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Managing Coastal Ecosystems in the Philippines

What Cash for Work Programmes Can Contribute

Tilman Altenburg
Cecilia Fischer
Kerstin Huck
Anna Kruip
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The German Development Institute / Deutsches Institut für Entwicklungspolitik (DIE) is a multidisciplinary research, policy advice and training institute for Germany's bilateral and multilateral development cooperation. On the basis of independent research, it acts as consultant to public institutions in Germany and abroad on current issues of cooperation between developed and developing countries. Through its nine-month training course, the German Development Institute prepares German and European university graduates for careers in the field of development policy.

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Abbreviations

4P	Pantawid Pamilyang Pilipino Program
BFAR	Bureau of Fisheries and Aquatic Resources
BMB	Biodiversity Management Bureau
CALABARZON	Region IV A, composed of the provinces Cavite, Laguna, Batangas, Rizal and Quezon
CBFM	Community-based Forest Management
CBLA	Cash for Building Livelihood Assets
CENRO	Community Environment and Natural Resources Office
CfW	Cash for Work
CI	Conservation International
CPR	common pool resource
DA	Department of Agriculture
DENR	Department of Environment and Natural Resources
DSWD	Department of Social Welfare and Development
ECfW	Environmental Cash for Work
ECCT	Environmental Conditional Cash Transfer
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
ha	hectare
LGU	local government unit
MFARMC	Municipal Fisheries and Aquatic Resources Management Council
MIMAROPA	Region IV B, composed of the provinces Occidental Mindoro and Oriental Mindoro, Marinduque, Romblon and Palawan
MPA	marine protected area
MSWD	Municipal Social Welfare Development
NGO	non-governmental organisation

NGP	National Greening Programme
PENRO	Provincial Environment and Natural Resources Office
PES	Payments for Ecosystem Services
PG-ENRO	Provincial Government Environment and Natural Resources Office
PHP	Philippine peso
PNAP	Philippine National Aquasilviculture Programme
UNOSD	United Nations Office for Sustainable Development
USAID	United States Agency for International Development
WWF	World Wide Fund for Nature

Executive summary

This research aims at determining whether Environmental Cash for Work (ECfW) programmes can effectively contribute to the sustainable management of natural resources and how they should be designed to achieve that goal. We focus on fish stocks and mangrove forests: being common pool resources, they are both prone to be exploited due to their characteristics of non-excludability and rivalry. We first conducted a desk study on two alternative financial incentive schemes – Payments for Ecosystem Services (PES) and Environmental Conditional Cash Transfers (ECCTs) – and compared their attributes with the ones of ECfW. We conclude that PES and ECCTs are preferable to Cash for Work (CfW) if certain preconditions are met, for example users of ecosystem services or public entities are willing and able to pay attractive fees and services, and services are unequivocally attributable to individual service providers. Currently, these conditions (with a few local exceptions) are not in place in the Philippines. ECfW, in contrast, do not presuppose such conditions and are therefore the most viable economic incentive scheme for the local context. As criteria for successful ECfW programmes, we list the clear specification of objectives and the translation of these into measurable performance indicators, a coherent impact chain, additionality and leverage of funding. In a second step, we conducted field research and examined two case studies in the Philippines to assess ECfW schemes: a closed season for fisheries and mangrove reforestation.

As a first case study, we evaluated the impacts of a highly innovative closed season for fisheries in Balayan Bay, implemented in December 2014. For the first time, a fishery ban during the spawning season of important commercial species was backed by a ECfW programme providing an alternative income for affected fisher folk. In focus group discussions, we collected the perceptions of local experts from the local government units (LGUs), municipal and commercial fishers as well as captains and owners of vessels. The respondents noticed increasing fish stocks and, in particular, a substantial rise of juvenile fish, which is why most of them evaluated the closed season positively and even called for a repetition and extension of the closure. Environmental awareness increased and no violations were reported during the closure. CfW proved to be the key element of the closed season, serving as an alternative income source, but it was called for aligning

the activities to already existing skills and to aim for the provision of long-term alternative livelihoods. Should the closure be repeated, the number of participants of the ECfW activities is likely to augment significantly. A remaining challenge is the delineation of the municipal waters in Balayan Bay and thus the issuing of a unified ordinance. That ordinance would include all municipalities of the bay, and set guidelines in terms of territorial delineations, permitted gear and sanctions. Moreover, the interviewees called for better apprehension and reporting procedures.

The second case study examined mangrove reforestation programmes in the MIMAROPA region. By conducting stakeholder interviews and focus group discussions, we aimed at getting background information on mangroves (mangrove cover, use of mangroves, etc.) as well as on past reforestation activities in terms of their design and success. The results show that most people in the *barangays*[1] use the mangrove areas, particularly for collecting crabs, clams and fish. There are no use restrictions, but usually that does not provoke any conflicts within the *barangays*. People are very aware of the value of mangroves and thus acknowledge the importance of protecting them. In the past, mangroves have been severely destroyed due to the creation of fishponds and illegal logging, whereas today there are only a few cases where people cut mangroves for timber or charcoal-making. Only in one research site is the destruction of mangroves still prevalent. All *barangays* are – or have been – involved in various reforestation programmes, but some of them are only partly successful in terms of ecological outcomes due to inappropriate planting. Additional incentives, as offered by ECfW programmes, are usually necessary to stimulate peoples' motivation to reforest. Moreover, our research shows that there is no "one size fits all" solution but that some ECfW design options have proven to be more suitable than others.

For each case study, we provide policy recommendations and establish that the following main conditions should be fulfilled for ECfW programmes to make a substantial contribution to the sustainable management of natural resources: establishing evidence-based impact chains that fit the objectives, embedding ECfW in a systemic policy approach, ensuring that ECfW provides additionality to the business-as-usual scenario and aiming to scale-up ECfW programmes.

1 *Barangays* are Philippine city districts or villages.

1 Introduction

The Philippines is one of 17 mega-diverse countries.[2] It comprises 7,107 islands and – with a total coastline of 37,000 km – includes a variety of coastal ecosystems.[3] As part of the Coral Triangle,[4] the coastal ecosystems in the Philippines are characterised by an enormous marine biodiversity and provide a multitude of ecosystem services. Their enormous importance for humankind, also in terms of economic value, is now widely acknowledged in the Philippines and worldwide. Coastal ecosystems provide the foundations for fishery and tourism as important sources for the livelihoods of local people. In the Philippines, more than 50 million people live in coastal areas (World Bank, 2005, p. 1), with approximately two million of them directly depending on fisheries for employment (Burke, 2012, p. 36). Moreover, fishery products make up an important part of the population's dietary plan.

However, many of the Philippine's coastal ecosystems are severely threatened by unsustainable local practices, including overfishing, deforestation of mangroves and release of untreated wastewaters. Due to poverty, the lack of economic diversification and population growth, people are highly dependent on the extraction of natural resources. Although the Philippines have quite modern environmental laws and a number of formal and informal arrangements at the local level to manage natural resources, these regulations are not capable of coping with the overexploitation of coastal ecosystems.

A number of financial schemes have therefore been created to provide additional incentives for communities to manage their natural resources in more sustainable ways: Payments for Ecosystem Services (PES); Environmental Conditional Cash Transfers (ECCTs); and Environmental Cash for Work (ECfW) programmes. We discuss their advantages and disadvantages and then, for two reasons, zoom into the ECfW modality: first, there are fewer preconditions for its implementation; and second,

2 In 2000, the World Conservation Monitoring Centre recognised 17 countries as being mega-diverse. The criteria are based on the total amount of species in a country and the degree of endemism. All mega-diverse countries harbour together more than 70 per cent of the world's species (Australian State of the Environment Committee, 2001, p. 13).

3 The term "coastal ecosystem" mainly covers coral reefs, mangroves and seagrass beds.

4 "Coral Triangle" refers to a roughly triangular area of the tropical marine waters of Indonesia, Malaysia, Papua New Guinea, Philippines, Solomon Islands and Timor-Leste. It hosts more marine species than any other place on earth; see http://thecoraltriangle.com/about

environmental objectives can be more easily linked to social objectives. In order to assess the relevance and design options of these ECfW schemes, the research was guided by two major questions:

1. Can ECfW programmes effectively contribute to the sustainable management of natural resources?[5]
2. How should ECfW programmes be designed to ensure the sustainable management of natural resources?

There are numerous examples of Cash for Work (CfW) programmes in the Philippines with different design options and varying impacts – some are related to natural resources management and others provide different public services. This study closely examines two types of ECfW programmes with different underlying logics:

- ECfW as compensation to fisherfolk for lost income during a closed season (Balayan Bay, Batangas) – the rationale here is to temporarily *cease* any use of natural resources. Offering ECfW activities for compensating fishers during a closure is a highly innovative approach and a first time experience in the Philippines. This study presents the perceptions of fishers and experts on the seasonal closure and identifies the ECfW component as a key element for the project's success.
- ECfW for mangrove reforestation (MIMAROPA region) – the rationale here is to encourage people to *undertake* an activity that builds new assets. The Philippine government invests significant financial resources into mangrove reforestation, mainly channelled through the National Greening Programme (NGP). Currently, a big debate on the outcomes of the NGP and whether it should be continued after 2016 is ongoing. This study provides insights into the advantages and downsides of reforestation through ECfW.

Field research was carried out in the Philippines from 16 February to 29 April 2015. The research was supported by the Biodiversity Management Bureau (BMB) under the Department of Environment and Natural Resources (DENR), by the Deutsche Gesellschaft für Internationale Zusammenarbeit

5 We follow the United Nation's definition of "sustainable management of natural resources and ecosystems that supports, inter alia, economic, social and human development while facilitating ecosystem conservation, regeneration and restoration and resilience in the face of new and emerging challenges" (United Nations Office for Sustainable Development, 2012).

(GIZ) and its Protected Area Management Enhancement in the Philippines programme, and by the United States Agency for International Development (USAID) and its Ecofish project.

This report starts with an overview of financial incentive schemes for coastal ecosystem management (Section 2). Here, we describe what has been called the "Tragedy of the Commons" (Hardin, 1968), a theory that explains how rational behaviour of individuals may lead to the depletion of common resources, and how this plays out in coastal ecosystems in the Philippines. We further discuss the advantages and disadvantages of PES, ECCT and ECfW schemes, arguing that ECfW may be the most suitable incentive scheme in the Philippines to achieve environmental goals, given the institutional constraints the country faces. We will then present the two case studies on the fishery closed season (Section 3) and on mangrove reforestation (Section 4). Each of these sections comprises information on the background of the study sites and the methodology, key findings of our field research as well as our main policy recommendations. Section 5 concludes and summarises design criteria for the implementation of successful ECfW programmes.

2 Managing ecosystems: the need for financial incentive schemes

2.1 The Tragedy of the Commons

Most of the Philippine people live along the coastline, and many directly or indirectly depend on coastal and marine resources. Weak regulation of resource extraction leads to unsustainable use patterns. The country's coastal ecosystems have been heavily degraded during the last years, thus affecting the coastal biodiversity, the provision of ecosystem services and the livelihoods of local people. Most coastal resources are common pool resources (CPRs), characterised by non-excludability and rivalry: it is very costly to exclude beneficiaries from using these resources and, at the same time, resource users are put into direct competition with each other. In most cases, this leads to an overharvesting of resources and unfavourable stakeholder dynamics, where free-riding and the exclusion of marginal groups are among some of the issues. In academics, this has been conceptualised as the Tragedy of the Commons: individuals act rationally

according to their own self-interest and, by that, jeopardise what is best for the whole community (Hardin, 1968). Short-term benefits derived from excessive resource use are valued higher than sustainable long-term revenues.

The overexploitation of resources is reinforced by population growth, which increases the demand for resources, and by climate change, which exacerbates the degradation of entire ecosystems, such as coral reefs, thus affecting biodiversity and the livelihoods of people. In this section, the preconditions for sustainable CPR management are explored, as well as the nature of the regulations, which can have a national or communal character. We furthermore point out the gap between existing rules and their implementation in the Philippines.

The requirements for managing CPRs sustainably are numerous. When CPRs are exploited for commercial use, there should be **extraction limits**, such as quotas, that determine the resource quantity that can be withdrawn without impeding the ecosystem's ability to recover. To determine who is eligible to partake in the extraction of CPRs, **access and usage rights** need to be defined. Although it proves difficult to exclude users from harvesting CPRs, this can be achieved by allocating access and usage rights on a communal basis. An example would be the marking of municipal water boundaries, thereby granting fishing rights to members of the municipality in question. This allocation of rights serves furthermore as a basis for effective **monitoring and enforcement**, which is the key to managing CPRs sustainably.

In reality, national and regional formal institutions are often unable to define consistent regulations for sustainable CPR management and enforce them effectively. Ostrom, therefore, suggested communal self-management as an alternative. In her seminal publication, "Governing the Commons – the Evolution of Institutions for Collective Action", (1990) and in subsequent publications,[6] she analysed the likelihood and characteristics of communities to self-organise and to establish communal rule systems in the absence of formal rules and enforcement. She shows that informal or formal communal arrangements and regulations can be highly effective in sustainably managing CPRs.

6 For further reading, see Ostrom (2007, 2009) and Ostrom and Cox (2010).

The management of these resources, whether on an informal or formal basis, often entails the restriction of the traditional users' access and/or usage rights. This is particularly challenging for poor people in developing countries: in particular, local CPRs such as fish stocks and mangrove forests are threatened, since many people depend on them, but people are either not aware of the resources' value or are not willing – or simply not able – to sacrifice short-term gains in favour of long-term benefits. When conservation programmes deprive people of their livelihood basis without offering an alternative, resource users cannot afford giving up unsustainable practices.

The Philippines has an extensive set of national regulations in terms of environmental protection; however, there is often a huge gap between laws and their actual implementation and enforcement. Apart from the policy issue, the management of CPRs is further complicated by different environmental and social characteristics: coastal ecosystem management is highly context-specific, due to, for example, different spawning seasons of fish species in different regions of the Philippines; varying soil conditions influencing mangrove reforestation; different socio-economic characteristics of the local population, and so on. Consequently, the management system has to match the system to be managed – rules need to fit the local conditions. Hence, a participatory approach in drafting these policies is required, combining national and local expertise to arrive at a coherent set of rules across all governance levels to cope with the Tragedy of the Commons. That this approach can be successful and thus a win-win situation for the people and the environment has been exemplified in case studies, such as the one by Lejano and Ingram (2007). Using a case study from the Turtle Islands in the Philippines, the authors show how to make sure that local communities take part in designing and implementing the resource management strategies.

The basis for a participatory management of CPRs is already in place, since the Philippines is a highly decentralised country, which grants LGUs extensive rights when it comes to managing their municipal area. This municipal self-management has been strengthened by national laws, in particular the Local Government Code (Republic Act 7160) and the Fisheries Code (Republic Act 8550), both transferring the responsibility for the management of coastlines and municipal waters to the respective municipality. National regulations applied in a top-down manner without local backing rarely work in the Philippines.

To ensure that both national and municipal interests are served, the existing institutional arrangements in the area of natural resources management comprise a system of multi-level governance, including formalised rules at the national, regional and local levels as well as partly informal practices of local self-management. Still, continuous degradation of corals, mangroves and fish stocks show that the existing institutional framework system does not work properly. The lack of clarity of mandates, overlapping competencies of departments at the national and local levels as well as a lack of funds are causing problems (for more details on the institutional framework and challenges in natural resources management in the Philippines, see Box 1). Innovative incentive systems are needed to counteract this downward spiral.

Box 1: Multi-level governance in environmental and natural resources management in the Philippines

Institutional framework

In the Philippines, two departments are responsible for the management of coastal ecosystems. The Department of Environment and Natural Resources, created in 1987, is responsible for "the conservation, management, development, and proper use of the country's environment and natural resources" (DENR [Department of Environment and Natural Resources], 2015). One of its sub-divisions, the Biodiversity Management Bureau, manages the protected areas that are nationally declared under the National Integrated Protected Areas System Act. The Bureau of Fisheries and Aquatic Resources (BFAR), which is under the Department of Agriculture (DA), is concerned with all marine resources, such as fish, mussels and sea grass. Its policy is laid down in the Fisheries Code (1998), which sets not only the framework for sustainable fishing practices for local and commercial fisherfolk but also forms a basis for the communal jurisdiction of municipal waters. Other relevant agencies at the national level are the DENR-attached National Mapping and Resource Information Authority, the National Water Resources Board, the Department of Energy and the National Commission on Indigenous People (World Bank, 2009, p. 10).

Following the Philippine's decentralisation and devolution process and the passing of the Local Government Code, some of the functions of the national government, including environmental and natural resources management, were devolved to the LGUs. The powers of the LGUs involve, among others, the establishment of protected areas and community-based forestry projects; the management of communal forests and watersheds; the regulation of fishing in municipal waters; and solid waste management (World Bank, 2009, p. 11).

Box 1 (cont.): Multi-level governance in environmental and natural resources management in the Philippines

Challenges

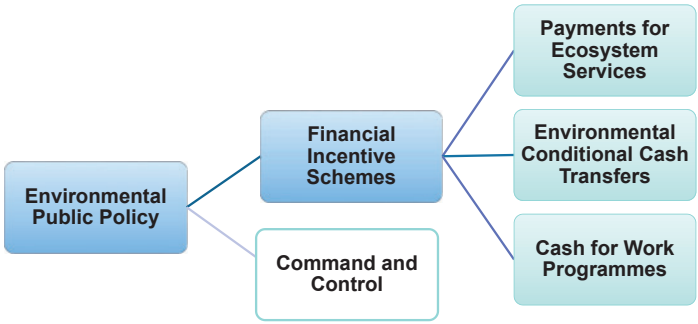
The Philippines has been a forerunner in passing environmental and natural resources legislation. However, several problems hinder their effective implementation. To begin with, one challenge is the lack of financial, human and technical resources. There is a disparity between policy pronouncements in favour of natural resources management and resources committed to carry these policies out. The already small share of the national budget for DENR has declined over the years: from 1.2 per cent in the late 1990s (World Bank, 2009, p. 16), it fell to 0.8 per cent, as expected for 2015 (Department of Budget and Management, 2014). As DENR's mandate is broad and deep, critics state that its budget is not commensurate to its responsibilities and problems (World Bank, 2009, p. 17). Moreover, the local management of natural resources is under constraints, too. Most often, municipalities give low priority to environmental issues, and the lack of financial, human and technical resources is even more accentuated at the LGU level, as they rely on financial transfers from the national government, having only limited revenue-generating powers and capacities themselves (World Bank, 2009, p. 19).

Furthermore, when it comes to the cooperation of national and local entities, institutional arrangements are often unclear. Many LGUs have their own environmental officer and legislative councils, whereas both DENR and BFAR are represented by a widespread net of national, provincial and community offices for their field operations. At the subordinate levels, Provincial and Community Environment and Natural Resources Offices (PENROs and CENROs) oversee the communal management of natural resources and assist LGUs in improving local governance, leading to an overlap of mandates at the national, provincial and local levels. Responsibilities overlap also between different departments, for example when it comes to protected areas or the conversion of abandoned fishponds (see Section 4.1).

Source: Authors

2.2 Policy options for financial incentive schemes

Figure 1: Types of environmental public policy (non-exhaustive)



Source: Authors

As a response to the continuous degradation of natural resources in the absence of sufficiently enforced regulations and weak local management, financial incentive schemes have spread all over the developing world in the last decade. These incentive schemes may contribute to restoring the socio-ecological balance by complementing dysfunctional management systems with positive incentives. In the following, we will analyse three financial incentive schemes (Figure 1) that are subject to an international debate (McConnachie, Cowling, Shackleton, & Knight, 2013):

- **Payments for Ecosystem Services** are economic transfers in which a buyer pays a service provider for a well-defined ecosystem service (e.g. downstream water users pay for upstream watershed protection). Hence, PES presuppose market-based transactions.
- **Environmental Conditional Cash Transfers** is a concept proposed by GIZ Philippines, offering payments to compensate for the temporary income loss while transitioning from unsustainable use practices to sustainable ones. In contrast to PES, transfers would be government-funded and target poor beneficiaries only.
- **Cash for Work** programmes employ poor people in work programmes providing value for communities. Traditionally a social welfare

instrument, they also offer vast possibilities for achieving environmental goals (ECfW). Moreover, the cash payments help to mitigate the financial constraints of poor households.

In principle, all three can be either "use-restricting" or "asset-building" (Pirard, Billé, & Sembrés, 2010). Table 1 explains both terms with regard to financial incentive schemes for environmental services. It should be noted that use-restricting schemes ultimately aim at improving environmental stocks and thus at asset-building. The main difference is whether schemes directly create assets or cease activities to allow stocks to regenerate by themselves. Moreover, both elements are sometimes combined, for example when CfW programmes employ people in activities creating assets directly to provide a source of livelihood while these stakeholders temporarily cease to exploit other resources at the same time.

