The Manupali is a critical watershed in southern Philippines that provides water for various uses by different water users
Photo: World Agroforestry Centre/Marcel Langer

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CHAPTER 19

Developing an equitable rewards scheme for water storage and livelihood improvement in the Manupali watershed, southern Philippines

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Highlights

- Intermediaries play a key role in developing schemes to reward watershed services.
- Resource mobilization and facilitation depends on political will.
- Power imbalances and social disparity affects equity.
- Trust, local champions and supportive policy are enabling factors.
- Social equity and cooperative behaviour are basis for conflict resolution.

19.1 Introduction

Rewards for ecosystem services (RES)[a] is an increasingly used alternative approach to environmental management. In this approach, ecosystem service (ES)[b] users pay for or provide appropriate rewards to land managers for adopting land-use practices that conserve or improve the level of ES[1]. The approach's impacts are often evaluated based on their ecological effectiveness, economic efficiency, and social equity[2,3]. While the meaning of equity as used in this approach still lacks clarity, there is no doubt that it is central to achieve just and sustainable outcomes on environmental management.

In RES literature, equity depends on the context and the local stakeholders' perceptions where a scheme is applied. It considers justice in terms of upholding human rights, which is relative to social relations between people and institutions[4]. This links to recognition[5] and legitimacy[3], which both refer to stakeholders' perceptions, whether a scheme respects their formal and informal rules, as well as norms. It also means fair and pro-poor, which refers to the distribution of cost and benefits, the process of inclusion and interaction, authority and control[2]. Needless to say, considering these facets of social equity are particularly important in the context of developing countries, where issues on skewed wealth distribution, contested

[a] In this case study, the authors use RES as an environmental management approach that does not only focus on ecological sustainability and economic efficiency, but also on social equity by ensuring that goals of poverty alleviation, rural empowerment and justice are considered. Additionally, RES not only centres on financial transactions but also includes in-kind rewards, such as access to lands, markets and capacity building, recognition of identity and rights, and many others[7].

[b] Ecosystem services are the tangible and intangible benefits that people derive from ecosystems. These include watershed services, biodiversity conservation, soil fertility, carbon sequestration, and landscape beauty, among others.

property rights, poor law implementation, power imbalances, and weak institutions are prevalent, and can greatly affect RES design and implementation.

While RES is commended for its effectiveness and efficiency, it is also for these reasons that the approach draws criticism for rarely considering the aforementioned social equity dimensions[6]. Experiences in Asia revealed that social equity or fairness is as important as market and efficiency in RES, proving that schemes which are 'fairly efficient' or 'efficiently fair' are possible[7]. In Africa, the approach's effectiveness actually depends on its social equity, ensuring that rewards are distributed fairly and people's perceptions of the schemes are legitimate, while involved institutions help strengthen their fairness and legitimacy[3]. In fact, Martin et al (2014)[2] argued that neglecting equity could undermine effectiveness and efficiency in the long run because it weakens cooperative behaviour and fosters conflict. Undoubtedly, these are intrinsically linked.

Although Wunder (2005)[8] has set the RES approach's principles[c], there are compelling differences across countries where it is used, with key enabling and limiting social equity considerations in practice. Hence, it is also important to clarify which dimensions of equity are being pursued. McDermott et al (2013)[4] provided a framework to analyse three dimensions of social equity in RES: the procedure or decision-making process, the distribution of costs, benefits and risks, and the context or pre-existing conditions that enable or limit people's access and participation. Here, the contextual equity focuses more on institutions and their social relations that set RES goals and rules, make social priorities and facilitate cooperation amongst the constituents[9]. Pascual et al (2014)[5] expanded this framework by adding recognition as another key dimension, which respects and considers the stakeholders' human rights, their knowledge, norms, and values in the whole process of design and implementation. They also emphasized the importance of understanding the local context as a prelude to RES design and implementation, as it is the surrounding social conditions that influence the participants' ability to participate and to gain recognition, participate in decision-making, and promote fair distribution of costs and benefits. Ultimately, social equity must be central in RES as neglecting this can worsen existing inequalities and weaken institutions and social relations.

In rewards for watershed services (RWS), hydroelectric power plants (HEPP) are among the major downstream users that benefit from the sustainable land use practices upstream, which ensure water supply, reduce soil erosion and sedimentation among others[10]. However, several HEPP projects in the past decades have been criticized for their various negative social and environmental impacts. In response, the World Commission on Dams (WCD) adopted five core values in strengthening integrated water resource management and sustainable energy development frameworks, which includes efficiency, equity and participatory decision-making (i.e. sustainability, accountability)[11]. This development in HEPP operations is supportive to RWS, particularly in developing countries, as these core values can form a basis to develop schemes of economic benefit-sharing through RWS, and help alleviate poverty. For example, in Lao PDR, equitable economic benefit-sharing has been beneficial when the poverty levels in areas where HEPPs are operating are much higher than the provincial or national averages[12]. This has profound implications on social equity, where institutions and social relations ensure that benefits are distributed equitably to communities through a participatory procedure as conditioned by the local context.

