metro Iloilo and Guimaras Economic Development Council (MIGEDC) under a bio-region, reef-to-ridge initiative with facilitation by a local academic consortium (Fernandez *et al.* 2013). The consequent widening of scope of coordination to include Guimaras province and to encompass economic concerns, as well as replication of tasks, further complicates management efforts.

Common Property (Held in Public Trust) and the Right to Management

The second level of the hierarchy comprises common property held in public trust by the *Katilingban sang mga Pumuluho nga Naga-atipan sa Watershed sang Maasin* (Federation of Communities Taking Care of Maasin Watershed), a federation of people’s organizations formed in 1997. It is composed of 16 upland communities in the Upper Tigum watershed. The residents are living and/or farming within the MWFR. Following initial reforestation initiatives by the provincial government from 1992 to 1994, the DENR Forest Sector Project provided a basis for continued community-organizing efforts through its two-year replanting and capacity building for socialized forestry

Table 2. Membership in the three bodies.

Tigum-Aganan Watershed Management Board (created by the Local Government Code of 1991)	Water Quality Management (created by the Clean Water Act of 2004)	Protected Area Management Board (created by the National Integrated Protected Areas Act of 1992)
Chair: Elected among the 8 Municipal Mayors member of the Board.	Chair: Department of Environment and Natural Resources Regional Executive Director	Chair: Department of Environment and Natural Resources Regional Executive Director
Members:		
Municipal Mayors of 8 local government units within the boundary of the watershed (Maasin, Alimodian, Leon, Cabatuan, Sta. Barbara, San Miguel, Pavia, and Iloilo City)	Mayors of all nine municipalities within the watershed (Maasin, Cabatuan, Sta. Barbara, Pavia, Alimodian, Leon, San Miguel, Oton, and Iloilo City)	Municipal Mayors of Alimodian and Maasin
	Iloilo Provincial Governor	Barangay Captains of 9, 5, and 1 barangays of the municipalities of Maasin, Alimodian, and Janiuay, respectively
		Head of the Provincial Planning and Development Office of Iloilo Province sits as an <i>ex-officio</i> member representing the Provincial Governor.
Department of Environment and Natural Resources	Maasin Forest Reserve Protected Area Management Board	Municipal Environment and Natural Resource Officer of the Municipality of Janiuay
Department of Public Works and Highways	Department of Public Works and Highways	Department of Public Works and Highways
National Irrigation Administration		National Irrigation Administration
Metro Iloilo Water District	Metro Iloilo Water District	Metro Iloilo Water District
Academe	Academe	
People's Organization (<i>Katilingban sang mga Pumuluyo nga Naga-atipan sa Watershed</i>)		Representative from people's organization
Non-government organization (<i>Kahublagan sang Panimalay Foundation, Inc.</i>)	Representative from non-government organization	Representative from non-government organization
Sta. Barbara River Federation of Irrigator's Association, Inc.	Department of Agriculture	
	Department of Health	
	Philippine National Police	
	Representative from the Iloilo Business Club	

(agreement-based forest management by the community) (Salas 2003). In 2002, they forged a community-based forest management agreement with DENR, a tenurial agreement that grants them 25 years of stewardship of about 3,416 forest land within the Reserve (TAWMB and CUI 2013). As stewards, the Federation has the responsibilities of protecting, preserving, and rehabilitating forested areas; enforcing forestry laws and preventing illegal cutting; and engaging in livelihood activities, including the utilization of minor forest products to support the livelihood and forest management activities of the local communities in the Reserve. Similar to the four aforementioned institutions, the Federation's right to management does not cover authoritative decisions on how, when, and where to abstract surface water, but rather on the preservation and making improvements in the watershed through collective efforts and normative framing.

The exercise of management rights to common property could only be attained with the shared understanding and acceptance of the ecology discourse (*i.e.*, that water and land are linked; that land use resulting in the removal of forest cover or conversion to agricultural land lead to soil erosion, which ultimately impacts downstream communities in the form of siltation and poor water harvest) by the Federation members and by various government agencies that relate to them. Because conservation strategies adversely impact livelihood derived from these forest resources, premium is on community organizing, consultation, dialogue, and awareness raising (Garrity *et al.* 2001, Salas 2003). Upland residents typically show mistrust toward outside agencies and they resent downstream residents who get to use the water, while they only have rudimentary provisions – given their remote location. For Francisco

Table 3. Private property right holders and the right to exclusion, transfer/alienation, access, and withdrawal.