Table 1: Use-restricting and asset-building schemes

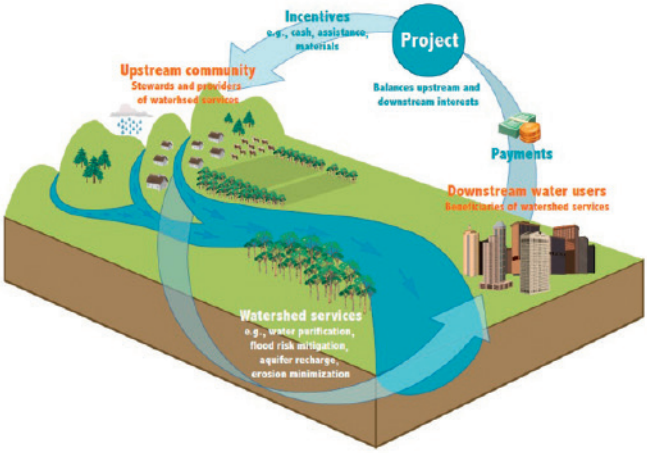
Use-restricting schemes	**Asset-building schemes**
Use-restricting schemes imply the cessation of resource-using activities. Payments are strictly conditional until the environmental degradation has ceased. Their appeal lies in the fact that it is easier to give cash and monitor the cessation, for example of logging in a forest, than to provide training and equipment for setting up tree nurseries and sustainable forest management practices. Over the long term, use-restricting schemes may become both costly (continued payments) and ineffective, as they tend to ignore the demand side (e.g. people may cut mangroves for charcoal production because they still need firewood). **Examples:** ban on logging, ban on fishing, establishment of protected areas	Asset-building schemes aim at changing practices or directly building environmental assets, for example via reforestation. Training needs and preparation of activities (e.g. tree nurseries) can make such schemes costly, but they may be more effective over the long term. **Examples:** reforestation, clearing of invasive plants, establishing sustainable practices such as a fertiliser-free agriculture

Source: Pirard et al. (2010)

Payments for Ecosystem Services

One possible incentive to reach ecological sustainability are PES. According to Wunder (2005, p. 3), PES are voluntary[7] transactions in which a well-defined ecosystem service (or a land-use likely to secure that service) is being "bought" by a (minimum one) buyer from a (minimum one) provider, if and only if the ecosystem service provider secures ecosystem service provision (conditionality) (see Figure 2). An essential component of any PES scheme

Figure 2: Example of a PES scheme



Ecosystem services such as water purification and flood risk mitigation are provided by watersheds, which is land that catches rainfall and feeds it into a river. Beneficiaries of these services are downstream water users (buyers). They pay the upstream community (sellers/providers) for the provision of the service. The payments they receive are incentives for the sellers to adopt sustainable land use practices, for example by using a suitable fertiliser. The payments are transferred only when the sellers meet the condition to provide the ecosystem service.

Source: Forest Trends and Katoomba Group (2010)

7 Although PES is supposed to be voluntary by definition, many times it is not, because PES schemes are often directly linked to environmental laws. Therefore, ecosystem service providers sometimes face two choices: either they agree to the PES scheme or they pay the penalties imposed on them by law. Rodríguez de Francisco and Rodríguez de Francisco and Boelens (2014, p. 2) cite a programme in Ecuador in which providers had to reimburse all received PES once they wanted to leave the programme.

is a contract that defines payment, timing of payments, requirements, etc. (Forest Trends & Katoomba Group, 2010, p. 36). Providers include the owners of an ecosystem (e.g. a forest owner), rights holders (such as leaseholders of a forest) and managers (e.g. protected area managers). Buyers of ecosystem services include, for example, tourists that frequent a park for pleasure, downstream communities that pay upstream communities for the sustainable management of the upstream forests or outsiders that pay locals in order to be allowed to fish in their fishing grounds.

Once the providers, buyers and the payment method are identified, the price of the service needs to be agreed on. Factors influencing the price include the buyer's willingness to pay, the provider's asking price and the transaction costs of the pricing. The buyers base their cost calculation on the costs of ecosystem restoration or maintenance, the substitution costs, the risk of investment and the price of other PES deals. The providers calculate their offers based on the opportunity costs, the management costs, the risk of failure and the competition with other providers. PES can be area- or product-based, public or private, use-restricting or asset-building and cash or in-kind (Wunder, 2005, p. 8).

National governments and international organisations have implemented PES schemes all over the world, including in the Philippines. However, PES do not imply that nature conservation automatically leads to poverty alleviation and that it creates only win-win situations. On the contrary, potential participants are typically the non-poor who own natural resources (or hold use rights) at a large commercial scale (Wunder, 2005, p. 1). The PES design can be adapted to also benefit the poor, but a trade-off remains between the scheme's intention to target the largest ecosystem service providers and address poverty reduction and equity concerns.

Environmental Conditional Cash Transfers

ECCTs extend Conditional Cash Transfers to the environmental sphere. Conditional Cash Transfers have expanded rapidly over the past decade, operating in more than 30 countries worldwide, including in the Philippines.[8]

8 An example is the Pantawid Pamilyang Pilipino Program (4P), which is a programme of the Philippine national government that invests in the health and education of poor households, particularly that of children. Since 2008, it has become a core pillar of the government's social protection strategy under the lead of the DSWD. It provides cash grants to beneficiaries, provided that they comply with the set of conditions. The programme covers 79 provinces, 1,484 municipalities and 143 cities in all 17 regions. As of 25 June 2014, 4,090,667 households were registered (DSWD [Department of Social Welfare and Development], 2014a).

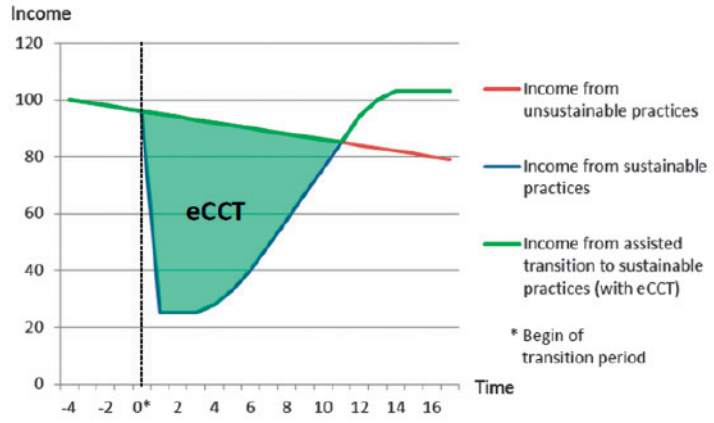
They provide aid to poor families on condition that they meet a pre-defined set of criteria such as children's school attendance, medical check-ups and vaccinations (Rawlings, 2005, p. 29). ECCTs are based on this concept, adding environmental matters and thereby combining PES and Conditional Cash Transfers. The concept was developed by GIZ in the Philippines and was launched in 2012 in cooperation with the National Convergence Initiative, DENR, the Department of Interior and Local Government, and the Department of Social Welfare and Development (DSWD).

ECCTs can be categorised as government-financed schemes that are different from PES schemes in that they only provide temporary support. As farmers and fisherfolk overuse natural resources because alternative livelihoods or sustainable practices are out of their reach, ECCTs offer an income to enable participants to bridge the transition from unsustainable practices, such as overfishing or slash-and-burn agriculture, to sustainable ones (e.g. sustainable fishing or agro-forestry). The approach is based on the assumption that the sustainable use of natural resources will be financially viable over the long term, but that people are locked into unsustainable practices because of the costs that incur when transitioning to other practices – for example because degraded soils or overexploited fish stocks may take years to recover. Therefore, beneficiaries of the programme should obtain cash in exchange for meeting environmental conditions. To be eligible, beneficiaries must live below a predefined poverty threshold. To establish the amount to be paid, the individual opportunity costs have to be taken into account. As this may result in excessively high implementation costs, GIZ proposes uniform payments (e.g. covering a household's rice needs) as a second-best alternative (GIZ [Deutsche Gesellschaft für Internationale Zusammenarbeit], 2012, p. 8). However, due to lacking tenure rights, constraints in data availability on resource users and limited political will, ECCTs have not been implemented yet.

The following example on marine protected areas (MPAs) explains the intervention logic of ECCTs. It is assumed that the creation of MPAs leads to spill-over effects with increased fish catches and larger sizes of fish in adjacent waters. In order to compensate fisherfolk for reduced fish catch during the first year after the creation of the MPA, it was planned to provide short-term incentives to small-scale fishers, who lost income due to the implementation of MPAs. Figure 3 illustrates the compensation through ECCT incentives. The income (in red) of unsustainable practices such

as overfishing is relatively high but decreasing. Switching to sustainable practices, through the establishment of MPAs, increases income over the long term (in blue), but fishers would experience a harsh income dip during the transition in the short term. The green area shows the compensation proposed by the ECCT. It would ensure that programme participants do not experience a transitory income loss (GIZ, 2012, p. 28).

Figure 3: Compensation of a temporary income dip through ECCT incentives



Source: GIZ (2012, p. 28)

ECCTs and PES have many similarities but differ in three aspects. First, ECCTs are temporary, covering a specific timeframe predefined as the transition from unsustainable to sustainable practices, whereas PES are created with the objective to permanently pay for the provision of ecosystem services. ECCTs assume that this provision can be secured without long-term payments and without putting a price on these services, parting from the assumption that sustainable practices are financially viable in themselves (GIZ, 2012, p. 29). Second, ECCTs are transfers paid for by government agencies, and the existence of a market for environmental services is not a precondition. Third, the ECCT concept excludes payments to non-poor participants.

Environmental Cash for Work

CfW programmes are defined as social transfer programmes that involve the regular payment of money upon condition that recipients provide labour benefitting the community. CfW is used by many governments throughout the world and is supported by large donors such as the World Bank. When implemented well, CfW can be a useful tool to reduce poverty and provide social protection (DFID [Department for International Development], 2005, p. 12). CfW programmes should create assets that benefit the community. Activities include, for example, the construction of markets or schools, but they can also focus on environmental issues such as de-clogging sewage systems, clearing of invasive plants or reforestation. Environmental CfW programmes, in particular, are sometimes described as possible win-win strategies for alleviating poverty while simultaneously restoring the ecological infrastructure (McConnachie et al., 2013, p. 544).

ECfW can be distinguished with regard to their main purpose: *asset-building* ECfW aims, for example, at restoring wetlands or reforesting mangroves, whereas *use-restricting* ECfW offers paid work to compensate for income that has been lost during a temporary halt in exploiting natural resources (e.g. during closed seasons for fisheries).[9] A multitude of (mangrove) reforestation programmes are currently being implemented in the Philippines (asset-building). Use-restricting ECfW schemes are less common but have recently been tried as an incentive for fisherfolk. The type of work undertaken in use-restricting schemes is of minor importance, as this ECfW scheme primarily aims at offering compensation for ceasing an environmentally harmful activity.

Furthermore, CfW programmes (environmental or not) vary considerably in terms of their duration. Examples include long-term mass employment schemes (such as the South African Expanded Public Works Programme), which primarily aim at decreasing chronic poverty, and short-term Cash/Food for Work programmes, addressing temporary poverty induced by seasonal, climatic and/or economic shocks. In the Philippines, many CfW programmes have been implemented as emergency relief measures after typhoons hit the country, destroyed coasts and villages on many islands and severely affected people's livelihoods. Affected stakeholders received

9 It should be considered that over the long term, "use-restricting" can also be considered as "asset-building", as the cessation of activities allows the resources (e.g. fish stock) to recover.

cash in exchange for contributing to community projects, such as the repair and reconstruction of damaged houses (DSWD, 2011; United Nations Development Programme, 2013; Asian Development Bank, 2014). In general, CfW programmes seem to be particularly appropriate for addressing temporary shock-induced poverty (Samson, van Niekerk, & Mac Quene, 2006, p. 12). However, the short-term nature of many projects may weaken both the social and ecological impacts.

The target group of CfW programmes are the poor and unemployed who are able to comply with the conditions. Children, elderly and handicapped persons can only benefit indirectly from CfW when a household member participates. In the Philippines, the payment is often fixed as a percentage of the local minimum wage. In other cases, mostly when the primary aim is asset-building, the payment may also depend on the outcome of the activity, or the participants are paid according to their efforts (e.g. per seedling during reforestation programmes) or even according to their performance (e.g. survival of planted seedling). By setting the wage at or below the minimum wage, CfW programmes mostly attract the poor and not those who already have employment in the formal market (self-targeting).

2.3 Environmental Cash for Work as a good option under institutional constraints

PES, ECCT and ECfW share similarities with regard to the environmental goals they want to achieve and partly also with regard to their programme design. However, all of them have their limitations, and governments and donors should carefully assess their pros and cons in any given local context. Especially the respective preconditions should be assessed before implementation in order to choose the instrument with the highest potential impact and the lowest risk.

Table 2 summarises the shared elements and the main differences between the three incentive schemes.

Table 2: Shared elements and main differences between PES, ECCT and ECfW

	PES	ECCT	ECfW
Shared elements	– Aim at providing incentives to choose sustainable practices and enable the recovery of threatened ecosystems – Can be designed as use-restricting schemes or as asset-building schemes – Conditional (provision of ecosystem services or labour, adoption of sustainable practices) – Require multi-departmental partnership – Require mechanisms for monitoring and sanctions – Terms and conditions must be predefined and agreed upon – Incentives are positive and can be cash or non-cash – Payments can be disbursed individually or as a community fund		
Underlying assumptions and technical preconditions	– Assume ecosystem services can be bought and sold in market-like settings – Assume that value of ecosystem services can be calculated and attributed to an individual provider – Clear jurisdictions (property rights, access rights)	– Assume that a level of sustainability can be reached where no more transfers are needed – Assume that lost income can be calculated – Clear jurisdictions (property rights, access rights)	– Assume that the state of ecosystems can significantly improve in specific (short) periods of time with the help of ECfW (e.g. reforestation)

Table 2 (cont.): Shared elements and main differences between PES, ECCT and ECfW			
	PES	**ECCT**	**ECfW**
Poverty alleviation side-effects	– PES are not by design pro-poor – Potential trade-off: effective provision of ecosystem services vs. targeting the poor – Risks: power asymmetries, loss of previously communal resources for non-participants	– Distinctive feature: only those who cannot afford the income dip are compensated	– Aims at supporting poor households but does not necessarily exclude other applicants
Targeting	– Geographic and household targeting – Challenges: data availability, identification of providers	– Geographic and household targeting – Challenges: data availability, identification of the poor	– Self- and community-targeting – Risk: may lead to (temporary) change of occupation to be eligible
Monitoring	– Need for independent verifier – When privately funded, monitoring is self-interest of buyer	– Verification of compliance necessary (may include negative incentives as sanctions)	– Verification of compliance with work requirement simple – Monitoring of ecological impact challenging

Table 2 (cont.): Shared elements and main differences between PES, ECCT and ECfW			
	PES	**ECCT**	**ECfW**
Source of funding	– User-financed or government/donor financed; the former assumes that buyers pay voluntarily	– Government or donor allocation	– Government or donor allocation
Level of payment	– Depends on agreed value of ecosystem services	– Two possibilities: take into account individual opportunity costs (high implementation costs) or uniform payments	– Percentage of minimum wage or payment per effort/performance
Duration	– Perpetual as long as customers pay for ecosystem services	– Temporary, medium-term compensation until transition to sustainable practice is bridged	– Temporary, short-term, predefined timeframe depending on programme design
Source: Authors			

Among the **commonalities**, PES, ECCT and ECfW programmes provide incentives for choosing sustainable practices and/or enabling the recovery of threatened ecosystems. As mentioned above, all can be designed as use-restricting schemes that pay for conservation, or as asset-building schemes that directly create new assets. Incentives provided are positive (instead of using sanctions) and can be cash or non-cash (such as trainings for alternative livelihoods or the allocation of tenure rights), disbursed individually or by means of a community fund, and must be predictable and reliable for the duration of the entire programme. They are conditional upon efforts to protect and enhance ecosystems. Terms and conditions regarding payments, actions to be taken and involved stakeholders must be predefined and agreed upon. In order to ensure smooth implementation and high levels of effectiveness, a multi-departmental partnership (e.g. between

the departments for natural resources, agriculture, and social welfare and development) and a close coordination between the national, provincial and local levels are crucial. The main **differences** between the three incentive schemes refer to the preconditions that must be met in order to establish the programme, such as the availability of specific data, their potential to achieve poverty alleviation goals, targeting methods[10] to be employed, monitoring and funding arrangements.

An aspect in favour of **PES** is their ability to create true commitment for environmental improvements, as those would directly result in higher payments. The Tragedy of the Commons is thus overcome, as PES translate the protection of CPRs, benefitting a large community, into economic benefits for individuals. Provided it is privately funded, for example by a company relying on access to clean water, there are no extra costs for taxpayers. Also, its long-term nature makes a sustainable ecological impact much more probable. The scheme is quite flexible and can be adapted to different ecosystems and local contexts whenever it is possible to identify buyers and sellers of ecosystem services.

However, the central assumption of PES schemes, namely that ecosystem services can be bought and sold in market-like settings, rests on many, often unrealistic, preconditions and may create high transaction costs: a provider and a buyer have to be identified, and a price for the provision of the ecosystem service has to be determined. To attribute a well-defined ecosystem service to an individual provider is challenging, as it is often unclear who the resource users are and who the ecosystem service provider is (Wunder, 2005, pp. 13-14). In particular, this is the case in developing countries, where property rights are often not well-defined. When identifying the potential buyers, one must take into account the buyers' willingness to pay for a service they either got for free before or that, in theory, should be protected by environmental laws. That creates a great risk

10 Targeting is a key concept in the design to promote programme efficiency by allocating available resources to the set of beneficiaries who need these resources most, and thus where the largest benefits can be generated. There is a wide range of targeting mechanisms used in different countries, such as: means-oriented targeting; geographical targeting (identifying an area with ecological vulnerability and high poverty incidence); community-based targeting (using community structures to identify beneficiaries); categorical targeting (which includes specific groups, e.g. disabled persons, specific occupations); and self-targeting (in which people decide individually whether to apply or not) (Samson et al., 2006, pp. 54-55; DFID, 2005, p. 28).

of free-riding. Another challenge lies in the determination of the price to be paid to the providers. Supposedly, the value of the ecosystem service has to be calculated in order to agree on an adequate pricing. In practice, factors influencing this price include not only the buyer's willingness to pay but also the provider's asking price and the transaction costs of the pricing.

Regarding poverty alleviation, PES schemes are not primarily designed to fit the needs of the poor. The poor can derive benefits from PES, such as diversification of income, alternative livelihoods, formalisation of tenure rights and, over the long term, improved resilience and higher productivity of local ecosystems (Forest Trends & Katoomba Group, 2010, p. 54). However, the inclusion of the poor might be problematic and potentially lead to trade-offs, since the people who are in the position to provide ecosystem services are often wealthy land owners and not the poor. A programme focussing on these wealthy land holders or the industry may have a larger impact on conservation and ecosystem recovery. Moreover, power relations as well as information and power asymmetries play a major role: when the providers of ecosystem services are marginalised groups and the buyers are private companies that are, in general, more powerful in terms of economic and political influence, this could lead to unfavourable deals for the providers (Rodríguez de Francisco & Boelens, 2014, p. 1).

In contrast to PES, **ECCTs** are of a temporary nature, assuming that, over the long term, any given ecosystem is able to sustain its current population if managed properly. However, ecosystems do have limitations in terms of carrying capacity for economic activities. Without knowing these limitations, one cannot simply assume that the given population in the respective region can establish sustainable use practices without overstretching the ecosystems. The assumption that a level of sustainability can be reached where no more transfers are needed calls for verification in the local context.

In order to define the amount and duration of the transfer, the lost income has to be calculated by taking into account the individual opportunity costs in bridging the transition. To do this for all participants implies considerable and costly monitoring. Alternatively, uniform payments are less likely to tilt the balance towards sustainable practices. A payment that is indifferent to varying opportunity costs may result in less-efficient resource allocation and may not incentivise beneficiaries sufficiently (GIZ, 2012, p. 60). Also, for sustainable financial planning, a predefined limit in terms of payments is mandatory; however, it may be nearly impossible to assess beforehand

how much time and effort a transition to sustainable practices would take for individual households.

ECCTs are designed to target the poor: only those who cannot afford the income dip during the transition are compensated. Therefore, programme participants must have incomes below a specified poverty threshold. Preconditions of efficient targeting are the availability of data on poverty and ecological vulnerability, as well as clarity with regard to property or tenure rights. Furthermore, a focus on the poor may lead to the same potential trade-off as in the case of pro-poor PES: the poor are most likely not the main culprits of environmental degradation, since providers of ecosystem services are most often land holders, who may not belong to the poorest (Rodriguez, Pascual, Muradian, Pazmino, & Whitten, 2011, p. 4). Whereas it is theoretically possible to identify areas where the incidence of both poverty and environmental degradation overlap, this is not automatically the case (Cañares, 2014, p. 9).

To sum up, PES and ECCTs require lots of preconditions, including the availability of buyers who are willing to pay, the ability to calculate the value of services or the cost of a medium-term transition to sustainable practices, as well as the availability of data for targeting and clearly defined property rights. National socio-economic indicators are not always reliable, and data is rarely available at the household level. The same applies for data on resource use: in order to establish baselines, for example on ecosystem deterioration, and to identify areas and households that are able to provide ecosystem services, resource users have to be identified, tenure rights have to be allocated and the impacts of resource use have to be clear. In many countries, there is no central registration office for the population. It is often unclear who the resource users are and who the land owner is (Wunder, 2005, pp. 13-14). This also holds for the Philippines.

In comparison, **ECfW programmes** are easier to implement, as they rest on considerably fewer preconditions. They can be applied flexibly for long-term improvements or in the short-term as disaster relief, as a compensation for use-restrictions or as asset-building. Most often, they use self-targeting of programme beneficiaries – an approach that saves costs and does not depend on the availability of socio-economic data. Thus, ECfW usually attracts especially poor applicants, as the payment is often below minimum wage. Wealthier people would not want to work for such low salaries. Thus, self-targeting reduces the leakage of public funds to the non-poor. Other forms of targeting include the use of socio-economic surveys or community

targeting, when local elites are appointed to choose adequate programme participants. Possible selection criteria include the socio-economic status of the beneficiaries, their occupations, the geographic area they live in or alternative income sources.

