Upscaling solutions

The role of conditional transfers for poverty reduction and ecosystem management

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While policymakers juggle policy objectives, budgets and votes, protecting the environment rarely gets the same political traction as poverty reduction. But as the Sustainable Development Goals are introduced, governments will need to tackle both these issues simultaneously. This paper looks at ways to combine economic instruments that tackle both social and environmental objectives at the same time. It looks at eight countries in Africa, Asia and Latin America using payments for ecosystem services (PES) or conditional social transfers (CST) at a national level to alleviate poverty and address environmental problems – from guaranteed employment to improve soil in India, to compensation during seasonal fishing bans in Bangladesh. It examines the challenges, the opportunities and the lessons for upscaling these policies in the new era of Sustainable Development Goals.

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Summary

Linking poverty and environmental actions offer potential for success, but the process is not pain-free. Tackling environmental and social problems requires a combination of multiple policy instruments. They may include government regulation such as rules and prohibitions, property rights, better education and capacity building, direct support to the vulnerable, and market-based instruments.

Market-based instruments are the focus of this paper. Over the last 20 years, we have learnt a great deal from programmes using economic instruments to improve ecosystems and reduce poverty. But these policy objectives have largely been pursued in isolation: from each other, and from other instruments. By harnessing the extensive experience gained so far it is now possible – and timely – to explore how combined or hybrid market-based instruments can achieve multiple objectives and what are the trade-offs of doing this, particularly at the national level. From improving the natural assets of the poor to promoting food security and poverty reduction, these tools warrant greater political support – and a larger share of government and donor budget for upscaling.

Two such policy instruments are payments for ecosystem services (PES) and conditional social transfers (CSTs). PES rewards ecosystem management agreements (such as improving soil conservation) expected to result in ecosystem benefits, like cleaner water or reduced carbon emissions. CSTs are a form of social protection, usually cash, used by governments to help poor or vulnerable people – provided that they meet targets or adopt behaviours with positive social impacts or which deliver public goods (such as sending their children to school).

Bringing science into policy

We now have a growing wealth of information on ecosystem services, from scientific measurement to tools to manage them.[1] A recent meta-analysis of PES schemes shows that effectiveness (in terms of additionality) increases with three features of PES design: spatial targeting, payment differentiation, and strong conditionality (Ezzine-de-Blas *et al*., 2016). The conditionality element attached to payments for ecosystem services has led to more attention to the links between action and effect: for example, does a particular land practice result in more stable water flows? By working with scientists like hydrologists, biologists and climate experts we have gained a better understanding of how ecosystems work. The debate has expanded to challenging myths that underpin many environmental policies and limit their effectiveness. For example, trees do not directly produce rainfall, and felling them does not automatically result in flooding (Calder and Aylward, 2006; Bonell and Bruijnzeel, 2005). It has also help question 'siloed' policies: for example, investing in upstream land management to improve water supply will bring little benefits to downstream users if it is not accompanied by similar investments in water delivery policies. As is the case for many other environmental instruments, there is a lack of large-scale randomised controlled studies that unequivocally connect PES to ecosystem outcomes. However, PES pilot experiences are providing lessons on how direct, conditional rewards may change behaviour, and from there what impacts we can expect on ecosystem services.

[1] See for example www.espa.ac.uk.

A struggle to upscale

Despite this, with a few exceptions like China and some Latin America countries, PES remains a minor instrument in the policy portfolio – in terms of scale of implementation and political priorities – and has struggled for financial sustainability. This is one reason why it is so difficult to measure impact, because it does not achieve sufficient geographic scale to make significant impacts, or because projects remain at pilot stage and lack permanence over time. Some suggest that one reason is that many PES schemes lack focus on equity issues and poverty reduction – or do it almost as an after-thought (see for example Pascual *et al.* 2014). This makes them appear less socially acceptable and therefore less of a priority for policymakers.

A 'people first' approach

Social issues tend to receive more attention in the policy portfolio. Most governments already allocate funding for social protection, and have a strong mandate to deliver on it. Conditional social transfers (using cash or asset transfers) are often used to increase positive social outcomes for the good of the household: the cash element associated with the transfer is seen as having a directly positive impact on household wellbeing, while the conditionality – such as sending your child to school or to be vaccinated – boosts child health and education and contributes to household human capital. Cash injections also have multiplier effects in the economy. For example, they can increase the demand for better educational facilities and therefore investments in infrastructure (Kakwani *et al.*, 2005). For public works schemes, the condition for payment is to work, often on locally prioritised infrastructure and ecological improvements.

Lessons from practice

We looked at eight national programmes that combine environmental and social objectives, using PES or CSTs, in Bangladesh, Brazil, Costa Rica, Ethiopia, India, Mexico, the Philippines and South Africa. These programmes all have some level of conditionality attached to their transfers, and use different forms of targeting. By making explicit the connections between poverty and environment, and through careful targeting, most of these programmes have managed to achieve some level of both social and environmental impacts in places where poverty and environmental problems coincide. CSTs are evolving from targeting the immediate causes of poverty during a crisis, to addressing underlying causes of poverty linked to environmental degradation during non-crisis times. We find that the sheer size of these programmes means that their impact on the environment can be, and is, significant in the aggregate.

The key challenges they face are similar to any programme of this scale and linked to efficiency – or lack of it: technical capacity, delays in transfers and reporting, lack of strong monitoring and evaluation, and staff turnover. Acknowledging that trade-offs exist is important, but should not be a deterrent to implementing pro-poor investments with clear environmental objectives. We find that while trade-offs occur, the likelihood of reaching poor people and protecting the environment increases if both objectives are clearly stated from the onset. Lukewarm approaches where either objective is just an "add-on" are more likely to have less impact and divert resources. Targeting and conditionality are useful mechanisms to increase permanence, but parallel measures are also needed when working in fragile ecosystems and/or with ultra-poor households.

1 Introduction

By affecting the way markets behave, policymakers try to harness their ability to deliver solutions to poverty and environmental issues. Typically, governments use a mix of regulation and incentives: they can set prohibitions or rules that legally bind behaviour; assign property rights; change perceptions through education; and change the perceived profits or costs by using incentives or taxes.

In this document we concentrate on two instruments used to change behaviour through direct incentives: payments for ecosystem services (PES) and conditional social transfers (CST).

Payments for ecosystem services (PES) are rewards or compensations given to people for protecting and improving ecosystems. Through their implementation we have learned that these positive incentives can be useful to promote better land-use practices (Wunder, 2015). We also learned that monitoring conditionality (such as asking, "Did the activity take place?") before giving the reward increases the chances of a positive environmental outcome (such as cleaner water). The emphasis on conditionality has also focused more attention on scientific understanding of ecosystem dynamics, with an increase in multidisciplinary research. But with a few exceptions, PES programmes have not been very good at amassing sufficient resources to scale up, and most schemes remain at pilot or micro level. Experience from ongoing PES suggests that they may moderately help reduce poverty (Wunder, 2016). and in many cases the payments go to large or relatively wealthier landholders (Porras, 2010, Rosa da Conceição *et al*., in press). This is no surprise, since the main objective of PES is to achieve environmental outcomes.

Conditional social transfers (CST) are social benefits used by governments to address welfare. Already in use for many years, they have also been widely evaluated. A wealth of knowledge has been produced on the way that conditionality affects outcomes, such as those conducted by the MIT Poverty Action Lab, the International Initiative for Impact Evaluation (3ie), and the World Bank Impact Evaluation Group. These instruments are perceived as helpful for poverty alleviation, and usually carry more political weight than instruments to address environmental issues only. Some CSTs have environmental conditions attached, like planting trees (such as in Ethiopia or Bangladesh). Since social planning institutions usually manage these programmes, however, the environmental outcomes are usually weak.

In this paper we look at the key design elements of both instruments. We also look at the potential for using them either as one single instrument (such as 'conditional socio-environmental transfers') or used in combination at national level.

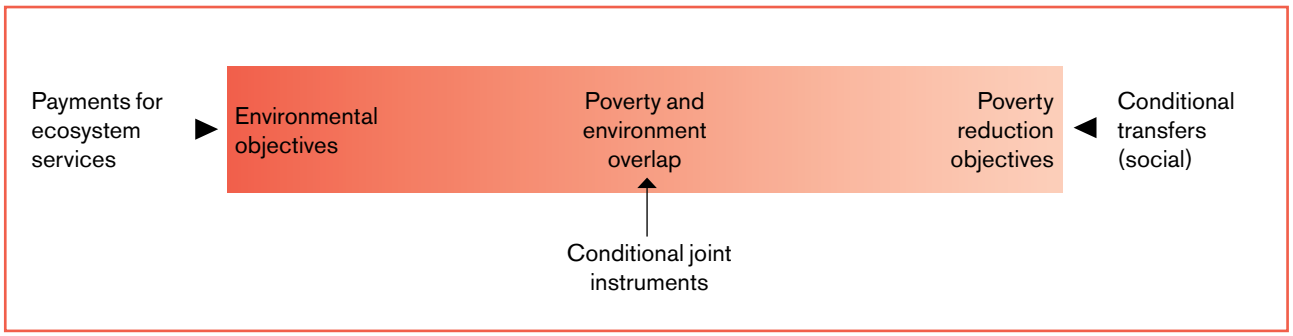
1.1 Key questions

Our aim is to analyse the key elements from a selected range of case studies in South East Asia, Africa and Latin America, looking at governance structure, impacts and their potential for upscaling. In particular, we ask:

1. What are the similarities and differences between CST and PES?
2. What are the opportunities and challenges in combining CST with PES to increase poverty and environmental outcomes?
3. What are the opportunities and challenges for CST in upscaling PES schemes?

Learning from CST can help inform the PES agenda by 1) helping to identify the 'environmental poor'; 2) reflecting on how CSTs work and are applied (such as targeting and conditionality); and 3) exploring the potential for overlapping agendas to provide funding for upscaling PES.

Figure 1. Economic instruments for environmental and poverty objectives



2

Shaping instruments to provide solutions

This section discusses why social issues – in particular poverty – and the environment could be approached together. It also discusses how incentive-based instruments can be used to change market signals to promote poverty alleviation and better ecosystems. We concentrate on two instruments: payments for ecosystem services and conditional social transfers.

2.1 Market gaps create imbalances

More often than not, markets ignore the benefits of resilient ecosystems and people.

A general state of environmental health provides multiple positive benefits beyond the individual and towards society at large. For instance, sustainable land management has direct impacts on nutrients on the site, but can also help regulate water inflows into a hydroelectric project. Likewise, healthier and better educated children will strengthen human capital to fuel the country's development.

But while the monetary values of such benefits are often missing, the cost of their absence is only too well known. Declining soil quality requires fertilisers. Reservoirs need constant dredging of sediments. Polluted rivers and estuaries affect fish catch and many people will lose their jobs, from fishermen to those who help distribute it along the chain to consumers. People who are unwell are less economically active members of society.

The imbalance in values, benefits and costs accounting often results in underinvestment in social and environmental capital. Governments use different instruments to correct these market failures, for example creating institutions to fill the gap (schools, or national parks), through regulation (like prohibitions to fish during certain seasons, or to deforest) or through 'economic' instruments that affect prices, like taxes, subsidies and incentives.

2.2 Instruments to correct market signals

While their objectives are different, conditional social transfers and payments for ecosystem services are similar in design. They are incentive-based instruments (e.g. seek to change behaviour through a reward) that try to increase impacts through a more targeted approach (e.g. focus on specific population or ecosystem), and use conditionality as part of their approach. They have been criticised on similar grounds to each other. For example, payments can create 'rent-seeking behaviours';[2] or create disincentives such as not conserving the environment without PES, or not seeking employment unless CSTs are given. As with CSTs, conditionality and targeting play a role in PES. These two conditions set them apart from other instruments, like integrated conservation and development projects, unconditional cash transfers and universal subsidies.

[2] Rent-seeking behaviour seeks to increase one's own share of wealth without creating new wealth to benefit society more widely.

2.2.1 Payments for ecosystem services

Environmental conservation has traditionally been achieved through direct interventions and regulation, such as creating national parks, prohibitions, or by assigning property rights. **Payments for ecosystem services** is a newer instrument that seeks to align the positive externalities created by good ecosystem management with incentives. There have been multiple definitions of PES, but for the purposes of this document we base our understanding on Wunder (2015) and Rodríguez *et al.* (2011). To be identified as PES, transfers must be: 1) voluntary – in the form of monetary payments or in-kind rewards; 2) involving service users (who benefit and can pay – including the government) in sharing costs of provision if ecosystem services; 3) targeted at service providers (normally landowners or those who manage the ecosystems); 4) conditional on agreed rules of natural resource management; and 5) generate offsite ecosystem services (externalities) – or at least demonstrate a change of behaviour that is expected to affect ecosystem services.

We now have a wealth of experience from PES projects since their beginnings in the late 1990s. For example, PES is used to improve land practices in watersheds to provide cleaner water. Or it can used to promote climate resilience in supply chains by planting trees in small coffee plantations. Making beneficiaries share the cost of provision, and the conditionality element attached to payments for ecosystem services has led to more attention to the links between action and effect: for example, does a particular land practice result in more stable water flows? By working with scientists like hydrologists, biologists and climate experts, we have gained a better understanding of how ecosystems work.

