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Conflict, Cooperation, & Collective Action: Land use, water rights, and water scarcity in Manupali watershed, southern Philippines

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Sustaining the environmental, social and economic development in Manupali watershed in southern Philippines is highly dependent on fair allocation of water use rights and judicious utilization of water as a scarce resource. There are many stakeholders and water users: smallholder farmers, indigenous people, multi-national companies, the local government, National Irrigation Administration, and the National Power Corporation. As demand for water outstrips supply, conflict arises between different user-groups over who can use water and how much each can use. This paper reports on initial results of on-going studies that examine water rights and land use change, to negotiate for better co-investment in managing watershed. A key issue in Manupali is the overlap in 'water rights', which is a privilege the government grants to use and further appropriate water. To avoid hostile confrontation between different user-groups and to manage competition of water use, some user-groups came up with voluntary agreements for water rights sharing. Viewed in terms of cooperation and collective action, these voluntary agreements facilitated conflict management of a disputed natural resource, but fairness and equity dimensions are in question, as the cooperating user groups extract benefits from non-cooperators who may suffer the consequence of protecting the upper watershed to maintain water supply. Supported by watershed hydrological data on water balance and its land use patterns, this paper argued that collective action at watershed scale is needed to ensure that benefits are fairly shared by both water users and producers.

Keywords: Water rights, water allocation, water conflict, cooperation, collective action

1. INTRODUCTION

Water conflict is not a new problem. Different cases around the globe have been reported and discussed for centuries but with increasing frequency in the past three decades. In 1997, Samson and Charrier noted the increasing number of human conflicts that are linked to issues around 'freshwater' supply, access and distribution, and predicted that growing conflict threatens ahead. In Myanmar, IRIN (2010) accounted the displacement of 15,000 people due to the construction of the Myitsone Dam; while water resources in China have been over-allocated, inefficiently used and polluted by human and industrial wastes, with 300 million people lacking access to safe water (Gleick & Palaniappan 2009). Since water knows no political boundaries, governments create artificial borders that trigger political tension and geopolitical instability. Homer-Dixon (1994) mentioned that among the renewable resources, river water is most likely to trigger interstate resource war. Altermann (2010) chronicled the political tension and impending social unrest as a result of the water crisis in the Middle East. The basic argument in many conflicts surrounding water is simple. Water is vital to life, hence, it is no surprise why this important resource is rapidly depleting, polluted, highly politicized, and has been central to military and political goals. Gleick (1993) described these issues with Jordan and Nile rivers as examples. Gleick and Palaniappan (2009) adds that many areas have already reached their 'peak ecological water' where their capacities to absorb the consequences of excessive use is already severely stretched.

In the Philippines, many cases of water conflict have also been reported. Reyes (2010) reported cases of disputes associated with mis-allocation of irrigation water in Bayugan City where farmers

experience tensions dealing with officials at the National Irrigation Administration (NIA). The same irrigation issue has triggered conflict between upstream and downstream farmers resulting to reduction in number of annual cropping cycle of rice among farmers in San Pablo City, as the use of upstream water is shifted for municipal use. Due to water crisis in irrigation, farmers have been calling the government's attention to prioritize provisioning of irrigation water by seriously implementing irrigation programs that enable them to produce rice to address domestic demand rather than rely on rice imports (Ordoñez 2010). Also, Israel (2010) accounted the water conflict in Tuburan, Cebu province amongst government officials on the operation of the town's water district. Tabios and David (2004) also documented cases of complex water disputes, including compensation issues for changing water allocations in Angat Dam, the conflicting use of Laguna Lake water for fisheries, transport, recreation, drinking water and as a waste sink, the accusation of coastal households to big industries for causing saltwater intrusion in Batangas City, and the unregulated groundwater usage in Cebu City causing seawater intrusion.

There are legal principles governing water management that guide allocation, however the same principles have often created conflict. Kho and Agsaoay-Saño (2005) identified two major laws that define water rights. The first is 'statutory rights' defined in the Water Code (PD 1067), which authorized the National Water Regulatory Board (NWRB) to manage water resources. Second is 'customary rights' defined in the Indigenous People Rights Act (IPRA 1996), which also created the National Commission on Indigenous Peoples (NCIP). However, the difference in perspectives between these two types of rights gave rise to major conflict between the government, indigenous peoples and other water users. Water right is a privilege granted by the government to appropriate and use water, whereas 'appropriation' is the acquisition of rights over water use or the diversion of water from natural sources allowed by law.

Resolving water conflict can be long and tedious; hence some stakeholders opt for simple compromises to settle disputes between them. Local experience shows that collective action works through voluntary agreements where 'users' voluntarily cooperate to solve shared water problems. Knox and Meinzen-Dick (2001) allude that collective action enables a more equitable distribution of [water] resource benefits but requires voluntary adherence to a common set of rules and coordinated contributions by its participants. There are factors that influence collective action outcomes, such as i) resource scarcity; ii) experience in other collective action; iii) degree to which [water] resources are central to people's livelihoods; iv) group heterogeneity and wealth distribution; v) political rights to organize and manage resources locally; vi) level of investment needed to make resources productive; and vii) government support in facilitating collective action. The potential of collective action at the watershed level is higher under moderate biophysical conditions, and organized communities with shared interests are more likely to facilitate collective action (Reddy et al., 2007; Sellamna, undated). Small-sized groups make communication easier, decision-making more efficient, and organizational mobilization and monitoring more cost-effective (Sellamna, undated). Additionally, equitable distribution of benefits increases the incentive for cooperation. Stakeholders are more likely to manage a common resource if benefits are easy to identify, materialize quickly, and accrue to those who incur the costs (Sellamna, undated). However, absence of clearly-defined [water] property rights is a major factor in the failure of participatory watershed development (Reddy et al., 2007).