Nevertheless, ECfW programmes are no silver bullet and have their drawbacks, too. Firstly, establishing the right level of payment is not easy. Payments should be high enough to ensure a decent income above certain poverty thresholds (Samson et al., 2006, pp. 103-104); at the same time, setting the payments high makes the programmes costly and may undermine the readiness to contribute voluntarily to community services for which no funds are available. Secondly, the targeting of beneficiaries is tricky. Although self-selection into the programmes is a good way to ensure that only poor people benefit (those willing to work for low salaries), the selection of beneficiaries through community organisations is often more readily accepted. This, in turn, may lead to less pro-poor outcomes. As Samson et al. (2006, p. 69) have shown for the Philippines, "decisions taken within the community tend to benefit as many people as possible, including the non-poor, regardless of targeting guidelines". Even more problematic, beneficiaries may be selected by community leaders to strengthen clientelistic networks of local elites, and poor people supporting other elite factions may be excluded (Samson et al., 2006, p. 69). Thirdly, when a specific occupation (e.g. fishing) is a precondition for participating, ECfW programmes may push people to temporarily change their livelihood in order to be eligible.

Monitoring and verification of compliance seems to be quite straightforward and much simpler than in the cases of PES and ECCTs: in the case of use-restrictions, people cannot exploit the banned resource, as they are employed by the ECfW programme and simply have no time for other activities. However, whereas the monitoring of compliance with a work condition is relatively easy (if not performance-based), monitoring the ecological impact is particularly challenging, as the short-term implementation of many ECfW activities somehow contradicts the long-term nature of the anticipated ecological impact. The assumption that the state of ecosystems can significantly improve after only short periods of intervention (e.g. a time-bound reforestation programme) or cessation of activities (e.g. a temporary fishing ban) is questionable and has to be proven by accompanying monitoring and research. Moreover, the positive ecological impact has to justify the project cost: ECfW requires that the government or programme agent administers and provides inputs for the project and that

the beneficiaries sacrifice time and energy. Only if conservation goals have a realistic chance of being achieved is ECfW a good investment. However, experience shows that the assets created by the projects are sometimes of poor quality (Samson et al., 2006, p. 13). This may be explained by the fact that participants may not be self-motivated to perform the kinds of tasks assigned to them and, as particularly poor community members, typically lack adequate training (DFID, 2005, p. 13).

In essence, PES and ECCTs are promising incentive schemes that may have long-term effects if preconditions are met. However, in the Philippines, widespread uncertainty with regard to tenure rights and the difficulty of attributing environmental costs and benefits to well-defined user groups and monetising them make it very difficult to implement such schemes. ECfW builds on a much simpler principle and is therefore easier to implement. Also, ECfW can easily be made conditional upon environmental criteria, thereby minimising the trade-offs between the social and the environmental goals. In many cases, self-targeting can ensure that the poor benefit the most from the incentive scheme. Despite its apparent drawbacks, ECfW is still the simplest and most promising option under the current circumstances. It is institutionally anchored in the Philippines, since many potential beneficiaries are familiar with its intervention logic, and government institutions and implementing agencies have gained experience over the years. This does not mean that experiments with, and debate on, PES and ECCTs should not be undertaken. As for now, ECfW programmes can be considered a preferable second-best solution for the Philippines.

2.4 Criteria for successful Environmental Cash for Work programmes

ECfW programmes need to meet certain general good-practice standards, if they are to contribute to more sustainable resource management in a cost-effective way. In the following, we identify criteria for successful ECfW programmes, building upon a review of experiences with public works programmes carried out by the World Bank (del Ninno, Subbarao, & Milazzo, 2009). These criteria will then be taken up, again, in the subsequent empirical sections.

- **Clear specification of objectives**: When designing an ECfW programme, implementing agencies need to be unambiguous about their objectives and should clearly communicate them. Mixing environmental and social

objectives may make programme design and implementation very difficult.

- **Translation of objectives into measurable performance indicators**: Pre-identifying measurable indicators will help implementers to assess the programme's outcomes, to compare the results among various project sites and to facilitate monitoring and evaluation for further amendments. Indicators have to fit the objectives and account for context and site-specific characteristics. Moreover, a baseline has to be established as a reference point for the indicators to measure the achieved progress. Determining the status quo through scientific research will enable policy-makers to identify specific entry points for external interventions as ECfW programmes. This is furthermore necessary to provide an impartial project documentation to counteract, for example, political dynamics that might jeopardise the programme's continuation.
- **Coherent impact chain**: Whereas ECfW programmes often follow a short-term logic, the rehabilitation of ecosystems needs time and should therefore be built on long-term planning. For use-restricting schemes, results may only become visible over the long term, which is the case for closed seasons for fisheries in order to allow fish stocks to recover substantially. Asset-building schemes in contrast, present outcomes rather quickly, as in the case of reforestation. However, this does not include subsequent maintenance efforts. Moreover, quantitative targets are often used for asset-building schemes to define the success of a programme, for example a certain amount of hectares reforested. Yet, this does not necessarily imply an increase in biodiversity or a restoration of complex ecosystems.
- **Additionality:** The ECfW programme needs to provide an added value that would not have occurred without providing ECfW incentives. People might have voluntarily engaged in resource conservation because they are convinced of the long-term benefits. Assessing additionality thus requires a deep understanding of the local situation and stakeholder involvement in decision-making. Establishing additionality becomes even trickier when the respective objectives are already laid down in laws but then not enforced.
- **Leverage of funding:** Ecosystem recovery can only be achieved over the long term. Government departments and implementing agencies have to ensure sustainable funding for the entire project until its goals are achieved.

3 Use-restricting Cash for Work: the case of a closed season for commercial fisheries

Balayan Bay is part of the Verde Island Passage, not only an extraordinarily biodiverse marine environment with one of the highest concentrations of shore fish species per square kilometre but also one of the most heavily fished areas in the Philippines. Fish landings along the Batangas coast have been relatively constant since 1980 (Campos, 2013, p. 2), whereas the number of fishing boats has increased substantially. Hence, the catch per vessel decreased – but as no data on fish stocks are available, it is not clear to what extent this reflects declining fish stocks. In the perception of most local fishers interviewed by us in March 2015, stocks of the most valuable fish species have been decreasing over the last years. Thus, the fishers have concentrated their efforts on catching smaller and less valuable species to compensate for the related loss of income. The decline was further accentuated by a largely unregulated catch of juvenile fish as well as by illegal fishing practices such as dynamite and poison fishing.

Due to concerns about declining fish stocks, a closed season for commercial fisheries targeting two important fish species – round scad (*Decapterus macrosoma*, locally known as "Galunggong") and big-eyed scad (*Selar crumenophthalmus*, locally known as "Matambaka") – was implemented in December 2014 with the support of the USAID-funded Ecofish project and Conservation International (CI) Philippines. The aim was to give marine life a chance to reproduce in order to increase fish stocks and thereby augment future fish catch and ensure a solid income for the fisherfolk. The closed season lasted for 22 days and was accompanied by ECfW activities offered to the affected crew members of commercial fishing vessels as compensation for their income loss.

The Balayan Bay closed season was an innovative policy experiment for three reasons:[11]

1. It was the first time in the Philippines that fisherfolk were offered **compensation in the form of ECfW** for income lost due to the closed

11 Before the Balayan Bay closed season, BFAR had imposed temporary fishing bans in Zamboanga peninsula, the Visayan Sea and the Davao Gulf. These did not included CfW compensation, but they were also partly led by local initiatives and were consensus-based (see Box 6).

season. In the past, closed seasons or no-take zones were declared by BFAR, often without offering any compensation.

2. The initiative was **led by the Provincial Government Environment and Natural Resources Office (PG-ENRO) in cooperation with municipal and *barangay* governments** rather than the central government. National institutions such as BFAR and the National Coast Guard were incorporated as enforcers at a later stage.

3. Implementation relied on a **previously built, broad consensus** among fisherfolk and local and provincial authorities.

Such projects, however, come at a cost. Overfishing is a result of what has been described as the Tragedy of the Commons: many individual fishers pursue their personally rational strategies to maximise fish catch and income, thereby collectively depleting fish stocks, because these are common pool resources for which no personal quotas exist. Any attempt to lower fish catch rates to sustainable levels necessarily reduces the short-term gains of some resource users. Compensating resource users for the income lost during a closed season may be costly, but it should be compared to the following two alternatives:

- allowing fishers to further deplete fish stocks, which implies enormous environmental damage and economic losses for future generations, and

- imposing restrictions on the fisherfolk without any compensation, which entails high social costs, reduces popular support and may therefore be much more difficult to enforce.

- Hence, an approach to fishery management that includes some sort of compensation and builds on local ownership and support is a promising undertaking. If the Balayan experiment proves to be successful, it can become a role model for fishery management nationwide and abroad. This report summarises the findings and policy recommendations of a joint programme assessment conducted by the German Development Institute and Ecofish. After a description of the programme's background and a short overview of the methodology, we will state the main findings of the field research before presenting our main policy recommendations.

3.1 Background

3.1.1 Coastal resources and livelihoods in Balayan Bay

Located south of Manila in the Verde Island Passage between Luzón and Mindoro, Balayan Bay forms part of the province of Batangas in the most densely populated region of the country outside Manila (Region 4-A: CALABARZON).

Figure 4: Balayan Bay

Source: Google Maps (s.a.)

Balayan Bay is an industrialised area and hosts big ports, steel corporations, sugar cane refineries and large power plants. Nevertheless, most people are engaged in fishing, agriculture or tourism, and are thus heavily dependent on natural resources. An estimated 7 per cent of the workforce are fisherfolk, and in coastal *barangays* the number is up to 20 per cent, not including those who earn their livelihoods in related activities such as fish trading or processing.[12] Thus, fishing is also one of the major sources of livelihood for thousands of families in Balayan Bay: there are municipal fisherfolk residing in each of the nine municipalities along the bay. In five municipalities, namely Bauan, Lemery, Calaca, Balayan and Calatagan, there are also commercial fishing vessels operating (see Table 3).

12 The estimation is based on the share of the active working population at the national level: 41 per cent (Central Intelligence Agency, 2014).

Table 3: Fisherfolk per municipality in Balayan Bay

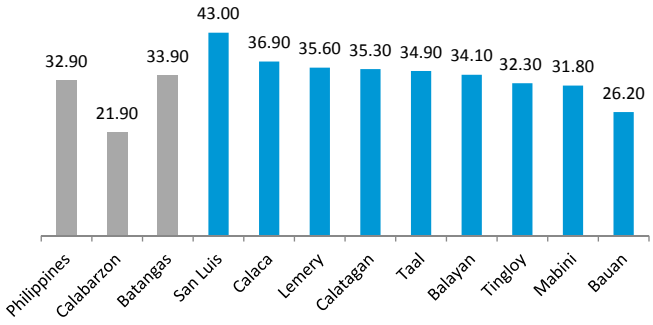
Municipalities along Balayan Bay	Registered municipal fisherfolk*	Commercial fishing vessels*	Commercial fisherfolk		Total fisherfolk	Population (2010)***	Population adjacent to Balayan Bay (2007)****
			Participating in the ECfW in 2014**	Total **			
Bauan	364	22	172	425	789	81,351	24,348
Lemery	1,467	63	707	1,072	2,539	81,825	27,149
Calaca	728	7	228	280	1,008	70,521	19,191
Balayan	2,741	48	153	1,210	3,951	81,805	20,873
Calatagan	3,897	38	224	408	4,305	51,997	34,433
Mabini	263	-	-	-	263	44,391	20,616
Tingloy	775	-	-	-	775	16,870	18,548
Taal	172	-	-	-	172	51,503	4,825
San Luis	240	-	-	-	240	30,701	10,091
Total	**10,647**	**178**	**1,484**	**3,395**	**14,042**	**510,964**	**180,074**

Data sources: *See the "Municipality of..." (2015) fishery profiles for the five municipalities; **Ecofish & Conservation International (2014); ***Philippine Statistics Authority (2010); ****Conservation International Philippines, Coastal Resources Center, and PATH Foundation Philippines, Inc. (2010). Note: Numbers per municipality, not all *barangays* of Bauan, Mabini, Tingloy and Calatagan are located at Balayan Bay.

Supposedly, all commercial fishing activity is prohibited within municipal waters (0 to 15 km from the shore) by the Philippine Fisheries Code (Department of Agriculture, 1998). Municipalities are entitled to grant exceptions for commercial fishing beyond 10 kilometres from the shoreline. Yet, in Balayan Bay, this is not applicable due to the geographical characteristics of the bay (there are no fishing grounds in the bay that are more than 10 km away from the shore), and most commercial fishing vessels go, in fact, fishing within municipal waters. On first sight, this raises questions about the additionality of the ECfW component of the closed season: the programme pays compensations for not fishing in municipal waters, although commercial vessels are already prohibited by law to enter these fishing grounds. However, fishing within the municipal waters has become a common practice, and violations are generally not sanctioned; moreover, the way municipal waters are delineated (see Section 3.3.2) leaves fisherfolk few other options for places to go. It is therefore unlikely that fisherfolk would have ceased fishing voluntarily without compensation.

In 2009, Batangas province had a 33.9 per cent poverty incidence, which was an increased from 2006 and was higher than the average of the region (CALABARZON: 21.9 per cent) and also slightly above the national average (32.9 per cent) (see Figure 5). Moreover, according to the representatives of the Municipal Social Welfare Development (MSWD), fisherfolk are among the poorest of the local population in Balayan Bay municipalities.

Figure 5: Proportion of population living below poverty threshold in % (2009)



Source: National Economic and Development Authority (2009)

Poverty among fisherfolk could become a reality for even more people, as the natural resources fishers depend on are highly threatened. As mentioned above, the Verde Island Passage is an extraordinarily biodiverse area, but according to local fisherfolk, overfishing and the use of illegal fishing methods are widespread, resulting in a depletion of fish stocks. This decline in fish catch has also been attributed to the establishment of industries in the coastal areas (Conservation International Philippines, Coastal Resources Center, & PATH Foundation Philippines, Inc., 2010). However, reliable data on changes of fish stocks and fish catch are still inexistent.

Regarding the management of its coastal resources, the province of Batangas has attained a high level of organisation and institutionalisation (Campos, 2013, p. 64). The Batangas Network of MPAs was established in 2008 – the same year that the Batangas Bantay Dagat Network for Enforcement was created (see Box 2). Overall coordination and oversight is provided by the PG-ENRO; each municipality has a municipal agriculturalist and a Municipal Fisheries and Aquatic Resources Management Council (MFARMC), and some of the LGUs have their own Fishery Management Officers (e.g. Municipality of Balayan) and Municipal Environment and Natural Resources Office (e.g. Calatagan). The already existing networks and the high level of commitment of the LGUs served as a basis for the establishment of the closed season in Balayan Bay.

Box 2: Bantay Dagat

Bantay Dagat can be translated as "Guardian of the Sea" and describes a participatory approach to coastal law enforcement undertaken by local volunteers of the municipal fisherfolk community (Rosales, 2008, p. iv). The concept of *Bantay Dagat* exists since the 1970s (Rosales, 2008, p. iv), but the *Bantay Dagat* network of Batangas was created as late as 2008. In Balayan Bay, each municipality has a *Bantay Dagat* team, whose main task is the enforcement of fisheries and environmental laws and the apprehension of violators. Therefore, the members of *Bantay Dagat* are entitled not only to apprehend within their own municipal waters but also in the municipal waters of other municipalities. This was stipulated by an Executive Order signed by the Provincial Governor of Batangas as well as by a Memorandum of Agreement signed by the mayors (Province of Batangas, 2013, p. 2). Further assignments of *Bantay Dagat* are the implementation of information campaigns and the surveillance of other coast-related tasks such as mangrove reforestation.

Box 2 (cont.): Bantay Dagat

Although the *Bantay Dagat* was often mentioned to be the enforcement body of choice, various advantages and disadvantages have to be considered when deciding about how the teams should best be complemented by national enforcement bodies, such as the Philippine Coast Guard. This collaboration is necessary to ensure an efficient and quick response to violations of fishery regulations and to protect the *Bantay Dagat* from armed attacks carried out by violators. It might also strengthen *Bantay Dagat*'s clout and credibility, which is being diminished by extralegal arrangements between political decision-makers, resulting in a catalogue of sanctions existing only in theory, not in practice.

An advantage of the *Bantay Dagat* is the teams' insight into municipal dynamics. Since its members are volunteers from the municipality, they know about possible violators and their accomplices. As local people, they might also be able to better understand the individual motives behind, for example, illegal fishing activities and to suggest fitting solutions. However, this advantage can also change to the contrary: some interviewees voiced concerns with regard to the close relationship between *Bantay Dagat* volunteers and the other municipal members. Relatives, close friends and neighbours might escape punishment because of personal relations. Another disadvantage that we experienced in several municipalities was the lack of modern gear to keep up with the technological equipment of the violators. This includes the provision of motorised patrol boats, which were often either absent, hired on a temporary basis from private boat owners or provided by donors that might misuse their donation for exerting pressure on *Bantay Dagat* in other life domains.

Most volunteers receive no compensation. However, their operations can take several hours, or even up to a whole day or night, which leaves the volunteer with no income for that period of time. It was stipulated that the team members should receive an honorarium of 300 Philippine pesos (PHP)[13] per month, which is, however, not put into practice in most municipalities. Other municipalities lead by example and employ the *Bantay Dagat* members at the local government level to officially integrate the enforcement component.

Source: Authors

13 EUR 1.00 = PHP 49.90; USD 1.00 = PHP 47.10 (effective 25 November 2015).

3.1.2 Origin and design of the closed season initiative in Balayan Bay

The initial impetus of the closed season can be traced back to research conducted by CI Philippines, in coordination with the PG-ENRO, showing that the productivity of fisheries in the Verde Island Passage is vulnerable to increasing fishing activities and climate change (Conservation International Philippines, Coastal Resources Center, & PATH Foundation Philippines, Inc., 2010). A study by CI Philippines and the University of the Philippines recommended a seasonal closure, preceded by an inventory of fishing gear and the registration of fisherfolk as a precondition for the closure's implementation (Campos, 2013, pp. 72-75). Further studies by the Ecofish Project and CI Philippines showed that about half of the fish catch in Balayan Bay was composed of Galunggong and Matambaka (Box 3). Their peak spawning season was researched and was found to be in December. This served as the basis for the time period of the closed season, which was 11-31 December 2014. The fishing ban was limited to commercial vessels. Three types of active gear[14] used by commercial fishing vessels[15] were banned during the closure: purse seine, ring net and bag net (pelagic trawl), whereas municipal fisherfolk were allowed to continue fishing using hook and line and gill nets (partly depicted in Box 4). The detailed terms regarding target species, timeframe, gears and penalties were specified in a unified ordinance issued by all nine municipalities along Balayan Bay.

14 The Fisheries Code of the Philippines (Republic Act No. 8550) distinguishes active and passive fishing gear. An active gear "is a fishing device characterized by gear movements, and/or the pursuit of the target species by towing, lifting and pushing the gears, surrounding, covering, dredging, pumping and scaring the target species to impoundments" whereas passive gear "is characterized by the absence of gear movements and/or the pursuit of the target species" (Department of Agriculture, 1998).

15 In the Fisheries Code, commercial fishing is defined as the "taking of fishery species by passive or active gear for trade, business or profit beyond subsistence or sports fishing". In Balayan Bay, only small-scale commercial fishing plays a role, which is defined as fishing with vessels of 3.1 gross tons up to 20 gross tons (Department of Agriculture, 1998).

Box 3: Target species

Round scad – Galunggong
Decapterus macrosoma

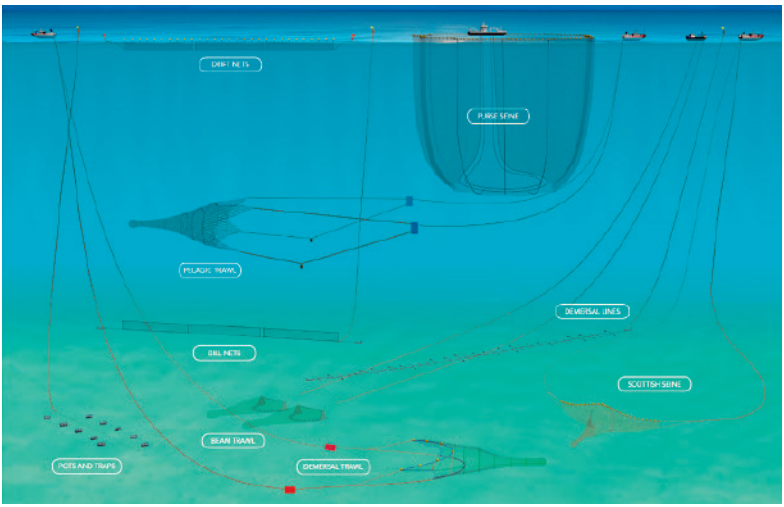
Big-eyed scad – Matambaka
Selar crumenophthalmus

Sources: top: Robertson (2010); bottom: Randall (1997)

Prior to the implementation, consultations and public hearings were held at the municipal level that included fisherfolk, municipal authorities and *barangay* captains to inform about – and create ownership for – the initiative. Given the concerns about depleting fish stocks, there was considerable willingness to join a seasonal closure. However, questions were raised in terms of the livelihoods of crew members (*barkada*), who, in most cases, do not have other sources of income. With the assistance of Ecofish, an agreement was reached to provide funds from the DSWD's Cash for Building Livelihood Assets (CBLA) programme (Box 5). The programme offered compensation for the fishers' lost income in exchange for their participation in ECfW activities, paying them 75 per cent of the regional minimum wage.[16] The activities included sorting of waste and the cleanup of beaches, coastal areas, canals and public markets and similar activities. Once the support of the fisherfolk was secured, enforcement agencies such as BFAR, the Philippine Coast Guard and the local *Bantay Dagat* were included.