The debate has expanded to challenge the myths underpinning many environmental policies and limiting their effectiveness (Kaimowitz, 2004). It has also helped question 'siloed' policies: for example, investing in upstream land management to improve water supply will bring little benefit to downstream users if it is not accompanied by similar investments in water delivery policies. The debate is helping increase our understanding of what land-based practices can and should be encouraged, and what changes in ecosystem services can be realistically expected. Some of the lessons from PES include:

- *Information and tools to measure impacts*. There are now several well-established platforms that support practical tools to improve science and policy interactions. This work has been supported by agencies like the UK Department for International Development (DFID), the German Corporation for International Development (GIZ), the Food and Agriculture Organization and the World Bank, making science more accessible to underpin these policies.
- *Forest hydrology.* The development of payments for watershed services has benefited from the advances in forest hydrology and integrated watershed management studies. Significant research has gone into understanding the relationship between forests and the management of water and land resources (Calder and Aylward, 2006, Bonell and Bruijnzeel, 2005, Calder, 2005). For example, challenging assumptions such as 'more forests, more water' and trying to understand the role of vegetation in evapotranspiration. The literature on the impact of trees on seasonal flows has also helped improve our understanding of the soil–water relationship. It questions the 'sponge effect' theory – that trees are expected to absorb water during rainfall and slowly release it into the ground. Instead, evidence shows that local conditions (type of soil, type of tree) are generally responsible for dry-season flow direction and magnitude of change. The impacts on flooding are also debated, again demystifying the role of trees and bringing the role of soil conditions to the fore, as well as the location of communities at risk of flooding (Calder and Aylward, 2006).
- *Regulating greenhouse gases.* We have gained a better understanding of carbon stocks, both above ground (such as in trees) and in the soil (Ryan *et al.*, 2011; Mitchard *et al.*, 2012); and this has improved our understanding of the land-based activities required to improve capture of greenhouse gas emissions. This directly informs the design of national schemes entering compliance and voluntary carbon markets and is key to designing activities that can avoid and/or mitigate the effects of climate change.
- *Soils and nutrients.* We now have a wealth of experience on the benefits of soil and water conservation strategies, especially linked to agriculture and greenhouse gas emissions (such as CO_2, CH_4 and NO_2); but also water quality and its regulation (see for example Rattan, 2014, for a summary of methodologies and impacts). This has important repercussions for the design of national programmes that directly target sustainable development goals for food security and the mitigation of climate change.
- *Marine protected areas*. Payments for ecosystem services has been less used in coastal and marine environments – where resources (fish) are more mobile and harder to monitor (Coral Reef Alliance, 2008) and where property rights are often ill-defined or insecure – remains embryonic. But it is increasingly seen as an option to increase the attractiveness of improved fishing methods, and/or to capture revenues along value chains to protect spawning sites. If well-designed, PES schemes could play a significant role in incentivising fisher or coastal communities to conserve, restore and sustainably manage their resources.

A growing number of examples from across the world point to ways in which adding PES to existing 'regulatory' schemes can make them more effective in protecting both environments and livelihoods. Compensating for lost earnings in marine protected areas – areas of coastal land and water where fish harvests are restricted (Albers, 2012) – typically aims to protect the resources underpinning livelihoods, while conserving biodiversity and recreation sites. But the combination of degraded fish stocks and harvest restrictions create difficulties for nearby communities with no other way to make a living and can be particularly costly, especially in the short term, for artisanal fishers. Adding a PES scheme into the mix can compensate these fishers for lost revenues and provide a strong incentive for them to actively participate in protecting coastal and marine parks (Mohammed, 2012).

As is the case for many other environmental instruments, there is a lack of large-scale randomised controlled studies that unequivocally connect PES to ecosystem outcomes (Ezzine-de-Blas et al., 2016). However, pilot experiences of PES are providing lessons on how direct, conditional rewards may change behaviour, and from there what impacts we can expect on ecosystem services. A better understanding of science – and tighter purses – has seen policymakers move towards evidence-based policies like PES that have been built on the recognition that investments in land activities do in fact impact on the provision of ecosystem services.

However, while PES has been used for a while in several countries in its different forms, it remains at pilot level or small-scale in most cases.

Some PES programmes have objectives in terms of social benefits (e.g. a proportion of contracts are allocated to small/poorer landholders, or giving priority to areas with low development index), but overall as an instrument PES struggles to achieve social benefits; especially in terms of poverty and justice (Laurans *et al.*, 2013). According to Rodríguez *et al.* (2011), attempting to incorporate a few measures to make PES look pro-poor and legitimate has meant less efficiency in achieving environmental outcomes – or not achieving either (Salafsky, 2011). This impact on reduced efficiency is important to take into account, and measure against other potential benefits of linking objectives. However, social criteria like fairness and equity are increasingly important in many developing countries. If well-defined, it may be possible to include both objectives within the same agenda – using a single instrument or a combination of instruments, where the geographic focus coincides.

2.2.2 Social protection to help people out of poverty

Social protection is a collection of government policies and programmes aimed at preventing, managing and overcoming situations that adversely affect people's wellbeing. They are usually targeted to individuals economically at risk, chronically poor and/or socially vulnerable. They could affect the labour markets (employment, protection of workers), social insurance (pensions, maternity leave), social transfers and assistance (disability and/or child grants, social services). Increasingly, these instruments are evolving: from targeting the immediate causes of poverty during a crisis, to addressing underlying causes of poverty during non-crisis times.

Social protection includes a variety of instruments, including conditional and unconditional transfers. **Conditional social transfers (CST)**, as the name indicates, transfer cash (or other benefits) on the basis that certain conditions are met. These conditions are generally thought to be "for the good" of the person – so there is a personal interest for them to comply. CST are usually linked to social objectives: education (children enrol and attend school), health (children get vaccinations and have their growth monitored), and nutrition (families participate in nutrition education). Cash is usually transferred to a pre-determined member of the household, like the mother or a student (Fiszbein *et al.*, 2009; Wong, 2014; Pascual *et al.*, 2014).

The conditional element affects the short- and long-term dimensions of poverty: the cash element is seen as having a direct positive impact on household wellbeing, and the boost to child health and education contributes to household human capital. Cash injections also have multiplier effects in the economy – including pushing the demand for better education facilities (Kakwani *et al.*, 2005). For public works schemes, the condition for payment is to work, often on locally prioritised infrastructure and ecological improvements.

Programmes using cash transfers or other types of reward are not uncommon in Latin America or Africa (see Table 1), although attaching conditions to benefit transfers is more common in Latin America than it has been in Africa. There is a significant body of work evaluating the use of conditional versus unconditional transfers, for example at MIT's Abdul Latif Jameel Poverty Action Lab; the Center for Effective Global Action in California; the International Initiative for Impact Evaluation (3ie); and the World Bank Impact Evaluation Group.

Table 1. Examples of conditional and unconditional cash transfers in Latin America and Africa

CONDITIONAL CASH TRANSFERS IN LATIN AMERICA	UNCONDITIONAL CASH TRANSFERS IN AFRICA
Argentina: *Programa Familias*	Botswana: Social pension, destitute allowance (government)
Bolivia: *Beca Futuro*	Ethiopia: PSNP (government, donors)
Brazil: *Bolsa Familia, Bolsa Escola*	Kenya: HSNP (government, DFID)
Chile: *Chile Solidario*	Lesotho: food and cash transfers (World Vision)
Colombia: *Familias en Accion Program*	Malawi: FACT (Concern), Mchinji (UNICEF)
Costa Rica: *Programa Avancemos*	Mozambique: GAPVU/PSA (government)
Ecuador: *Bono de Desarrollo Humano*	South Africa: child support grant (government)
El Salvador: *Red Solidaria*	Swaziland: food and cash transfers (Save the Children)
Honduras: *Programa de Asignacion Familiar*	Zambia: 5 district pilot projects (INGOs, DFID)
Mexico: *Progresa, Oportunidades*	
Nicaragua: *Red de Proteccion Social*	

Source: Devereux, 2009.
Notes: DFID – Department for International Development; FACT – Food and Cash Transfers Project; GAPVU – Office for Assistance for Vulnerable People; HSNP – Hunger Safety Net Programme; INGO – international non-governmental organisation; PSA – Food Security Programme; PSNP – Productive Safety Net Programme; UNICEF – United Nations Children's Emergency Fund.

2.3 Targeting, conditionality and trade-offs

According to Kakwani (2005), conditional cash transfers (CCTs) are more popular in Latin America than in Africa (Devereux, 2009). An ex-ante study of 15 CCT programmes designed to increase school attendance in Africa suggested that designing policies with a broad target – such as a geographical one – may enable programmes to avoid incurring the high administrative costs of heavily targeting schemes.

Types of targeting in social transfers (Kakwani *et al.*, 2005):

- **No targeting** (such as every child, or by age group; those with forests)
- **Poverty and geographical** targeting (such as poor children or children in rural areas; poor landowners in rural areas)
- **Progressive** targeting (such as all children aged 5–16, with a transfer value that rises with the child's age).

The conditionality attached to CCT helps to raise short-term capital (cash) and improve long-term human capital (education). It also makes CCT more palatable to the middle-class, tax-paying sector of countries' populations. On the other hand, the conditionality may be a problem to individuals in places with weak public services and where attendance at the nearest clinic, or the local school, may require hours of walking. According to the World Bank report (Fiszbein *et al.*, 2009), conditionality may exclude the poorest and neediest people if the system that enables them to fulfil the conditions are not available, or the cost of complying is too high for the level of compensation.

Governments have a mandate to alleviate poverty; this is a significant political motivator. Yet combining conservation and development has a rather mixed track record in terms of measurable impact on the poor. According to Dilys Roe of IIED (Roe, 2014) this lack of knowledge is not only linked to the type of impacts reported from these projects – good impacts like more food, or less savoury ones like human–wildlife conflict – but also to impacts that are not measured or less studied (such as traditional knowledge held by poor groups), and not reported back to policymakers.

Table 2. Advantages and disadvantages of targeting and conditionality

	ADVANTAGES	DISADVANTAGES
Targeting	• Increases effectiveness by reducing leakages to non-poor	• Reduces efficiency by increasing the cost per beneficiary • Puts pressure on total budget through increased administration, and reduces value of total transfer to targeted population – reducing potential to make meaningful contribution to household budgets
Conditionality	• More political support from tax-paying sector of population (ie not 'money for nothing'	• May exclude the poorest and neediest if they lack the means to fulfill conditions (eg clinics or schools too far away), and if conditions are imposed without considerations of cultural context

Table 3. Advantages and disadvantages of a combined poverty-environmental conditional instrument

ADVANTAGES	DISADVANTAGES
• Generally agreed that poverty and environment are linked and the poor may be in areas of rich biodiversity and climate vulnerability. Investment in the environment can be seen as supporting natural capital assets of the poor • Political pull: in most contexts the social agenda carries more votes (and therefore political traction) than conservation; combining them can help support conservation • Budget share: poverty and social agendas have allocated budgets and institutions – it may be possible to link institutional transfer schemes, reducing transaction (ie administrative) costs	• Overloading agendas can increase administrate costs and reduce impact • Geographic targeting: the poor may not be located where the environmental problems/objectives are and vice versa • Using PES can create rent-seeking behaviours and contribute to asymmetric power distribution • Poor people may have higher priorities than making conditional behaviour changes for environmental objectives

Researchers have also warned that overloading agendas by combining environmental and social objectives can be counterproductive. It can challenge technical capacities, increase administrative costs and weaken impacts; trees are planted in the wrong places or at the wrong time, or poor quality drainage structures installed. Geographic targeting can be a problem: the poor may not be located where the environmental problems are, and vice versa.

In some situations, conditional transfers will impose additional burdens on beneficiaries. For example, family members (usually women and children) might have to walk long distances to fetch water for tree seedlings; or to have their children's weight monitored at a distant health centre.