In Asia, there is a paucity of literature that studies RWS schemes with HEPPs, or perhaps only a limited number of schemes was developed with HEPPs. Although the existing literature mostly discusses the economic efficiency of such schemes, the outcomes highlight the importance of

[c] PES schemes should be voluntary and involve a defined ES bought by one party from another, and payment must be conditional based on the provision of that defined service.

social equity. For example, although the national-to-local economic benefit-sharing mechanism with the Kulekhani HEPP in Nepal already exists, there is still discontent between the upstream and downstream communities, that the former should receive all the revenue[13]. This implies the important role of institutions in facilitating participatory decision-making, setting acceptable benefit-sharing schemes, and managing conflicts[9]. In Bakun, Philippines, payments from two HEPPs have improved the economic status of the municipality, yet it is unclear how the funds are allocated and used for watershed protection[14,15]. Apparently, there is no mechanism that directly rewards the Bago-Kankanaey indigenous people (IP) for maintaining this service either. NGOs can play this mediating role as explicitly shown in the Rewarding Upland Poor for Environmental Services (RUPES) project in Sumberjaya, Indonesia, where the World Agroforestry Centre (ICRAF) has successfully facilitated the development of several RWS schemes with HEPPs[16]. In Romblon, the World Wide Fund for Nature-Philippines and the local government unit (LGU) also worked with the Romblon Electric Cooperative in initiating the Cantingas Mini-Hydro Watershed Management and Development Program[d] to maintain the good quality of river water and sustain the local livelihoods of Mangyan-Tagabukid[17]. Indeed, considering social equity in RWS can shape the schemes' outcomes. However, not much has been done on analysing the various dimensions of social equity, their interdependence and how disregarding this can affect the viability of RWS.

This case study discusses the different dimensions of social equity in the context of the ongoing RWS scheme in the Manupali watershed. The watershed services buyer is the National Power Corporation (NPC-Pulangui IV) HEPP, a government-owned and -controlled corporation. This HEPP is important in southern Philippines because, together with Agus HEPP in Lanao del Norte province, it generates more than 50 percent of the power supply needed to fuel the booming economy of Mindanao[18].

However, erosion in the upper landscape of the Pulangui watershed, which includes the Manupali River, was causing sedimentation and siltation that in turn shortened the lifespan of the HEPP's reservoir. In response, NPC sought ways to control and minimize erosion and ensure water storage. It rewarded the upland communities in the Municipality of Lantapan monetarily with livelihood assistance in return for improving their existing sustainable land-uses and/or adopting better systems that reduce the soil erosion problem in the Manupali River.

Consisting of migrants and indigenous farming households, these upland watershed services providers entered a three-year contract voluntarily and were rewarded when they met the performance requirements. The process was mediated by the Bukidnon Environment and Natural Resources (BENRO), the LGU of Lantapan, the Department of Environment and Natural Resources (DENR) and ICRAF. This case highlights the importance of making social equity central to RWS design and implementation.

This case study is based on empirical analysis of primary and secondary data and information, government policies and official documents, and relevant literature. The Rapid Hydrological Appraisal (RHA) framework[19] was used to determine the quantity of water delivered to downstream users, and to develop an acceptable scheme to reward the upland communities for their sustainable land-use and management practices. NPC's approach has been eight years in the making, and finally realized in the Alanib and Maagnao sub-watersheds in 2014. The Manupali watershed was a learning site of RUPES I (2002–2006), a project site of Rewards for Use and Shared Investment in Pro-Poor Environmental Services (RUPES II) (2008–2012) and

[d] The HEPP voluntarily allocates PHP 400,000 annually for reforestation, enforcement, livelihoods and scholarships to benefit the indigenous communities.

the country site for the Climate-smart, Tree-based, Co-investment in Adaptation and Mitigation in Asia (Smart Tree-Invest) Project (2014–2016)[e].

19.2 The context: Land-use change and degradation, and social conditions in the Manupali watershed

The Municipality of Lantapan is wholly contained in the Manupali watershed, Bukidnon province (Figure 19.1). With a total land area of 35 465 hectares, Lantapan is located in a river valley between the very biodiverse Mt. Kitanglad Range Natural Park to the north and the Manupali watershed to the south. Several rivers and creeks flow from the Park through the intensively cultivated agricultural areas and into the Manupali River. The river then runs into a network of irrigation canals constructed by the National Irrigation Administration and currently operated by the Bukidnon Irrigation Management Office. The whole system flows into the Pulangui River, and finally drains into the NPC reservoir, which is the biggest HEPP in Mindanao[20].