16 The regional minimum wage for the region 4-A for non-agricultural activities amounts to PHP 261.00-362.50 (Department of Labour and Employment, 2015).

Box 4: OL fishing gear in the water column



Source: "Types of Fishing Gear" (2014); image supplied by Seafish (www.seafish.org)

Box 5: The limitations of the DSWD-funded Cash for Work

The DSWD's most important programme is the Pantawid Pamilyang Pilipino Program (4P), a conditional cash transfer programme that provides cash grants to poor households provided that they comply with a set of conditions related to health care and education. In addition, the DSWD offers a range of smaller programmes that aim to create sustainable income sources. These are targeted at microenterprise development (through skills training or the provision of start-up capital for individual or group enterprises) or employment facilitation. Eligible recipients include poor households covered by, or graduated from, the 4P, as well as other disaster-affected or vulnerable persons. The National Household Targeting System for Poverty Reduction is used to identify which households are below the poverty threshold of their respective provinces. The database, however, is quite outdated (currently 2009 data are used), and the de facto selection of beneficiaries mainly relies on assessments carried out by local governments using rough proxy data for poverty-targeting.

Although the conditional cash transfer programme is a nationwide programme that reaches 5 million Filipinos and can fund beneficiaries for up to five years, the programmes that aim at sustainable employment and income-generation have a limited coverage and provide only short-term assistance.

Box 5 (cont.): The limitations of the DSWD-funded Cash for Work

The Balayan Bay 2014 closed season ECfW programme was funded by one of the sustainable livelihoods programmes, namely the CBLA programme. This is a short-term employment fund "for the development, rebuilding or protection of physical and natural assets to increase productivity for profitable, sustainable livelihood projects" (DSWD, 2014a). It usually offers 11 days of ECfW per beneficiary. In the case of Balayan Bay, the programme was exceptionally extended to 22 days, and ECfW was offered to all crew members of commercial fishing vessels. As many of them did not appear in the DSWD's 2009 database, *barangay* captains and other local government officials were asked to certify the eligibility of applicants; ultimately, all applicants were admitted to the programme as long as the registration was submitted in time. With 1,484 beneficiaries, the total cash transferred amounted to about PHP 9 million. If the closed season was to be repeated in 2015 with more beneficiaries and for a longer duration, as we advocate in this policy paper, much higher compensation payments would be needed.

The DSWD's policy is to spread its small budget for sustainable livelihoods activities as broadly as possible among its clientele, the 11 day allowance should usually not be exceeded and beneficiaries should not receive the allowance more than once. Although the DSWD signalled certain flexibility to contribute to a second closed season in 2015, the programme with its current funding structure can clearly neither be employed as a regular annual closure, nor can it cope with any potential extensions of the closed season in terms of duration or number of beneficiaries.

Sources: DSWD (2014a, 2014b); Iñigo and dela Cruz (2015)

More than 150 commercial vessels and 1,484 crew members participated in the programme. Five of the nine municipalities of Balayan Bay were included (namely Bauan, Lemery, Calaca, Balayan and Calatagan), as the other four only host non-commercial fishers. Interestingly, all commercial boats stopped operating for the entire period, even though the closure was limited to Balayan Bay, to two fish species and three types of fishing gear. In principle, fisherfolk could have gone to other areas or used other types of gear.

The Balayan Bay closed season was not the first closed season in the Philippines. We identified three previous initiatives (in Zamboanga, the Visayan Sea and the Davao Gulf) with quite different designs in terms of geographic coverage, duration and targeted fish species. Box 6 provides an overview of lessons learnt. For two of these initiatives, positive impacts on fish stocks were documented, whereas no information is available for

the Davao Gulf closure. What sets the Balayan Bay closure apart are (a) the compensation of fisherfolk through ECfW and (b) the participatory consensus-building process before starting the closed season.

Box 6: Closed season experiences in the Philippines

Closed season for the conservation of sardines, Zamboanga

In 2011, a closed season for the commercial fishing of sardines (*Sardinella lemuru*) was decided upon by a joint Administrative Order of the DA and the Department of Interior and Local Government. Covering an area of 13,987.15 sq km in the East Sulu Sea, Basilan Strait and Sibuguey Bay (Zamboanga peninsula), the first closure lasted for three months, from 1 December 2011 to 1 March 2012. In this area, sardines make up 90 per cent of the average catch. During the fishing ban, most violations were effectively prevented by enforcement bodies such as the Philippine Coast Guard. The closure's impact was clearly visible already in 2013, when a 30 per cent sardine catch increase (an absolute increase of 20,000 metric tons) was recorded in comparison to 2012. Moreover, spill-over effects to other regions (e.g. Region IX) were visible and Zamboanga City, the "sardines capital" of the Philippines, registered an increase in production in canned sardines. The success of the Zamboanga closed season now serves as a door-opener and best-practice case study for similar projects, such as the Davao Golf closure.

Key to the success of the closed season was the consensus prior to the law-making, education about the degrading fish stocks and possible solutions, and dissemination of this information to reach this consensus. All the stakeholders, even commercial vessel owners, were fully cooperative and decided in 2014 to make the closure a permanent one, which is why it will be repeated on an annual basis. However, scholars advise to change the beginning of the closed season to November due to new scientific evidence on spawning seasons. Concerning the livelihood of the affected 30,000 fishworkers, there were different approaches:

- The Department of Labour and Employment, in cooperation with the Technical Education and Skills Development Authority, offered vocational trainings for the affected fisherfolk. This included paying them a salary for one month and providing them with trainings and materials. In the two remaining months, the fishers were supposed to earn money with the learnt skills. Some even continued this new livelihood after the end of the ban.
- The private sector participated, too: sardine canneries, in cooperation with *barangay* captains, redirected their employees' working efforts into rubber-planting activities and continued to pay them.
- A small-scale cash for mangrove reforestation programme was offered to some affected fishers.
- BFAR offered training in seaweed farming as an alternative livelihood.

Box 6 (cont.): Closed season experiences in the Philippines

However, some of the fisherfolk had no alternative but to go back to their provinces and pursue other activities, such as farming.

Davao Gulf closure

Implemented for the first time in 2014, the Davao Gulf closure lasted from June to August. As in Zamboanga, the closed season only applied to commercial fisherfolk. Scientific studies that were conducted beforehand showed evidence of declining fish stocks. This made it easy to convince the mayors of the neighbouring municipalities and to reach a consensus among all stakeholders. To sustain the livelihood of the affected commercial fisherfolk, they were granted access to fish-aggregating devices outside the Davao gulf area.

Visayan Sea closure

The closure in major parts of the Visayan Sea and some of its surrounding waters was introduced to ensure a fish stock recovery of small pelagic fish, namely sardines, herrings and mackerels, every year for four months (15 November to 15 March). The closure was imposed already in 1989 by the Fisheries Administrative Order 167, but its implementation and enforcement proved to be challenging. In recent years, the implementation has been better enforced, and first positive impacts are visible: scientific evidence shows a doubling of biomass in the Visayan Sea from 2007 to 2013. However, no alternative livelihood or compensation schemes are offered to the affected fishers, who seem to have adapted to the situation, as the closure has already exists for a long time.

Sources: National Fisheries Research and Development Institute, Bureau of Fisheries and Aquatic Resources and United States Agency for International Development (s.a.); Santos and Barut (2015)

3.2 Research methodology and sampling

We conducted focus group discussions in the five municipalities of Balayan Bay, which participated in the closed season in 2014 and in the ECfW programme, namely Bauan, Lemery, Calaca, Balayan and Calatagan. In every municipality, we interviewed four different groups of stakeholders with a total of 83 respondents (see Table 4): starting with fishery experts of the LGU, we talked among others to the Municipal Agriculturalist, the MFARMC and *Bantay Dagat* chairmen, Fishery Officers and representatives of the MSWD. Among the fisherfolk, the LGU chose two to seven representatives of commercial vessel crew members, commercial

vessel owners and captains, and municipal fisherfolk. Additionally, experts from BFAR, the DSWD, Ecofish, the PG-ENRO and the World Wide Fund for Nature (WWF) were interviewed at the provincial level as well as in Manila. The interviews were conducted in English and/or Tagalog. In the latter case, we used the services of two translators, who accompanied us.

Table 4: Distribution of interviewees

	Bauan	Lemery	Calaca	Balayan	Calatagan	Total
Fishery experts of LGUs	4	6	6	4	5	**25**
Commercial vessel crew (*barkada*)	4	7	2	3	5	**21**
Commercial vessel owners/captains	3	2	5	4	3	**17**
Municipal fisherfolk	5	3	5	4	3	**20**
Total	**16**	**18**	**18**	**15**	**16**	**83**

Source: Authors

3.3 Main findings of the closed season case study

The focus of our research was on the 2014 closed season experience. Stakeholder interviews, however, clearly highlighted that sustainable management of fishery resources is not just an issue of implementing closures. Underlying regulatory issues such as the delineation of fishing grounds and allocation of use rights, the regulation of fishing gears or the enforceability of rules are also very important. In the following, our main findings are therefore grouped in two sub-sections, dealing first with the closed season in a narrower sense, and second with complementary policies.

3.3.1 Closed season

All fisherfolk (*barkada* and municipal fishers), LGU fishery experts and most vessel owners evaluated the closed season in general positively. Fisherfolk noticed increasing fish stocks and, in particular, a substantial rise of juvenile fish. These perceptions, however, cannot be scientifically

validated so far. It should be noted that monitoring local fish stocks systematically is a challenging undertaking because fish may migrate into and out of the respective region, and migratory and spawning patterns of fish are subject to lots of determinants, which may change from year to year. Ecofish is currently assessing the impacts of the closure on fish stocks, using proxy variables such as the changes in the percentage of reproductive fish among the fish traded at local landing sites.

All *barkada*, fishery experts and most vessel owners are willing to repeat the closed season under the premise that there will be ECfW activities as in 2014. Respondents underlined the importance of scientific studies to ensure political support. As a side effect that should not be underestimated, environmental awareness increased, and a bay-wide consensus on the need for sustainable fishery resource management has emerged. Regarding enforcement, all respondents reported that there were no violations during the closed season. The cooperation of *Bantay Dagat*, the Philippine National Police, the Philippine National Police Maritime Group and Coast Guard, with support of and coordination by BFAR, was perceived as being highly effective.

Nearly all respondents acknowledged the negative impact of *Dulong* fisheries (Box 7) on the results of the closed season, as the peak season for *Dulong* overlaps with the spawning season of Matambaka and Galunggong. Consequently, many juveniles of these species are caught during and after the closed season ("false *Dulong*"). That reduces the effectiveness of the closure, which has also been acknowledged by the *Dulong* fishers. However, conflicts between municipal and commercial fisherfolk concerning *Dulong* fisheries are not followed up upon, since there seems to be a common understanding that *Dulong* fishers have no alternative income source.

Box 7: Small fish, big impact – *Dulong* fisheries

Dulong is a term commonly used in the Philippines to describe a set of small fishes that are caught by using fine-meshed nets with a mesh size of less than 3 cm. *Dulong* fishing occurs in most coastal communities in the Batangas province and represents a significant industry in the whole Verde Island Passage. It is estimated that annual *Dulong* catches for the Batangas province could have reached 573 metric tons with a total value of PHP 38 million in 2010 (Geronimo et al., 2013, p. 8). *Dulong* is a local delicacy with high consumer demand.

Box 7 (cont.): Small fish, big impact – *Dulong* fisheries

According to common belief, *Dulong* is comprised of a single species that attains maturity at a small size. However, research conducted by the FishBase Information Network, supported by CI Philippines, USAID and the Coral Triangle Initiative, has identified *Dulong* catches from San Juan, Batangas, as post-larval to early juvenile stages of mainly sardines and anchovies. An in-depth analysis of the taxonomic composition of the *Dulong* showed that 97.5 per cent of samples were immature specimen belonging to 11 different families (Geronimo et al., 2013, p. 37).

In the Philippines, the Fisheries Code clearly prohibits the catch of juvenile fish and the use of fine mesh nets or nets with mesh sizes that are less than 3 cm. An exception is made for the catch of "species which by their nature are small but already mature, to be identified in the implementing rules and regulations by the Department" (Department of Agriculture, 1998). As the Fisheries Code does not contain guidelines for such identification, regulating *Dulong* fisheries is difficult.

In recent years, the magnitude, scale and species composition of *Dulong* fisheries in the Philippines have become a cause of concern for scientists and conservation groups, and have drawn attention to the possible negative impacts of continuous and unabated fishing. Continuous heavy exploitation of *Dulong* could eventually lead to the depletion of adults in the stock (Geronimo et al., 2013, p. 33). Most fishers we interviewed identified the months between November and February as peak season for *Dulong* fishing, thus coinciding with the month of the closure. Most fisherfolk, including *Dulong* fishers, acknowledged the fact that *Dulong* fisheries, by catching the larvae and juveniles of protected fish species, defeat the purpose of the closure.

Note: "Small Fish, Big Impact – Dulong Fisheries of San Juan, Batangas, Philippines" by Geronimo et al. (2013) is a synthesis report of different studies on Dulong fisheries in the province that was funded by the USAID-funded Coral Triangle Support Partnership and contributes to the Coral Triangle Initiative.

The ECfW activities were crucial for the successful implementation of the closed season, as the affected fishers mostly have no alternative livelihoods. At first, most of the *barkadas* were sceptical regarding the ECfW arrangements (particularly in the municipalities of Balayan and Lemery). After the public consultations and hearings, all of our respondents were convinced; however, there were many cases where people registered too late due to their initial scepticism, which meant that they could not take part in the ECfW programme. Due to the high number of sceptical fisherfolk and delayed registrations in 2014, the number of *barkadas* willing to participate

is expected to augment significantly if the closed season will be repeated annually with a regular budget (see Table 5 below). Some vessel owners mentioned that they would also like to receive compensation or to be included in the ECfW activities.

Although the ECfW payments are set at 75 per cent of the regional minimum wage, they are widely regarded as being an appropriate incentive. The income of the fisherfolk fluctuates strongly. Usually, crews receive a certain share of the fish catch rather than a monetary income. The catch varies greatly from day to day, depending on the fisherfolk's luck to catch a large school of fish, as well as on weather conditions and seasons.[17] Moreover, market prices of fish (and thus the monetary equivalent of the catch) show strong seasonal fluctuations. This makes it particularly difficult to establish whether the daily ECfW salary of PHP 271 fully compensates for income lost during the closed season. Most respondents from our interview groups stated that this amount was not sufficient for sustaining their families, and some argued that their income would be considerably higher had they gone out fishing; this however, would challenge the DSWD's assumption that all crew members live below the provincial poverty threshold. Also, the widespread enthusiasm about the ECfW opportunity suggests that the payment is actually quite attractive. Some respondents also valued the fact that the ECfW compensation provided a stable and calculable income.

Most respondents from all stakeholder groups suggested including municipal fishers in the closed season and ECfW activities. As municipal fishery accounts for an estimated 75 per cent of fish landings along the Batangas Coast (Geronimo et al., 2013, p. 4), the success of the closed season highly depends on them. The municipal fishers themselves declared that they are willing to participate as long as they also receive compensation. According to the interviewees, the efforts of hook and line fishers only have a small impact on Galunggong and Matambaka stocks. Most interviewees argued, therefore, that these fisherfolk should be allowed to continue fishing, should the closed season be repeated.

Most respondents requested an extension of two to three months (between mid-November and mid-February) in order to improve the impact on fish

17 According to our interviewees, there are informal social-sharing rules between fisherfolk in Balayan Bay: if one vessel does not catch anything, the others share a small proportion (about 10 per cent) of their catch with that vessel, in order to ensure at least fish for home consumption.

stocks. Vessel owners were more reluctant and would like the closed season to last for a maximum of one to two months. It was furthermore suggested to replicate the closure on a greater scale, including the neighbouring municipalities.

Apart from this, it was proposed to align the ECfW activities with the already existing skills of fisherfolk and to aim for capacity-building and the provision of long-term alternative livelihoods (e.g. food processing) in order to diminish the dependency on the DSWD. Fisherfolk requested to be engaged in activities in their own *barangays* in order to increase ownership and to minimise transport expenses. Ideas for complementing activities were: strengthening of *Bantay Dagat* (building of outpost), engagement of *barkada* in enforcement during closed season and mangrove reforestation (Calatagan).

3.3.2 Complementing policies

The closed season is a very useful instrument, but in itself not sufficient. Policy-makers should be aware that complementing policies are needed to ensure the success of fishery conservation.

Apart from closed seasons, other fishery management mechanisms exist to protect fish stocks, including the establishment of quota systems, no-take zones and MPAs,[18] or incentive systems to acquire less harmful types of gear and change fishing practices. In Balayan Bay, policy-makers and conservation groups try to improve gear regulation (ban of fine mesh nets) and have already created various (small) MPAs. The registration of fishing boats and fisherfolk as a precondition for most management instruments is also progressing. According to our respondents, however, there are two further main aspects that act as preconditions to the effectiveness of each of these instruments: 1) the delineation of municipal waters, and 2) enforcement measures to counteract still existing fishery violations. In the following, we summarise our findings with regard to these factors contributing to the success of the closed season.

18 In 2013, Senator Loren Legarda proposed the declaration of the Verde Island Passage as an MPA and ecological tourism zone. For this purpose, a "Verde Island Passage Advisory Council" under DENR should be created based on pre-existing management structures. The "Verde Island Passage Act of 2013" (Senate Bill No. 1898, 16th Congress of the Republic of the Philippines), filed on 13 November 2013, is still pending in the committee (Legarda, 2013).

Delineation of municipal waters

The geography of Balayan Bay renders the practical implementation of the municipal water boundary, which was set at 15 km by the Republic Act No. 8550 (Philippine Fisheries Code), impossible. According to the proposed delineation by the National Mapping and Resource Information Authority, the municipal waters of some municipalities in Balayan Bay only stretch up to 7 km. Some municipalities, such as Lemery and Balayan, have only very small municipal waters, but, at the same time, account for the highest number of commercial fisherfolk (Table 3).

Supposedly, all commercial fishing activity is prohibited within municipal waters (0-15 km from the shore) by the Philippine Fisheries Code (Department of Agriculture, 1998). An exception can be made by the municipality by issuing an ordinance that allows commercial fishing from 10.1-15 km. Yet, in Balayan Bay, this is not applicable due to the geographical form of the bay, which is why most commercial fishing vessels go fishing within the municipal waters. This seems to question the additionality of the closed season programme, which pays compensations for not fishing in municipal waters – a practice that is already prohibited for commercial fishing vessels by law. However, when the law is constantly violated, additionality may be given.

Consequently, the legal municipal water boundaries cannot be applied, and there is a major mismatch between the allocation of fishing areas and the number of fisherfolk living within these areas. Combined with the lack of fishery law enforcement, this leads to an encroachment of commercial vessels into neighbouring municipal waters. This practice is tolerated by some municipalities, as long as they are granted the same rights. Others choose to guard their municipal waters from outsiders. But the majority of municipalities endorse the 10.1 km line, allowing the commercial fishing vessels to enter the 15 km zone. Nevertheless, municipal as well as commercial fisherfolk testified that some vessels catch their fish as near as 1-3 km from the shoreline. The general sentiment was to find an overarching solution without compromising the livelihoods of the fisherfolk. The solution brought forward was to endorse a new line at 6-8 km from the shore, allowing commercial vessels to fish beyond that line. This could, however, have serious implications for the conservation of marine resources and require the amendment of a national law. The talks concerning the delineation of municipal waters in Balayan Bay are continuing, and the final outcome is

envisioned to be a unified ordinance covering all municipalities of Balayan Bay as well as the setting of guidelines in terms of territorial delineations, permitted gear and sanctions imposed. This provides an opportunity for an efficient co-management of municipal waters of neighbouring municipalities. As a result, commercial fisherfolk from municipalities with small municipal waters could fish in adjacent waters with the permission of the respective municipality. However, this is difficult to implement because some municipalities, especially Calatagan and Mabini, clearly benefit from the current situation due to the large area of their municipal waters, and it seems like there is little incentive for them to support a unified ordinance.

Violations and enforcement

The interviewees listed numerous fishery violations: the use of fine mesh nets; non-adherence to the municipal water boundaries; the use of illegal fishing gear and practices facilitating the catch of fish (e.g. cyanide, dynamite fishing); the stealing of fish from established *Boyas* (artificial fish-aggregating devices); and the use of "superlight" (>300 watts) and of machine-operated nets (*Pangulong*) in municipal waters (see Box 8). In most cases, the violators were said to come from other municipalities or regions, or to be migrants. Overall, however, illegal activities seem to have decreased, in particular after the Fisheries Code was put into practice in 1998.

Should a violation be observed, then the imposition of sanctions proves to be difficult; often there is no apprehension at all, and even the reporting procedures in place differ: some fisherfolk would inform the *Bantay Dagat*, some would report to their boat owners and some to the *barangay* captains. Several interviewees also expressed a mentality of "give and take": the observers of fishery violations would remain silent, as long as they can enjoy the same treatment. The most common practices seem to be oral warnings and political interventions. Consequently, only a few cases were filed – in general, these rather concerned "outsiders", not vessels from the same municipality. The stringency of sanctions established by the Fisheries Code has also been substantially reduced by some municipalities, thereby undermining the incentive to respect existing regulations.