Level of Hierarchy of Property Right	Holder of Property Rights	Types of Right				
		Management	Exclusion	Transfer/ Alienation	Access	Withdrawal
Private Property	1) National Irrigation Administration		✓	✓	✓	✓
	2) Metro Iloilo Water District		✓	✓	✓	✓
	3) Irrigators' associations		✓	✓	✓	✓
	4) Farmers				✓	✓
	5) Households				✓	✓

and Salas (2004), a high level of understanding among the community and resource managers is key to a functional watershed management initiative.

Private Property and the Right to Exclusion, Transfer/Alienation, Access, and Withdrawal

The third level is private property right held by the NIA and the MIWD, derived from water permits issued to them by the NWRB as provided in the Water Code of the Philippines. These permits grant them rights to exclusion, transfer/alienation, access to, and withdrawal of surface water from the TAW. Included at this level are the farmers and households, which have access and withdrawal rights (Table 3).

Property rights of exclusion and alienation/transfer. The NIA's basic functions with respect to the management of irrigation systems are operations, repair and maintenance, fund management for organization and management, enforcement of procedures and resolution of water-related conflicts, and provision of agricultural support services. It operates and maintains the irrigation systems in partnership with its farmer-beneficiaries organized into irrigators' associations. The agency conducts institutional development activities to strengthen and enhance the capabilities of these associations to make them effective partners in the operation and maintenance of the irrigation systems (NIA 2016). It has intake facilities midstream of the TAW and was granted water rights by the NWRB on 30 Apr 1980 to extract 7,965 and 7,450 Lps of surface water from Aganan River and Tigum River, respectively. It manages the entire system but transfers specific operation and maintenance activities to the irrigators' associations.

On the other hand, the MIWD – a domestic water provider – is a government-owned and-controlled corporation that is locally controlled and managed with support from the national government in the areas of technical advisory services and financing and whose operation is overseen

by the LWUA, a regulatory body. It was granted a permit to extract its water supply from the Tigum River for domestic use through an intake dam in Maasin with a capacity of about 30,240 cu m of water per day. It supplies water for domestic use to residents of Iloilo City and six municipalities of the province of Iloilo. MIWD had a spate of contentious relationship with the LGUs of Maasin, Oton, and San Miguel where its water sources (ground and surface) are located. Following legal opinions from the Office of Government Counsel, the MIWD stopped payments to these LGUs for “share of national wealth,” but subsequently provided for a payment in kind to Maasin for watershed protection (CSA 2009). It currently has standing arrangements with the LGUs of Oton and San Miguel to continue extracting from deep wells within the latter's jurisdiction, but not for additional drilling or water source development.

The NIA distributes water through its network onto farmers organized as irrigators' associations for collective decision-making and consultative problem-solving. The Aganan River Irrigation System has eight irrigators' associations, while the Sta. Barbara-Tigum River Irrigation System has four (NIA 2014). The irrigators' associations are responsible for the maintenance of canals; operation activities such as discharge monitoring and preparation of list of irrigated and planted area; distribution of irrigation service fee bills; and campaign for payment. By contrast, the MIWD with level 3 (individual household connection) deals with customers individually. The District's consumers, majority of whom are Iloilo City residents, are neither organized nor do they participate actively in consumer assemblies. There are no effective mechanisms for household consumers to make MIWD accountable for improving its services (CSA 2009).

In view of the usufruct rights granted, both the NIA and MIWD hold the property rights of exclusion and provide property rights of access and withdrawal to farmers

through the irrigators' associations and households, respectively. Both irrigation agency and water district establish rules for access (*e.g.*, membership in an irrigators' association, payment of irrigation fees, application for meter connection into pipelines, and payment of fees based on a set rate of domestic water consumption) for its end users, which are farmers and households.

Property rights of access and withdrawal. The farmers and households in the service area of the aforementioned irrigation agency and water district, respectively, also hold the rights of access and withdrawal to surface water. Generally, the legal framework allows individual/household access and withdrawal from surface water for less than 100 L a day – without need for a permit. There are 2,413 farmers with average farm size of 2 ha accessing water for irrigation from the Aganan River Irrigation System. For the Sta. Barbara-Tigum River Irrigation System, there are 1,857 farmers with an average farm size of 1 ha extracting water for irrigation from Tigum River (NIA 2014). They primarily grow rice and access water in accordance with rules and regulations set by the NIA and the irrigators' associations.