2.4 Tailored approaches for dual purposes

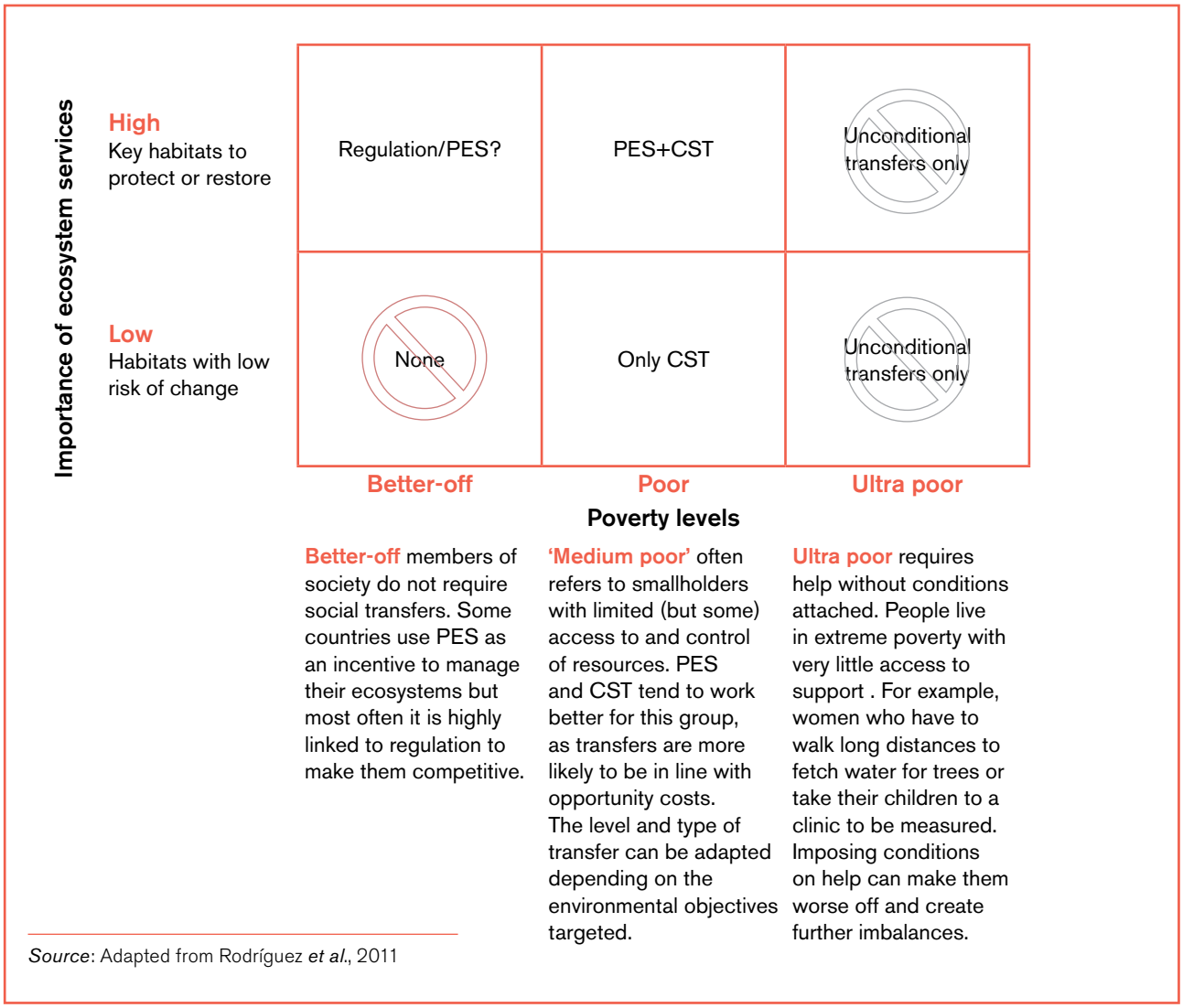
Rather than a one-size-fits-all approach, instruments could be tailored and targeted. Figure 2, for example, shows the contextual situations where PES and CST are used, both as separate instruments and also in relation to each other and other policy instruments, such as regulations and prohibitions.

Setting conditions on transfers, whether social or environmental, may have negative impacts for the 'ultra poor' – those at the very bottom of the ladder (MacMillan, 2015), like women who have to walk long distances to fetch water for trees or attend health units.

Likewise, wealthier members of society may not require social benefits or rewards to comply with environmental legislation: they may have better access to technical support and incomes that do not depend completely on natural resources.

According to researchers at the United Nations Environment Programme (Rodríguez *et al.*, 2011), conditional transfers will be most effective in the middle section of society: the 'middle poor'. These are, generally speaking, those with some level of access to technical support, or markets for their produce, or services like clinics. Supporting the middle poor through conditional socio-environmental transfers can have an immediate impact on their food security, and will strengthen their ability to better cope with changes to their environmental assets. Importantly, it will also prevent them from sliding down the income scale.

Figure 2. Tailoring instruments for maximum impact



Source: Adapted from Rodríguez *et al.*, 2011

3

Methodological framework

It is crucial to understand policies' 'distribution justice' issues – such as who might win or lose, and unintended consequences across key groups – in order to change behaviour and achieve social and environmental outcomes. In this section we identify the main criteria used to evaluate PES and CST, combining ex-post criteria (like impacts on jobs, or sediments), with ex-ante indicators (like using targeting, conditions, or the financial sustainability of the programme).

We use these indicators as guidelines for the analysis in Section 4 of eight ongoing national programmes that combine social and environmental objectives. While social protection has a wider range of randomised control studies, these are seriously lacking for PES schemes. The information is therefore indicative, and will be used as a basis for discussion at an international conference in September 2016.

The impacts of PES and CST can be evaluated in two ways:

1) Ex-ante (before implementing instrument and making transfers), through better targeting of the instruments. Lessons from ongoing PES and CST programmes show that the likelihood of positive impacts (and cost-effectiveness) is correlated with the degree of targeting before the economic transfers are made.
2) Ex-post (after transfers have been made), by measuring the outcomes through monitoring. This requires a selection of performance indicators in terms of both social and environmental outcomes.

Evaluations of PES and CST should include a combination of social, environmental and administrative criteria, for example:

- Social: are people better off? Indicators include the payment amount, the extent that households are lifted out of poverty, and the number of beneficiaries or extent of people lifted out of poverty.
- Environment: is there a positive impact on ecosystems? Criteria include whether conditionality is achieved in focus locations, such as trees planted, fish nurseries protected, soil conservation terraces and check-dams constructed; and the extent of leakages, such as the extent of displaced environmental damage in non-focus areas.
- Administrative/economic: criteria include the viability for upscaling and reaching target populations in relation to other government programmes, such as the amount of funds, source of funds, administrative costs and political support for the scheme.

Table 4 presents a summary of the main indicators used to evaluate PES and CST. For both ex-ante and ex-post, indicators need to be easily measurable, verifiable and also easy to replicate and upscale. It is worth noting that in practice most evaluations, when available, use only a handful of indicators.

Table 4. Performance criteria and indicators for CST and PES

CRITERIA	INDICATORS	
Transfers to beneficiaries	Type	• Cash or in-kind (eg technical support/food vouchers) • Predictable frequency designed to reduce barriers to entry • Individual or group level transfer • Amount and type of transfers to beneficiaries

	Level	• Amount and proportion (eg in relation to local wages)
		• Meaningful payment level, to cover:
		  • Social: direct cost of sending children to school or to medical check-ups, income lost from child going to school rather than working
		  • Ecosystem services: opportunity costs of land management
		• How targeting (see below) affect benefits: eg in terms of transfer level, or in terms of preference in allocation to enter programme (progressive, regressive, neutral)

Targeting	Geographic targeting	• Social development index at district level, infant mortality rates • Biome distribution, landscape connectivity, coastal areas, important areas for hydrology
	Household/ plot identification	• Income: Direct or proxy means test, means test, community assessment • Vulnerable condition: Examples include orphan and vulnerable children; gender and ethnic minorities; "two or more children, head has not completed secondary school"; part/not part of other social security programmes • Capacity to generate ecosystem services: proportion of forest in plot, type of activities promoted (conservation, agroforestry), degraded lands only – which is expected to affect provision of ecosystem services
	Universal targeting	• All children under 16, all women-headed households • All forest landowners
Conditionality	Under the control of the participant	• Target group (farmer, household head) receiving payments has control over land/actions • Clear definition of what activities must be complied with in order to get the payments. For social: eg regular visits to health centre, enrolment and actual school attendance. For ecosystem services: planting x amount of trees, engaging in x activities
	Monitoring and enforcement	• Clear description of monitoring and feedback channels in place to satisfy standards • Clear rules of restrictions and infractions (eg what triggers 'non-payment')
	Context affecting conditionality	• Institutions exist to facilitate compliance: eg local, accessible clinics, technical support for agriculture and forestry, access to local markets to sell produce from improved agriculture systems
	Permanence of programme	• Established programme with permanent funding • Emergency-type programme, time-bound • Voluntary / one-offs / re-negotiated

CRITERIA	INDICATORS	
Management of programme	Clear definition of objectives	• Social: role as safety nets / avoiding poor becoming poorer in times of shocks • Ecosystem services: Definition of the environmental objective (in line with conditionality). Ecosystem services may be bundled but clear target may help to improve implementation (eg protect water catchment, increase forest cover)
	Administrative/ jurisdiction	• Who manages the programme • Institutions exist at different levels to manage and deliver • Reported costs to manage (as proportion of payment to household) • Overlap with other government programmes (for implementation)
	Source and type of funds	• National programmes through general budget or earmarked taxes • International lending/grants from donors • Investment from private sector (eg large hydroelectric) • Role of private sector as suppliers of infrastructure: eg schools, clinics, intermediaries and technicians for PES

4

Learning from practice

There are examples of policymakers realising the importance of linking social and environmental objectives in national public programmes. The importance attached to each objective is different. Some are designed with a purely social objective (such as cash for work) and attached to an environmental project. For others the entry point was environmental outcomes (such as reforestation) and social benefits were added because of a political agenda. Their experience provides invaluable lessons on how to upscale the socio-environment agenda at the national level.

We look at eight case studies that use conditional transfers to achieve a combined social/environmental agenda, all of them **national programmes**, rather than small-scale projects. We look at cases in Asia and Southeast Asia (India, the Philippines and Bangladesh), Africa (Ethiopia and South Africa) and Latin America (Brazil, Mexico and Costa Rica).

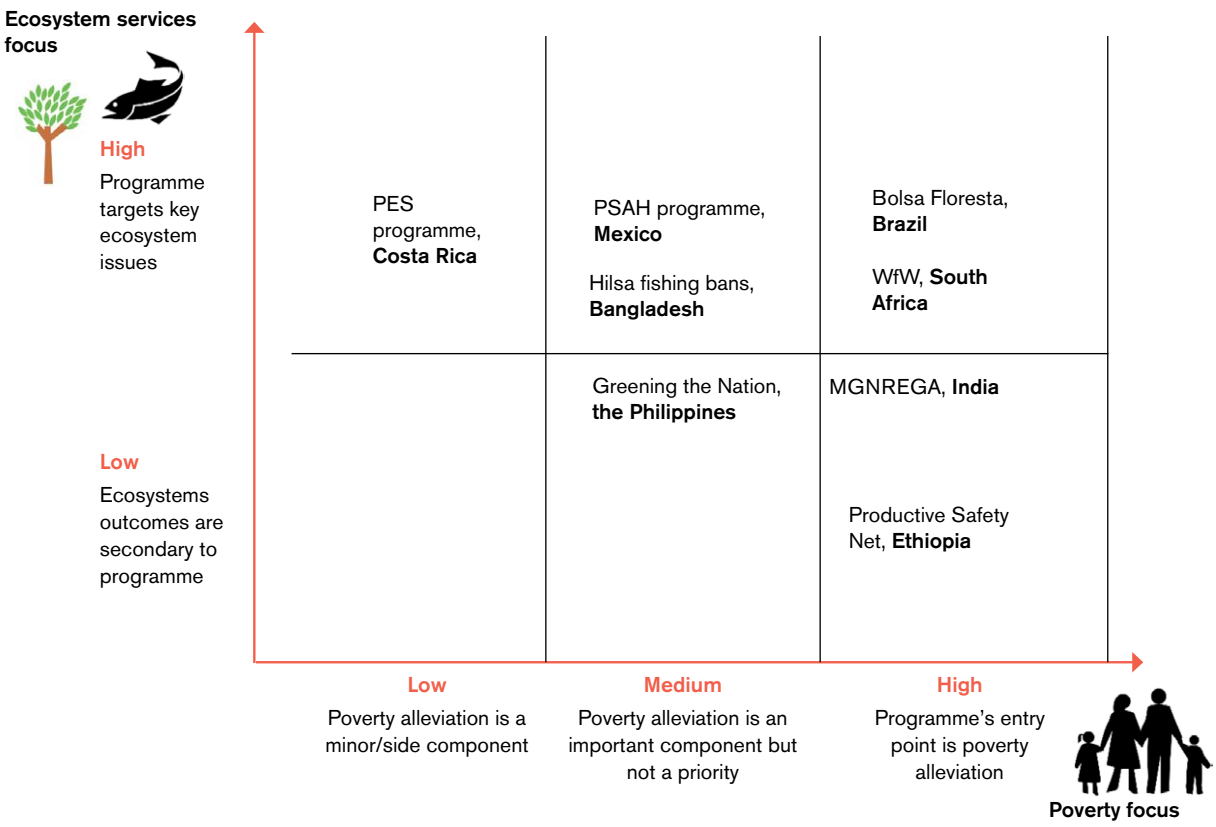
The focus on poverty and ecosystems varies across the programmes (see Figure 3). Trees feature strongly in many of these schemes: in the Philippines the government pays people to plant trees on public land, while in South Africa they pay people to remove alien tree species from waterways. The Bolsa Floresta Programme in Brazil prevents deforestation in the Amazon through a combined package of benefits that includes education for children. In Mexico and Costa Rica the governments pay people to protect forests and reduce deforestation. Social security measures used in India and Ethiopia pay people to do unskilled manual work, often related to watershed management. In Bangladesh the government gives food to fishers during fishing ban periods.