This paper describes the water conflict and cooperative agreements adopted by different water users in the Manupali watershed, Bukidon province in the southern Philippines. Among the key user-groups in Manupali are farmers, indigenous people, multi-national companies, the Local Government, National Irrigation Administration (NIA) and National Power Corporation (NPC). As demand for water outstrips supply, conflict arose between different user-groups over who can use water and how

much each one can use. As a first step, it was important to reach a shared understanding on the actual water balance of the area and its dependence of land use patterns.

The study used data from the Rapid Hydrological Appraisal (RHA) conducted for Manupali. Survey-interviews and group discussions were also conducted to understand the nature of conflict and the actions taken by different stakeholders, and policy documents were also reviewed.

2. THE MANUPALI WATERSHED: LAND USE CHANGE AND WATER BALANCE

The Municipality of Lantapan is wholly contained in the Manupali watershed, Bukidnon province (Fig 1). It has a total land area of 35,465 hectares, of which 60% is devoted to agriculture while 40% is forest. Its elevation ranges from 320 to 2938 masl, and its climate falls under Type IV climatic conditions with evenly distributed rainfall throughout the year, but with indistinct dry and wet seasons. The maximum annual rainfall recorded between 1987 and 2005 was 2522.4 mm while the mean annual rainfall was 1,500 mm. About 70% of the area has slopes greater than 18%. West (1996) described the watershed's soils as generally well-drained with clayey surface and subsoil horizons, slightly to moderately acidic with low organic matter and high P fixation capacity, and has low capacity to retain nutrients. The total population recorded in 2007 was 51,406 persons with a land density 1.44 people per hectare. The ethnic groupings include 25% Talaandig, 14% Bukidnon, 51% Dumagats (lowland migrants), and 10% Ifugaos from Benguet Province in northern Luzon. Amongst these, the Talaandig is the most dominant indigenous peoples' (IP) group in Lantapan.

Lantapan is a river valley located between the biodiversity rich Mt. Kitanglad Range Natural Park (MKRNP) on its northern side and the Manupali river on its southern border. Several rivers, creeks and springs drain from MKRNP across the intensively cultivated agricultural lands of Lantapan to the Manupali river. The river runs into a network of irrigation canals currently operated by the Bukidnon Irrigation Management Office (BIMO).[1] The whole system ultimately drains into the Pulangui reservoir that supports the biggest hydropower facility in Mindanao operated by NPC (Coxhead and Buenavista 2001).

[1] Deputized agency of the National Irrigation Administration (NIA)

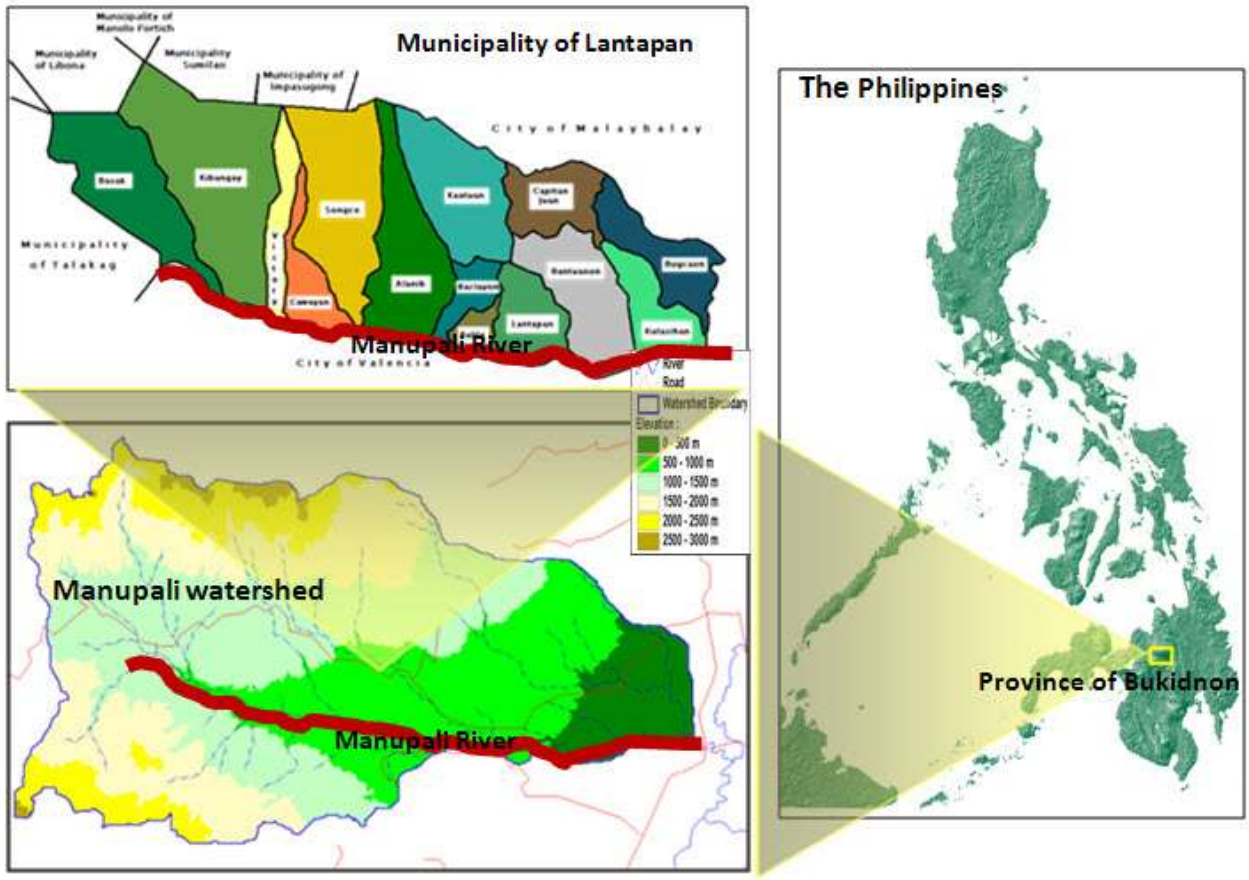


Figure 1. Municipality of Lantapan within the Manupali watershed, in northern Mindanao, Philippines

Lantapan is rich in natural resources and has favorable climatic conditions, which attracted migrant farmers and the agribusiness sector. Majority of the people have since been dependent on small farms for their livelihood; however, agribusiness had started to dominate agricultural activities in 2000. Corporate farming and swine and poultry production stimulated economic growth, and were key drivers of land use change in the last 10 years.