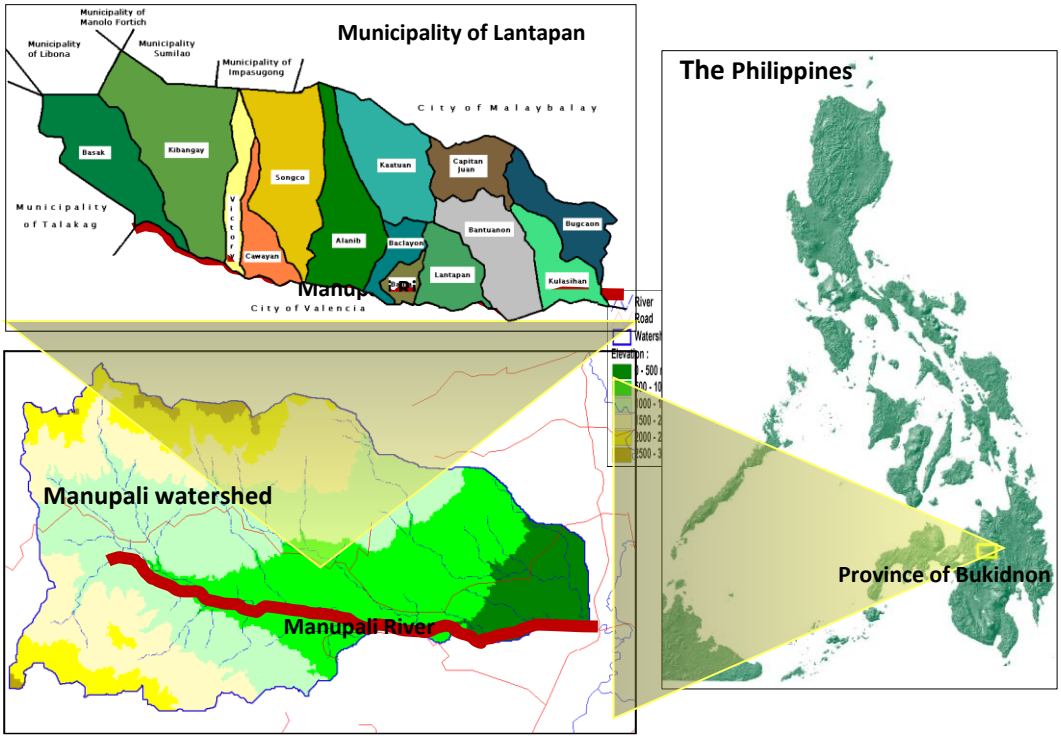

Figure 19.1 The Municipality of Lantapan within the Manupali watershed, Bukidnon, Philippines.

Lantapan has a total population of 55 934 in 2010 with a land density of 1.58 people per hectare. The ethnic groupings include 51 percent Dumagats (lowland migrants), 25 percent Talaandig, 14 percent Bukidnon, and 10 percent Ifugaos from the northern Philippines. Among these, the Talaandig, one of Bukidnon's seven tribes, is the most dominant tribe in Lantapan[21]. The tribe's ancestral domain is based in the village of Songco, where customary laws and indigenous ways of living are still practiced and preserved. Originally swidden cultivators, the Talaandig are now cultivating their lands for cash crops (e.g. corn, coffee,

[e] These three projects are supported by the International Fund for Agricultural Development (IFAD).

vegetables). Many of them have reached college level, and hold positions in government and private offices. Nonetheless, a majority remain below the poverty threshold level earning less than PHP 5 000 per month.

Lantapan's rich natural resources and favourable climatic conditions have attracted migrant farmers and agribusinesses. Although many of the people remain dependent on small-scale farming for their livelihoods, agribusinesses have dominated the agricultural landscape since 2000[22]. Corporate banana farms and, recently, pineapple, swine and poultry production stimulated economic growth and are key drivers of land-use change in the past decades. The distinct pattern of change from 1990–2007 has been towards non-tree-based land use or agricultural systems (18%)[23]. This trend is characterized by agricultural expansion and intensification even in high-altitude and steeply sloping areas. However, with unsustainable land management practices, this land use promotes soil erosion[24] and degradation of river water quality[25]. Consequently, decreasing farm productivity prompted some farmers to diversify their livelihoods, such as labouring in bigger farms or plantations.