Box 8: Unsustainable fishing practices

Dynamite/ Blast fishing (local term: *Putok*): After a school of fish has been visually spotted, the fisherfolk throw dynamite into the school, which either kills or paralyses the fish. Afterwards, the fish are simply scooped up (Pet-Soede & Erdmann, 1998, p. 29). In Balayan Bay, this method is used in particular to paralyse Don Pilas, a fish species that was reported strong enough to pull the fishing net downwards, aggravating the manual hauling in. *Dangers:* The dynamite impact shatters corals, and it might hurt other animals nearby, especially juveniles (Pet-Soede & Erdmann, 1998, p. 29). The noise might also cause other animals to leave that area permanently. Also, this can be potentially very dangerous for divers, who can be injured or even killed by the explosions (see the case of Al Bernard Coyoca, 2015) (Codilla, 2015).

Cyanide (local term: *Bayate*): Divers use "bursts of cyanide solution from squirt bottles to stun their targets" (Pet-Soede & Erdmann, 1998, p. 30). This is meant to paralyse the fish, which will be subsequently collected by a diver. In Balayan Bay, cyanide is furthermore used on bait. *Dangers:* The concentrated amounts of cyanide also affect other marine creatures and lead to the death of invertebrates, smaller fish and corals. In addition, the collection of fish is often accompanied by the breaking of corals serving as refuges (Pet-Soede & Erdmann, 1998, p. 30).

Superlight: Strong lamps are directed to the water, since their light is used to attract schools of fish. Within municipal waters, it is only allowed to use light of up to 300 watts. Stronger light is allowed only beyond the 15 km line. *Dangers:* Juveniles occurring in shallow waters might be killed by the heat emitted by the lamps. The Fisheries Code also sets maximum limits for the wattage of lights used beyond the municipal waterline (Bureau of Fisheries and Aquatic Resources, 2000).

Beach seining, bottom trawling and purse seining: For beach seining, a fine mesh net of about 100 metres of length is put into the water from a small boat and then drawn ashore by ropes. The net possesses a weighted line to hold it down, which means that its bottom is dragged across the ocean floor (Mangi & Roberts, 2006, cited in Hillman, 2011, p. 7). *Dangers*: As the fine mesh net is used in shallow waters, juveniles often comprise the main share of the fish caught (Hillman, 2011, p. 8). Furthermore, by dragging the weight over the ocean floor, the net entangles in corals and breaks them. The same principle is at work for bottom trawling, which is also disruptive to the ocean floor. The difference is the depth of the sea, since bottom trawling damages the deep sea corals (McClellan, 2010). A third gear, which was reported to have negative environmental effects, is the purse seine (*Pangulong*), a highly effective gear using a mechanical net hauler. The use of this net leads to large numbers of by-catch of non-targeted species, also including juvenile fish. Since it causes an exploitation of fish on a greater scale, it should only be employed beyond the municipal water border, which affects especially municipal fisherfolk, who do not have the technical means to fish beyond 15 km.

Box 8 (cont.): Unsustainable fishing practices

Catching juveniles: Catching juvenile fish is prohibited under the Fisheries Code of 1998. Exceptions are fish that are already mature at a really small size, such as *Dulong* (Department of Agriculture, 1998, p. 29). *Dangers:* Often, these small but mature fish cannot easily be distinguished from actual juveniles of other species, which can have serious impacts on the fish populations (see Box 7).

Encroachment: Fishing vessels from other provinces enter the municipal waters of Balayan Bay to catch fish there. The municipal borders have also not yet been drawn between the municipalities of Balayan Bay themselves, leading to boats from one municipality intruding into another municipality's territory. *Dangers:* This further aggravates the pressure on fish stocks in Balayan Bay and leads to conflicts among the fishers.

Source: Authors

An important instrument to apprehend, monitor and report violations is the *Bantay Dagat*, although its efficiency is compromised (see Box 2). For effective enforcement, however, all enforcement bodies should collaborate to ensure an efficient monitoring and enforcement chain, which was cited as a prevailing opinion during the interviews. In this regard, the Batangas Environmental Response Team task force was mentioned. Fisherfolk also stated that they would like to engage in monitoring activities in their *barangays*, thereby indicating that they felt comfortable to report local offenders.

3.4 Policy recommendations

1. **The closed season was a successful experiment and should be repeated on an annual basis.** Commercial boat owners and crews fully respected the closed season. Acceptance among commercial boat owners, *barkadas*, municipal fisherfolk and LGUs is overwhelming and has increased with the successful implementation. Hence, we strongly recommend establishing the closed season on a regular annual basis, which is a precondition for long-term sustainability. Moreover, the one-time investment in networking and trust-building would then fully pay off, with transaction costs related to the registration of boats and crews, information and coordination greatly decreasing over time.

2. **Cash for Work – the innovative feature of the Balayan experiment – was a key success factor.** The implementation of closed seasons or no-take zones can hardly be enforced when people's livelihoods depend on regular fishery. The Balayan experience demonstrated that ECfW greatly enhances the acceptability of the closed season. In addition, the fact that *barkadas* were involved in ECfW activities and could not go fishing at the same time contributed to the fact that commercial vessels actually stopped fishing rather than moving to adjacent fishing grounds not covered by the closure.

3. **The closed season needs to be extended in outreach and time if fish stocks are to regenerate fully.** Commercial fishers account for only 25 per cent of total fishery landings along the Batangas coast, with municipal fishers (which were not included in the closed season) accounting for the remaining 75 per cent. Also, the period of 22 days is very short, especially when a major share of juvenile fish falls prey to fine-meshed net fishery. Considering these two issues, an extension in outreach and time is highly recommended. That would substantially increase the programme costs, but we would like to emphasise that this is a necessary investment, since a continuous overexploitation of fish would mean burdening future generations with much higher costs. Table 5 anticipates the expenses of the Cash for Work component for different extension scenarios: the figures show, for example, that the full inclusion of all commercial *barkada* would more than double the cost of the ECfW component; extension to all commercial *barkada* and municipal fisherfolk in the entire bay would imply costs that are nine times higher; and extending the duration to 60 days would imply almost a 25-fold increase in expenditure. Since the efforts of hook and line fishers seem to have a smaller effect on fish stock recovery than commercial and municipal net fishing, and their contribution to the total annual catch is – at 12 per cent – relatively low (Campos, 2013, p. 14), one could reduce programme costs by excluding them from the closed season and ECfW programme. As it is estimated that about 75 per cent of municipal fisherfolk in Balayan Bay are hook and line fishers, their exclusion would reduce the programme costs significantly (see scenarios 3 and 5). Further studies are needed to determine the impact of hook and line fishery on the development of fish stocks.

Table 5: Cost estimates for the Cash for Work component when extending the closed season (in PHP)*

	22 days	60 days
Participation in closure December 2014 (1,483 commercial *barkada*)	8,847,608	24,129,840
Scenario 1: All commercial *barkada*	20,240,990	55,202,700
Scenario 2: All commercial *barkada* and municipal fisherfolk (5 municipalities)	75,073,504	204,745,920
Scenario 3: All commercial *barkada* and municipal fisherfolk excluding hook and line** (5 municipalities)	38,518,495	105,050,440
Scenario 4: All commercial *barkada* and municipal fisherfolk (9 municipalities)	83,718,404	228,322,920
Scenario 5: All commercial *barkada* and municipal fisherfolk excluding hook and line** (9 municipalities)	41,400,128	112,909,440

** Costs for enforcement are not included*
*** Estimated share of hook and line fishers: two-thirds of municipal fisherfolk*

Data sources: See the "Municipality of..." (2015) fishery profiles for the five municipalities; Ecofish and Conservation International (2014)

4. **New sources of long-term funding need to be tapped.** The DSWD's CBLA programme proved to be a reliable partner financing the ECfW activities during the closed season. However, the programme specifications do not allow for an annual repetition of the closed season, and funds are too limited for a major up-scaling in the number of participants and duration. Moreover, fishery management needs to be improved all over the Philippines. Small localised projects, such as the one in Balayan Bay, are important to test policy solutions but cannot have a big direct impact on fish stocks. Hence, the Philippines need a nationwide programme for the conservation of coastal and marine resources and a reliable funding mechanism.

5. **Private-sector co-funding can be sought to share the programme costs.** The Batangas Coastal Resources Management Foundation, with the backing of powerful local enterprises, such as First Gas, could be

approached to contribute to the programme costs. The Foundation has already contributed to environmental protection in the region in the past and, according to initial conversations, is considering co-funding the next ECfW programme. In addition, private enterprises in the region may provide temporary employment opportunities for *barkadas* during the closed season. The fact that the 2014 seasonal closure created a lot of visibility and earned strong support among coastal communities implies that any private-sector support will pay off in terms of an improved corporate image. Moreover, the strong commitment of provincial and municipal governments during the first closed season strongly increases the likelihood of private-sector funding.

6. **To assess the real value of the closed season, the implementation should be accompanied by further research and monitoring for results.** To date, only perception data on the effects of the closed season are available. In the medium term, fish stock monitoring and research programmes should be commissioned by BFAR to determine long-term impacts and to learn more about timing and sequencing of closure times, as well as about causal relations between closed seasons and the reproduction cycles of different fish species. Research on larvae dispersal patterns might show spill-over effects to neighbouring bays and the Philippine Sea beyond the Verde Island Passage. Such evidence can be a game changer, not only to improve programme effectiveness but also to secure the support of fisherfolk and politicians and to create acceptance in other Philippine regions. Therefore, scientific results have to be translated into comprehensive education and information campaigns for fisherfolk and other local stakeholders.

7. **A learning platform among regions that are pioneers for innovative instruments for sustainable fishery management should be created to share experiences and best practices.** This would enable a systematic comparison of closed seasons and other pilot projects among various regions of the Philippines or even at an international level (e.g. including the countries belonging to the Coral Triangle) and could provide important insights to further improve evidence-based policy-making. National and international universities, international non-governmental organisations (NGOs) and donor agencies should be approached to co-fund such activities.

8. **Cash for Work activities should support the development of alternative livelihoods, be located in the home *barangays* of participants whenever possible and be linked to fishery management.** Activities should be aligned with already existing skills of fisherfolk or be invested in capacity-building to open up new livelihood perspectives. The deployment of fisherfolk in their own *barangays* increases ownership and minimises transport expenses. Whenever this proves to be too difficult for implementation, it should be a requirement to reimburse the transport expenses of participants. Additionally, some participants should be included in enforcement and monitoring activities for the duration of the closed season in order to raise their awareness about the impacts of illegal fishing practices.

9. **A unified municipal ordinance for Balayan Bay is urgently needed, setting guidelines in terms of territorial delineation, permitted gears and sanctions.** The closed season itself is not sufficient and needs to be complemented by additional policies. Due to the geographical features of Balayan Bay, the co-management of fishery resources among municipalities and a fair delineation – enabling fisherfolk from all municipalities to pursue fishing activities – are strongly recommended. Municipalities should agree on the ban of particularly damaging gear within municipal waters and on sanctions imposed upon fishery violations. Since this requires the support of the provincial government, we emphasise the important role of the PG-ENRO in the coordination and implementation of this process.

10. **The successful cooperation of various enforcement bodies should be firmly established beyond the closed season, and funding for *Bantay Dagat* should be secured.** Local and national bodies fulfil complementary roles and need to cooperate to apprehend violators and to enforce the law. The Batangas Environmental Response Team represents the provincial task force, but its implementation has been quite weak up to now, since the reporting procedures for violations are not followed properly. Moreover, the *Bantay Dagat* teams need to receive additional support and funding, which concerns their training, the technologies used and the provision of patrol boats. An honorarium should be envisaged for the team members in order to acknowledge their commitment. These financial means could be secured from a private-sector company, which should be preceded by a municipal resolution to confirm the importance of *Bantay Dagat* teams and their funding.

Another possibility to secure the funding would be to put a trust fund for *Bantay Dagat* into action, using the fines from the apprehended fishing vessels as input. Other incentives such as health insurance for the members of *Bantay Dagat* should also be considered.

11. **The Balayan case should be documented in every detail and disseminated as a good-practice example in the Philippines and abroad.** In doing so, it should be communicated that ECfW can be an excellent incentive to motivate seasonal closures. The up-scaling of this project could lead to an improved fishery management and create awareness about the pressures that marine ecosystems face.

Note: At the time of publication, the Balayan Bay closed season had been repeated in 2015, with a duration of 21 days, and in 2016, with a duration of 22 days. However, it did not receive any funding from DSWD for these two closures but was continuously supported by USAID/Ecofish, working in collaboration with the PG-ENRO Batangas, which coordinated the closures. Municipal fishermen have not been included so far, but some of them were reported to have nevertheless respected the closed season. Finding additional sources of financing to institutionalise and broaden this closed season is of utmost importance to ensure long-term success.

4 Asset-building Cash for Work: the case of mangrove reforestation

Efforts to reforest mangroves have been undertaken in the Philippines for half a century, and many of these efforts involved ECfW. Mangrove cover nevertheless decreased sharply until the end of the 20th century, when, according to the data,[19] a reversal trend seems to have set in. Since 2011, reforestation has been scaled-up significantly with the launch of two national programmes,[20] and many donor-funded activities were added after typhoon Yolanda hit the Philippines in 2013. However, Chan and Baba (2009, p. 25) show that some of the reforestation projects have failed or achieved little success. The ECfW component of the reforestation programmes provided additional incomes to many poor inhabitants of coastal regions. Still, mangrove reforestation also receives a lot of critique, especially from ecologists claiming that reforestation is often done in unsustainable – and

19 See Section 4.1.2 for a controversy about the data.

20 The National Greening Programme (DENR) and the Philippine National Aquasilviculture Programme (BFAR).

even environmentally harmful – ways. Also, the usage of the ECfW modality has been criticised for creating inappropriate incentives, and some NGOs advocate alternative approaches based on genuine local commitment rather than financial incentives. Given these controversies, it is time to review the experiences so far. Against this background, we explored what makes a good mangrove reforestation programme and how important ECfW are for that purpose.

To answer these questions, we adopted a three-step approach. In a first step, we reviewed the available literature, including non-published policy reports. In a second step, we interviewed key informants from government departments, universities and other research institutions as well as from NGOs and international organisations. This provided background information on the current state of, and threats to, mangroves in the Philippines as well as expert[21] insights on mangrove reforestation and ECfW programmes (Section 4.1). In a third step, we visited four *barangays* in Mindoro and Palawan, where we conducted extensive semi-structured interviews with participants and non-participants of mangrove reforestation programmes and held focus group discussions. These in-depth site visits helped us to better understand people's attitudes towards mangrove ecosystems, assess the level of community self-organisation in the management and use of mangroves, and comprehend how reforestation programmes and ECfW are implemented on the ground (Section 4.2). These two perspectives helped us answer our research questions in Section 4.3.

4.1 Mangroves in the Philippines: ecosystem services, current status and reforestation measures

This introductory section provides an overview of the ecosystem services provided by mangroves, the current mangrove cover in the Philippines as well as ongoing management and reforestation efforts. The section ends with a discussion of two particular critical issues of mangrove reforestation.

21 For detailed information on the interviewed experts, see list in the Annex.

4.1.1 Ecosystem services

The Philippine's mangrove forests are particularly biodiverse, hosting more than 35 different mangrove species (Primavera et al., 2012, p. 3). Overall, there are three dominant mangrove groups (FISH Project Philippines, 2001, p. 11):

I. bakauan group (bakauan lalaki [*Rhizophora apiculata*], bakauan babae [*R. mucronata*], bakauan bato or bangkau [*R. Stylosa*]);

II. bungalon group (bungalon [*Avicennia marina*], api-api [*A. officinales*], piapi [*A. lanata*]); and

III. pagatpat group (pagatpat [*Sonneratia alba*], pedada [*S. caseolaris*], pagatpat baye [*S. ovata*]).

Among their commonalities are the various ecosystem services that mangroves provide (Primavera et al., 2012, p. 7):

1. supporting (e.g. nursery habitats);
2. provisioning (e.g. subsistence and commercial fisheries);
3. regulating (e.g. protection of beaches and coastlines from storm surges, waves and floods);
4. cultural (e.g. tourism and recreation).

1) In terms of supporting ecosystem services, mangroves not only offer spawning habitats but also provide shelter for the hatching juveniles of numerous marine species, such as crabs, fish and molluscs, many of them being commercially important (Armitage, 2002, p. 205). Moreover, they provide these juveniles with food, since the detritus supplied by these salt-tolerant forest ecosystems enriches the surrounding waters with nutrients (Mitra, 2013).

2) Fish catches in the open sea, as well as local subsistence fisheries, thus highly depend on the conservation of mangroves, as the mature fish migrate to deeper waters and other ecosystems such as coral reefs (Department of Environment and Natural Resources, Bureau of Fisheries and Aquatic Resources, & Department of Interior and Local Government, 2001, pp. 9, 10, 22). Also adding to the provisional ecosystem services of mangroves are the different usages of their bark for fuel and tanning, their wood, which is used for construction and as firewood, and their resin, which is used in local medicines (Mitra, 2013, p. 37).

3) One of the most important regulating ecosystem services is the protection of low-lying coastal areas from storm surges, cyclones and tidal waves, since the mangroves mitigate the impact of the natural disaster and also act as gathering places for washed-up debris (Mitra, 2013, p. 38).

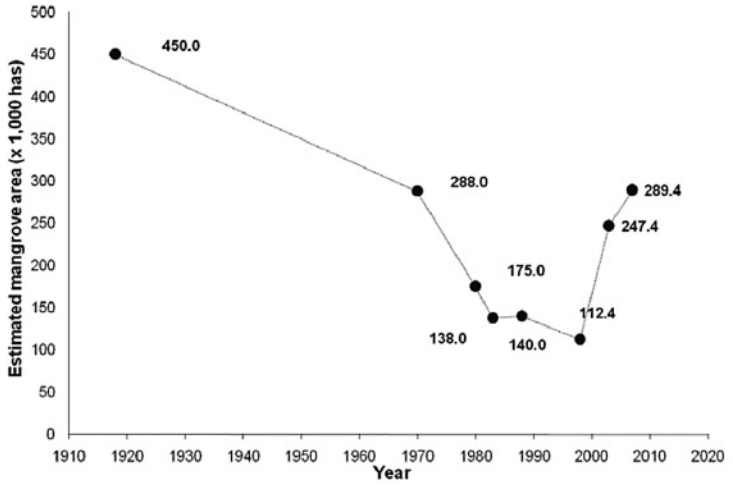
4) The cultural aspect should not be underestimated: mangrove areas can offer recreational spaces for birdwatchers, photographers and tourists in general (Mitra, 2013, p. 39). To generate financial means for environmental protection and community support, entry fees can be set up for mangrove boardwalks, for example (see the Calatagan Mangrove Forest Conservation Park (Balinton, 2011)).

The monetary value of ecosystem services has been well-known for quite some time (see e.g. United Nations Environment Programme, 2010). Although estimates vary significantly, depending on different underlying assumptions, they clearly show that the ecosystem services provided by mangroves have a high economic value and are worth protecting. For example, Primavera et al. (2012, p. 7) state that the total value of such services ranges from USD 14,000 to USD 16,000 per hectare per year. According to other estimations by Melana, Melana and Mapolo (2000b, p. 4), the direct economic value of mangroves in the Philippines ranges from USD 253 to USD 1,396 per hectare (ha) per year. Since it is quite difficult to arrive at exact valuations, especially with the limited means of most developing countries, countries are increasingly being supported by NGOs and international organisations in estimating the value of ecosystem services as well as the funds needed to protect these. An example is the Biodiversity Finance Initiative, which was launched by the United Nations Development Programme in 2012 and helps countries to evaluate their financing needs and identify potential sources of funding for a better management of ecosystems and biodiversity (United Nations Development Programme & Biodiversity Finance Initiative, s.a.).

4.1.2 Mangrove cover in the Philippines

Although the situation seems to have improved since the turn of the century, mangroves are still subject to severe deforestation and degradation, including the conversion of mangrove areas into fishponds or agricultural land as well as the encroachment of human settlements and industrial areas. Figure 6 shows the mangrove cover in the Philippines. Trends differ significantly among provinces and regions.

Figure 6: Mangrove cover in the Philippines 1918-2007

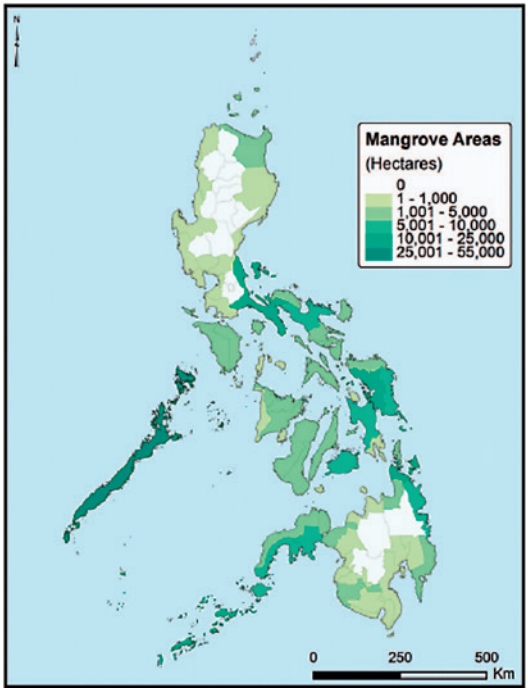


Source: Samson and Rollon (2011, p. 33)

It can be derived from the graph that the mangrove cover in the country decreased continuously: from 450,000 ha in 1918 to 138,000 ha in the 1980s. Starting in the 1950s, there was a widespread view that mangroves and other wetlands were wastelands and the Philippine government pursued a policy to replace such wetlands with aquaculture (Melana et al., 2000a). Aquaculture became the major cause of mangrove decline, as thousands of hectares of mangrove forests were converted into fishponds (Dacles, Malunes, & Jaquinta, 2009). This was accelerated by the "Shrimp Fever" in the 1980s, when lucrative export prices led to an increased pond development of 4,700 ha per year, made possible inter alia by the provision of a vast number of aquaculture loans (Primavera, 2000, pp. 93, 98). Consequently, mangrove cover was reduced to 112,400 ha in the late 1990s, "despite the government ban for further conversion of mangrove forests" by DENR in 1988 (Dacles et al., 2009, p. 2). At the same time, several counter movements took place, as government-sponsored and foreign donor-funded mangrove reforestation programmes also started in the 1980s. Among them, the Central Visayas Regional Project-Phase I, funded by the World Bank, and the 1988 Integrated Social Forestry Programme of DENR took the lead (Primavera, 2000, p. 97). They were complemented by further donor-

funded programmes targeting marine conservation, fishery management and Integrated Coastal Management, most of them launched in the 1990s (Balgos, 2005, pp. 4-5). The impact of the programmes varied, with seedling survival rates ranging from 0 to 97 per cent; also, projects arguably did more harm than good, as they ignored site-specific ecological conditions (Primavera & Esteban, 2008, p. 6).