Agricultural expansion has led to land use conversions into banana, corn, vegetables, sugarcane and others. This decreased the forest area by 6% and 3% between 1990-2002 and 2002-2007, respectively (Fig 2). Similarly, the area dedicated to agroforestry has decreased by 2% between 1990 and 2002, and further dropped by 73% between 2002 and 2007. Correspondingly, mix agriculture increased by 18 and 24% between 1990-2002 and 2002-2007. With increasing demands for land for smallholder production and agribusiness, and lack of land use policy, it is expected that cultivation will encroach into the buffer zone of MKNRP.

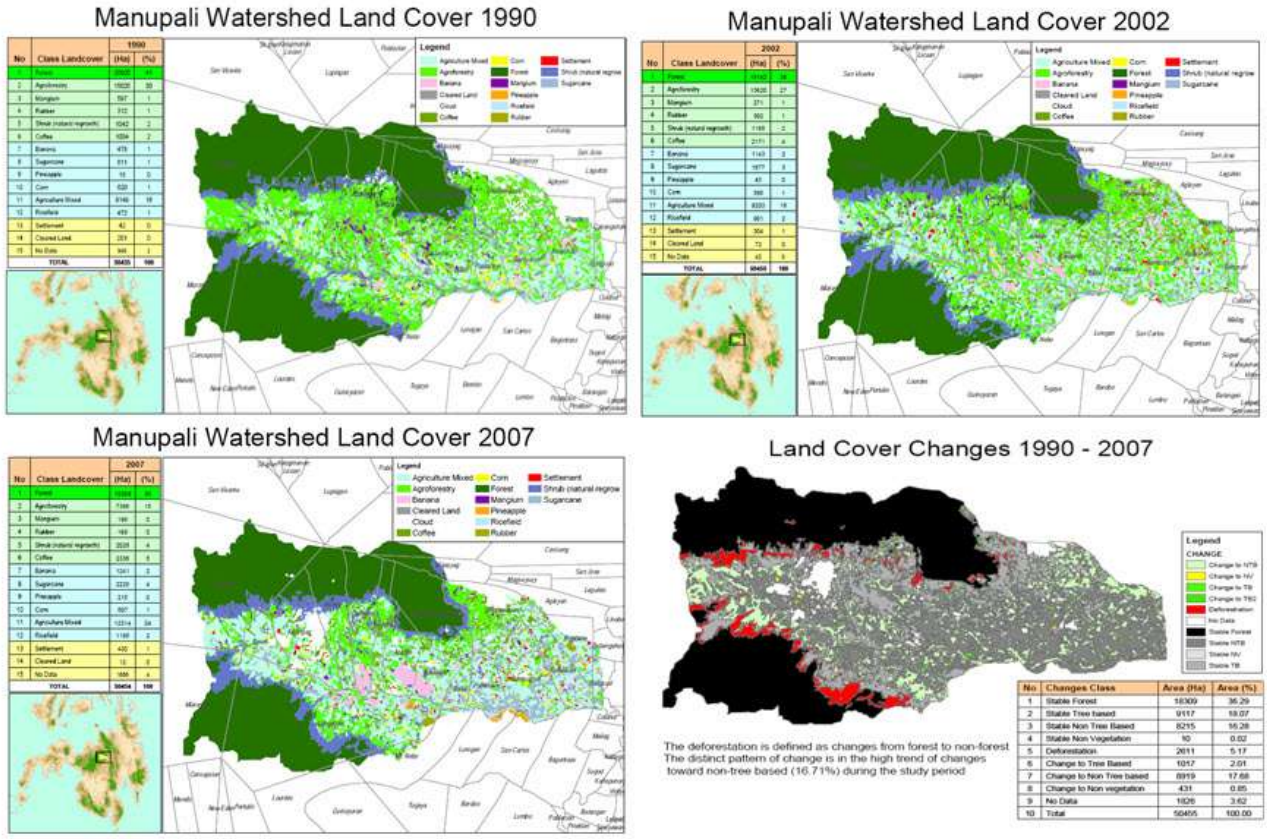


Figure 2. Land cover change in Manupali watershed, Bukidnon (1990, 2002 and 2007) (Source: ICRAF-ASB Project)

Agricultural intensification with vegetables required application of fertilizers, pesticides and other chemicals, and promoted soil erosion in Manupali (Daño & Midmoore 2002). In 2001, Deustch et al. reported both qualitative and quantitative evidence of water quality degradation in the watershed, and found that total suspended solids (TSS) were higher in areas where agricultural cultivation was more intense, while seasonal TSS coincides with months of intensive land preparation. The eroded sediments that contain pesticides, chemicals and other contaminants affect the aquatic life in rivers and springs (Ella 2005) and may create health problems for farm households and those living downstream. Soil erosion also resulted in serious off-site effects including sedimentation in rivers and reservoirs, affecting the efficiency of irrigation and hydropower generation. The Manupali Irrigation River System (ManRIS)[2] has reported sedimentation problems in the diversion dam and irrigation canals. From 1995-2002, the system has incurred 17 million PhP to remove the silt deposit in irrigation canals; the silt is either dredged from the canals or flashed out to the Pulangui reservoir. As a result, siltation in the Pulangi reservoir increased by up to 1.5m3/year. This voluminous silt deposit is limiting water inflow from tributary rivers, resulting in fluctuation of the water level in the reservoir; as a consequence, NPC can only operate at full capacity in short periods. Recently, NPC has allocated more than 200 million PhP for dredging the reservoir.