In this section we present a summary of each programme, focusing on institutional design, poverty and environmental impacts, and budget. (See the annex for a summary of the findings.) In the following section we discuss the main findings, and next steps for research.

4.1 India: Mahatma Gandhi National Rural Employment Guarantee Act

The world's largest social protection scheme, the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA, or NREGA) has covered the whole of India since 2008. It aims to enhance livelihood security in rural areas by providing up to 100 days' guaranteed waged employment to every household each financial year (this can be increased in times of

Figure 3. National programmes that combine better ecosystems with less poverty



The PSAH in Mexico (Payments for Hydrological Environmental Services) makes cash payments to forest owners (individuals and communities) located in areas of hydrological importance (recharge, sediment reduction, reduction of flood risk).

The PES Programme in Costa Rica makes cash payments to forest owners for conservation, reforestation, agroforestry and sustainable forest management.

Bolsa Floresta in Brazil is aimed at families on low incomes. In exchange for cash payments they agree to perform sustainable management activities within their properties.

Hilsa fish programme in Bangladesh gives incentives (food and some support for alternative income generation) to fishers during the fishing ban period.

MGNREGA in India guarantees the 'right to work', by providing at least 100 days of wage employment in a financial year to every household in exchange for unskilled manual work – often related to watershed and other ecological improvements.

The National Greening Program in the Philippines aims at sustainable human development and economic and ecological security through the planting of 1.5 billion trees in public lands between 2011 and 2016.

PSNP in Ethiopia (Productive Safety Net Programme) provides transfers (often linked to ecological outcomes) to the chronically food-insecure population in rural Ethiopia in a predictable way (ie not through emergency relief) so that timing of payments and planning of interventions will be improved.

Working for Water in South Africa works with local communities providing jobs to remove alien plants from rural ecosystems, especially waterways.

extreme conditions, such as prolonged drought, to 150 days). Adult members of these households volunteer to do unskilled manual work. As well as improving rural areas' productive assets and livelihood resource bases, the work is designed to proactively ensure social inclusion and to strengthen *Panchayat Raj* (traditional local government) institutions. The type of projects that can be included are public works linked to natural resource management (mostly watershed-related projects); improving the conditions of individual assets for vulnerable sectors of the population; and building rural communal infrastructure.

4.1.1 Design

The government created the programme by public act in 2006, then implemented it in stages; initially introducing it in 200 districts, then extending it to 130 more districts in 2007–8. It now covers all rural districts (Government of India, 2014).

Funding for the programme comes from central and state governments. Central government covers the full cost of the unskilled wages, and 75 per cent of the costs of materials, skilled/semi-skilled workers and administrative expenses. State governments cover the remaining 25 per cent of the costs and share some of the administrative costs. The State Employment Guarantee Funds was created to ensure long-term funding for the programme.

Total spending on the programme amounts to about 0.8 per cent of GDP. A threat to the programme emerged during the Narendra Modi administration in 2014, which introduced a cap on funding from central government. This led to further rationing of funds released to states and local governments were unable to pay wages, accumulating large and growing arrears (Ghosh, 2015). After much pressure, in February 2015 the budget was revised upwards and the government now pledges its full support (Jaitley, 2015).

The programme is self-targeting: households enrol themselves into it. Registration takes place at household level. Adult members eligible for employment are issued a job card to present when applying for work. In theory employment is guaranteed within 15 days of application and within five kilometres of the village (an additional 10 per cent is paid if further away), although administrative rationing – when there are insufficient funds to satisfy demand – may mean that some are denied jobs. Payments are made weekly or fortnightly, through beneficiaries' bank/post office accounts.

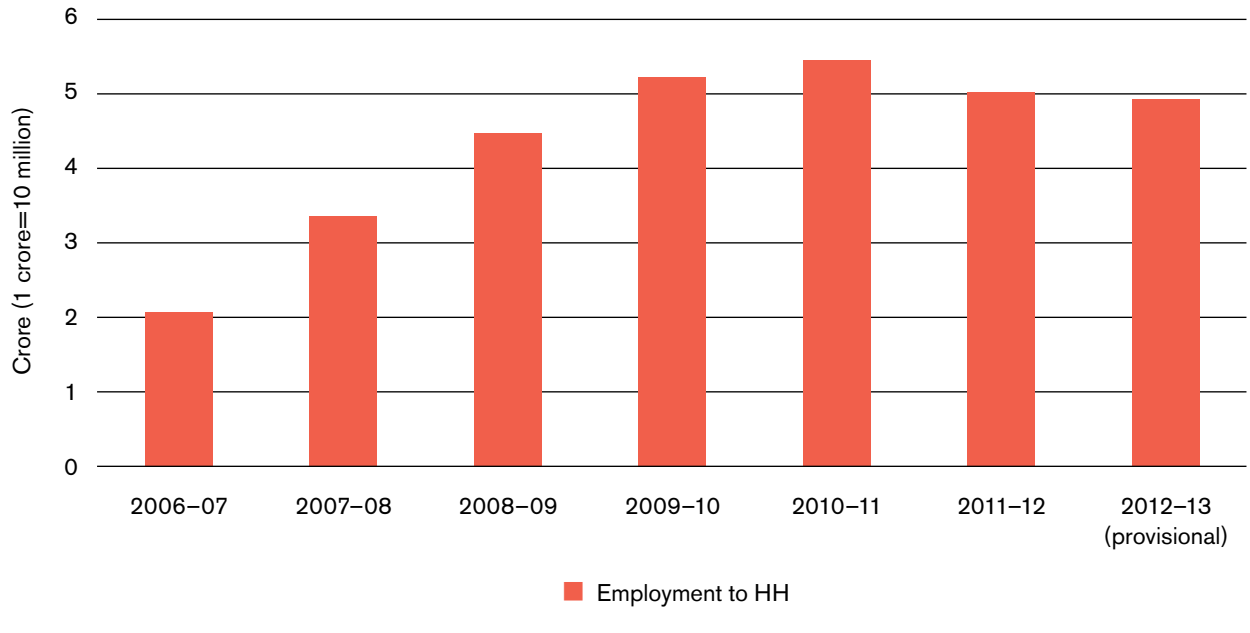
The financial inclusion achieved by these measures is impressive: nearly 90.3 million accounts have been opened under the programme, bringing the poor into the formal sector and in some cases providing them with better access to credit (Government of India, 2014).

4.1.2 Poverty impacts: beneficiaries and transfers

As the world's largest social protection programme, MGNREGA provides jobs to about 50 million households every year – equivalent to nearly 25 per cent of all rural households in India (see Figure 4). The programme has influenced rural average wages across the country, from 65 rupees (about US$0.90) per person per day to 124 rupees (about US$1.80) by 2013 (Government of India, 2014). A study of national and state-level data from 27 states by Liu and Barret (2013) looked at the type of households taking part. They concluded that the policy of allowing households to self-select, given the low wage rate, meant that the majority of participants were poor. This demonstrates that, while heterogeneity exists, the programme effectively has a pro-poor angle.

The study also found that at the national level there is a bias towards the middle class rather than the poor, through the way that rationing patterns are implemented. The authors also found that the self-selecting nature of the programme made it less effective at reaching poor female-headed households (Liu and Barret 2013), although women's participation nationally has ranged

Figure 4. Employment provided to households by India's MGNREGA programme



Source: Government of India, 2014

between 40 and 51 per cent since its introduction, reaching a current high of 57 per cent.

There is great variation at state level though. States that introduced pro-poor targeting, for example in the way they apply rationing, showed a significant increase in poor households' participation.

4.1.3 Environmental impacts

MGNREGA public work investments in soil and water conservation include water harvesting, small-scale irrigation, water supply schemes, afforestation, rural infrastructure development and social services. Nearly 53 per cent of the works are linked to soil and water conservation. Several studies have looked at the impact of these works. For example, the Tiwari *et al*. (2011) study in Karnataka suggests that the programme provided "multiple environmental services and reduced vulnerability, apart from providing employment and income to rural communities". The main impacts included better groundwater recharge, water percolation, more water storage in tanks, increased soil fertility, reclamation of degraded lands and carbon sequestration. The improvement in the resource base had positive impacts on agriculture, for example through increased crop and livestock production. A study by the Institute for Human Development (cited by Dreze, 2015) of 1,000 randomly selected dug wells showed 70 to 80 percent completion, and high levels of use especially to grow vegetables and for domestic and husbandry use. Based on these figures, the study suggests a 6 per cent social return rate in real terms. GIZ has launched a small programme to improve the environmental benefits (EB) of NREGA, called MGNREGA-EB.

4.1.4 Lessons

Internationally, NREGA is the first ever law to guarantee wage employment on such a large scale – leading to some resentment from private landlords over wage levels. While there have been criticisms of the quality of MGNREGA investments, most evidence is positive (Dreze, 2015). The low (but guaranteed) wages are pro-poor (middle to better-off household will try for better options), suggesting that self-selection under these conditions works well. However, states that introduce further targeting for rationing, when there are insufficient funds, can further ensure a pro-poor impact. The strong emphasis on water and soil conservation in the poorest areas has a positive impact on agricultural productivity.

4.2 Ethiopia: Productive Safety Net Programme

Ethiopia's Productive Safety Net Programme (PSNP) is the largest social protection programme operating in sub-Saharan Africa outside of South Africa. It is intended to provide employment for five days a month to people who are food-insecure persons during agricultural lean seasons, to support public works programmes including watershed management. In contrast to previous food-for-work programmes, the PNSP focuses consistently on selected households over five consecutive years, with the explicit objective that it will eventually be phased out.

4.2.1 Design

The PSNP was launched in 2005 by the Ethiopian government and a consortium of institutions, including the World Bank, the US Agency for International Development, the Canadian International Development Agency, and several European donors. Its current phase, PSNP Phase 4 (2015–2020) cost US$3 billion, funded by the government of Ethiopia (14 per cent) and nine donors. DFID will contribute US$384 million (11 per cent of the total). DFID funding is front-loaded: spend will be £49.1m in 15/16, then around £31m in each subsequent year. Importantly, the programme is designed to work within existing government structures. This requires programme staff to be fully integrated, rather than working on an add-on activity.

The programme has an annual budget of nearly US$500 million and reaches more than 7 million Ethiopians (Gilligan *et al*., 2008). A second stage of the programme goes from 2013 to 2017.[3,4]

Wages are set slightly below average market values in order to attract only the chronically food-insecure, and are paid in cash or in kind depending on specific circumstances. The criteria for selecting participants include:

- Basic criteria: households should be members of the community and chronically food-insecure, or have suddenly become more food insecure as a result of a severe loss of assets; and/or lack family support and other means of social protection and support.
- Additional criteria: status of household assets (such as land holding, quality of land, food stock), income from non-agricultural activities and alternative employment and support/remittances from relatives or community are taken into account.

[3] See https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/480617/Ethiopia_PSNP4_case_study.pdf.
[4] See www.acdi-cida.gc.ca/cidaweb%5Ccpo.nsf/projEn/A035155001.

Communities are involved in choosing the participants, as well as the type of activity promoted by the project.[5] Activities may include (Sandford and Hobson, 2011):

- Water and soil conservation, for example terracing and planting trees and restoring degraded watersheds to increase agricultural productivity of land
- Small-scale water collection and irrigation initiatives to provide water sources during the growing season and increase availability of water when rainfall is limited
- Community infrastructure (such as roads) to improve access to markets, schools and health centres.

Food is also provided directly to those beneficiaries who are unable to participate in public works, such as orphans; pregnant and lactating women; households with only elderly residents; young children; mothers in female-headed households; and people living with HIV/AIDS.

Households are expected to 'graduate' within five years of joining the programme, when they have enough to eat without the programme's money, and without having to sell their assets. Some families may want to leave the programme earlier, for example to work on their own land. Local government and community committees carry out reviews every year to check households' level of assets and to decide whether or not they qualify to continue. Graduates who disagree can appeal the decision.

4.2.2 Poverty impacts: beneficiaries and transfers

The programme provides labour in the agricultural lean season to over seven million Ethiopians (Gilligan *et al.*, 2008). Providing five days of work a month during this season is expected to enable households to even out their consumption and avoid selling productive assets in times of need – thereby reducing seasonal liquidity constraints and stimulating potential investments. The preferred way to make payments is through cash, giving families the flexibility to decide on how to allocate the money. However in some circumstances it may be food transfers, for example in parts of Ethiopia where there is not enough food in local markets, or there is little access to markets because of poor infrastructure (banks, or roads) or insecurity.

Since participating households do not need to sell their assets, the programme is expected to contribute to asset building and to enable participants to graduate after five years. Participants in the PSNP are also able to access other Food Security Programme benefits, like subsidies for voluntary resettlement, and loans for agricultural and non-agricultural activities. It is important to understand the social context: "different families can provide different amounts of labour. Often it is the poorest families who can offer least. Including both those who can work in exchange for PSNP payments, and those who cannot, acknowledges this reality and ensures equity among households" (Sandford and Hobson, 2011).