Unfortunately, land degradation in Lantapan has also increased offsite soil erosion rates causing sedimentation in rivers and reservoirs that affect the efficiency of hydropower generation. The ArcSWAT model results of Alibuyog et al (2008)[26] showed that converting 50 percent of forest and grasslands of a sub-watershed into crop production will cause increased run-off and sediment yield, and decreased stream flow, especially where land management practices are poor. Sediments are flushed into the Pulangui River and finally build up in NPC's reservoir where an estimated 1.5 m^3 of silt are deposited annually[18]. This has reduced the reservoir's storage capacity by up to 30 percent, while dredging costs have already mounted to more than PHP 200 million since the dam became operational in 1985. Indeed, sustaining the volume and quality of water demanded by NPC and other users has become challenging. Water competition not only leads to scarcity but also aggravated conflict stemming from overlapping water rights and poor benefit-sharing[27].

In the Manupali watershed, there are three overlapping watershed management regimes[28]: 1) the upper portion of Manupali watershed is part of the protected area (PA) managed by the DENR under Republic Act (RA) 7586 (1992)[f]. The Protected Area Management Board (PAMB)[g] serves as the Park's decision-making body; 2) the LGUs are mandated by RA 7160 (1991)[h] to share with the DENR to manage the environment and natural resources within their jurisdiction; 3) the National Commission on Indigenous Peoples advances RA 8371 (1997)[i], which supersedes when it comes to ancestral domain. Without proper cooperation, sustainable management of this critical watershed can be very complex and challenging.

The Manupali watershed actually exhibits a classic tension between customary and statutory laws and leaders' contending views on culture and development, which has caused a rift within the tribe. There have been conflicts that affected many development projects in the watershed for some time. This began when, upon the approval of RA 8371, the Board favoured the ancestral domain claim per municipality over the united ancestral domain claim that the tribe, the DENR and the PAMB agreed to work on earlier. The proclamation of Mt. Kitanglad as a full pledge PA through RA 8978 (2000)[j] followed this, although the IPs were not consulted. Another incident that triggered this dispute was when the tribe penalized the PAMB for allowing road construction inside the Park, which the DENR then countered by charging a tribal leader for cutting an indigenous tree for community use[29]. Within the tribe,

[f] The National Integrated Protected Areas Systems Act
[g] A multi-sectoral group composed of representatives from government agencies and NGOs
[h] Local Government Code of the Philippines
[i] The Indigenous People's Rights Act
[j] Mt. Kitanglad Protected Area Act of 2000

there is also animosity between two leaders, characterized by their seemingly divergent views on culture and development. This confuses not only their people but also those surrounding them. The voice of their leader represents the voice of their people. Fortunately, conflicts have been resolved gradually. Indeed, Larson, Cronkleton, & Pulhin's (2015)[30] argument about the importance of understanding authority relations in the recognition of IP's rights to land and forest is fitting in this case. Although the process of constructing legitimate power to represent the community may lead to competition or conflict, it can also present an opportunity for negotiation or cooperation to emerge. These are some local dynamics that require recognition and respect[5].

Interestingly, Cairns (1997)[21] found common agendas between ancestral domain claims and the Park's conservation, which strengthened the synergy between biological and cultural diversity. He then proposed empowering the people to partner with the DENR towards protecting Mt. Kitanglad through a social contract. This contract includes the provision of livelihood alternatives and their meaningful participation in planning and implementing conservation activities in the Park.

19.3 Designing and testing an equitable social contract in the Manupali watershed

Table 19.1 Stakeholders' interest, power and legitimacy

Stakeholder	Interest	Power	Legitimacy
LGU (Lantapan/Bukidnon)	H	H	H
NPC	H	H	H
National Irrigation Administration (NIA)	H	L	H
Farmers	H	L	H
Agribusiness	M	H	H
ICRAF	H	L	H

Legend: High-H; Medium-M; Low-L

In 2006, ICRAF[k] collaborated with local partners to form an informal group[l]. The aim was to develop and institutionalize an acceptable mechanism to reward the upland communities of the Manupali watershed for the services they provide to downstream users (i.e. agribusiness, irrigators, HEPP). There were three main activities implemented (Table 19.2)[19,31]. First, an integrated watershed assessment was implemented using RHA, a cost-effective and replicable tool. Several discussions were conducted to understand the RWS approach to watershed protection, as well as various capacity-building activities to strengthen the group (Figure 19.2). As mentioned, the Manupali watershed was merely a learning site of the RUPES I-project, meaning that the team could only use accessible information but without any financial assistance. Even then, the partners' commitment to design and test this innovative approach encouraged them to share financial and in-kind resources to conduct the planned activities.

[k] ICRAF has implemented various research and development activities on agroforestry in Lantapan since 1993, which earned it good relationships with the community and local partners.

[l] This includes BENRO, LGU-Lantapan, Bukidnon Watershed Protection and Development Council, DENR, NIA and the NPC. Except for LGU-Lantapan, all are also members of the BWPDC's Technical Advisory Council. Apparently, this existing good partnership enabled the development of RWS.