RHA was conducted to clarify the relations between specific land use in the watershed and the environmental services that are of sufficient value to downstream stakeholders to become the basis for reward mechanisms (van-Noordwijk et al., 2008). It aims to provide clarity, by providing answers on: i) how the watershed function is provided; ii) who could be responsible for providing this service; iii) how watershed function is being impacted upon at present; and iv) how rewards can be channeled to

[2] A large irrigation system currently under the management of BIMO

effectively enhance or at least maintain the function. RHA also accounts observations of local stakeholders on watershed functions. The main concern of stakeholders in Manupali was declining water quality and quantity due to sedimentation and diversion of flows (Table 1). Stakeholders also reported observations on stream flow variability in association with changing rainfall pattern. However, decreasing water quantity meant differently to different user-groups. Majority of user-groups upstream (e.g. farmers and banana plantations) did not experience serious problems with regards to water supply, but stakeholders from the middle and lower sections of Manupali reported water scarcity as a serious problem that severely affected their economic activities. Stakeholders identified many factors affecting water scarcity, but singled-out 'diversion of flows' for commercial banana production as the most obvious source of water scarcity. Ultimately, stakeholders linked water shortage with land use change associated with banana expansion and forest conversion into agriculture.

Table 1- Perceptions of key water-users groups on current hydrological situation (2009)

User-group	Issues & concerns	Causes	Needed Interventions
Farmers	-decreasing water quantity -chemical contamination -decrease river flow by about 50% -Unsafe water condition for domestic use -siltation	-disposal of chemicals and pesticides -unsustainable farming practices -intensive cultivation -diversion of flows -decreasing forest cover - disposal of chemical wastes	-regulate cutting of trees -regulate expansion of banana plantation -adoption of sustainable farming system -implementation of environmental protection programs and projects -regulate agricultural expansion in critical areas
LGU	-shortage of potable water supply during dry season -poor water quality -siltation at the source -high treatment cost	-population growth -expansion of banana plantation -decreasing forest cover at source -intensive cultivation in sloping areas -improper disposal of solid wastes and waste water	-massive environmental awareness - compliance of environmental protection -awareness campaign & training on SWC -implementation of environmental policies -regulate agricultural expansion at buffer zone -regulate expansion of banana plantation -crop zoning
Multi-national banana corporation	-shortage of water during dry season	-increasing water demand by water users	- tree planting -water recycling - adoption of SWC
NIA -IAs	-water shortage during dry season -siltation in canals -high maintenance cost of canals -poor rice production	-diversion of flows for banana plantations and vegetable farms -increasing demand for domestic use -unsustainable farming practices	-reforestation projects -adoption of SWC -incentives to upland communities -regulate expansion of banana plantation
NPC	-decreasing river flow -high dredging cost	-decreasing tree cover in the uplands -soil erosion -intensive cultivation	-reforestation -IEC -watershed rehabilitation

Alibuyog et al. (2008) applied the ArcSWAT[3] model to examine the relations between land use and sedimentation, and supported the observations of local stakeholders showing that converting 50% of forest and grasslands of a sub-watershed in Manupali into crop production will result to 3 to 14% increase in run-off, 200 to 273% increase in sediment yield, and 2.8 to 3.3% decrease in stream flow, with the higher value indicating a condition without soil and water conservation (SWC) measures. Much of the rainfall is lost as surface run-off, which results to significant soil erosion, sedimentation in dams and reservoirs and downstream flooding. In a geohazard assessment report, Uncad (2009) adds that Lantapan is susceptible to flooding, erosion and mass movements. These probably explain why landslides and flooding occurrences have been frequent in recent years, damaging millions of properties and agricultural crops around Lantapan.

As part of RHA, the GenRiver model[4] was used to calculate the water balance in Manupali with current land uses. Based on Table 2, Alanib and Kulasihan, two of Manupali's four major sub-watersheds are in critical conditions with seasonal river discharges and low buffering capacity. In terms of water supply and demand, we noted that the total volume granted to banana plantation companies and few individuals in Alanib, Maagnao and Kulasihan sub-watersheds were 10,146 m^3/day, 13,153 m^3/day and 29,217 m^3/day respectively, whereas the total water yield for each river were 26,784, 128,736 and 37,152 m^3/day based on GenRiver simulation (Fig.3). Hence, the net volumes that can be available to other users of the three rivers are 16,525, 115,383 and 7,848 m^3/day. However, ManRIS' water rights' alone, of the Manupali river and all its tributaries is 492,480 m^3/day; this further means very little water left, or a net deficit in water that can be available to other users.