Early assessments suggest that the programme reaches its intended beneficiaries, in part because of local communities' high rates of participation in implementing the targeting guidelines. The communities' own understanding of targeting has improved over time. This improvement in targeting is important, as it informs the upscaling of the programme. According to Coll-Black *et al.* (2013), there is little evidence of 'elite capture' in the several communities analysed. A thorough econometric analysis of the first 18 months of the programme conducted by Gilligan *et al.* (2008) shows that the degree of impact depends on the definition of the participant. Results ranged from "low evidence of impact" to finding that participants were more likely to have food security, to borrow for productive purposes, to use improved agriculture technologies, and to carry out their own non-farm business activities.

Households receive an average of US$137 per year spread over six months, timed to be received before or during the hungry season (Sandford and Hobson, 2011). Between 2013 and 2014 the programme provided about 33,545 tonnes of food transfers and assisted six million clients from 319 districts across the eight regions of Ethiopia.

There is concern, however, that if assets are used as buffers or as a way to spread risk, introducing a public safety net may reduce the demand for asset holdings and lead to less on-farm investment (Andersson *et al.*, 2009). Andersson *et al.* looked at the way assets, specifically livestock and tree holdings (mostly fast-growing eucalyptus) are used as informal safety nets, and how they were affected by the introduction of the public safety net under the PNSP.

Food security: Ethiopia depends on imported food, as the country does not produce enough domestically. Increasing productivity in the local agriculture sector is key to ensuring food security. The activities promoted under the PSNP help this: at the beginning of the PSNP, families reported running out of home-produced food for more than four months in a year. By 2010 this had decreased to two and a half months (Sandford and Hobson, 2011).

[5] Communities are involved in assessing people's poverty and propose who is included. They are also involved in deciding which activities to support, which increases local ownership of the programme and acceptance of results (Sanford and Hobson, 2011).

4.2.3 Environmental impacts

Safety net activities include public works, on-farm improvements, education activities, and environmental protection measures, such as tree planting on public land and soil/water conservation measures carried out on communal land. A thorough econometric assessment of the programme in 2009 (Andersson *et al*., 2009) found no indication that participation induces households to disinvest in livestock or trees, and in fact the number of trees planted increased – potentially linked to increased skills in forest management from working in public forest projects under the PSNP, and to the ability to invest in long-term reforestation, given the assurance of cash flows from the PSNP while the trees mature. Shocks (in weather, for example) appear to lead households to disinvest in livestock but not in trees – although the programme is still in its early stages and it is not sure what the final impacts will be.

Each year, the PSNP initiates approximately 34,000 public works projects. By March 2014 the programme had achieved significant results (World Bank, 2015):

- 12 sample micro-watersheds in Productive Safety Net Programme districts showed a decrease in soil loss of more than 12 tonnes per hectare, and a decrease in sediment loss of 15.3 tonnes/hectare/annum
- Crop yields showed a substantial increase of up to 66 per cent for cereals, and 22 per cent for pulses
- Carbon sequestration is significant in PSNP watersheds, typically accumulating around 5 tonnes per hectare; there is also a faster accumulation of 10 to 15 percent more livestock for PSNP households compared to non-PSNP households
- Public works included constructing or rehabilitating 10,515 kilometres of rural roads, 20,944 hectares of gully control, and developing 66,500 hectares of forestry.

PSNP's land management work contributes to environmental transformation at scale in Ethiopia and mitigates negative impacts of climate change. It has been referred as "the biggest climate change adaptation programme in Africa" (Sandford and Hobson, 2011). DFID is involved in the PSNP Phase 4 (July 2015–June 2020) with a focus on the programme's spillover benefits, in terms of its contribution to climate change mitigation through carbon sequestration.

4.2.4 Lessons

The Productive Safety Net Programme shows that it is possible to build a single government-led programme using multiple funding streams and multiple implementing organisations, by creating a platform for long-term planning, through multi-annual (rather than emergency) support where timing of payments and planning of interventions can be improved. There have been challenges of scale and capacity. Despite this, and based on early results, the programme continues to be extended as existing participants graduate. Phase 4 (2015–20) focuses on upscaling to eight million participants with multi-annual transfers and an additional two million for short-term (seasonal) support. Understanding social context is key to target the type of benefit transfer (jobs or unconditional support). Communities are key participants in the design and implementation of this programme, to share ownership and acceptance of results. Targeting has improved as communities learn how to apply the suggested guidelines to their own context. This has important effects for upscaling and effectiveness. The key challenges for the PSNP are similar to any programme of this scale: capacity, delays in transfers and reporting, lack of effective monitoring and evaluation, and staff turnover.

4.3 Philippines: National Greening Program

The Philippines National Greening Program (NGP) aims to plant 1.5 billion trees on 1.5 million hectares across the Philippines from 2011 to 2016; although its true goals are much broader.[6] The Philippine government has made the NGP a priority programme, championed by the president, because of the central role it plays in reducing poverty while promoting food security, environmental stability, and biodiversity conservation (Israel and Arbo, 2015).

4.3.1 Design

The funds allocated to the programme have increased each year, from 1.166 million Philippine peso (US$3.5 million) in 2010 to US$140.5 million in 2013 (DENR, 2015). Such is the significance of the programme that overall, US$650 million was set aside to fund it (Bonita, 2013).

[6] See www.denr.gov.ph/priority-programs/national-greening-program.html.

The National Greening Program is managed by the Department of Environment and Natural Resources (DENR), and implemented locally through local government units (LGU) (DENR, 2014). DENR prepares surveys, maps and planning for each area, and provides financial resources based on a memorandum of agreement with the LGU, released in five payments throughout the project cycle: the first payment is 15 per cent, then 40 per cent, 20 per cent, 15 per cent, and finally 10 per cent. It also conducts regular monitoring and evaluation. LGUs implement the plans, ensuring a survival rate of at least 85 per cent of trees, and where possible they prioritise hiring indigenous people and members of organised upland communities, providing equal opportunities for men and women. LGUs also carry out additional education and communication activities linked to natural resources management.

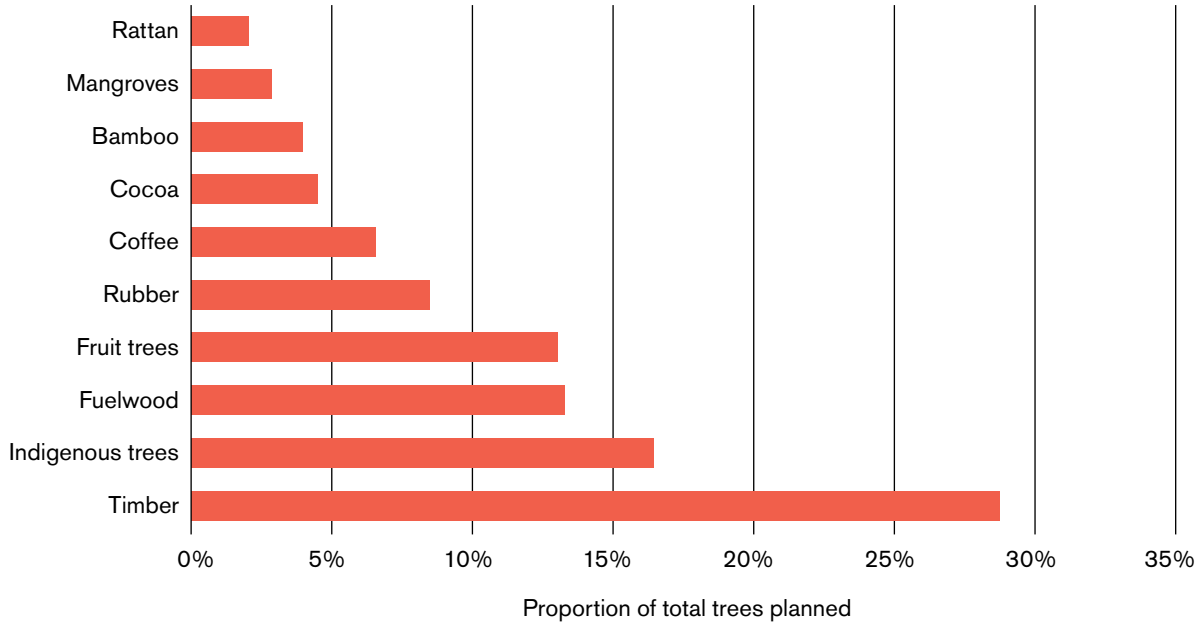
The programme plants multiple tree varieties, chosen for their different uses: from fuelwood species, providing energy to about nine million households and large-scale industries (including tobacco, bakeries, brick-making); to bamboo and rattan for furniture; industrial crops like coffee, cocoa, rubber and fruit-bearing trees; and trees for protected areas, mainly indigenous and mangrove species (see Figure 5).

4.3.2 Poverty impacts: beneficiaries and transfers

The NGP was conceived to promote inclusion, by helping to provide alternative livelihood activities for otherwise marginalised upland and lowland groups.[7] In practice, these livelihoods have come from local communities being involved in seedling production and in tending the hundreds of thousands of new trees successfully funded and planted each year (Israel and Arbo, 2015).

Through their community-based approach, within two years of starting the NGP had employed more than one million people (an estimated 1,182,000) from upland and rural communities in reforestation activities (Lachica, 2014). By the end of November 2015 the NGP had employed 2,507,391 people (DENR, 2015).

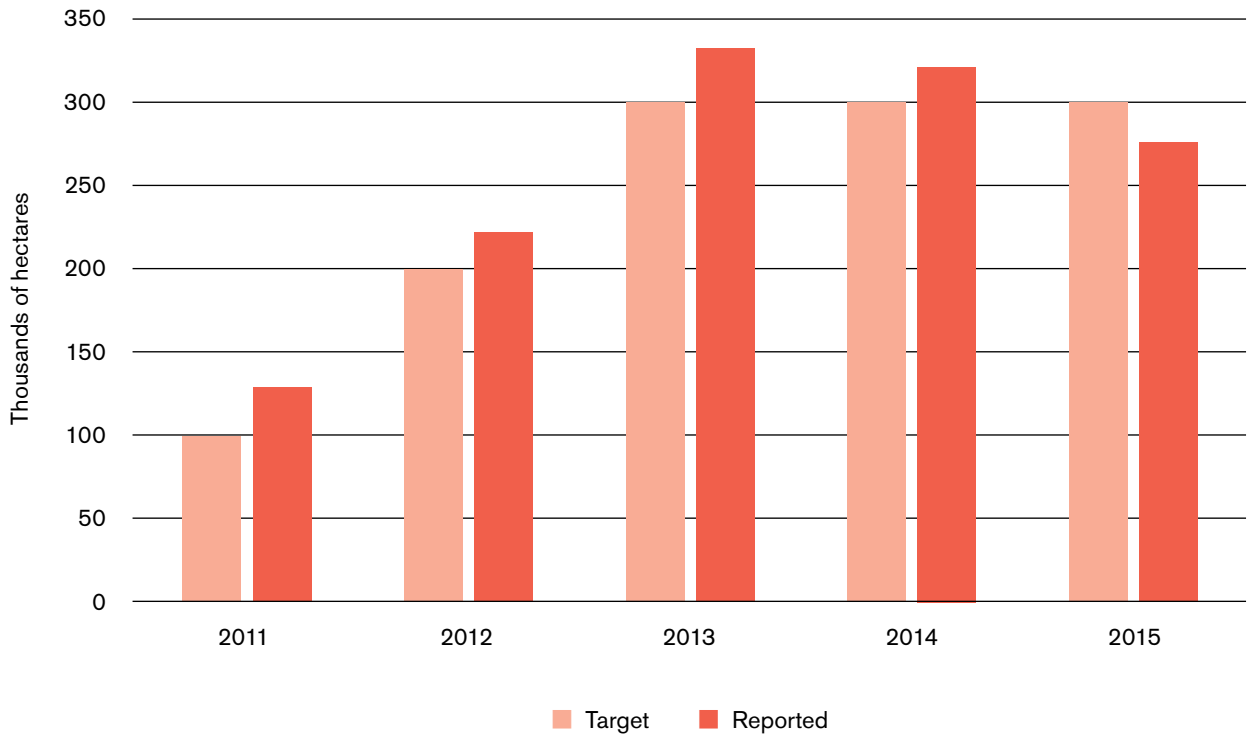
Figure 5. Tree species used in the National Greening Program in the Philippines



Source: National Commodity Roadmap 2013–16 (DENR, no date)

[7] See www.denr.gov.ph/priority-programs/national-greening-program.html.

Figure 6. Target and reported areas for the Philippines National Greening Programme, 2011–13 (thousands of hectares)



Source: Israel and Arbo, 2015; Bonita, 2013; DENR, 2015 (Israel and Arbo, 2015, Bonita, 2013, DENR, 2015)

The local and indigenous communities themselves are contracted to manage planting and maintain the trees, while seeds are procured from a network of clonal nurseries and state colleges, or where this is not possible, through competitive bidding. Surveys found that NGP participants perceive the programme to be working well, raising incomes and livelihood opportunities while improving environmental conditions through planting (Israel and Arbo, 2015).