The MIWD has a total of 28,020 connections for domestic use in its service area, roughly 20% of Iloilo City households (PPDO 2011). This is equivalent to the number of households availing of surface water from the TAW for domestic use. The water district also provides limited level 3 connection to households in municipal centers, but the majority of villages have their independent water systems abstracted from the river or from groundwater sources.

In 2008, the MIWD entered into an agreement with the Maasin LGU to set aside Php 1 M for watershed rehabilitation, with the amount to be administered by the LGU. However, owing to alleged irregularities in fund disbursement, the said "donation" was never repeated. Water districts, as government-owned and -controlled corporations, are exempt from paying local government taxes. The MIWD also has no payment for environmental service fee in its consumer billing, unlike other water districts. Any commitment it makes toward watershed rehabilitation or conservation is voluntary.

Outcomes of Current Property Right Assignment

Property rights are effective only if there are some kind of institutions to stand behind them, and the rights are only as strong as those institutions (Bruns and Meinzen-Dick 2005). As revealed in various reports and as confirmed during the RTDs and key informant interviews, there are physical outcomes and conflicts that resulted from the unclear assignment of property rights coupled with the lack of the right incentives for institutions to effectively carry out their mandates, duties, and responsibilities.

Periodic monitoring by TAW WQMA revealed increasing amounts of sediments and localized deposits in areas upstream for the past three years. The monitoring results for total suspended solids from 2014 to 2016 for all stations upstream to downstream showed 500–1,100 mg/L, which is way above the 80 mg/L standard. The NIA and the MIWD, which have intake facilities midstream, have noted this problem for years. The former applied for a grant for a sediment-expelling machine for its intake facility, while the latter observed a longer processing time in its sediment-settling plant.

Further, the watershed is experiencing advanced deforestation – only 8% of the watershed remained as closed-canopy forest cover; forest land caused landslides, flooding or drying up (non-availability of water) in the area (TAWMB and CUI 2013). Degradation of the riverbed can be seen in the mid- to downstream areas, with some bridge footings exposed above the river bed caused by sedimentation and improperly regulated quarrying. This, in turn, affects the livelihoods and socioeconomic conditions of the communities in the TAW.

According to Ibabao *et al.* (2015), all focus group discussion participants reported experiencing conflict with the same (and other) stakeholders. Among the stakeholders, the local government unit representatives reported many issues involving households in their areas. Farmer groups reported verbal altercations with households that they hold accountable for causing pollution coming from domestic/animal wastes, contaminating the gravity-based irrigation canals. The conflict was about poor irrigation water quality arising from household use.

On the other hand, the household group holds the LGUs responsible for unreliable delivery of water supply and for not making water more accessible in other areas. In summary, the reported conflicts revolve around poor water quality, inaccessible water supply, and inadequate (or no) water supply. In addition, in terms of geographic location, specific issues were reported by participants (Ibabao *et al.* 2015):

- Upstream participants reported disputes about alleged provision of more water supply to downstream communities at the expense of upstream areas; poor (or lack of) maintenance of facilities; non-payment of fees; indiscriminate water use, especially during dry months; and ignorance or non-recognition of implicit and explicit rules on water access.
- Downstream, the conflicts involved poor water quality due to pollution from activities upstream; non-payment of fees; close distance of dug wells, which is perceived to result in water competition; indiscriminate use of water; stealing of water

meters; and putting the full responsibility of facility maintenance on water service providers.

- Midstream disputes involve competing water uses between businesses/industries and agricultural and residential sectors.

CONCLUSION

Property rights to water in the form of a water permit issued by the NWRB puts more emphasis on access, withdrawal, alienation, and exclusion dimensions. NIA's water permit authorizes the agency to abstract water for irrigation, but historically its focus is building infrastructure necessary for distribution of irrigation water to farmers who are organized collectively to manage the resource. Water districts like the MIWD likewise focus on these dimensions. However, because they are a quasi-government corporation, there are no subsidiary rights for management given to consumers who – unlike the irrigation associations – are not organized collectively.

While preservation and conservation are also included amongst the bundle of rights in the water permit, neither the NIA or the MIWD are compelled to make decisions on the improvement of the resource as their outfits are structured on the distribution rather than the production side of water. For both, there are alternatives to reduced surface water harvest arising from sedimentation or pollution (*e.g.*, ground water, bulk water supply, more treatment). As the fees collected by both institutions do not include environmental services, there is little to spare for these conservation or protection measures.