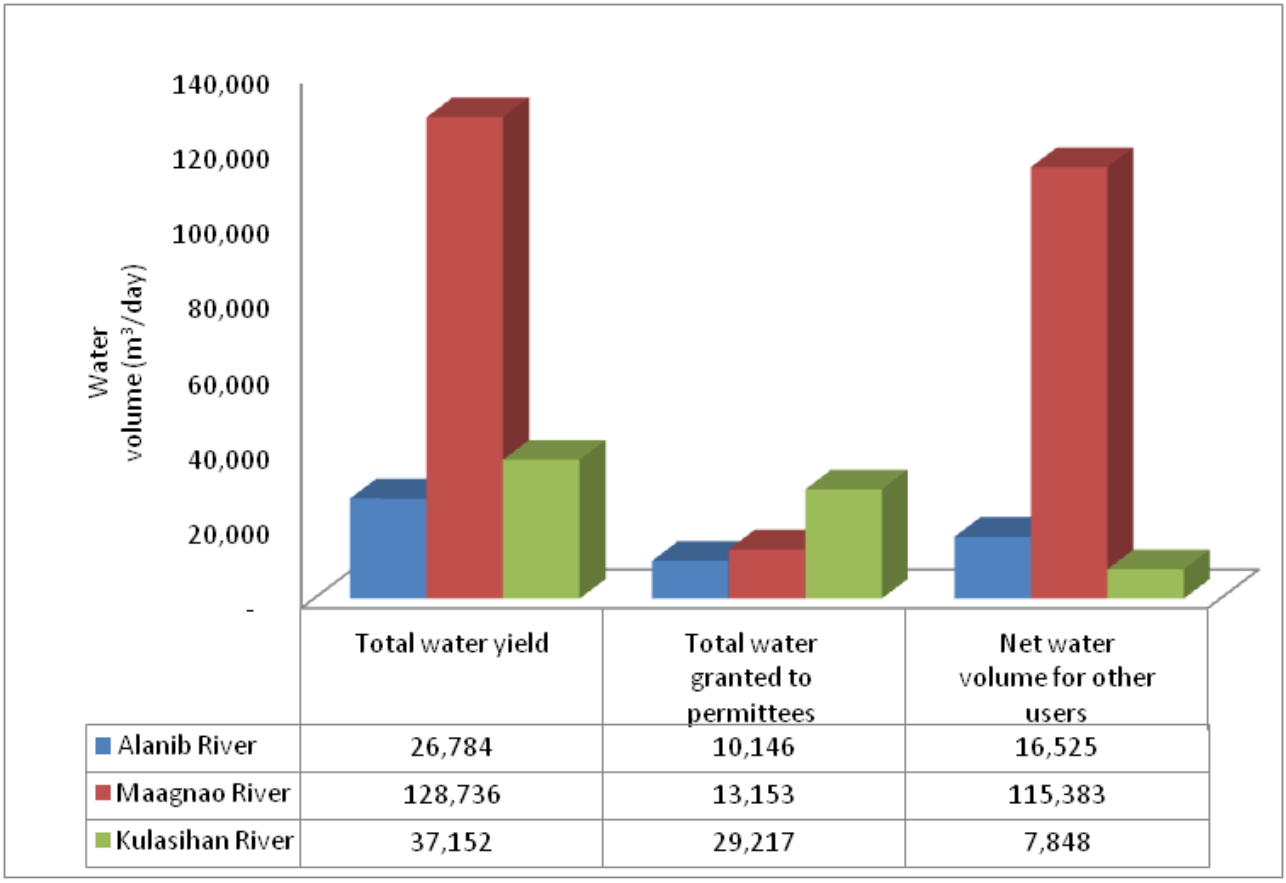
Table 2- Average water balance of Alanib and Kulasihan sub-watersheds during a12-year GenRiver simulation

No.	Dynamics of water	Alanib sub-watershed		Kulasihan sub-watershed	
		Computed (mm)	**Simulated (mm)**	**Computed (mm)**	**Simulated (mm)**
1	Precipitation	2272.36	2260.34	2300.67	2222.09
2	Evapotranspiration		760.42 (33.64)		1058.50 (43.67)
3	Other losses		654.94 (28.98)		401.61 (16.46)
4	River flow		844.98 (37.38)		980.35 (40.17)
	• Run-off	496.12	516.49 (23)	535.20	536.90 (22)
	• Soil quick flow		≥0.00		31.00 (1.27)
	• Baseflow		328.49 (15)		≥0.00
	• Surface quick flow				412.45 (16.90)

[3] ArcSWAT is a physically-based, river basin scale model that quantifies the impact of land management practices on water, sediment and agricultural chemical yields in complex water watersheds over a period of time on a daily time step.

[4] GenRiver is a generic river model on river flow. It accounts rainfall and traces subsequent flows and storage in the landscape that can lead to either evapotranspiration, river flow or change in storage.

Figure 3- Simulated net water yield during a 12-year simulation period (1994-2005) versus volume of water rights granted (2007) in three sub-watersheds



	Total water yield	Total water granted to permittees	Net water volume for other users
Alanib River	26,784	10,146	16,525
Maagnao River	128,736	13,153	115,383
Kulasihan River	37,152	29,217	7,848

(Source: RHA, TULSEA-Bukidnon Team, 2010)

It is also important to understand the relations between banana expansion and water availability. Clearly, there is overall dependence on river water by plantations given the standard irrigation requirement of 45m3/ha/day for high quality export bananas. Rainwater is by all means, utilized by banana plantations, but with high rainfall variation, it was crucially important to impound water by diverting flows from the river for year-round irrigation. To ensure regularity of water flow, banana companies tend to extract more water than was permitted. For example in Kulasihan, given the plantation size of 387.63 and 190.89 has in 2002 and 2007, the total irrigation requirement was 6,366,822.70 m3 and 3,135,368.20 m3 respectively. But since the average annual yield of Kulasihan was only 11,599,019 m^3/yr, this means that the banana plantations' share was 27 to 55% of the water, with the remainder being shared by ManRIS, farmers, poultry operators and households for domestic purposes. Doubling the current size of banana plantation will therefore leave other user-groups with almost no water.[5] Ultimately, this calls for serious land use planning and enforcement of land use policy.

Furthermore, using a different approach, Feril-Lacandula (2007)[6] compared a land use with and without banana, and found a significant difference in monthly average stream flow of 0.377 and 0.071m3/sec, respectively. She went further by looking at the effects of diverting flows for plantation

[5] Banana plantation is still expanding.
[6] Lacandula utilized the electronic streamflow meter and collected data within a period of 5 months.

operations and found that diversion significantly reduced downstream flows; she estimates that on average, 26,590m3/day is diverted from Maagnao River to the banana plantation. Finally, without diligent monitoring, it was easy for plantation companies to divert more water than what is permitted by NWRB.