Suggestions for further improving the NGP programme's inclusivity include a cumulative target of assisting 4.5 million local and indigenous people in securing land-use tenancy of the reforested areas, with an ultimate goal of ensuring self-ownership and management for all by the NGP project's end in 2016 (Bonita, 2013). One way of achieving such a proposal in the Philippines is to develop public-private partnerships (PPP) for developing and reforesting indigenous lands, where the 'public' aspect of the partnership is fulfilled by indigenous owner/managers themselves (Bonita, 2013).

Overall the NGP has delivered, and will deliver, a wide range of benefits to communities in the Philippines. Indigenous agroforestry developed from the reforestation is expected to lead to self-sufficiency for timber, coffee, fuelwood, and paper products.[8]

Reforestation in the uplands has helped distribute economic activity across the islands, and improved welfare for excluded communities. These communities will also benefit in the medium term from improved environmental stability and climate resilience.

4.3.3 Environmental impact

The NGP has fulfilled and even exceeded its planned annual targets for 2011–2015 (see Figure 6). By November 2015 the programme had planted 1,281.5 million hectares of forest, surpassing its own 1,200 million target. Using a mix of tree varieties (see Figure 5) and focusing on watershed management across the different local government units has generated important environmental impacts, while promoting economic activities.

Implementation at local level does not always go to plan, and can lead to unplanned effects. For example, large-scale reforestation using exotic species can lead to a reduction in water flows, or forest fires (intentional or unintentional) that prevent seedlings from establishing. The programme has also been criticised for its focus on trees for commercial use, rather than a stronger emphasis on trees for conservation. Because payments are made for seedlings planted, and the 85 per cent

[8] See http://ngp.denr.gov.ph/index.php/site-map/expected-project-outcome.

survival rate is not thoroughly enforced, there are complaints of people burning newly planted young trees in order to plant new seedlings (Ranada, 2014).

Acknowledged areas for improvement include delays in initial funding for reforestation and a lack of personnel (Israel and Arbo, 2015). In the light of these challenges, there have been proposals for more explicit 'enhanced targets' for the NGP, taking into consideration the number of local or indigenous people benefiting from sustainable livelihoods as a result of the programme (Bonita, 2013). The challenge is to transition from short-term paid maintenance of forests to truly sustainably managed forest and agroforestry plantations, in which the interests and livelihoods of participating local people play a central role (Bonita, 2013).

Beyond the domestic, social and environmental benefits, the NGP is also making a key contribution to international climate change mitigation.[9] The Philippines experienced extensive deforestation and degradation throughout the 20th century, largely as a result of population pressures leading to upland migration, agricultural expansion, and heavy logging (Lachica, 2014). By planting more trees in six years than have been planted in the Philippines in the past 50 (Lachica, 2014), the NGP has helped to restore the Philippines' lost forest stock – benefiting local communities, while acting as a carbon sink to offset global CO_2 emissions.[10]

On completion, it is predicted that the NGP will have increased forest cover by 12 per cent (on 2003 levels) and increased carbon sequestration by 8 per cent per year.[11] With decades of deforestation reversed, indigenous farmers downstream will also enjoy reduced flooding and soil erosion, as well as the many environmental service benefits provided by healthier ecosystems.[12]

4.3.4 Lessons

The programme works on private and public land. It is a well-funded large-scale programme, and has operational problems common to large-scale programmes; especially delays in funding and mismanagement of transfers. Although protected areas are included, there is a clear emphasis on commercial species (timber, fuelwood) as a means to generate revenue, while unclear long-term monitoring has generated criticism from an environmental pespective. Despite claiming social impacts, an important limitation of the programme is the lack of explicit criteria for how to reach local participants to ensure its social objectives are met.

4.4 South Africa: 'Working for' environmental public works schemes

South Africa's environment authorities have pushed forward inclusive green growth primarily through a series of joint environmental/social protection job schemes. The main programmes that combine these objectives are:

- The Social Responsibility Programme, initiated in 1999. Its sub-component, Working for the Coast, hires and trains unemployed people from coastal communities to protect and conserve coastal environments and estuaries.
- Working for Water (WfW), launched in 1995, has a main focus on removing alien invasive species in waterways while creating jobs.
- Working for Wetlands, established in 2002, promotes cooperative governance and partnerships that support the protection, rehabilitation and sustainable use of wetlands.
- Working on Fire, active since 2003, promotes employment through integrated fire management to help protect lives, livelihoods and ecosystem services.

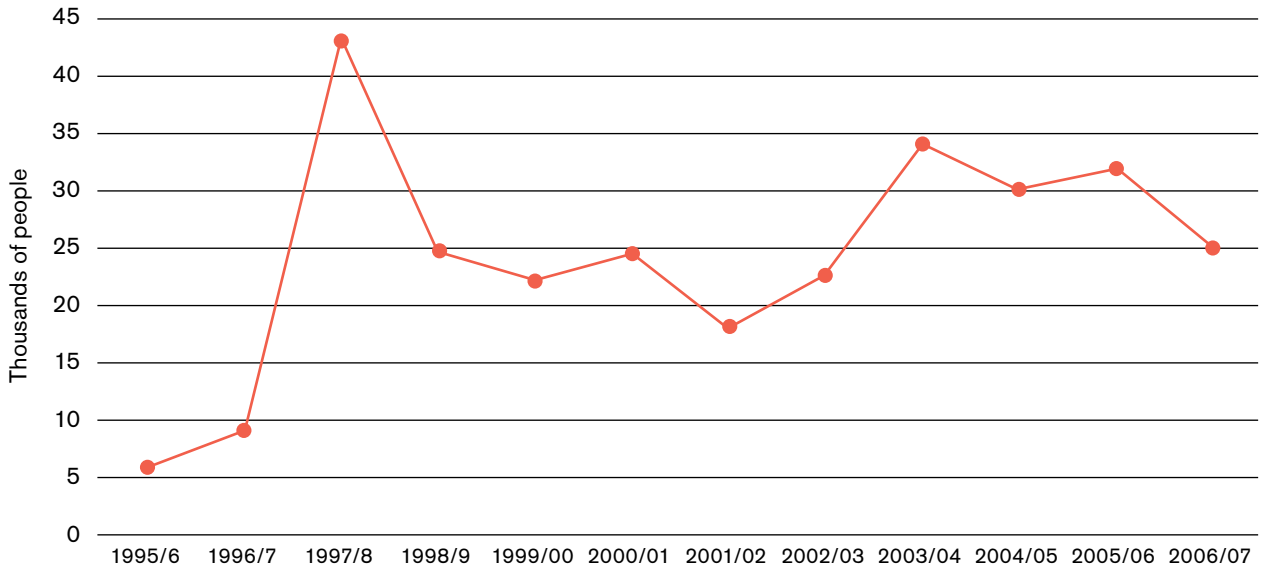
4.4.1 Design

This government-led programme is managed under the Expanded Public Works Programme umbrella. The 2007 budget for Working for Water alone was 450 million South African rand (US$28.8 million).

The programmes work together to target different threats to South African ecosystems and the social pressures that contribute to their degradation – unemployment and poverty in particular, which lead to social unrest (Government of South Africa, 2011). Each component is supported by specific legal acts (such as the Biodiversity Act or Disaster Management Act). Different government departments manage the various programmes. For example, the Department of Water Affairs manages Working for Water, in conjunction with other national departments and local communities. The South African National Biodiversity Institute currently heads Working for Wetlands, although this programme has been headed by, in chronological order, the Department of Environmental Affairs and Tourism, the Department of Agriculture and the Department of Water. The Department of Water Affairs and Forestry manages

[9] See www.denr.gov.ph/priority-programs/national-greening-program.html.
[10] See www.denr.gov.ph/priority-programs/national-greening-program.html.
[11] See http://ngp.denr.gov.ph/index.php/site-map/expected-project-outcome
[12] See http://ngp.denr.gov.ph/index.php/site-map/expected-project-outcome

Figure 7. Number of people involved in the Working for Water Programme (thousands)



Source: Government of South Africa, 2011

Working on Fire as a component of the Working for Water programme.

For the purposes of this document we focus on Working for Water. This programme aims to alleviate poverty through the provision of temporary work and skills development on watershed enhancement projects, mainly involving the removal of invasive alien plants (IAPs). Environmental benefits have been confirmed, and although most of the funding comes from the government's poverty relief fund, water users also contribute, either through the government's water management fees or through individual regular donations. This is essentially an intra-sectoral transaction: government paying to secure environmental services (mostly) on government-controlled lands. However, the Department of Water Affairs and Forestry has been trying to encourage voluntary payments from private and municipal actors with catchments infested with invasive plants. A few municipalities, state-owned utilities, and private companies have paid into the WfW programme in order to have WfW teams clear invasive species from their catchments, and they use the institutional structure provided by WfW.

4.4.2 Poverty impacts: beneficiaries and transfers

Through Working for Water, people from disadvantaged groups are employed to clear waterways of invasive plant species, creating jobs for the economically disenfranchised while improving community water availability. Around 20,000 to 30,000 jobs per year have been created, and half of the employees are women (Government of South Africa, 2011); see Figure 7. Moreover, the two-year contracts for employees was a crucial economic support for those who typically only had access to irregular, informal employment.

Social development in the Working for Water programme is achieved through a variety of activities, including:

- Job creation for previously unemployed individuals (with an objective of 60 per cent for women, 20 per cent for youth, 2 per cent for disabled people)
- Technical training (on average two days per person per month) and HIV/AIDS training/awareness raising (one hour per quarter)
- Management through a steering committee
- Access to childcare facilities for working families.

WfW works in partnerships, for example with the Planned Parenthood Association of South Africa in the Eastern Cape. The association actively engages in skills development, training, and raising community awareness of health issues, hygiene, environmental health, inoculation, sexually transmitted diseases, pregnancy and menopause. The partnership makes a visible difference and there appears to be a decline in teenage pregnancies, rape and alcohol abuse (Department of Environmental Affairs).

Working for Wetlands was launched in 2002 with the aim of generating jobs that protect and rehabilitate wetlands in 15 river basins. The programme created

almost 10,000 permanent jobs and provided 100,000 days of training. The jobs created were targeted to benefiting low-income workers and single-parent families, as well as those living with HIV/AIDS. Support for these diverse and vulnerable groups was provided through training and the development of basic skills in health and education (Government of South Africa, 2011; WWF, 2006).

4.4.3 Environmental impacts

Working for Water removes vegetation along waterways because the plants reduce water flow. Although this principle goes against many popular beliefs elsewhere – which assume that trees are needed for water – the hydrological research underpinning this programme is strong (Marais and Wannenburgh, 2008, Turpie *et al.*, 2008, Porras and Neves, 2006).[13] The focus is on invading alien plants, which have become established in over 10 million hectares of land in South Africa. About 750 tree species and 8,000 herbaceous species have been introduced to South Africa from every other continent, especially South and Central America and Asia. Nearly half of these species have become significant pests, using seven per cent of the resources (like water) and mounting increasing competition to native species and biodiversity.

One example of an invasive species is the water lettuce (*Pistia stratiotes*) that originates from South America and causes serious problems to aquatic bodies throughout South Africa. For example, the dense mats from the weed stops light from infiltrating the water bodies, reducing the available oxygen. The decaying plants affect the smell and taste of water, and block canals, pumps and turbines, as well as providing breeding grounds for dangerous mosquitos.

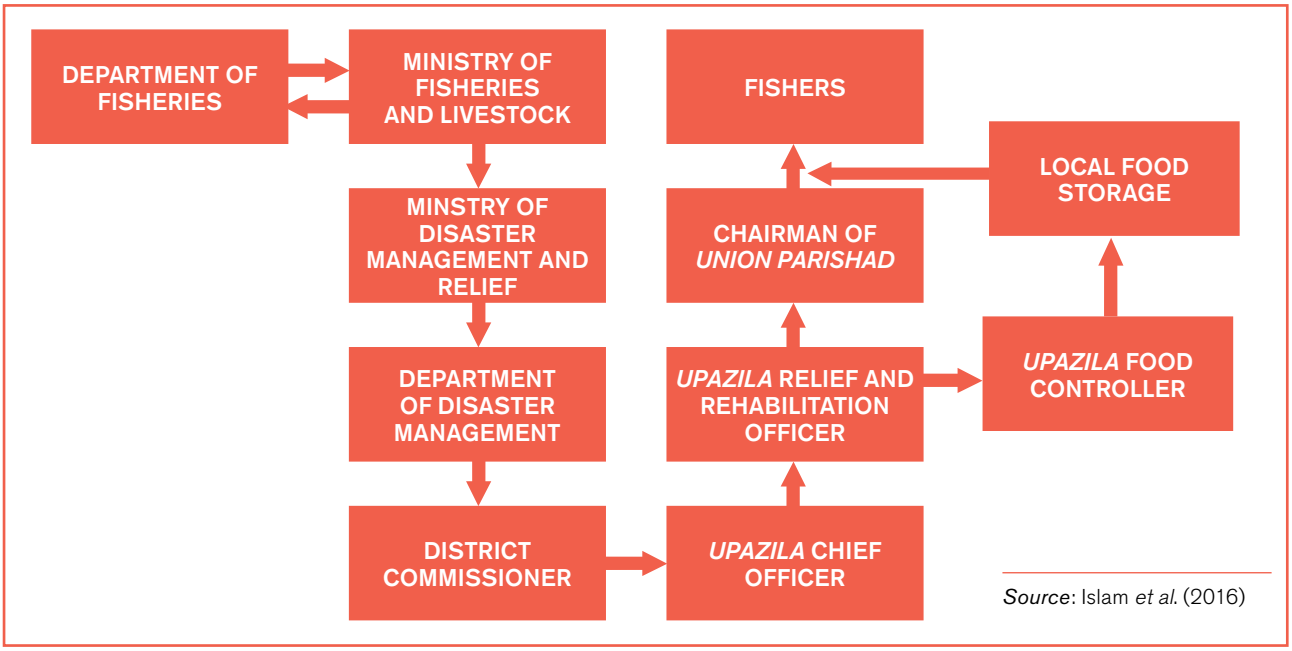
The methods used to control the IAPs include mechanical methods (felling, removing or burning); chemicals (such as environmentally safe herbicides); biological and integrated control. Under Working for Water, one million hectares of land has been successfully cleared (Government of South Africa, 2011).