These institutions have sole rights to exclusion, alienation/transfer, access, and withdrawal of water, but shared rights to management on the watershed upon which water supply is contingent. These initiatives are primarily program-based and the internal arrangements between these two institutions and the concerned LGUs are temporary and non-binding, subject to the political whims of the local government executives and the water organization managers. Although the NIA supports reforestation programs, it is not the core of its business. In the light of previous decisions by the Inter-Agency Government Advisory Body that local governments are not entitled to a share of the national wealth arising from resource development (*e.g.*, water), the MIWD has also taken a pragmatic stance towards support for LGU reforestation programs as a “voluntary donation.”

Dealing with externalities (such as sedimentation and pollution) fall under the management purview of the management boards and LGUs tasked to devise and implement rules regarding forest, watershed, and land

use. Their management rights are derived from national legal mandates, but are limited by their institutional set-up, which puts local government chief executives as lead and with insecure funding bases to effect improvements on the water resource. In the case of the TAWMB, mayors – and consequently, commitment to management strategies – change every election period. Funding for reforestation and conservation efforts are not sustained. The NIA and the MIWD are members of these management, but their membership carries little weight. Because these management boards are set up as coordinating platforms, they do not function beyond planning, monitoring, and reporting by individual agency, LGU, or civil society initiatives for watershed or surface water quality improvements.

Farmers and households, who also hold subsidiary rights to access and withdrawal of water, are also not connected to the management schemes because of their geographic placement and gaps in their ability to exercise those rights as a collective body. Those to whom management measures are applied (upstream swidden farmers) are separate from those who consume the water (rice farmers midstream and downstream urban city dwellers). Improper garbage disposal by households upstream affects the quality of water in downstream irrigation canals. Households hold private property rights to water, which include access and withdrawal, but the resource requires management as a collective property because of its nature. The formulation and enforcement of rules governing behavior that compromise water quality are often left to local government, to which households have little input.

RECOMMENDATIONS

Water permits issued by the NWRB is the singular embodiment of water rights, which the state as sole owner of all water resources awards to entities such as the NIA and water districts. While the water permit clearly articulates rights to exclusion, alienation, access, and withdrawal, the management aspects of the resource is not given due emphasis as part of the obligation of the water permit holder. Management rights instead are given to various Boards convened under separate legal instruments (Water Quality Act, NIPAS Act, Local Government Code), within which framework the water permit holders are neither compelled nor obligated. Watershed protection and maintenance of surface water quality, which is a resource management concern, become disconnected from the other rights because they are not matters of obligation to water permit holders. It is recommended that NWRB permit should be amended to include robust requirements for management tasks by permit holders,

earmarking a dedicated percentage of earnings from water resource development and distribution for watershed protection, and water quality amelioration. Rather than the current scheme of voluntary donations by the MIWD and program-based watershed protection activities by NIA, a more regular funding base can be established for the management task.

While LGUs have no direct claims nor entitlements on water resource within their administrative jurisdiction, it is important that they should be supported for protecting the resource. To further isolate the process from local government capture, it is recommended that legal instruments be drawn between the water district and the NIA, and the upstream local governments specifying concrete amounts and measures for watershed improvements, which the latter commits to implement. A memorandum of understanding, for instance, that stipulates monetary contribution from these two entities and complementary mechanisms on how the money is to be used for watershed management is a good start. In turn, NIA and MIWD could develop a payment for environmental service, included in their operations billing in order to raise money for watershed management, which will eventually address the sedimentation problem.

At the local level, there is a need to streamline the Board's membership so that key decision-making may be done by those who hold the property rights to access and withdrawal of surface water (households through their village government and irrigators' associations, NIA, and MIWD). A parallel cooperation arrangement (through a memorandum of agreement) could also be done between the PAMB and the TAWMB so that upstream concerns on the watershed could be undertaken by the former, leaving the latter to concentrate on midstream and downstream issues. Mapping the extent of the current protected forest *vis-à-vis* land that has been opened up for cultivation could help identify how upstream LGUs be better involved in managing the watershed. Moreover, the property rights of the national government agencies, non-government organizations, and the academe who have the mandate to protect and maintain the TAW should be spelled out. It is also important that the platform membership rules be amended to include the private sector – small-scale water providers and small enterprises (*e.g.*, piggeries and eateries) whose activities impact on water quantity and quality.

At the user level, public information on property rights to water should be accompanied by suggestions for individual efforts at water management. From conservation to water recycling and water-harvesting techniques, the NWRB as well as the NIA and MIWD should devote more resources toward an effective information and education campaign.

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