3. WATER CONFLICT

Table 3 presents the competing water demands of different user groups. As mentioned above, since ManRIS and banana companies altogether require the highest water volume than any other user-group, it is likely that further expansion will lead to a net deficit in water supply for all other users, potentially raising current conflict level. This conflict had started to emerge in early 2000s but received attention only recently, as a result of a survey by Catacutan & Duque-Piñon (2009). Note however, that the conflict issue has more to do with overlapping rights and water sharing, than has to do with water availability or scarcity associated with land use.

Table 3- Water demand by user-groups in Manupali watershed (2009)

Agro-ecological zone	Land use	User-group	Water demand for:
Protection forest	Protected area	DENR-IPAS/PAMB	Maintaining the overall integrity of MKRNP
	Agroforestry	IP farmers & households	Producing trees & agricultural crops for food and
	Water source	Local water system & multi-national banana companies	Tapping springs for the municipal water system & irrigating banana plantations
Production forest	Buffer zone	DENR-IPAS/PAMB	Maintaining the overall integrity of MKRNP
	Agroforestry, abaca, tree farms, vegetable farms & grasslands	IP & Dumagat farmers & households	Producing trees & agricultural crops for household use & income, & domestic use
A&D (Upstream)	Agroforestry, abaca, tree farms, banana, vegetable farms & grasslands	IP & Dumagat farmers & households	Producing trees & agricultural crops for household use & income, & domestic use
	Banana plantations	Multi-national banana companies	Producing banana for export
	Poultry & swine	Agri-business companies	Growing chicken and pig
	Water system	Local water system	Maintaining the economic viability of the municipal water system
	Fishing & recreation	Households	Source of fish for food & picnics
A&D (Mid-stream)	Agroforestry, tree farms, banana, corn & sugarcane	IP & Dumagat farmers & households	Producing trees & agricultural crops for household use & income, & domestic use
	Banana plantations	Multi-national banana companies	Producing banana for export
	Poultry & swine	Agri-business companies	Producing chickens & pig
	Water system	Local water system	Maintaining the economic viability of the municipal water system
	Fishing & recreation	Households	Source of fish for food & picnics

Agro-ecological zone	Land use	User-group	Water demand for:
A&D (Downstream)	Agroforestry, tree farms, banana, corn & sugarcane	Dumagat farmers	Producing trees & agricultural crops for household use & income, domestic use
	Banana & pineapple plantations	Multi-national banana & pineapple companies	Producing banana & pineapple for export
	Poultry & swine	Agri-business companies	Producing chickens & pig
	Water system	Local water system	Maintaining the economic viability of the municipal water system
	Irrigated rice	NIA-ManRIS/ Irrigators' association	Irrigating NIA canals for rice production
	Fishing & recreation	Households	Source of fish for food & picnics
A&D (beyond Lantapan)	Pulangui reservoir	National Power Corporation	Power generation
	Fishing	Households	Source for food

In upper Manupali, water scarcity has been the source of conflict in drier months, where farmers compete for access. Village officials narrated cases of disputes among farmers who accuse each other of either stealing or cutting water pipes used to irrigate their vegetable gardens, and farmers destroying small impounding reservoirs to allow water flows downstream. The issue of 'who establish water pipes and small water impoundment first' and 'fair sharing' of benefits between upstream and downstream users has been a constant discourse among farmers.

On the other hand, multi-national banana plantations can be found in the middle to mid-lower section of Manupali. The first companies operating in Lantapan are Mt. Kitanglad Agri-Ventures Inc. (MKAVI) and DOLE-Skyland Philippines. Conflict began when DOLE applied for a water right in Maagnao River at the NWRB, of which MKAVI has obtained rights in 1999, including Alanib and Kulasihan Rivers. The issue became complicated when ManRIS presented their water rights obtained in 1979. Water right has thus become the major dispute between banana companies and ManRIS. In the Water Code, it was clear that 'rights' belong to the user in the order in which they apply for; with this, ManRIS would have been the senior and legitimate water right holder in Manupali. The Code also stipulates that in times of water shortage, those with senior rights can use the full volume allocated to them, while those with junior rights must do with less or nothing. However, the opposite is happening in Manupali with ManRIS contending with what is left from banana plantations. In 2000, the Local Government attempted to settle the dispute, but more issues revealed including red-tape, illegal processing of water rights tolerated by the NWRB and surreptitious diversion of water. It was also disclosed that the technical design of diversion canals established by plantation companies was not presented to the affected communities; hence, there was commotion when the flow was cut by the diversion canal. As a result, local people who were dependent on the river for their domestic needs complained to village officials for being denied access to this important resource.

Conflicts were also reported in private lands with open-access water. In Capitan Juan, a piece of land with spring-water was sold to a poultry operator who secured the property, and built a reservoir for his poultry. As a result, the community lost access to the spring and complained for not being consulted by village officials and the poultry owner on the construction of the reservoir. On the basis of Article 3 of the Water Code, which states that 'all waters belong to the State', the local community further argued to secure their access rights to the spring. A compromise solution was reached, and farmers were allowed to utilize the 'excess water' from the reservoir; however, there is almost no 'excess water 'in dry months, so people had to walk for three kilometers to fetch water.