4.4.4 Lessons

The 'Working for' umbrella programme has been very effective at combining environmental objectives with providing jobs to people. By using different individual components (Working for Water, Working for Wetlands, and so on) it is possible to target different ecosystem threats or issues, while using a similar social development model to provide social benefits. The programme also has many biophysical and hydrological studies underpinning its operations.

One of the main constraints of the WfW programme is securing sustained control of IAPs in cleared areas. This requires ongoing follow-up or handing the land over to landowners; it is unclear whether, once the land has been cleared, landowners feel an obligation to maintain it and prevent future infestations. Given that the programme is government-led, the bureaucratic process often results in delays in payments and contract approvals, which can be especially harmful for the vulnerable groups with which the programme works.

Figure 8. Agencies involved in food distribution in the Hilsa programme, Bangladesh



Source: Islam *et al.* (2016)

[13] See results from multiple studies here: www.environment.gov.za/projectsprogrammes/wfw/research - stats.

4.5 Hilsa Fisheries Management Action Plan, Bangladesh

Once a cheap fish affordable even for the poor, hilsa catches declined gradually over 30 years to reach a low point of only 0.19 million tonnes in 1991–92, then stagnated until 2001–02. This prompted the government of Bangladesh to designate five hilsa sanctuaries in 2003 and introduce a seasonal ban on hilsa fishing to protect the important stages of its life cycle. To compensate for lost earnings during ban periods, and to incentivise compliance with the new regulations, the government started providing affected fishing communities with rice and alternative income-generating activities.

The primary goal of this scheme, the Hilsa Fisheries Management Action Plan, is the conservation of hilsa and associated biodiversity. However, as it is funded through a national Vulnerable Group Feeding programme, which aims to reduce food insecurity (Ahmed *et al.*, 2009(Ahmed *et al.*, 2009, Uraguchi, 2011), it is also intended to improve the socioeconomic conditions of affected fishers living inside and around the sanctuary areas (Government of Bangladesh, 2012; DoF, 2012, Haldar and Ali, 2014).

4.5.1 Design

The programme is led by the Department of Fisheries (DoF) and supported by various other government agencies to channel food incentives to the affected fishers (see Figure 8). It is monitored, policed and enforced: the country's navy, coastguard, police, Rapid Action Battalion, air force and Border Guard Bangladesh help run mobile courts to enforce the fishery regulations.

The programme is fully funded by the government, and takes about 5.5 per cent of the total DoF development budget (about 1,813 million Bangladeshi taka, or US$23 million) for 2014–15. A National Hilsa Conservation Fund has been proposed to support the scheme's long-term financial viability, earmarking a percentage of government earnings from hilsa exports, and introducing a fee to users (such as processors and retailers) to generate resources for a PES programme.

The process of finalising the list of food incentive recipients, allocating and distributing the food (rice) is lengthy and complex. It requires 13 separate steps and involves every tier of Bangladesh's administrative hierarchy, from meetings at the *union parishad* (local council) to approval from the Director General of the Department of Fisheries, with several layers in between and back again, to decide how rice is distributed to the fishers. The transaction costs however are very low: taken together, administration and transaction costs account for US$11.89 for each metric tonne of rice distributed, or 3 per cent of the total cost.

There is no prescribed targeting, although the programme aims to "reach the poorest and most vulnerable fishers" (Haldar and Ali, 2014, DoF, 2012). Practical criteria used include "genuine hilsa fishers" as those who are "fully dependent" on fishing for

Table 5. Distribution of grain compensation in the hilsa programme, Bangladesh (2004–14)

FINANCIAL YEAR	NUMBER OF HOUSEHOLDS	RICE (KG/HH/ MONTH)	MONTHS	TOTAL RICE ALLOCATED (TONNES)
2004/5	33,300	10	3	1,000
2006/7	103,000	15	1	1,546
2007/8	145,335	10	3	4,360
2008/9	143,252	10	3	5,731
2009/10	164,740	30	4	19,769
2010/11	186,264	20	4	14,471
2011/12	186,264	30	4	22,352
2012/13	206,229	30	4	24,748
2013/14	226,852	40	4	36,296
Grand total of food distributed				130,272

Source: Haldar and Alia, 2014
Note: In 2005/6 food assistance was not provided; HH – households.

their livelihoods, and those without assets such as agricultural land or boats (Mome, September 2014). Local councils present a list of hilsa fishers to higher levels of administration. Such a lengthy system, without clear-cut targeting, leads to problems like favouritism and elite capture. From 2013 a new system was introduced in which local primary teachers prepare a list of the hilsa fishers in their community, and more recently, an ID card system was introduced.

4.5.2 Poverty impacts: beneficiaries and transfers

Fishers affected by the fishing ban are entitled to receive compensation in the form of 40 kilograms of rice per household per month for four months (this amount has changed over time; see Table 5). The government identified a total of approximately 287,000 fisher households that are directly affected by the declaration of hilsa sanctuaries, based on 2004 census data. The households are from 20 coastal districts, covering 91 sub-districts (*upazila*). Out of these, 226,852 vulnerable households were selected to receive food compensation.

Food assistance has been provided to fishers under the hilsa management plan since 2004 (see Table 5) and the programme's reach has expanded considerably in that time. Nearly 223,000 families received about 36,000 tonnes of rice across 88 sub-districts.

Since 2009 the hilsa management programme has also offered support for alternative income generation activities, including training in livestock rearing and running small businesses. So far, 21,690 households across four districts have engaged with this programme, receiving training and benefits worth an equivalent of US$97 per household. The costs of beneficiary selection and administration amount to only 0.7 per cent of the programme's total costs. Households that participated in the programmes increased their supply of food as a temporary buffer to seasonal asset depletion, in addition to earning highly needed income during slack seasons. But participation has been affected by inclusion errors (some food-secure households were included) and exclusion errors (some food insecure households were not included); see Uraguchi (2011).

4.5.3 Environmental impacts

The impact of the programme has so far been anecdotal, as there are no counterfactual reports (assessing what may have happened in the absence of the programme) or before/after impact evaluations. There is an agreement that the hilsa catch had declined in the pre-intervention period, both in its volume and the size of individual fish. It has been assumed that the management interventions have increased the availability of large hilsa and a large number of brood stock, both of which have positive impacts on population regeneration. Some of the reported changes from visits to the sites include:

- A higher number of mature hilsa fish (at maturity stages V and VI) than in the other adjacent areas (Rahman *et al.*, 2012), as well as a higher number of 'spent' fish (which have recently completed spawning; Rahman, 2013).
- Increased production of hatchlings and juveniles: Rahman *et al.* (2012) recorded about eight times as many eggs and *jatka* (juveniles) in 2011 than in the base year 2007–8, attributed to the 11-day fishing ban in hilsa spawning grounds during the peak spawning period.

These results are mostly subjective though, and better research on the environmental impacts of the ban need to take place, as many things can affect the size of the fish stock. Conditionality and monitoring are difficult to enforce and measure, due to the open access nature of the resource, fishers breaking the ban at night to elude the coast guards, or because of pirates attacking fishers and taking their catch away. Proposals for local communities and fishers to have a more active role in monitoring have been put forward to try to tackle these issues.

4.5.4 Lessons

While economic incentive mechanisms of this kind have been hailed as the most cost-effective and efficient way to manage natural resources and alleviate poverty, their efficiency depends on how much the incentives cost to implement. The lengthy administration chain from the national government to fishers has low reported transaction costs – but is long, and time consuming. Other, less reported, costs include potential misuse of funds; for example local *union parishad* leaders withholding some of the rice for their own costs even when these are covered by the programme. There have been concerns regarding equity and political interference in the distribution of compensation, elite capture and high levels of inclusion and exclusion errors (Haldar and Ali, 2014, Rahman *et al.*, 2012, Matin, 2000, Matin and Hulme, 2003). The impact on the ecosystem is difficult to measure, especially because of the open access nature of the resource, and the absence of counterfactual reports.

4.6 Bolsa Floresta, Brazil

The key objective of the Bolsa Floresta (BF) programme is to conserve forests and improve the welfare of residents in selected sustainable development reserves (SDRs) of the State of Amazonas in the Brazilian Amazon. This is a government–private sector partnership, managed by the Sustainable

Amazonas Foundation (FAS), a private Brazilian non-governmental organisation.

4.6.1 Design

Bolsa Floresta is mostly funded by Bradesco Bank and the Amazon Fund (funded through the Brazilian National Development Bank/Government of Norway). Almost 80 per cent of FAS funding is from private sources, including Coca-Cola, Samsung, Abril Media Group and Marriott International. One of the SDRs enrolled in the programme, SDR Juma, is a certified REDD+ project, and another reserve is ready for certification. The Juma REDD+ initiative is co-funded by Marriott International and Abril Media Group. The REDD+ project targets the voluntary over-the-counter carbon market.

FAS works with various state agencies involved in managing the protected areas: the Amazonas State Secretariat of the Environment and Sustainable Development; the State Center on Climate Change; and the State Secretariat of Planning and Economic Development. The Amazonas State Institute for Environmental Protection carries out monitoring and law enforcement in the protected areas and the National Institute for Amazon Research is responsible for carbon monitoring. Several private companies offer voluntary assistance in initiative management and auditing, including PricewaterhouseCoopers and Bain & Company.

FAS was created in 2007 as a partnership between the Amazonas state government and Bradesco Bank, evolving from a 2003 initiative called Zona Franca Verde. It now works in 15 sustainable development reserves in the State of Amazonas. The key laws are Policy on Climate Change Law (PEMC; Law 3.135/2007) and the State System of Protected Areas (SEUC; 53/2007), which both provided the legal framework necessary to implement REDD+ initiatives in Amazonas State (Viana, 2008).

A fixed amount of funds is available for each SDR, depending on the number of people living in the area (see below). Bolsa Floresta has designed different forms of benefits based on these funds. All participants receive a combination of cash, in-kind, individual and group benefits:

1) *BF Renda* ('income'): a community investment of US$84,916 per year per SDR, to support income-generating activities that are in line with the protected area's management plan
2) *BF Social*: US$84,916 per year per SDR for improving community infrastructure

Table 6. A comparison of rules: Bolsa Floresta and sustainable development reserves, Brazil

	BOLSA FLORESTA	JUMA SDR	UATUMÃ SDR
Management plans	Requires compliance with reserve management plan rules	Establishes preservation, extensive-use and intensive-use zones (approx. 123,000ha, or 21% of the reserve) in the reserve. Defines use intensity for each zone	Establishes preservation, extensive-use, and intensive-use zones (ca. 25,000ha or 6% of the reserve). Defines use intensity for each zone
Membership	Requires membership of the reserve association and regular association fee payment	No regulation	No regulation
Agriculture	Requires agricultural fields to be no larger than in the year when the community entered Bolsa Floresta and only convert secondary vegetation (zero net deforestation)	Primary forest areas can only be converted by new families. Agricultural fields cannot be larger than 4 quadras (approx. 4ha)/year. The total area for shifting cultivation[14] should not be larger than 12ha per family	Converting primary forest requires authorisation. Agricultural fields cannot be larger than 3ha/year without authorisation
Children	Requires children of school age to be sent to school if located nearby	No regulation	No regulation
Fire prevention	Requires use of fire breaks and to inform community when fire is used for land preparation	Requires use of fire breaks and limits use of fire to once per year per family	Requires use of fire breaks and fire use to be minimised

Source: Börner *et al.* 2013; Bakkegaard and Wunder, 2014

[14] Temporary cultivation of an area, which is then left to return to its natural state.

3) *BF Associação*: grants to the reserve dwellers' associations. It corresponds to 10 per cent of all the family forest allowances granted in

4) *BF Familiar*: a monthly cash transfer of US$30 to the female spouse of each household.