Table 19.2 The seven stages in developing Rewards for Watershed Services scheme using the Rapid Hydrological Appraisal (RHA) tool as applied in the Manupali watershed, Philippines.

Stage	Activity	Methods	Key participants
1. Scoping 2. Awareness 3. Identifying partners	Implement integrated watershed assessment using the RHA tool	• Literature review • Spatial analysis of the watershed's land uses and land use change • Stakeholders' analysis (who is involved, affected) • Local ecological knowledge documentation and analysis • Public-and-policy-makers' ecological documentation and analysis • Modellers' ecological knowledge documentation and analysis	RHA team composed of representatives from Department of Environment and Natural Resources (DENR), Bukidnon Environment and Natural Resources Office (BENRO), Municipal Government of Lantapan, National Irrigation Administration, and the World Agroforestry Centre (ICRAF)
4. Negotiations 5. Action plans	Facilitate negotiations of agreements	• Formal and informal meetings and discussions	Buyer: National Power Corporation (NPC) Intermediary: Seller: Farmer leaders from upland communities in the Manupali watershed
6. ES reward support for action 7. Monitoring	Implement NPC's family approach to forestry and agroforestry development in the Manupali watershed (2014-2016)	• Co-investment • Co-management • Participatory monitoring and evaluation	Buyer: NPC Seller: Farmer-cooperators from Alanib and Maagnao subwatersheds Project Management Team: BENRO, DENR, Municipal Government of Lantapan, and ICRAF

Figure 19.2 Results of stakeholders analysis conducted to characterize the partners' capacity to develop a RWS scheme in the Manupali watershed (2007).

NPC was among the major water users identified. NPC is an active member of the Bukidnon Watershed Protection and Development Council's Technical Advisory Committee, and a partner of the provincial government on various watershed management projects in Bukidnon. This link enabled the group to present the RWS approach to the NPC's management board, who generally appreciated the rationality behind the approach and how the conditionality ensures the sustainability of their operation, particularly on soil erosion control. However, data was lacking to support this claim. Moreover, NPC was already implementing various watershed protection projects around the plant's area as mandated by RA 6395 (1971)[m]. Sec 212 of this law authorizes NPC to exercise control over watershed areas surrounding their reservoir. Nonetheless, the management expressed commitment to support the group's goal of developing a RWS scheme.

To address these data gaps, ICRAF led the group in conducting RHA to determine the hydrological functions of the Manupali watershed, based on local ecological knowledge (LEK), policymakers' ecological knowledge (PEK), and modeller's ecological knowledge (MEK). From 2007–2008, LEK and PEK data were completed but lagged behind MEK due to a lack of technical expertise. Fortunately, RHA was among the tools tested in the Manupali watershed under the BMZ[n]-funded and BENRO-led project "Trees in multi-Use Landscapes—Southeast Asia" (2008–2010). Based on its assessment, the Alanib and Kulasihan sub-watersheds turned out to be in critical condition with seasonal discharges and low buffering capacity, while the Maagnao sub-watershed was still in good condition. The modelling results also showed that changing land use can affect water balance, including the watershed's functions. Finally, it recommends developing land-use policies and incentives for sustainable land use, regulated water rights allocation, and a watershed-level collective for co-investment and equitable benefit-sharing[23].

These were presented and discussed in various formal and informal meetings with NPC, which started the second major activity: the negotiation phase. The ES provider and intermediaries were further equipped with a local policy for negotiating a reward scheme. In 2009, the LGU of Lantapan enacted Ordinance No. 114, which adopts the incentive-based mechanism that urges public and private entities to award incentives to smallholder farmers or farmer organizations (FOs) for adopting sustainable farming practices[o]. This policy is aimed at increasing farm productivity and profitability, and sustaining the ecosystem services the Municipality provides[32].

In 2010, NPC finally agreed to develop a RWS scheme that fits in with their rigid planning and budgeting system. Our partner from NPC researched policies to support the scheme. Indeed, Sec 34 of RA 9136 (2001)[p] states that "NPC shall manage and continue to be responsible for the rehabilitation of watershed areas supporting hydropower generation." This justifies the scheme since Manupali is part of the upper Pulangui watershed that provides water to NPC's reservoir. Their existing Memorandum of Agreement (MoA) with the DENR also supports this endeavour, which designates specific and critical areas within the Pulangui watershed for NPC to manage, protect and rehabilitate. In the same year, the MoA was drafted while the proposed project, including its budget, was submitted to NPC's central office for evaluation and approval. The MoA was finalized as early as 2013 because BENRO wanted to include the Sawaga watershed in Malaybalay City. Although the RUPES II-project included farmer leaders from the city's buffer zone communities during various RES capacity-building activities, not

[m] An Act Revising the Charter of the National Power Corporation
[n] Germany's Federal Ministry for Economic Cooperation and Development (BMZ)
[o] These rewards include subsidies for crop production and natural-resource-based livelihoods, subsidies for crop insurance, microfinancing, infrastructure, awards and recognition, and extension and marketing support
[p] Electric Power Industry Reform Act

much has been done in cooperation with the city government. Hence, it took a while for the city government to decide. The group finally decided to pioneer the RWS scheme in the Manupali watershed where awareness on the approach already existed. To date, the project is still implementing the agreements and monitoring performance, details of which are discussed in the following section.