Figure 7: Mangrove area by Philippine province in 2010



Source: Adapted from Long, Napton, Giri and Graesser (2014). Reproduced with permission of the Coastal Education and Research Foundation

The sudden increase in mangrove cover in 2000, as shown in Figure 6, could not be unambiguously explained away by experts. Some interviewees think that the increase is real and due to increased reforestation efforts (reflecting stronger adherence to international environmental and climate change treaties), better Integrated Coastal Management approaches and increased public awareness. Other experts raise doubts about the reliability

of the data. One expert pointed out that the spike may not be real and rather reflects changes in surveying methods, such as an increased use of satellites and other sophisticated technologies around the year 2000. Another source suggested that the increase is explained by a new definition from the Food and Agriculture Organization of "forest" adopted by the government in 2003. With the new definition, the forest cover statistically went up from 5.39 million ha in 2002 to 7.2 million ha in 2003, an increase of 33 per cent (Center for Environmental Concerns-Philippines, 2012, pp. 13-15). According to that source, the new definition includes tree plantations, bamboo, palm and fern formations, logging roads and open spaces adjacent to logging sites of corporate forest concessions.

Not surprisingly, data on the latest trends diverge enormously: Long et al. (2014, p. 10) state a *decrease*: from 256,185 ha in the year 2000 (Palawan: 56,261 ha; Oriental Mindoro: 2,975 ha; Occidental Mindoro: 1,843 ha) to 240,824 ha in 2010 (Palawan: 54,457 ha; Oriental Mindoro: 2,375 ha; Occidental Mindoro: 1,229 ha). In contrast, DENR's Philippine Forestry Statistics (Forest Management Bureau, 2013, p. 10) actually observed an *increase* of up to 310,531 ha until 2010 (Palawan: 63,821 ha; Oriental Mindoro: 3,949 ha; Occidental Mindoro: 1,594 ha).

To provide more coherent and validated data on mangrove cover, several higher education institutions participate in the Phil-LIDAR 2 programme. It is composed of five projects, one being the Assessment of Coastal Resources Assessment, including mangrove mapping (Blanco, Tamondong, Perez, Ang, & Paringit, 2015) by using "state-of-the-art technologies such as LiDAR and other remote-sensing and [Geographical Information Systems] technologies" (Phil-LIDAR 2, 2015). The data collection, however, is not finished yet.

4.1.3 Mangrove management and reforestation programmes

After having promoted the conversion of mangroves to fishponds for several decades, the Philippine government now recognises the high value of mangroves and the necessity to protect them. Cutting mangroves is officially prohibited by law throughout the country by the Republic Act No. 7161 passed in 1991. The main governmental department in charge of mangrove protection is DENR. It is mandated to be the "primary government agency responsible for the conservation, management, development, and proper use of the country's environment and natural resources" (DENR, 2015).

However, managing mangrove forests is also of concern to BFAR, which is handling Fishpond Lease Agreements. Although BFAR promoted the conversion of mangroves to fishponds in the past, the agency is now also concerned with the planting of mangroves to ensure people's livelihoods by providing a suitable habitat for fish to propagate. "We are shifting from the old paradigm of cutting trees to grow fish. Now we grow trees before growing fish" (Abangan, 2012). To combine that approach with BFAR's mandate, the solution brought forward is aquasilviculture, which allows for the ponds to be managed more sustainably.

Both DENR and BFAR have set up ambitious national programmes on the basis of ECfW. DENR's flagship programme is the National Greening Programme, and BFAR's flagship programme is the Philippine National Aquasilviculture Programme (PNAP). Although other government departments such as the DSWD as well as local governments and NGOs also pursue reforestation activities with ECfW components, most of the projects we saw have been financed through either the NGP or PNAP. Further details on ECfW for mangrove reforestation programmes in project sites in Mindoro and Palawan can be found in the Annex.

The National Greening Programme

The NGP is a large forest rehabilitation programme of DENR, established in 2011 by President Benigno S. Aquino III. Initially it sought to grow 1.5 billion trees on 1.5 million ha nationwide within a period of six years (2011 to 2016) (DENR, s.a.); it was recently extended until 2028. Areas suitable for reforestation include all lands under public domain, including mangrove areas, and priority sites have been identified in 16 regions in the Philippines. Mangrove reforestation is not the exclusive focus but an important part of the NGP, as is reducing poverty and providing alternative livelihood activities. However, there is no systematic monitoring on how the money is used by the people upon receipt.

For the implementation of the NGP, DENR signs contracts directly with LGUs or civic groups (called "people's organisations" in the Philippines). The budget allocated for the mangrove planting, maintenance and monitoring is calculated per hectare, which is why the amount an individual planter receives varies. Aspects determining the financial amount received are, for example, the number of planters, the geographic site and whether the mangrove propagules can simply be collected and planted or whether they need to be nursed first. The latter is particularly the case for areas

situated near the shore, since small propagules would be washed away by the sea immediately. Since the nursing requires more time and effort, it is also more expensive. The expenses of DENR amounted to PHP 7,500 per hectare for collected mangrove propagules, compared to PHP 30,000 for nursed seedlings (Annex 1). The funds for an NGP site are allocated for three years: the first year covers the planting, whereas the second and third years focus on maintenance and protection (DENR, s.a.).

The Philippine National Aquasilviculture Programme

PNAP was launched by BFAR and the Commission on Higher Education in December 2011. It encompasses three components:

1. Resource/habitat rehabilitation of mangroves;
2. Aquasilviculture projects; and
3. Community-based, multi-species hatcheries.

The programme is implemented by at least 71 state universities and colleges – including one of our partners (Western Philippine University) – in 61 provinces throughout the country. Areas targeted by PNAP include abandoned, undeveloped and underutilised areas, fishpond lease agreement areas, key biodiversity areas identified by DENR as well as areas identified for reforestation/afforestation covered by co-management agreements between the DA, DENR and LGUs (Dieta & Dieta, 2014). Target beneficiaries are (Dieta & Dieta, 2014, p. 77):

1. coastal fisherfolk;
2. a minimum of 1,000 fisherfolk for the aquasilviculture livelihood component; and
3. 64 state universities and colleges for the community-based, multi-species hatcheries.

For the individuals planting the mangroves, payments amount to PHP 6 per propagule paid at three stages (Flores et al., 2014, p. 171):

- PHP 1.50 per gathered mangrove propagule;
- PHP 2.00 per mangrove propagule planted with the corresponding support stake;
- PHP 2.50 for each fully grown and live mangrove tree after one year from planting.

There is no nursery component included in the implementation phase (Flores, Tungol, Antonio, Medairos, & Salas, 2014, p. 179). For the establishment and operation of community-based, multi-species mangrove hatcheries, each state university or college receives PHP 1.2 million, and each aquasilviculture livelihood project is financed with PHP 65,000 (Dieta & Dieta, 2014, p. 77).

Other mangrove reforestation programmes

Apart from these two main mangrove reforestation programmes, there are smaller ones, such as the **Mangrove and Beach Forest Development Project.** It includes ECfW payments, was launched in 2014 as a reaction to the damages caused by typhoon Yolanda and is part of the overarching Rehabilitation and Reconstruction Programme. For the implementation, the government released PHP 1 billion to DENR to promote mangrove reforestation. Priority sites of this programme are Yolanda-affected areas as well as areas damaged by earthquakes and previous typhoons. It includes activities such as site preparation, nursery development, mangrove and beach forest planting, as well as maintenance and protection. The programme will be ongoing for three years, from 2015 to 2017, starting with the planting that took place in 2015 and created about 89,000 jobs. After the programme comes to an end, alternative livelihoods and livelihoods based on a sustainable mangrove management are foreseen to be offered and are thus currently being evaluated and discussed with the local people.

The **Sustainable Coral Reef Ecosystems Management Programme** of DENR-BMB, started in 2013, is meant to increase the management effectiveness of MPAs and coastal ecosystems, using eco-tourism as an alternative income source for the locals.

Central government agencies are not the only ones launching mangrove rehabilitation projects. Planting is also being initiated by LGUs, civic groups and NGOs such as the Zoological Society of London (ZSL), which implemented the **Community-based Mangrove Rehabilitation Project** from 2007 to 2011 (Primavera et al., 2012). The aims were to increase food resources, coastal protection and diversify livelihood options by reverting fishponds back to mangroves, integrating forestry with aquaculture and expanding the number of MPAs in the Philippines (ZSL, s.a.). More than 4,000 volunteers were involved in the planting of 100,000 mangroves of different species, thereby rehabilitating more than 100 ha in total. Instead of focussing on problematic seafronts, the rehabilitation activities took place

at the middle to upper intertidal sites of former mangrove forests where fishponds had been created in the past. Communities and local stakeholders played an important role during the planning and implementation process.

All of these "other" programmes follow the Community-based Forest Management (CBFM) strategy that was concluded in 1995 to ensure the sustainable protection and management of forest lands. The key features of the CBFM strategy are the security of tenure, social equity, DENR and LGU partnership and investment capital, and market linkage (Aquino & Daquio, 2014). The communities are issued CBFM Agreements, giving them tenure for 25 years to manage mangrove resources sustainably, prevent illegal activities and develop livelihood capabilities (Agoncillo et al., 2011). With the help of CBFM Agreements, communal technical knowledge can be built, and legislative frameworks can be set up to manage the forests sustainably. Starting in the uplands, the agreements were later introduced also for coastal areas. Once a CBFM Agreement is in place, communities can access government funding and support, allowing them to implement various forestry and/or livelihood programmes.

4.1.4 Two critical issues of mangrove reforestation

There are several issues that complicate the implementation of reforestation programmes. In the following, two particularly critical issues of mangrove reforestation are discussed.

Reforestation vs. fishponds: conflicting interests and lack of integrated planning

As stated earlier, fishpond development was the main reason for mangrove deforestation in the past. There is a legal procedure to convert public lands into commercial ponds: DENR designates parcels of land that can be used for the establishment of fishponds. Following that, BFAR is eligible to issue fishpond lease agreements to individuals for developing the ponds. These lease agreements are limited in time and entitle the holders to use the leased areas exclusively for fishpond purposes. The areas remain as public lands. After the lease ends, the lease agreements can either be renewed if the fishpond is managed well or cancelled by BFAR. In that case, the lands need to be turned back to DENR, again, for mangrove reversion.[22]

22 This procedure only concerns the public lands.

According to Primavera et al. (2013, p. 5), there are at present 240,800 ha of remaining mangroves and 239,000 ha of fish/shrimp culture ponds, leading to a 1:1 pond-to-mangrove ratio in the Philippines, whereas they estimates the environmentally tolerable ratio to be 4:1. Most of the ponds in the Philippines are idle, abandoned or underutilised (Samson & Rollon, 2011, p. 31). In fact, the lease agreements of almost 65 per cent of fishponds have already expired and, according to the list published by BFAR in December 2010, have not been renewed (Samson & Rollon, 2011, p. 31). Moreover, many fishponds had been established illegally (Samson & Rollon, 2011, p. 38). Hence, abandoned, undeveloped, underutilised or illegally established fishponds would be the best areas for mangrove reforestation. Experiences show that former fishponds revert back easily.

In practice, however, no one is really driving the reversion process of abandoned, undeveloped and underutilised fishponds back into mangrove areas; if started at all, the reversion process is very slow. Expert interviews and existing reports revealed several reasons for this.

- One reason mentioned is institutional rivalry between BFAR and DENR. If fishponds are given back to DENR for reforestation, BFAR loses its mandate for the respective area. Critical observers state that BFAR, despite all its efforts to reforest mangroves, is still more interested in aquaculture development than mangrove protection. It promotes aquasilviculture, which combines planting of mangroves with exploitation of resources and aims to help farmers establishing a livelihood.
- A second reason mentioned (but difficult to verify) is that DENR might shy away from seizing abandoned and illegal ponds and returning them to forest status, probably to avoid confrontation with politically influential pond owners who are unwilling to give up their pond areas. The same applies when ponds are in operation but the time of tenure has passed (Samson & Rollon, 2011, p. 33).
- Third, DENR evaluates the fishponds before its recommendations are sent to the Congress, which can declare the land as abandoned, undeveloped and underutilised. However, if a recommendation to cancel the fishpond lease agreements is filed, the owner can appeal by submitting a motion for reconsideration. As long as nobody processes the motion – a process that can take years – the status quo remains; the fishpond remains abandoned, undeveloped and underutilised; and no conversion can take place.

- Fourth, many people obtained fishpond lease agreements and used them as collateral to take out pond development loans. Some, however, did not use the loans to develop the ponds and did not pay them back. As a result, the lessee got free money, and the banks seized and resold the fishpond lease agreement rights. This led to the massive privatisation of public land (Primavera et al., 2013, p. 14).

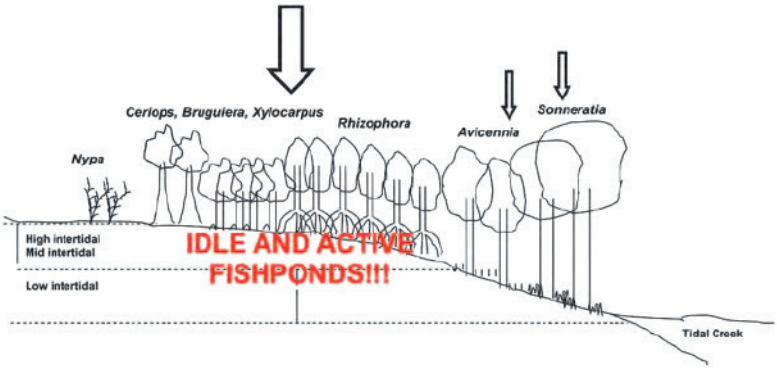
Steps have been taken to tackle these problems and address the issue of overlapping mandates between DENR, BFAR and local governments, which, according to the Local Government Code, also have the mandate to decide on matters of mangrove reforestation and the allocation of land to fishpond users. A Technical Working Group composed of representatives from all involved parties has been set up to foster cooperation between the agencies and solve the described problems (Dacles et al., 2009, p. 4). Samson and Rollon (2011) suggested the best technical options for dealing with a range of fishpond situations in the Philippines. An overview is provided in the Annex 2.

Selection of species and place

Mangrove ecosystems in the Philippines are particularly biodiverse, hosting a large number of tree species. Most reforestation programmes encourage only the planting of *Rhizophora* species. The main reasons are that *Rhizophora* propagules are easily available, and planting is relatively uncomplicated, as the seedling does not require to be grown in a nursery beforehand, since the propagule can be used for planting right away.[23] However, planting only *Rhizophora* species results in a monoculture that is poor in biodiversity, thereby leading to a reduced variety of commercial fishery resources such as crabs, clams or fish. *Rhizophora* monoculture also severely reduces the mangroves' capacity to withstand storms. One expert stated that after typhoon Yolanda, there was much more coastal damage in areas where only *Rhizophora* mangroves were planted compared to areas where reforestation used different species. Figure 8 provides a stylised picture of an ideal Philippine mangrove forest showing high diversity of mangrove species, which in turn provides the habitat for highly diverse fauna, thereby allowing local communities to harvest various resources.

23 This is valid for general planting guidelines; however, it varies according to site-specifics, such as shorelines, where nursed plants have a much higher probability of surviving.

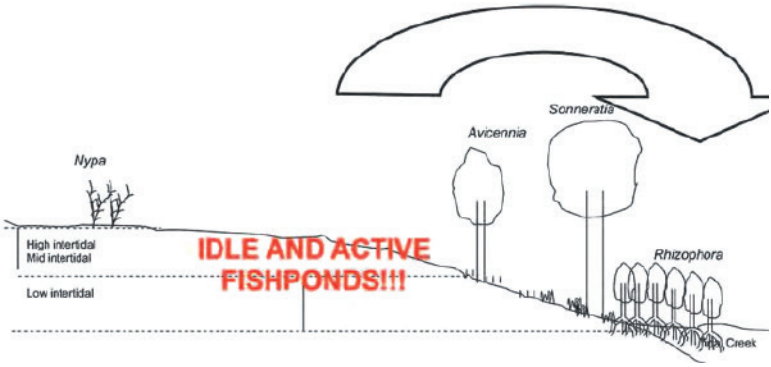
Figure 8: Ideal zonation of mangrove ecosystems in the Philippines



Source: Samson and Rollon (2011, p. 34)

However, not only the selection of the right species needs to be taken into account but also the selection of the right site: "[M]angrove reforestation programmes focus mostly on the narrow coastal band from the lower intertidal down to the subtidal zone that includes tidal flats and seagrass habitats" (Primavera et al., 2012, p. 8). This poses few ownership conflicts, but the narrow band does not allow for dense forests and is characterised by a high level of exposure to waves, leading to low survival rates of the planted seedlings. Instead, mangrove rehabilitation ideally takes place between the upper and middle intertidal zones, but these are often already occupied by active and abandoned fishponds, an issue that is illustrated by Figure 9. In addition, different species require being planted in specific tidal zones: in the Philippines, *Rhizophora* has mainly been reforested in the lower intertidal area, although *Rhizophora* species grow best in sheltered sites, and thus are not adequate "front liners". This stands in contrast with the *Avicennia* and *Sonneratia* species, which can better withstand tidal waves (Primavera et al., 2012, p. 5).

Figure 9: Zonation of mangrove ecosystems in the Philippines today



Source: Samson and Rollon (2011, p. 34)

Rehabilitation projects that focus on the middle to upper intertidal sites of former mangrove forests could help restore original ecological conditions, make mangrove forests more resilient and at the same time increase the survival rates of seedlings. Therefore, Primavera et al. (2013) developed a manual on mangrove reversion of abandoned and illegal fishponds.

4.2 Case studies: mangrove reforestation with Environmental Cash for Work in Mindoro and Palawan

As the analysis above has shown, mangrove reforestation programmes still face challenges in their design and are subject to conflicts of interest. Although the increase of the Philippine mangrove cover has become an important part of the country's environmental policy portfolio, serious concerns regarding the quality of the reforested areas remain. To gain a better understanding of implementation problems at the local level, we examined several recently implemented ECfW programmes for mangrove reforestation in four *barangays* in Mindoro and Palawan (see Figures 10 and 11 and Annex 3). This allowed for an assessment of how people at the local level use mangroves, what their perception of the value of mangroves

Figure 10: Map of Occidental and Oriental Mindoro and project sites

Source: Google Maps (s.a.)

is, which threats mangrove forests face today and how communities manage their mangrove areas. Furthermore, we aimed at examining different mangrove reforestation programmes: the four *barangays* we included in our research allowed us to cover programmes implemented by DENR, BFAR, the Western Philippine University, and others, which all used different targeting and payment methods, and varied significantly in scale and scope. Lastly, we tried to establish whether ECfW is an appropriate mechanism for mangrove reforestation. Therefore, we analysed different design options. Our field research took place in:

- one *barangay* in Occidental Mindoro (Ansiray on Ilin Island, which belongs to the municipality of San José);
- two *barangays* in Oriental Mindoro (Milagrosa, which belongs to the municipality of Bulalacao; and Budburan, which belongs to the municipality of Mansalay); and
- one *barangay* in Palawan (Busy Bees, which belongs to the municipality of Taytay).

Figure 11: Map of Palawan including project site

Source: Google Maps (s.a.)

4.2.1 Socio-economic backgrounds of the four *barangays*

Table 6 gives an overview of socio-economic indicators in the four project sites (for more detailed maps on the location of each of the four *barangays*, see Figures 12 to 15). All four *barangays* show relatively high proportions of people living below the poverty threshold and display annual population growth rates between 2 to 3 per cent. Both aspects – population growth and high prevalence of poverty – amplify the pressure on natural resources as they increase the number of resource users. Poor people often do not have any other option but to keep on harvesting the natural resources close to their homes. This is most prevalent in San José (Occidental Mindoro), as it is the most densely populated area in Occidental Mindoro (Municipal Government of San José, 2015).

The people of both Oriental and Occidental Mindoro live predominantly in rural areas. For example, in San José, about 42 per cent of the total population reside in urban areas, whereas 58 per cent are situated in rural

Figure 12: Map of Budburan

Source: Google Maps (s.a.)

Figure 13: Map of Ansiray

Source: Google Maps (s.a.)