Competition between and amongst water users in the upper and middle sections of Manupali is becoming obvious, but it is the conflict with downstream institutional users that received more attention. With seasonal flows, sustaining the irrigation system with a service area of 4,395 has. has become more challenging for ManRIS, while farmer-irrigators[7] were suffering from crop losses when water supply drops. Apparently, rotational irrigation did not help much to manage water scarcity. Violent conflicts due to water scarcity were reported with some farmers resorting to carrying 'guns' to protect their families in times of violent conflict over irrigation water. One banana company[8] , operating within ManRIS also complained of water shortage due to poor maintenance of the canals and the dam. They complained for paying irrigation dues for the water that is not there. ManRIS officials admitted their inadequacy in maintaining irrigation facilities due to internal financial problems. As a cost-cutting measure, three irrigation systems including ManRIS were consolidated under the management of BIMO. The previous ManRIS team has however expressed more concern in protecting the watershed while current BIMO officials seem to relegate the responsibility to DENR, arguing that BIMO is itself a consumer than a watershed manager. With regards to processing water rights and associated complains, BIMO officials stressed that their role is limited to receiving applications at the local level, while NWRB grants approval. Nonetheless, as a deputized agency at the local level, BIMO was blamed for failure to raise issues arising from misallocation of water rights to NWRB. Ultimately, it was suggested that NWRB assess the present condition of watersheds before granting water rights.

Water conflict can be attributed to so many factors but the root cause can be also traced from overlapping management regimes and uncoordinated efforts of watershed management institutions (Catacutan et al., 2001). As far as watershed management is concern, at least three management frameworks overlapped; with lack of effective coordination, management often fell into cracks. First, watersheds, protected areas and national parks are managed by the Department of Environment and Natural Resources (DENR). At the local level, MKNRP is managed by an Executive Board (Protected Area Management Board or PAMB) which is a multi-sectoral group supported by DENR. Second, the Local Government is mandated by the Local Government (RA 7160) to manage natural resources within their political jurisdiction. Third, the IPs have customary rights over natural resources as defined by the Indigenous Peoples Rights Act (IPRA). This Law provided the basis for the Talaandig's claim over MKNRP and adjoining landscapes as their ancestral domain.

A classic case of tension between 'statutory and customary' rights is also evident in Lantapan. The Talaandigs invoked the primacy of their customary water rights over statutory rights by penalizing (termed as 'sala') major user-groups such as the Lantapan government, banana companies and DENR for failure to obtain pre-and-prior informed consent (PPIC) on all water-related activities implemented in the locality. Conflict heightened when some Talaandig residents removed the calibrated meters of the Local Government Waterworks and refused to pay their bills; accordingly, the source is their ancestral property, and therefore, they should be freed of any charges. Despite efforts to explain that the bill represents the distribution cost rather than the value of the resource, about 20 households remain unconvinced and continue to avoid the bills. The Local Government seemed reluctant to resolve this matter through legal means since the IPRA states that customary laws and practices should be used to resolve disputes involving indigenous people, in that, all measures embodied in the customary Law must first be exhausted before resorting to regular courts, and any ambiguity in the application and interpretation of laws shall be resolved in favor of the indigenous peoples (Kho and Agsaoay-Saño, 2005).

[7] Farmers were organized as Irrigators Association (IA)
[8] Alberto M. Soriano Farming Corporation (AMSFC)

4. COOPERATION AND COLLECTIVE ACTION

Water competition amongst water users in Manupali could trigger violent confrontations, but fortunately they opt to use different ways and means to secure their individual rights, and have come to terms to avoid hostilities by voluntarily agreeing to cooperate on applicable water rights sharing schemes, which are discussed in turn.

a. ManRIS and MKAVI – The management of MKAVI has recognized ManRIS' prior water rights over the Manupali river and its tributaries. They also recognized the impact of their diversion canal on the availability of irrigation water to rice producers. To avoid conflict, the management responded by agreeing to pay an irrigation service fee (ISF) to ManRIS – a form of settlement to compensate for the amount of water that could have been used for rice production. The company is currently paying an ISF equivalent to a total of 150 hectares of irrigated rice.

b. Dole and Hilltop Multi-Purpose Cooperative (MPC) – The company's application of water rights was denied due to overlapping rights held by MKAVI and Hilltop MPC in Maagnao river. Hilltop MPC is a farmer cooperative that has obtained the water rights of Maagnao river in 2000. Through negotiations mediated by village officials, MPC members entered into agreement with DOLE on condition that it provides financial assistance to Hilltop farmers for tapping irrigation water from their source to the plantation.

c. HIVAC and Indigenous Community– Mediated by the Protected Area Management Board (PAMB) of Mt. Kitanglad, the Celebrate Life, Inc. Banana Company successfully negotiated with the Talaandig community within a Community-Based Forest Management (CBFM) area, for the water rights of Kibuda spring. The legal basis of the negotiation was the NIPAS and IPRA Laws. In return, the company has to fund a community conservation project covering 5,000 hectares as well as support livelihood projects.

d. ManRIS and AMSFC –Since ManRIS is not able to maintain the road system around its service area, they accepted the Company's offer to maintain the road system and an ISF equivalent to 375 kg of rice/yr/ha. As part of the Company's Social Responsibility Program, it also supported tree planting activities along small creeks in the service area.

e. Cawayan Village Government and Indigenous People (IPs) – To provide the residents with potable water, the village government of Cawayan was permitted by the IP to develop a reservoir for the village water system. In turn, the government will share 10% of the project's income to the IP community, which will be used for watershed protection activities upstream.

f. Green River Gold Ranch and IPs – The Green River Gold Ranch entered a memorandum of agreement (MOA) with the IP community, to draw water from an open-access spring, for a small water impoundment in the ranch. In turn, the ranch pays one cattle for every 100 cattle per year to the IP community.

The Manupali experience offers insights on conflict resolution and collective action. It shows that given the complexity of policies on property rights, collective action through cooperative agreements can mitigate hostile confrontation between multiple resource users. These cooperative agreements have a strong 'voluntary' element and are working to show how local stakeholders manage, organize, and cooperate in the face of change. Such agreements were based on the provisions of the Water Code, which allows the transfer or lease of water rights in whole or in part to other users, as well as adoption of a pricing scheme. As a reference point, existing policies with all their ambiguities thus

make way, for voluntary cooperative actions, although these do not guarantee a long term solution when it comes to addressing the root cause of water scarcity.