The different stakeholders in Manupali watershed recognize the importance of protecting its services to sustain various water uses. Photo: World Agroforestry Centre/Caroline Duque-Piñon

NPC's family approach to forestry and agroforestry development

NPC's family approach to forestry and agroforestry development in the Manupali watershed is oriented towards watershed protection and livelihood development to alleviate poverty in the uplands. The main strategy is to promote sustainable land use, such as forestry and agroforestry systems, which reduce soil erosion along the riverbanks and provide livelihood opportunities to the farmers at the same time. The scheme aims to cover 70 hectares in the Alanib and Maagnao sub-watersheds in the villages of Songco and Cawayan in 2014–2016.

The participants

The scheme was originally designed to benefit farmers in the upper portion of the Alanib sub-watershed who are mostly IPs. This sub-watershed is already degrading in terms of water yield and functions[23]. Hence, capacity-building activities conducted in preparation for this scheme involved farmers mostly from the village of Songco. Indeed, there was a positive response when the scheme was presented to the wider community during the consultation in 2013. However, power dynamics within the tribal community prevented its implementation in the village when a leader opposed the project. Hence, the farmer-cooperators now include those in the nearby Maagnao sub-watershed in the village of Cawayan. The residents of these villages are predominantly from the Talaandig tribe, whose farming and land management practices still demonstrate their traditional knowledge and close connection to the natural world of forests and rivers[21]. Currently, there are 21 farmer-cooperators involved in the scheme with 70 hectares of land contracted to coffee and rubber-tree farms and fruit orchards.

To ensure that the scheme's goal is achieved, a project management team (PMT) representing the intermediaries was institutionalized in the MoA (Table 19.3). Conversely, the NPC formed its own team to implement the project. They hired several staff that provide technical assistance to the farmer-cooperators, and monitor and evaluate the progress among others.

Table 19.3 Actors' roles and responsibilities in Manupali's family approach to RWS (2014–2016)

NPC-Pulangui IV (Buyer)	Project Management Team: BENRO, DENR, LGU-Lantapan and ICRAF (Intermediaries)	Farmer-cooperators in Alanib and Cawayan sub-watersheds (Sellers)
• Provide technical assistance to farmer-cooperators • Allocate funds for project implementation within 3 years • Provide free quality seedlings • No ownership claim over the developed tree or agroforestry farms • Monitor the project's status even after the expiration of the contract	• Facilitate on-time implementation of activities • Provide necessary technical assistance (e.g. reforestation and agroforestry development) • Support monitoring and evaluation of farms • Mediate in case of conflict during the implementation • Link with other water users to complement and expand the coverage of RWS in Manupali	• Develop land into tree or agroforestry farms • Provide labour, equipment and materials to improve the land • Do not plant seedlings under the transmission lines • Maintain and protect the planted trees until the age of maturity • Are responsible for possible intruders (e.g. illegal occupants, incendiarism or intentional burning)

The procedure

To protect the Manupali watershed and alleviate poverty through livelihood development, NPC suggested the family approach to RWS. It builds on the decision-making process of the farming household to voluntarily join in the scheme and agree on the land use they prefer to adopt, utilizing their own resources (e.g. land, labour, skills) to improve their livelihoods and economic status. While the transaction cost is high, NPC insisted on establishing a contract with each family for them to appreciate the trust given to them, understand the seriousness of the agreement, and instil in them a sense of co-investment and shared responsibility.

The scheme's condition is a 90-percent survival rate of the trees planted. If the rate of survival is lower, the farmer-cooperator has to shoulder the cost of seedling/s for replacement, including the charge for labour. However, NPC may assist when trees are affected by climatic conditions, such as droughts and typhoons. Moreover, the contract features other salient clauses that protect the welfare of the farmer-cooperators, e.g. that NPC has no ownership over the products of the tree and agroforestry farms. However, NPC has the authority to continue monitoring the progress of the scheme for its long-term impact on the family and the watershed.