Table 6: Selected socio-economic indicators of the project sites			
Province / Municipality / Barangay	**Population**	**Annual population growth**	**Population below poverty threshold**
Oriental Mindoro	**785,602**[1]	**1.8%**[8]	**62.5%**[7]
Bulalacao	33,754[1]	2%[1]	86.8%[7]
Milagrosa	*2,471*[2]	*n.a.*	*92%*[7]
Mansalay	51,705[1]	2.85%[1]	79.6%[7]
Budburan	*1,480*[2]	*n.a.*	*82.7%*[7]
Occidental Mindoro	**427,233**[3]	**1.44%**[8]	**62.8%**[6]
San José (Ilin Island)	131,188[3]	2.38%[3]	56.6%[6]
Ansiray	*945*[2]	*n.a.*	*83.4%*[6]
Palawan	**755,412**[4]	**3.64%**[4]	**63.7%**[5]
Taytay	53,657[4]	2.83%[4]	69.8%[5]
Busy Bees	*1,200*[2]	*n.a.*	*54.2%*[5]

Sources:
[1] Provincial Government of Oriental Mindoro (2015)
[2] Numbers deducted from interviews with *barangay* officials
[3] Municipal Government of San José (2015);
Provincial Government of Palawan (2015)
[4] Provincial Government of Palawan (2015)
[5] Provincial Government of Palawan (2011)
[6] Provincial Government of Occidental Mindoro (2011)
[7] Provincial Government of Oriental Mindoro (2011)
[8] Mimaropa Regional Development Council (2015)

barangays (Municipal Government of San José, 2015). Where people live can also depend on the seasons, for example in Milagrosa and in Budburan (Oriental Mindoro), where people change homes depending on the time of the year. People's occupations can also be dependent on the season: in Budburan and in Busy Bees (Palawan), many people are farmers during the rainy season (June to December) and go fishing during the dry season, leading to increased pressure on coastal and marine resources during the dry season. Others live from coastal resources all year round. In San José, three-quarters of the population is engaged in agriculture (Municipal Government of San José, 2015; Provincial Government of Palawan, 2015).

Figure 14: Map of Milagrosa

Source: Google Maps (s.a.)

Figure 15: Map of Busy Bees

Source: Google Maps (s.a.)

4.2.2 Methodology and sampling

We conducted 42 semi-structured individual interviews with participants and non-participants of mangrove reforestation programmes in three *barangays* in Mindoro (Ansiray, Budburan and Milagrosa). With the support of a translator, 14 members of each *barangay* were interviewed, in English and in Tagalog. Apart from the individual interviews, we conducted four focus group discussions in all four *barangays*, including Busy Bees in Palawan. For that purpose, we invited a group of eight individuals per *barangay* to participate in the focus group discussion. Each discussion took about 90 minutes and was supported by one or two translators. The group was ideally composed of:

- one representative of *Bantay Dagat*,
- one representative of *barangay* justice,
- two non-participants of the mangrove reforestation programme (who were young to middle-aged; able to participate in ECfW programmes but did not; were not *barangay* officials; and lived in the lowlands), and
- four participants of the mangrove reforestation programme (two living in the lowlands and two living in the uplands) who depend on mangroves and are not *barangay* officials.

By including a highly diverse group of participants in the discussions, we aimed at stimulating debates from different points of view. With regard to their backgrounds, power and roles within the community, and their knowledge of – and experiences with – reforestation programmes, we sought many opinions as well as detailed information in order to complete our findings from the individual interviews.[24]

24 The group discussions always followed the same procedure: after a short introduction of all participants, the discussion started with an open question that was relatively easy to answer, in order to encourage the participants to contribute to the discussion. Afterwards, we turned to more complex questions combined with interactive elements. Participants were asked to create a new fictitious reforestation programme and to discuss different design options within the group. Thus, the individual or the group as a whole had to decide, for instance, how to choose participants of mangrove reforestation programmes, how to pay them, whether to include alternative livelihood programmes, and how to implement monitoring and sanctioning. In order to do that, each participant was provided with coloured cards representing the different options. When asked for their preferred design option, the participants would raise the respective card to indicate their choice. At the end, the cards were pinned to a wall in order to provide the participants with an overview of their choices.

4.2.3 Summary: the state, use and management of mangroves at the *barangay* level

In the following, we present our main interview findings and insights on mangrove reforestation, obtained from the expert interviews on the national and regional levels as well as from the individual interviewees at the *barangay* level.

State of mangroves: Section 4.1.2 has shown that, at the national level, mangrove cover decreased until around 2000 and seems to have increased since then. In order to assess the changes in mangrove cover in the project sites, individuals were asked to give their points of view on current and past developments. The interviewees of all *barangays* confirmed severe destruction in the past, back when fishponds were established in their regions and many people frequently used mangroves for charcoal production or as timber. In recent years, most interviewees have perceived an increase in mangrove cover, especially due to reforestation. Among the local experts, some confirmed that destruction rates have decreased considerably, whereas others felt that mangroves were still cleared for settlements or to be used for firewood and charcoal-making, and that there was no increase in mangrove areas.

Use of mangroves: We further wanted to find out whether and how people use mangroves in the project sites and to what extent they depend on these natural resources for their livelihoods. Our results showed that most people in the *barangays*, both upland and coastland dwellers, use mangrove-associated resources such as crabs and clams from the mangrove areas. Many people also engage in fishing, usually not directly within, but close to the mangrove areas. Resources from mangrove areas are thus important for a large number of *barangay* members; they use them either for home consumption or for sale. The mangrove areas of the research sites are also used by people from neighbouring *barangays* for the gathering of resources. Interestingly, although there are no agreements on regulating resource use by outsiders, there seem to be no conflicts. With regard to the state of the resources, interviewees confirmed that resource stocks are in decline, which leads to increased pressure on the remaining resources. Some of the reasons mentioned were population pressure, overfishing and also the cutting of mangroves.

Threats: Even though the cutting of mangroves is prohibited by law, the question remains whether these laws are being sufficiently enforced at the

local level or whether there are still people cutting mangroves illegally. The interviews reveal that, today, incidences of cutting mangroves for the use of charcoal or timber are, in general, very rare, but vary among the project sites. In Mindoro, the illegal logging of mangroves seems to have decreased significantly over the past decades. Only a few cases have been reported in which outsiders cut mangroves close to *barangay* borders. Yet, the findings from our project site Busy Bees in Palawan differed a lot. Here, illegal cutting and charcoal-making from mangroves is still a severe problem. Another serious issue and trigger for illegal activities that was mentioned in Busy Bees is poverty: people exploit mangroves and other resources because they do not have alternative sources for their livelihoods. Lastly, locals mentioned that threats to mangroves such as population increases, poison fishing and boats from outsiders accidentally destroy the mangroves. Experts confirmed that illegal cutting for charcoal-making is still predominant in Palawan, especially in the northern parts, where charcoal is transported to Manila. In southern Palawan, mangroves' tanbark is harvested and exported to Manila or even to other countries (particularly Malaysia), where it is used for colouring textiles. Apparently, the harvesting of mangrove bark has decreased, as enforcement has become stricter. Harvesting the bark is, like the cutting of mangroves, prohibited.

Perception of the mangroves' environmental value: In most *barangays*, illegal logging of mangroves has decreased, but what remains unclear is whether this decrease can be traced back to the enforcement of national law or to a change in perceptions of local people towards environmental issues. Interviews on the *barangay* level confirmed that people know that mangroves are an important breeding ground for fish and serve as storm surge protection against typhoons and big waves. As a consequence, people understand and acknowledge the importance of protecting mangroves. Yet, people have only limited knowledge about the various environmental functions of different mangrove species. In addition, the high level of awareness about the value of the resource, in many cases, does not lead automatically to the initiation of protection measures undertaken by the people themselves.

Self-management of natural resources: Although people are very aware of the importance to protect coastal ecosystems, nationwide mangrove protection might be difficult to enforce on the local level in some municipalities. This raises the question of how *barangays* organise themselves, and especially how resource use, as well as monitoring and

sanctioning, is locally managed. As to that, we observed that there seem to be no, or only few, conflicts regarding the use of natural resources in all *barangays*. In our view, a culture of consensus-based and participatory decision-making predominates. Within the *barangays*, there are certain areas of responsibility: besides the *barangay* captain, people can, for example, be part of the *barangay* police or work as *barangay* counsellors, and they usually get a small compensation for their work. Some *barangay* members are organised in groups, such as farmers' or fisherfolk's associations. In general, people feel well-represented and trust their *barangay* captain and other officials.

Concerning the use of fish and shell fish, social sharing agreements exist in some cases, for example when fisherfolk share their catch with other fishers who did not catch any fish. There are only a few traditional rules and no official rules within the *barangays* restricting the use of fish and shell fish, which leads to unlimited use. Nevertheless, interviewees agreed that they are not in favour of such rules. They argued that it would be difficult to set and enforce them because people depend on these resources for their daily needs and have no alternatives.

Concerning the use of mangroves, either formal or informal rules exist at the *barangay* level: whereas in some cases the *barangay* has its own ordinance that prohibits the cutting of mangroves, in other *barangays* members agree to protect the mangroves informally. When in place, these rules usually seem to be respected by the people. However, in the cases where no formal or informal rules exist that prohibit the illegal use of mangroves at the *barangay* level, the community (Busy Bees) seems to face the biggest problem in terms of enforcing the national law against the destruction of mangroves. That is why locals acknowledged that setting rules might be helpful here to prevent the illegal use of natural resources.

Monitoring and sanctioning: Within the four *barangays*, different monitoring schemes exist. Besides the *Bantay Dagat* (see Box 2), monitoring activities are usually part of governmental reforestation programmes (e.g. the NGP and PNAP) and are carried out by municipal officials, *barangay* officials or voluntarily by community members. Some of these monitoring activities take place regularly several times a week, whereas others take place less often. One major problem is that volunteers of the *barangay* community do not have an official mandate and lack the equipment (e.g. boats or fuel) to monitor and patrol in an effective way. However, that

differs among the *barangays*. Whereas one *barangay* has monitoring and enforcement activities in place and can thus observe and tackle the illegal cutting of mangroves and credibly state that these activities nowadays seem to play a minor role, there is no monitoring or enforcement in place in another *barangay* at all, resulting in an ongoing destruction of mangroves.

The protection of mangroves also depends on effective sanctioning mechanisms that target people who illegally use the natural resources. *Barangays* have a variety of formal sanctioning mechanisms, including, for example, reporting to the *barangay* captain, reporting to DENR/BFAR and demanding that the offender replant destroyed mangroves. Some sanctions are graduated, meaning that people are warned when they commit the first offence before a case is filed when they get caught the second time. However, all of these sanctioning mechanisms exist only on paper. In practice, the sanctions applied are mostly only warnings, which seem to be respected within the community but are not effective when given to external violators. Regarding potential sanctioning mechanisms, respondents prefer cash penalties over social work (e.g. replanting of mangroves).

4.3 Main findings of the mangrove reforestation case study

ECfW will remain a major component in mangrove reforestation programmes, as the NGP has been extended to 2028, and new programmes such as the Sustainable Coral Reef Ecosystems Management Program are under way. However, as the implementers and payment schemes vary significantly across the country, and as the impact of these programmes is neither systematically evaluated nor monitored, it is difficult to compare the various programmes and derive design recommendations for ECfW programmes in general. What can be stated is that there is no "one-size-fits-all" solution, as ECfW programmes depend significantly on the local context.

There are basically two approaches to planting based on different incentive systems. The most common approach used in the two big national mangrove reforestation programmes, the NGP and PNAP, is **based on ECfW**. Here, interventions are relatively short. If managed well, they can increase the mangrove cover fairly quickly. People's incentive to join is mainly to obtain monetary compensation for their work rather than an intrinsic motivation to restore mangroves. Some interviewees pointed to adverse incentives inherent in the ECfW modality. Depending on the programme design,

participants may be encouraged to plant as many mangroves as possible, no matter the survival rate, only to have a higher income. Some interviewees mentioned that reforestation may lead to the careless use of existing forests, as people may think that they can easily replace old trees. One expert warned that the dependency of people on the ECfW payments might encourage them to destroy, or at least neglect, plantations to attract the next mangrove reforestation programme.

The **Community-based Forest Management** approach, in contrast, mostly works without salary payment. It involves long-term capacity-building of people's organisations and the deep engagement of facilitators with the communities to convince them to mobilise their own resources for coastal management, help them with self-organisation and train villagers, for example, on how to plant and how to manage nurseries. This approach ultimately requires more resources for long-term community work but is likely to yield more sustainable results than a one-off ECfW programme, since the continuation of the reforestation, monitoring and protection activities does not depend on the availability of external funding, and people are more likely to convey the values they believe in to their children. Motives for people to join the voluntary activities could be, for example, the improvement of their social status as a planter, the opportunity to "leave something behind" for their children and to guarantee that the decrease in fish, shrimp, etc., populations is halted and reversed.

It may be promising to **merge both approaches** in future programmes, thereby combing the benefits of ECfW (big push in terms of reforested areas and temporary income-generation for poor villagers) and community-based management practices (self-reliance and local ownership for environmental objectives). There are two main reasons for people to participate in the ECfW programmes: some join mainly because of the payments, others to improve the environmental conditions in their *barangays*. Our interviews suggest that few are willing to engage actively in reforestation activities for longer periods of time. Poor families, in particular, might not be in a position to dedicate much time to voluntary planting activities, as their opportunity costs are high. Hence, monetary incentives are, in most cases, necessary to stimulate peoples' motivation to reforest; at the same time, more community engagement may help to correct perverse incentives and ensure greater environmental awareness and sustainability.

Community-based approaches may also be better able to create **alternative livelihoods**. One livelihood option is to invest into aquasilviculture, nurturing and exploiting, for example, mud crabs for commercial use within the mangroves. Another option is to sell mangrove propagules or built nurseries and offer larger plants to other communities. Some communities already partner with nearby schools, whose students come and pay PHP 10-15 for each seedling to be planted. Box 9 shows the example of a mangrove eco-tourism park as a potential source of alternative livelihoods. It should be noted, however, that such approaches are quite exceptional in the Philippines and cannot be applied to every single mangrove reforestation programme, as there is no one-size-fits-all solution, and alternative livelihood approaches can easily fail if they are not carefully designed.

Box 9: Potentials and limitations of mangrove-related eco-tourism – the case of the Silonay Mangrove Conservation and Eco-tourism Park

The coastal *barangay* Silonay in Oriental Mindoro has been identified by DENR as particularly vulnerable to coastal hazards such as typhoons and storm surges ("Mindoro Mangroves", 2014). In response to recurrent and destructive weather events, the governments of the Province of Oriental Mindoro and Calapan City established the 42-hectare Silonay Mangrove Conservation and Eco-tourism Park in close collaboration with CI. This pilot ecosystem-based adaptation project aims at rehabilitating and conserving community mangrove forests in order to mitigate negative impacts from storm surges, sea level rise and coastal erosion, thereby contributing towards protecting people's livelihoods. Apart from reforestation activities, the project includes an income diversification component that is co-managed by a community organisation of primarily housewives and fisherfolk (Conservation International, 2014).

Launched in November 2013, the eco-park attracts visitors with its close-to-nature activities and infrastructure, such as the 350-metre bamboo boardwalk, kayaking tours and a 6-meter-high observation tower, ideal for bird watching – all operated by the community organisation. Moreover, visitors can plant mangrove seedlings themselves or buy hand-painted t-shirts, souvenirs and locally prepared snacks, thereby providing additional income to the community ("Mindoro's Paradise Island", 2014).

Surveys conducted by CI showed a substantial increase in local mangrove species (from 8 in 2009 to 14 in 2014), which was attributed to reforestation activities ("Mindoro's Paradise Island", 2014). This benefits not only local biodiversity, wildlife habitats (e.g. for birds and bats) and the availability of fish and other aquatic resources but also strengthens the coastal residents' resilience towards the aforementioned hazards.

Box 9 (cont.): Potentials and limitations of mangrove-related eco-tourism – the case of the Silonay Mangrove Conservation and Eco-tourism Park

Although this successful example clearly demonstrates that in some areas there is unexploited potential with regard to mangrove eco-tourism, it remains uncertain whether this local approach can be transferred to a broader regional level. Since the establishment of basic touristic infrastructure requires, among other things, initial funding and capacity-building for the training of guides and park staff, the concept of the park will have to be linked to further personnel and funding sources, as, for instance, from the Department of Tourism or the Department of Social Welfare and Development. Moreover, replication and up-scaling of eco-tourism projects is limited to the actual extent of regionally existent market demand for such touristic supply and infrastructure.

Our research also proves some lessons with regard to practical programme implementation, as described below.

Different types of **targeting** have been used to select the beneficiaries for the ECfW programme: in some cases, participants were selected by the implementer, with selection criteria being, for example, membership in a fisherfolk's association or the poverty rate, whereas in other cases they were selected by the *barangay* captain. It is unclear which of the selection methods is preferable and whether the different backgrounds of participants impact the success of the programmes in any way. In general, people trust the *barangay* captain to select participants; however, it seems that selection is sometimes also used for political purposes, such as vote-buying. When *barangay* members had the choice to a) either include a large number of participants for a short period of time with a relatively low payment, or b) include only a small number of participants for a longer period of time with higher payments for each individual, they clearly preferred the first option. This shows the high prevalence of a sense of justice within the communities.

Different **payment schemes** are being used: per day, per area or per seedling. There was a broad consensus that payment per seedling is the most appropriate scheme. Furthermore, cash and individual payment is preferred over in-kind payment or group funds for the community (for paying school material, vaccinations, etc.). Past programmes, which were based on payment per seedling, offered participants cash ranging from PHP 2 to 6 per seedling. People agreed that PHP 6 per seedling is an appropriate amount but that payment needs to be higher if seedlings have to be gathered by the participants, as this would require additional effort. In some cases,

disbursements are tied to medium-term impacts, for example participants had to replant or received less money if mangroves did not survive. Avoiding delayed payment was mentioned as a very important element to keep up people's motivation.

In addition, **monitoring and evaluation** needs to be improved to ensure that programmes meet their objectives. For example, the NGP and other programmes aim to establish alternative livelihoods and reduce poverty, but there is no monitoring how recipients use their cash payments. Different modes of fairly basic output monitoring are in place, but there is no clarity about which mode works best. Reporting can sometimes be done by the programme participants themselves, and in other cases by *barangay* officials or government officials. In general, interviewees think that monitoring is more effective when carried out by the *barangay* members/ officials themselves – because they are already on site and are aware of local conditions – instead of monitoring being done by government officials. Success could be further improved by creating ownership through the allocation of specific areas of responsibility to individuals or groups, which is already practiced in some cases. On the other hand, political clientelism at the *barangay* level was mentioned as a problem. Hence, a combination of monitoring by *barangay* members/ *barangay* officials and government officials would probably be most effective.

In any case, **policy coordination** between central government entities and local governments need to be improved. Our field visits revealed that, in some cases, the same communities were chosen for the NGP as well as the PNAP programme, and sometimes even for reforestation programmes of NGOs or international organisations. Consequently, the same communities would receive money several times for the same purpose but with different procedures in terms of payment, monitoring, etc. Also, it seems that records of reforested mangrove areas from the various programmes are added up in national statistics, with the effect that the same areas would be reported more than once.

4.4 Policy recommendations

In the following, we present our main recommendations that shall serve policy-makers as suggestions, or even guidelines, on how to successfully complement reforestation activities with ECfW payments.

1. **Efforts to increase the Philippine's mangrove cover need to continue.** Given the enormous importance of mangroves for coastal protection, fishery and other environmental services, and considering the threats to this particular ecosystem, mangrove protection and rehabilitations programmes need to be continued. Strong weather events, such as typhoons, will continue to make reforestation programmes necessary to mitigate negative impacts on coastal ecosystems and coastal dwellers' livelihoods. Besides, there is mixed evidence on whether strong legislation on the cutting of mangroves alone can sufficiently prevent further mangrove degradation or whether complementary incentive policies are needed. By engaging a large number of participants, reforestation activities can raise collective awareness on the importance of mangrove forests and change people's mindsets towards a more sustainable resource use. The protection of mangroves should also be reflected in the government's policies and bills protecting the coastal and forest ecosystems, such as Executive Order No. 533, the Integrated Coastal Management Act, passed in 2006; and the Senate Bill No. 2179, the National Coastal Greenbelt Act of 2014, which is still pending approval.

2. **ECfW is a necessary component to achieve nationwide effects in the short term.** Without cash payments, it is very difficult to mobilise large-scale reforestation. Bottom-up initiatives for replanting mangroves out of conviction and without external payments exist locally and seem to be particularly valuable and sustainable, but they are unlikely to emerge spontaneously on a country-wide scale and without external facilitation, which in itself is costly.

3. **Mangrove programmes should gradually be developed from pure ECfW to comprehensive approaches.** While planting mangrove seedlings is relatively easy, rehabilitating a functioning mangrove ecosystem and ensuring its long-term protection is far more demanding. It requires proper planning and supervision with the involvement of local communities. An integrated approach would include accompanying measures such as long-term maintenance, monitoring and evaluation, as well as the promotion of alternative livelihoods for mangrove users. This may be costly and ambitious, but the simple focus on just increasing the number of planted mangroves through ECfW is likely to be unsustainable and costlier over the long term, as the repeatedly failed reforestation in ecologically unsuitable sites suggests. International funding for climate change mitigation and adaptation is likely to increase in the near future;

such funding should be used to implement comprehensive mangrove reforestation programmes.

4. **Set fixed payments across all programmes.** To optimise the efficiency and comparability of mangrove reforestation programmes and to ensure fair payments for everyone, it is recommended to agree on one fixed price to be paid to the planters, which should only differ in terms of whether the propagules were simply collected or also nursed.