When viewed from 'cooperation theory', these cooperative acts evolved through reciprocal altruism between actors or cooperators. Reciprocal altruism is based on the simple idea that an individual will not be disadvantaged if it helps another provided the other helps in return (Stewart 2008). It can be argued in this case, that different user groups opted to cooperate because everyone recognized the i) value of water; ii) scarcity of water; iii) social capital that exist for cooperation and collective action; and iv) legal basis for voluntary agreements. However, cooperation does not solve easily with self interest standing in the way (Stewart 2008). There were concerns that these voluntary water rights sharing schemes were partial to the interest of banana companies, with farmers incurring much of the present and future costs of cooperating. Obviously, the banana companies could easily recoup their initial costs of cooperating as soon as water flows freely into their reservoirs, regardless of whether or not the benefits outweigh the costs of other cooperating parties.

As with cooperation, the situation becomes impossible when power comes to play, differentially impacting the less-powerful cooperator, distorting the balance of the favors that are being exchanged, and eventually breaking reciprocity (Stewart 2008). Interviewed farmers disclosed that banana companies did not comply many of the conditions in the contract, while irrigators reported no benefits from the cooperative agreement of ManRIS and MKAVI. Indeed, compliance to voluntary agreements has always been the hardest to follow. Similarly, farmers grumbled that the Local Government did not really convey direct benefits from supporting banana expansion. Nonetheless, driven by a unitary interest over a scarce resource, cooperating stakeholders secured their individual right by sharing it with others, instead of harboring conflict. Such cooperative acts thus have their merits, because they helped to mitigate hostile confrontation between different user groups. However, these forms of cooperation and social organization can break down easily if the actors/cooperators cease to interact, re-organize and re-cooperate, and adapt to new rhythms of change.

On top of this, an important question that remains is whether collective action has in this case, addressed the bottom of the water scarcity problem? A simple prognosis of the problem shows that water availability and scarcity are linked to land use patterns, with water rights confounding the issue. From a water balance perspective, further expansion of banana plantations and poorly-designed tree plantations of fast-growing evergreen tree species will further lead to water shortage, while decrease in natural forest will lead to poor stream flow or water regularity. Sustainable land use that helps improve water yield and reduces stream flow variability is essential to improve water balance and reduce current deficits in water supply. This objective is untenable without collective efforts of all user-groups and other stakeholders at a watershed scale. Policymakers should be much-more involved in fostering collective action at that level, and in enforcing policies that provide incentives for sustainable land use.

In view of the above, the level of collective action, which centered on water rights sharing has not so far addressed the core problem of water scarcity; in fact, it unintentionally created another problem when viewed at the landscape level, because altogether, the cooperators were collectively extracting favors from other stakeholders who were non-cooperators, for example, farmers in the buffer zone who may have incurred high opportunity costs by not shifting from current land use to maintain watershed services. Clearly, all cooperators currently in the table have cheated by receiving favors and gaining all the benefits without sharing any of the costs incurred by non-cooperating stakeholders; this created higher level of inequality. Upland communities will unlikely endure the costs associated with maintaining water, if they continue to be excluded or cheated from the benefits derived from maintaining such services.

However, the multiplicity of interests of stakeholders and ambivalence in water rights, present greater challenge in fostering collective action at the watershed scales. Intra-group and inter-group collective actions have been manifested by different user groups by agreeing to cooperate to manage conflict; but collective action beyond this point can be hampered by lack of common understanding on the real water balance of the watershed. As a first step, collective understanding on the importance of water balance and its dependence on land use patterns is therefore necessary to foster collective action to shift into sustainable land use, and to benefit from cash incentives or secured water rights. But whether secure water rights and improved benefit sharing leads to investments in sustainable land use or vice versa remain uncertain. It maybe, that secured water rights create new incentives for further change in land use that induced water deficits. A combination of actions on land use policies, effective institutional mechanisms, and incentives for co-investments and collective action is therefore necessary, to resolve resource conflict and manage watershed resources effectively.

5. CONCLUSION

From this experience, several ideas, lessons and recommendations can be drawn that can guide stakeholders in improving 'collective action' to resolve water conflict that is linked to rights, scarcity, and sustainable land use.

1. Voluntary cooperative agreements are important to resolve immediate water rights conflict and can lead to new forms of cooperation and higher-level collective action. However water rights allocation is just one thing, while benefit-sharing is another thing; in this case, collective action should move towards improved benefit-sharing between cooperators currently in the table, and engage upstream communities who are currently excluded from the benefits of cooperative agreements.
2. Despite the relative ambiguity of policies, they provide legal bases for the emergence of voluntary agreements. However, issues around overlapping management regimes, lack of coordination, and low capacity of water management institutions need to be resolved in order to address systematic problems in watershed management.
3. Shared understanding on the relations between water balance and land use patterns is crucial in unpacking complex issues around water; equitable allocation of water rights alone will not ensure water supply in the long term. Land use regulation, incentives for sustainable land use, and improving water rights potentially provides win-win solutions.
4. Effective watershed management requires collective action at that level; cooperation and collective action within particular user groups and between user groups is a necessary step, but cooperation amongst all user groups should be coordinated to foster watershed-level and lasting collective action.

Finally, the Manupali experience was an excellent case for understanding 'conflict and cooperation' over natural resources. The stakeholders, despite their distinctive identities and interests were willing to cooperate and self-organize to manage conflict, with all the imperfections of water rights sharing schemes. However, the problem of water allocation, scarcity and land use, requires collective action beyond the current level, to ensure equitable distribution of benefits, sharing of responsibilities and co-investments in watershed management.

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