The benefit-sharing scheme

The scheme is a combination of financial and in-kind incentives. Aside from the free, high-quality tree seedlings, the farmer-cooperators are given financial assistance of about PHP 21 000 ha^{-1} for fruit trees and PHP 35 000 ha^{-1} for coffee and rubber tree farms to prepare the area, plant and maintain the trees. While this amount represents the labour fee of tree growing, it should not be used to sub-contract any part of the work. This amount is paid in eight instalments until the end of the three-year contract to ensure that the trees have already matured.

While maintaining the trees, the farmers can grow agricultural crops in between the tree rows. They can also continue other livelihood activities in the farm as long as these are not detrimental to the newly planted trees. One of the issues that emerged during the implementation is that some farmers who initially expressed interest in the scheme did not continue to join upon realizing the high opportunity cost they would incur if they allocated

portions of their land to planting trees rather than cash crops[q]. NPC appreciates that trees have long gestation periods. To address this, while waiting for the economic benefits of trees, NPC provides small-scale livelihood activities, such as goat dispersal, which farmers can integrate in their farming systems.

19.4 Discussion

This section largely uses the framework of McDermott et al (2013)[4] in analysing the three dimensions of social equity in Manupali's family approach to RWS. First, the procedural equity warrants people's basic rights in the decision-making process, such as access and participation. The multi-sectoral composition of the working group that initiated the scheme was instrumental in ensuring that the stakeholders' diverse rights and interests were recognized. The role of LGUs (BENRO and LGU-Lantapan) is crucial in representing these rights and interests in the process of RWS design[15] . Hence, when the scheme was presented, there was an affirmation from the community on its fairness—they are given livelihood assistance as an incentive for choosing sustainable land use that will sustain Manupali's watershed services. Needless to say, this scheme with NPC was highly anticipated in the community since the collaborative work began in 2006.

The HEPP staff explains to the farmers the details of their proposed reward for watershed services scheme during a community consultation. Photo: World Agroforestry Centre/Isidra Bagares

The implementation of RHA provides a venue for stakeholders in Manupali watershed to understand major issues affecting them and their environment, and come up with better solutions. Photo: World Agroforestry Centre/Caroline Duque-Piñon

Meaningful engagement in decision-making involves allowing people to weigh their options[5]. The family-approach scheme provides enough space for farmer-cooperators to decide various aspects of the contract. Participating in the scheme was entirely voluntary. Farmers who participated in the consultation were encouraged to discuss the scheme with their household members, and were given ample of time to decide. When a family decides to join, they express this by enlisting and submitting the required land-ownership and other documentation. NPC staff and a representative from the PMT visit and evaluate their area based on certain criteria. When approved, the family can then agree what land use they prefer, based on their own goals. For example, they can choose to reforest their barren lands for biodiversity purposes, or develop this into an agroforestry farm for income. In the latter case, they can choose fruit-based, timber-based or rubber-based agroforestry, among others, depending on the suitability of the system to the biophysical condition of their lands (e.g. slope, soil).

[q] Some of farmers' considerations were their children's school expenses and daily needs.

While a strong focus on the marginalized groups (e.g. women, IPs, landless) is encouraged in social equity[4], the scheme was opened to all interested landowners in the village—men or women, Talaandig or migrants, small or big landholders. Measuring the impact of the scheme was very important to the team. Hence, it was decided that the geographic position of the farms would form the base for prioritizing those farmer-cooperators that dwell along the riverbanks in the upper portion of the watershed. Contiguous areas also reduce the cost (e.g. time) during monitoring and evaluation. To be fair and to ensure that many landowners can participate, NPC agreed to cover a maximum of ten hectares per family, as the scheme covers only 70 hectares. As mentioned, land ownership was one of the conditions to participate in the scheme. The motive behind this is to ensure that the developed farm will not change ownership before the end of the three-year contract. For example, renting out the land to agribusiness companies is not allowed within the contract period because it would require changing the land use by planting corporate crops. Eliminating the land-title requirement[5] for this scheme is difficult because its conditions are based on land use.

Evaluating the distribution of costs, benefits and risks is another important dimension of social equity in RWS. In the case of NPC, the implementation of environmental and development projects in their host village, municipality and other designated watersheds evolved from national laws and MoAs with LGUs and national government agencies (e.g. DENR). Regardless of the outcomes, budget was allocated annually to implement similar activities in the same areas. However, this has saturated the communities over the years. Environmental projects have become less appreciated, and gradually developed a dependence on external assistance. Whereas in RWS scheme, the farmer-cooperators have to share in the investments required (e.g. land, labour), and consequently the benefits and risks. The farmer-cooperators have stakes as much as NPC, hence there is a motivation for both parties to realize the agreement.