5. **Support the assessment of mangrove cover to enable progress-tracking against a verifiable and unambiguous baseline.** The various figures existing for current mangrove cover in the Philippines complicate the tracking of progress made by reforestation programmes and lead to an ever-shifting baseline. Spatial planning and evidence-based site assessment are necessary preconditions in the field of natural resources management. However, these processes do not seem to be fully internalised within current mangrove reforestation efforts, thus restraining programme achievements. Creating a baseline of historical and present mangrove cover at the national and regional levels will further help to properly identify priority areas and potential reforestation sites and to continuously monitor and evaluate programme progress. Also, it guarantees transparent project site-selection that is based on technical and environmental considerations rather than on political reasons. Initiatives such as the Phil-LIDAR 2 programme should receive sufficient funding and support to ensure coherent and validated figures on mangrove cover. They should be accompanied by ground-truthing.

6. **Improve monitoring, evaluation and enforcement.** To assess the environmental and social impact of mangrove reforestation programmes, it is important to translate environmental and social objectives into measurable indicators and monitor progress continuously. Measuring the amount of hectares or seedlings planted tells little about programme success. Complementary indicators should address issues such as short- and long-term effects on livelihoods, the level of ecosystem biodiversity reached through reforestation measures, the increase in the availability of aquatic resources or the number of violations that are still encountered. Villagers, *barangay* officials and government officials should work hand in hand to guarantee effective monitoring and enforcement. The local *Bantay Dagat* should be included in the enforcement activities, as they are the designated representatives of the municipality, having the

mandate to arrest violators and to refer them to court. If not already in place, implementing agencies should assist the LGUs in establishing municipal and/or *barangay* ordinances that outline viable sanctioning procedures for the destruction of mangroves. Depending on the severity of the offence, gradual sanctions might be preferred. A transparent monitoring system is also essential to avoid corruption, which seems to be prevalent from the national level down to the local level, and ensure full disbursement of ECfW funds to local workers. Lastly, double counting of reforested areas should be avoided by registering the municipalities that have already participated in reforestation programmes and by monitoring and validating the reported mangrove areas, not only via spatial images but also through random tests on the ground.

7. **Foster coordination and policy learning among implementing agencies.** As a "comprehensive assessment of all reforestation activities that include those which are not conducted by DENR has not been conducted yet" (Israel & Lintag, 2012, p. 5), there is limited knowledge about the outcomes and long-term impacts that these various activities have had in the past – and will have in the future. A necessary step was taken by the government, which recently assigned the Philippine Institute for Development Studies to conduct an impact assessment of the NGP that considered not only the environmental and economic dimensions but also the social and institutional ones (Israel & Arbo, 2015, pp. 6-7). This should be expanded to other reforestation programmes that do not fall under the NGP and are implemented by other actors.[25] A systematic evaluation of these different approaches would reveal which programme design has eventually proven itself to be most effective and can trigger policy learning among implementing agencies. Moreover, this learning process would stimulate closer coordination between the main actors in the field of mangrove reforestation and contribute to harmonising the different project approaches.

8. **Undertake site-specific zoning before planting and consider abandoned fishponds as primary sites for rehabilitation.** To ensure that reforestation meets local ecological requirements and that reforestation

25 Programmes are sometimes directly implemented by state departments, and sometimes contracted out to universities or NGOs. The performance of these implementing agencies should be evaluated in terms of their capacity to manage project funds and to supervise planting activities, among other criteria. Implementers that do not perform well, for example delay in fund disbursement, should not be taken into consideration for future projects.

sites are ecologically appropriate to guarantee comparatively higher survival rates of seedlings, site-specific conditions need to be analysed. For this purpose, there needs to be a detailed mapping of the designated area, data on historical mangrove cover should be obtained, followed by the development of a zoning plan of the respective sites. This plan would clearly designate areas for reforestation as well as for natural rehabilitation, indicating mangrove species that originally grew in that designated area and that are, thus, better adapted to grow either in exposed seafront sites or in middle to upper intertidal sites, respectively. Seafront planting faces challenges due to wave energy and strong winds and should thus be accompanied by the nursery of propagules, further protection and maintenance measures. To effectively steer the rehabilitation of abandoned, undeveloped and underutilised fishponds, an assessment of the current fishpond area should take place, distinguishing between productive and idle as well as between different ownership conditions (privately owned, with lease agreements, or illegal). The process of conversion would have to be fast-tracked; banks would have to be monitored on a regular basis as to whether the loans granted are, in reality, used for the development of ponds; and DENR, BFAR and the LGUs would have to clearly divide the mandates between them to avoid confusion and ambiguity in terms of the allocation of areas for fishpond development and for mangrove conversion.

9. **Fund research on the link between mangrove biodiversity and the availability of aquatic resources.** Current reforestation efforts mainly concentrate on the plantation of *Rhizophora* species. There are good reasons to assume that a more diverse selection of mangrove species would enrich local biodiversity, potentially benefiting the reproduction of various commercially important fish species and other edible resources. The communication between scientists and implementers should be improved, and it should be kept in mind that the prerequisites, growth patterns and resiliency vary tremendously among the different mangrove species. Therefore, also the "survival" of a seedling is a relative concept and depends on the species planted, not on the reforestation programme.

10. **Release additional funds, allowing for longer time periods of maintenance and monitoring of mangrove seedlings in order to achieve higher survival rates.** Although the common practice would be to finance maintenance for up to six months (which usually coincides

with the seedlings' development of six leaves), experts state that it takes five to ten years to assess whether a new plantation will grow into a new mangrove belt. Hence, a substantially longer period of maintenance is required. It is therefore advisable to allocate designated reforestation areas to a certain group of participants and to link part of their payment to a periodic assessment that is based on their maintenance work and the seedlings' survival rate. Such a results-based performance scheme can enhance the participants' continuous commitment to – and ownership of – the project, as they will feel responsible for their proper area.[26] Apart from demarcating reforestation areas, fencing off newly planted areas (seafront) can serve as a means of protecting young seedlings from being damaged or uprooted by passing fishing boats.

11. **Ensure reliable cash disbursement to the participants.** When conducting an ECfW programme, the reliable disbursement of funds is of utmost importance. Given the poverty of most programme participants, implementing agencies need to disburse funds also for initial expenses (e.g. boat gasoline for collecting mangrove propagules). If a sequenced payment scheme is implemented, the release of cash should be on time in order to sustain the participants' continuous commitment to the maintenance of mangrove plantations and future project activities. This also applies to programmes for the development of alternative livelihoods: in some cases we found communities that had made initial investments, for example in setting up fish cages or crab fattening, lost these investments because programme funds were not disbursed in time, and fish and crabs died because the local community had no money to feed them.

12. **Invest in alternative natural resources.** Where mangroves are cut for their timber and used as building materials, investment in other natural resources should be increased to reduce the pressure on mangrove ecosystems. One option is the planting of bamboo, which grows fast and can be harvested already after five years. In addition, bamboo has a higher carbon sequestration rate.

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26 When considering such a results-based payment scheme, one should also consider factors that cannot be influenced directly and might negatively impact the seedlings' survival rate (e.g. storm surges or encroachment by outsiders). These factors cannot be traced back to the participants' actual maintenance efforts and should thus not result in lower payments. An option could be to offer an agreed basic payment and, in addition, a reward for good performance in terms of above-average survival rates.

5 Conclusions

The Tragedy of the Commons is a severe problem for both fish and mangrove resources. Population growth and climate change add to the pressure on natural resources. Therefore, genuine efforts at the national level are needed to shift to sustainable resource use. Financial incentive schemes that complement existing policies are an important part of these efforts. The schemes we discussed and compared to each other were PES, ECCT and ECfW schemes.

Our analysis suggests that a successful implementation of PES and ECCT schemes is only possible to a limited extent in the Philippines due to institutional constraints and the lack of data. However, we suggest to continue exploring PES and ECCT schemes and to invest in creating the very preconditions that have so far limited their applicability and effectiveness. This mainly includes establishing baselines with regard to natural resources and socio-economic data, clarifying property rights and encouraging buyers of ecosystem services.

ECfW programmes are the most suitable scheme to implement when aiming for environmental as well as social improvements under the current institutional constraints and data restrictions, especially because monitoring and verification of compliance is relatively easy. ECfW can effectively contribute to the sustainable management of natural resources. This has been proven by the examples of fishery management and mangrove reforestation. For the closed fishing season, the ECfW component prevented leakage to other bays, provided an income to commercial fishers and led to a higher general acceptance of the closure. For mangrove reforestation, the ECfW programme encouraged reforestation, increased mangrove cover in the project sites and provided additional income for participants during the programme.

Consequently, we propose two things: first, to establish the basis for more elaborate and sustainable schemes such as PES and ECCT, and second, to improve and upscale ECfW programmes to be able to carry out interventions in the near future. To ensure that ECfW programmes can make a substantial contribution to the sustainable management of CPRs, they have to be carefully and context-specifically designed. To ensure a sustainable management of natural resources, the following main conditions should be fulfilled.

First, **evidence-based impact chains that fit the objectives need to be established**. This implies, as a precondition, that the programme objectives need to be clearly defined and underpinned by performance indicators and baseline studies. So far, this is rarely the case. In the case of the closed season in Balayan Bay, for example, poverty objectives were pursued on paper but poverty-targeting of households was very imprecise. Indicators exist only for short-term objectives for both case studies (e.g. survival rates of mangroves) and baselines are largely missing (e.g. decline of particular fish species; existing mangrove cover). Also, the assumed impact chain from ECfW to sustainable resource management requires a better scientific basis. In the case of fishery, data is lacking on fish stocks, migration cycles, larvae dispersal patterns, etc., which makes it very difficult to measure progress. In the case of mangrove reforestation, serious doubts have been raised with regard to the inappropriate selection of sites and species. Therefore, more accompanying research is necessary as a basis for evidence-based policy-making.

Second, **ECfW needs to be well-embedded in a systemic policy approach.** Switching from unsustainable to sustainable resource use presupposes far-reaching changes, not only in people's values and attitudes but also in governance systems. This requires the harmonisation of already existing regulatory frameworks and the co-management of resources between the national level and local authorities and communities. For example, user boundaries have to be defined in collaboration with all concerned stakeholders, which has been acknowledged by the authorities in Balayan Bay, where the closed season was implemented. Also, ECfW depends on effective enforcement, which requires ownership and the participation of enforcement bodies at different levels. Strengthening the apprehension and reporting chain in the case of violations is therefore essential, as well as including local and national enforcers in one task force, such as the Batangas Environmental Response Team. It is obvious that a single incentive scheme such as an ECfW arrangement cannot substitute for all these reform needs. It can, however, have positive effects on the overall governance, for example when it helps to create environmental awareness or to build trust among citizens and local governments.

Third, **ECfW programmes need to be additional to the business-as-usual scenario.** This, however, proves to be quite difficult in certain contexts. For example, in the case of the closed season experiment, it is prohibited by law for commercial fisherfolk to fish in municipal waters.

Therefore, the programme is not additional if benchmarked against the de jure situation. However, since commercial fisherfolk do catch fish within the 15 km boundary and no sanctions are imposed upon violations, the ECfW programme is clearly additional if compared to the de facto situation. The ECfW scheme was furthermore the key incentive for fisherfolk to cease their fishing activities during the closure. The same holds true for mangrove reforestation. Despite their awareness of the mangroves' value, community members rarely start replanting without any form of compensation. Policy-makers should, however, be careful not to create perverse incentives: community members who know that there is a possibility to get paid for conservation activities may either be discouraged to carry them out without a financial reward or switch their occupation to be eligible for the ECfW payments.

Fourth, **ECfW needs to be scaled-up in order to make a nationwide impact.** At the moment, numerous different programmes are being tested on a very small scale, such as the closed season in Balayan Bay and many NGO-driven mangrove reforestation schemes. Without having access to long-term funding, they only serve as testing grounds to find and assess policy solutions, and their actual contribution to the sustainable management of CPRs is relatively small. The establishment of special funds such as the NGP and the Mangrove and Beach Forest Development Project for mangrove reforestation are first steps in the right direction and need to be followed up to ensure an up-scaling of pilot sites. When national funds are created, they also need to account for regional differentiation. Our finding that programme success depends on the "fit" with local governance structures and on co-management with local authorities calls for flexibility also in funding. With regard to the closed season, there is currently no governmental funding available for a second round. To leverage further funding, alternative donors should also be considered, including private-sector companies. Possible synergies and mutual interests should thus be identified as early as possible to guarantee a continuation of the ECfW programme. Moreover, ECfW schemes should aim at improving the very policy framework of the country, guaranteeing adherence to already existing laws, institutionalising innovative ideas with regard to environmental protection and improved livelihoods, and paving the way for even more sustainable financial incentive schemes, such as PES and ECCT.

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Annexes

Annex 1: NGP 2014 cost per hectare

Species/ Commodity	Seedlings			SMP	Social mobilisation		First year maintenance and protection	First year total	Maintenance and protection		Total cost per hectare
	Density (per hectare)	Unit cost	Cost per hectare		Site preparation	IEC/transport/mobilisation			Second year	Third year	
Mangrove (Propagule)	2,500	3	7,500	450	3,000	1,000	1,000	12,950	3,000	2,000	17,950
Mangrove (Potted)	2,000	15	30,000	450	3,000	1,000	1,000	35,450	3,000	2,000	40,450

Source: Adapted from Forest Management Bureau and Department of Environment and Natural Resources (2014)

Annex 2: Management strategies for the utilisation of fishponds in the Philippines

Fishpond lease agreement active	
1) Overall fish yield is optimal → semi-intense aquaculture	2) financially not sustainable → optimise production and reduce pond size
Fishpond lease agreement expired	
3) Pond existence is necessary (based on bioeconomic analysis) → reapply lease agreement and optimise fish yield	4) Pond existence is necessary and production is suboptimal (based on bioeconomic analysis) → revert to mangrove areas through natural vegetation or assisted planting
Titled ponds	
5) Active → aquasilviculture	6) Idle → optimise fish yield, reduce pond size and revert unutilised areas to mangrove forest

Source: Adapted from Samson and Rollon (2011)

Annex 3: Cash for Work for mangrove reforestation programmes in project sites in Mindoro and Palawan						
Barangay	**Agency**	**Date**	**Participants**	**Area**	**Payment**	**Alternative livelihood**
Budburan	DENR NGP	2012				
	BFAR	2012				
	DENR NGP	2013	40 households, especially poor households and *mangyan* (indigenous people)	For every seedling planted and for the time used PHP 2 per seedling		
	LGU (Strategic Intervention and Community-focused Action towards Development – SICAD)	2013				
Milagrosa	DENR	2010				
	BFAR	2011 3 days	72 participants responsible for 1 ha, each of them employed 4-5 people, who were chosen by them (without considering specific criteria)	72 ha abandoned fishponds 5,000 mangroves each	1st payment PHP 4,000 / person 2nd payment PHP 1,000 / person	

Annex 3 (cont.): Cash for Work for mangrove reforestation programmes in project sites in Mindoro and Palawan						
Barangay	**Agency**	**Date**	**Participants**	**Area**	**Payment**	**Alternative livelihood**
Milagrosa		2012	*Barangay* officials, day care workers, health workers, *Barangay* police		1 day, PHP 200 per day + a T-shirt	
	BFAR	2013	50 persons (*Barangay* officials, Philippine Army)	1 ha 3,000 plants		
Ansiray	DENR	2010-12	Participation voluntary, especially poor people			
	BFAR (PNAP) Implementer: University	2012-14, each time 3 months	8 groups of 8-10 members Participation voluntary, especially poor people	100,000 seedlings	Payment: PHP 6 per seedling Planters need to take care of their mangroves for 3 years	Aquasilvi-culture
Busy Bees	LGU	2012 1 day	High school students			
	BFAR (PNAP) Implementer: Western Philippine University	2012 1 month	30 participants, fisherfolk, usually those belonging to the fisherfolk association 4 groups		Collection of seedlings – PHP 1 Planting – PHP 2 Survival (after 6 months) – PHP 3	Aquasilvi-culture
	2014	CTI 1 day	High school students			
Source: Authors						

Annex 4: List of interview partners in the context of closed season fisheries

Organisation	Name	Function
National level		
Ecofish/ USAID	Nygiel Armada	Deputy Chief of Party
	Rina Maria P. Rosales	Senior Resource Economist
	Manuel E. Narvadez, Jr	Site manager
National Fisheries Research and Development Institute	Noel C. Barut	Interim Executive Director
	Dr Mudjekeewis D. Santos	Scientist II
NGOs for Fisheries Reform	Dennis Calvan	Executive Director
ASEAN Centre for Biodiversity	Atty Roberto V. Oliva	Executive Director
	Dr Sheila Vergara	Director, Biodiversity Information Management
	Lilibeth R. Cabebe	Clearing Housing Mechanism and Knowledge Management Officer, Biodiversity Information Management
	Dr Filiberto A. Pollisco, Jr	Policy & Programme Development Specialist
	Dr Berthold Seibert	Project Director, ACB-GIZ Biodiversity and Climate Change Project
Regional/provincial level		
Bureau of Fisheries and Aquatic Resources	Rosario C. Del Mundo	Fisheries Officer
DSWD – Sustainable Livelihood Programme	Melantie C. Aceveda Luis Daniel de la Cruz	Regional Project Coordinator Sustainable Livelihood Programme, Project Development Officer

Annex 4 (cont.): List of interview partners in the context of closed season fisheries		
Organisation	**Name**	**Function**
Regional/provincial level		
DSWD – Sustainable Livelihood Programme	Evangeline O. Inigo	Sustainable Livelihood Programme, Project Development Officer
Environment and Natural Resources Office (PG-ENRO), Provincial Government of Batangas	Loreta Sollestre	Head of Coastal Management Section
Local level		
Municipality of Bauan	Antonio V. De Lacy, Jr	Municipal Administrator/ ICT Head/ DRRM Officer
	Wilfredo C. Guevarra	Municipal Agriculturalist
	Evelyn Cullar	MFARMC and Bantay Dagat
	Femie D. Bautista	Municipal Tourism Officer
	Noel C. Bautista	Municipal Secretary
Municipality of Lemery	Charisma M. Alilio	Mayor of Municipality of Lemery
	Theresa Valencia	Municipal Agriculturalist
	Domingo Bonado	MFARMC
	Maria Cristina Rosales	MPDE
	Marlene M. Palo	MSWD
	Cecilia Carolino	MENRO
	Nelia Aguila	Engineer 1 at the Municipal Engineering Office of Lemery

Annex 4 (cont.): List of interview partners in the context of closed season fisheries		
Organisation	**Name**	**Function**
Local level		
Municipality of Calaca	Alice Cabrera	Municipal Agriculturalist
	Alice Balitustis	Municipal Agriculture Officer
	Luisito M. Manalo	Municipal Planning & Development Coordinator and Zoning Administrator
	Edwin Talaog	MFARMC Chairman
	Maharani G. Bahasa	MSWD
	Vicente Catambay	Office of the MA/ Bantay Dagat
Municipality of Balayan	Christa S. Manguiat	Municipal Agriculturalist
	Ramelyn H. Creag	Fishery Technician
	Felipe C. Delos Reyce	MFARMC Chairman
	Jasmin O. Andal	Chairperson Committee of Agriculture/Fisheries, Municipal Councilor of Balayan
Municipality of Calatagan	Emelyn C. Custodio	Municipal Agriculturalist
	Wilfredo A. Hernandez	MFARMC Chairman
	Rodrigo de Jesus	Bantay Dagat Chairman
	Beatrix Pastas	MSWD
	Rexio P. Bautista	Sangguniang Panlalawigan
Additional expert interviews		
	Romeo B. Trono	Former Country Executive Director Conservation International Philippines
Source: Authors		

Annex 4 (cont.): List of interview partners in the context of mangrove reforestation		
Organisation	**Name**	**Function**
Bureau of Fisheries and Aquatic Resources (BFAR)	Dr Nelson A. Lopez	Chief, Inland Fisheries and Aquaculture Division
Department of Environment and Natural Resources (DENR)	Manuel Escasura	Regional Coordinator, National Greening Programme, Region 4B (MIMAROPA)
Department of Environment and Natural Resources (DENR) – Ecosystems Research and Development Bureau (ERDB)	Henry A. Adornado	Director
	Dr Antonio M. Daño	Assistant Director
GIZ	Terence P. Dacles	Senior Advisor
	Klaus Schmitt	Chief Advisor
Food and Agriculture Organization of the United Nations (FAO) – Provincial Office San José, Occidental Mindoro	Celso M. Tatlonghari	Provincial Programme Officer & OIC – Area Operations Officer
	Samuel Joseph M. Castro	Programme Officer
Palawan Council for Sustainable Development (PCSD)	Madrono P. Cabrestante, Jr	Chief of Environmentally Critical Area Network Knowledge Management Division
Philippine Institute for Development Studies (PIDS)	Dr Danilo C. Israel	Senior Research Fellow
Philippine Tropical Forest Conservation Foundation (PTFCF)	Eric Buduan	Senior Project Officer
Western Philippine University (WPU)	Dr Lota A. Creencia	Dean, College of Fisheries and Maritime Technology

Annex 4 (cont.): List of interview partners in the context of mangrove reforestation		
Organisation	**Name**	**Function**
World Wide Fund for Nature (WWF) Philippines – Provincial Office Mamburao, Occidental Mindoro	Lito Tiongson	Project Manager
World Wide Fund for Nature (WWF) Philippines – Provincial Office Puerto Princesa, Palawan	Marivic Matillano	Project Manager
Zoological Society of London (ZSL)	Dr Jurgenne Primavera	Chief Mangrove Scientific Advisor
	Dr Heather Koldewey	Head of the Marine and Freshwater Programme
Source: Authors		

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