In this context, the needs-based approach was a good alternative for the conventional system of handouts. Benefits are specifically designed for the area that requires the most urgent intervention to not just protect the watershed or improve the HEPP's water storage, but also to improve human welfare. This is coupled with a rewards-based approach, where the perceived future benefits the farmer-cooperators gain are proportional to their input, which is the opportunity cost for adopting sustainable land use. Additionally, the scheme provides technical assistance, training and the information needed to improve the capacity of the farmer-cooperators on sustainable land use and management practices. Meanwhile, the only risk of the scheme so far is meeting the 90-percent survival rate of the planted trees. A recently conducted inventory estimated the survival rate at 70–80 percent. Provisions are made to ensure that this condition can improve. In fact, NPC bears the bigger risk of uncertainties arising because of their high transaction cost in implementing the scheme.

Finally, the contextual equity refers to the pre-existing socio-economic conditions that enable or delimit the communities' ability to access and participate, be recognized and benefit from the scheme. In this case, the scheme was coursed through the LGUs—from the provincial (BENRO) and the municipal (LGU-Lantapan) down to the village government represented by the captain. The scheme also involved the tribal chieftain of Mt. Kitanglad who represented the three tribes in the PAMB. This chieftain was also the village captain of Songco when the RWS effort began in 2006. He was among those local partners who have a deep understanding on the intrinsic interdependence of upstream and downstream communities, and hence espoused the concept of RWS as fair.

Context also involves power dynamics and social relations, which are sometimes hidden but can have a huge impact on a community's access to a scheme. When the scheme was about to be implemented in early 2014, field visits and evaluation were conducted to assess land

suitability, and road access among others. The team involved the tribal chieftain as the recognized tribal leader and representative to the LGU for many decades. During the implementation however, another person, who has also been claiming tribal leadership, opposed the scheme and asserted that he was unaware of the project. He accused it of not going through the process of free-and-prior-informed consent.

Needless to say, this authority issue caused turmoil in the project[30]. The community people, particularly the IPs, were confused and torn as animosity between the two leaders resurfaced. But IPs are generally not confrontational. They wanted to participate in the scheme but still followed the decision of the chieftain, which was to uphold peace within the tribe over development. The voice of their leader is also their voice. This shows that participants' motives in the project determine how well behavioural change is sustained, particularly their cooperation to realize the outcomes[2]. Finally, it was decided that the scheme's boundaries will be changed to include the adjacent Maagnao sub-watershed. There were still some farmers in Songco who continued with the scheme. But they were migrants and not necessarily sanctioned by tribal laws. This is critical because the scheme's livelihood opportunity may compound the existing economic gap between IPs and migrants, which was meant to be distributed equitably.

Indeed, there are power dynamics at the local level that can affect, and even redirect the scheme's implementation. It strengthens certain voices while surpassing others, which consequently leads to inequity in other dimensions. However, power can also be recreated through social relations and institutions that can influence behaviour through voluntary cooperation[27]. There was disappointment on the part of NPC, who felt they were in a precarious position. But their trust in the PMT sustained their commitment to continue the scheme in another but equally important sub-watershed of the Manupali watershed. This demonstrates how contextual equity is constrained by power dynamics, but in turn transforms and strengthens social relations within the team, and with new partner institutions and communities in other villages. Although the procedural and distributional equity was well considered, there were still uncertainties from a local context, such as hidden leadership conflicts within the community that prevented the targeted people from participating in the scheme. Paradoxically, this incident may deepen existing inequalities and lead to greater social disparity. Therefore, traditional authorities and other local structures should not be undermined[30]. Indeed, there is still more to learn about the complexity of social-ecological systems, particularly about the interdependence of procedural, distributional and contextual dimensions of social equity in RWS design and implementation.

19.4 Conclusion

The experience of developing and testing a RWS scheme in the Manupali watershed highlighted the key role of intermediary agencies and their trust and commitment in coming up with an equitable scheme. This is especially true when water users are large private companies such as HEPPs, which are seemingly difficult to work with. While NGOs crucial in raising the awareness about RWS, it is the LGU's political will that mobilizes resources and cooperation to facilitate the process. Supportive policies, organizing local champions through collaborative work, enhancing understanding about the approach through continued capacity building, and ensuring social equity in the design are also important factors.

While it is the economic efficiency of the RWS that initially engages people, we argue that its social equity dimensions should also be considered to minimize, if not avoid, uncertainties in the process. Underlying power dynamics and social disparities at the community level have great impact on social equity. As shown, although NPC and intermediaries controlled and managed the initial stage of procedural and distributional dimensions of the scheme, the

context's pre-existing social relations and traditional institutions restrained it from achieving these during the implementation phase. While these can be transformed and strengthened, it requires resources, time and focused effort, and the community's trust and commitment. We therefore suggest prudent consideration of the interplay of institutions and social relations—including stakeholders' norms and belief systems—in social equity's different dimensions as part of the complexity of social-ecological systems in the context of RWS.

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