4.6.2 Poverty impacts: beneficiaries and transfers

The approach for the social and income components of the Bolsa Floresta programme is pragmatic and solution-focused. Each protected area has a budget, based on US$175 per family; each programme therefore has, on average, US$70,000 per protected area per year. Bolsa Floresta runs two workshops in each SDR to define the investment priorities. In the first workshop Bolsa Floresta presents the rules and conditions of the social and income components, and invites people to discuss investment priorities with their families and communities. In the second workshop, people present their priorities and vote for the most important ones.

Their target group is clear: remote communities living in 15 state conservation units throughout the State of Amazonas, currently covering over 10 million hectares (Bakkegaard and Wunder, 2014). By 2012, Bolsa Floresta benefited more than 30,000 people in and around all 15 forest reserves. Community payments will benefit everybody, whether they participate or not. Individual payments require a signed agreement that commits the household to good forest management practices, including zero net deforestation.

The cash payment was initially proposed to be small and temporary. However, interviews with people have shown that they see this as one of the main benefits and want to ensure it continues. Cash payments mainly support current consumption, such as the purchase of food, clothes and other basic goods; similar to cash transfers used elsewhere (Barrientos *et al.*, 2010; Arnold *et al.*, 2011).

4.6.3 Environmental impacts

Bolsa Floresta operates within the restrictions of each SDR. For example, households are allowed to deforest up to 20 per cent of their land, but land sales are strictly prohibited (see Table 6).

A CIFOR study of two sites (Bakkegaard and Wunder, 2014) found that deforestation had decreased about 12 per cent more inside the reserves than in the rest of the State of Amazonas since the Bolsa Floresta programme began, resulting probably in a modest difference of about 1,500 hectares of additional forests preserved from deforestation. Bakkegaard and Wunder (2014) looked at the effect of cash transfers on conservation behaviour ('conservation spillovers') in a sample group where governmental transfers were the main source of cash income. Results show that these transfers led to (positive) marginal reductions in the area of land under crop and early fallow, and that currently transfers have positive conservation and equality effects and provide a welcome cash injection, in addition to the in-kind benefits from other Bolsa Floresta components.

4.6.4 Lessons

The programme has been effective in securing multiple sources of funding; a strong government presence; private sector engagement; and international initiatives like REDD+. Having a private organisation running the programme promotes effective management and reduces the red tape common to many government programmes. The transaction, operational and monitoring costs are still very high, because of the remoteness, geographical expanse and strong seasonality (e.g. floods and draughts). Significant efforts are made to include local communities in monitoring and taking responsibility for the programme.

By itself, Bolsa Floresta is not designed to be a source of income for families, but rather a reward for forest conservation. However, while the cash payment was initially intended to be small and probably temporary, beneficiaries report that it is one of the most important benefits they receive. According to Bakkergaard and Wunder (2014), the mix of benefits (health, education and sustainable livelihoods) may do more than cash payments to improve lives in the communities. By targeting remote communities with little access to markets and opportunities, the programme has important social benefits, and it also manages to remain competitive given the level of payments. Although cash transfers have been used in Brazil for many years – for example retirement pensions and transfers for family wellbeing (*bolsa familia*) – transfers for forest stewardship are newer. Replicating Bolsa Floresta's low-value, uniform-across-household transfers may be more challenging in settings where there is more competition for land use (Börner *et al.*, 2013).

4.7 Payments for Hydrological Services in Mexico

The primary objective of the Payments for Hydrological Environmental Services (PSAH, *in Spanish*) programme is to offer payments for environmental services generated by forest ecosystems in a way that compensates landowners for conserving their forest lands. The programme was established in 2003, and in 2006 the objectives were modified to include poverty alleviation (Muñoz-Piña *et al.*, 2008; Alix-Garcia

et al., 2014). The initial idea, of concentrating on over-exploited aquifer areas, was later expanded to a nationwide approach.

4.7.1 Design

PSAH was created by law in 2003 (Article 223: *Ley Federal de Derechos*), and implemented the same year. An associated programme linking carbon and biodiversity, the Programme of Payments for Carbon, Biodiversity and Agro-forestry Services, began in 2004. Water is considered national property, and the Federal Rights Law had already established a fee for its use. These fees were increased and the extra money allocated to PSAH.

Total investment in the programme between 2003 and 2009 amounted to 5.5 billion Mexican pesos (US$306.69 million). The main source is central government, through the *Fondo Forestal Mexicano* (Mexican Forest Fund), which captures revenues and allocates payments to different environmental objectives, of which PES is one. Clear operational rules ensure accountability. Initially funds came from a percentage of water users' fee –later a set amount- and it has expanded to incorporate other sources of funding. For example, the National Forestry Commission of Mexico (CONAFOR) has also created the *esquema de Fondos Concurrentes (*Fund-Matching scheme*)*, which encourages voluntary contributions from local stakeholders (local governments and the private sector).

Table 7. Allocation of points for PSAH applications in Mexico, 2006–10

CRITERIA	2006	2007	2008	2009	2010
Primary:					
Hydrological importance and deforestation risk	44%	37%	29%	25%	19%
Secondary:	56%	63%	71%	75%	81%
Social	22%	19%	13%	11%	12%
Administrative			3%	2%	8%
Other forestry programmes	11%	26%	27%	36%	37%
Other environmental programmes	22%	19%	29%	26%	23%
Max. number of points	45	54	70	81	106
Min. number of points	15	18	28	23	26
Criteria number	9	12	17	21	26

Source: Muñoz-Piña *et al.,* 2011

Table 8. Criteria for selecting areas for PSAH and PASB

WATER (PSAH)	FOREST (PSAB)
• Has a certain percentage of forest cover • Is found within a Natural Protected Area; within the limits of the 60 Priority Mountains; upstream from a population centre of 5,000 inhabitants or more; within a high deforestation-risk area; in a high water-scarcity area; in a marginalised locality; within the recharge zone of an overexploited aquifer • Is found in a municipality with an indigenous majority • Has an existing contract with an ecosystem service user	• Has forests with good conservation status • Is located in the buffer zone of a protected area • Includes species at risk of extinction • Is not receiving support from any other PES • Requires proof of land ownership where the project is to develop • Must show that PES activities are additional • Applicants belong to an ethnic group with a high level of social marginalisation • Requires proof of either a forest management plan, an environmental management unit, or commitment to the project through a local assembly act

Source: Muñoz-Piña *et al.*, 2008 (PSAH); Corbera *et al.*, 2009 (PSAB)

These matching resources are vital for long-term financing, but also to ensure local targeting.

The programme's operational rules are as follows:

1. CONAFOR provides capacity and technical assistance to participating landowners.
2. The participants design Best Management Practice programmes, and all of them must agree to perform a series of mandatory conservation activities (there are also some optional ones).
3. The programme uses social safeguards, to ensure that economically vulnerable groups can take part.
4. The programme empowers landowners by promoting and strengthening their technical and organisational capacities.

CONAFOR looks at two main criteria for areas applying to enter the programme, based on the 2013 rules of operation.

Primary criteria: 1) vegetation type, prioritising cloud forests and jungles; 2) risk of deforestation; 3) overexploited aquifers; 4) natural protected areas; and 5) poor municipalities.

Secondary criteria: 1) socio-economic: poverty, part of an indigenous group, gender, collective organisation; 2) environmental: tree cover, level of biodiversity, biomass density, disaster risk, water availability, land degradation, and priority watersheds; and 3) criteria involving other conservation or development efforts: presence of local PES mechanisms, community surveillance networks, community land-use plans and so on.

Table 7 presents the criteria and the points allocated to each of them, and how they have changed through the years depending on where the programme wants to target its efforts on a yearly basis.

Table 8 presents the main criteria for any area to be considered eligible for the two main programmes, PSAH (PES for water- in Spanish) and PASB (PES for forest, in Spanish). Not all criteria must necessarily be fulfilled, but rather a combination of them.

Implementation costs**:** Studies of the PSAB modality have found it to be cost effective, with an internal rate of return of approximately 17.60 per cent (Corbera *et al*., 2009). But implementation costs vary significantly. For example, biodiversity projects often do not cover their costs, as they involve labour, infrastructure development and additional assistance from experts in fauna and flora (Alatorre-Troncoso, 2014).

4.7.2 Poverty impacts: beneficiaries and transfers

The programme targets private forest owners and *ejidos*, which are community groups who own areas of communal land. Landowners may enrol a portion of their property, where they must maintain existing forest cover, but can make changes to land cover in other parts of their property. Verification of forest cover is made by satellite image analysis or ground visits. Participants are removed from the programme if CONAFOR finds deforestation due to conversion to agriculture or pasture within the enrolled area. Payments are reduced if forest is lost due to natural causes such as fire or pests.

Payments are made in cash. Initially, payments were equivalent to US$36 per hectare for cloud forest land and US$27 per hectare for land with other forest types, and this was adjusted for inflation in later years. Between 2003 and 2011, CONAFOR allocated approximately US$450 million to enrol more than 2.6 million hectares of land in the programme. According to a study by the International Initiative for Impact Evaluation (3ie), between 2003 and 2009 4,893 *ejidos*, communities and small farmers benefited from PSAH (Alix-Garcia *et al*., 2014). By 2013, 4.27 million hectares were enrolled into the programme, benefiting 7,350 private or communal lands and representing an investment of US$651 million (Alatorre-Troncoso, 2014).

There are benefits for groups**.** In Mexico, 80 per cent of the forests are owned by *ejidos*. Since the forest is owned in common, PES does not directly remunerate households or individual landowners but rather the *ejido* as a whole. Once enrolled, the *ejido* decides allocation rules: it can decide to redistribute the payments among its members, to invest in public goods (such as roads, a school, new income generating activities), or remunerate labour for programme-related activities, such as patrolling the forest or building firebreaks.

A comparison of household and community survey responses from both beneficiaries and applicants rejected by the programme in 2008 suggests that the programme has generally neutral or positive socioeconomic impacts. Alix-Garcia *et al.* (2014) found that on average all households are gaining in material wealth over time, but wealth increases for PES beneficiaries are not significantly larger than those for non-beneficiaries.

Alatorre-Troncoso's thesis (2014) has a different result. Using 'gap analysis' (comparison of actual performance with potential or desired performance) to examine

whether marginalised communities were targeted at the expense of conservation goals, she concludes that:

> *"… high poverty areas are not being targeted, but this does not mean that the environmental conservation objectives of the PES programme are being met instead. Only 6.5 per cent of the PES enrolled lands are found in the most important and threatened biodiversity areas (Extreme CPAs). The misdirection of conservation funds towards poverty alleviation is reason enough for concern, but if neither objective is being fulfilled (as the data for 2010 show) then the design and implementation of Mexico's PES must be carefully re-examined."*

4.7.3 Environmental impacts

Findings from a 3ie study (Alix-Garcia *et al.*, 2014) suggest that the programme has significantly reduced forest loss compared to what would have been expected without the programme (additionality). An analysis of programme selection criteria and the characteristics of enrolled land suggests that the programme has met the dual goals of targeting funds to areas of ecological and social priority. In particular:

- On average, land enrolled between 2004 and 2010 had a similar risk of deforestation, higher hydrological priority and a similar degree of marginality to all forested lands in the country – meaning that land enrolled was broadly representative of available land.
- Looking at the evolution of the programme over time, targeting high deforestation risk and more marginalised areas has improved substantially between 2004 and 2010 due to changes in the programme rules and the eligible zones. This has resulted in the selection of higher risk areas and a higher number of poor recipients from within the applicant pool.

4.7.4 Lessons

This is a long-term programme, with clear sources of income based on a legal mandate, and clear operational rules that promote accountability. The programme has been adapting along the way, and currently it shows better emphasis on targeting to improve programmes' environmental impacts – at least in terms of reaching areas more at risk of deforestation. The programme works on private and communal lands (*ejidos*). On communal lands, contracts are signed with the *ejido* board, which decides how to distribute the money internally. There are suggestions of a bias towards paying those who already engage in good practices, but not those who deforest the land (such as cattle ranchers), suggesting limitations to additionality. The introduction of social benefits was a requirement to make the programme politically acceptable, even if it led to trade-offs. Evidence in Mexico on trade-offs is contradictory: some show that it is possible to achieve social and environmental impacts (Alix-Garcia *et al.*, 2014), and others that linking them may lead to achieving none (Salafsky, 2011; Alatorre-Troncoso, 2014).

4.8 Payments for Ecosystem Services in Costa Rica

From its introduction in the late 1990s, Costa Rica's Payments for Ecosystem Services (PES) programme aimed to promote the country's re-greening process, and prevent continuing rates of deforestation. Since then, forest cover has been steadily recovering and it now covers about 52 per cent of the country. The programme has now revised its long-term objectives (Porras *et al.*, 2013):

- Protect existing forests: eliminate 'conservation gaps' (forests with no protection status at risk of change) in about 14 per cent of the country, increasing protection of existing forests in private lands to reach a target of 256,000 hectares by 2030, and promoting connectivity between forests through biological corridors.
- Regenerate degraded areas and secondary forests: to begin regenerating forest in 8,500 hectares of degraded areas through agroforestry systems; and support 20,000 hectares of 'secondary' forests (re-grown after deforestation).

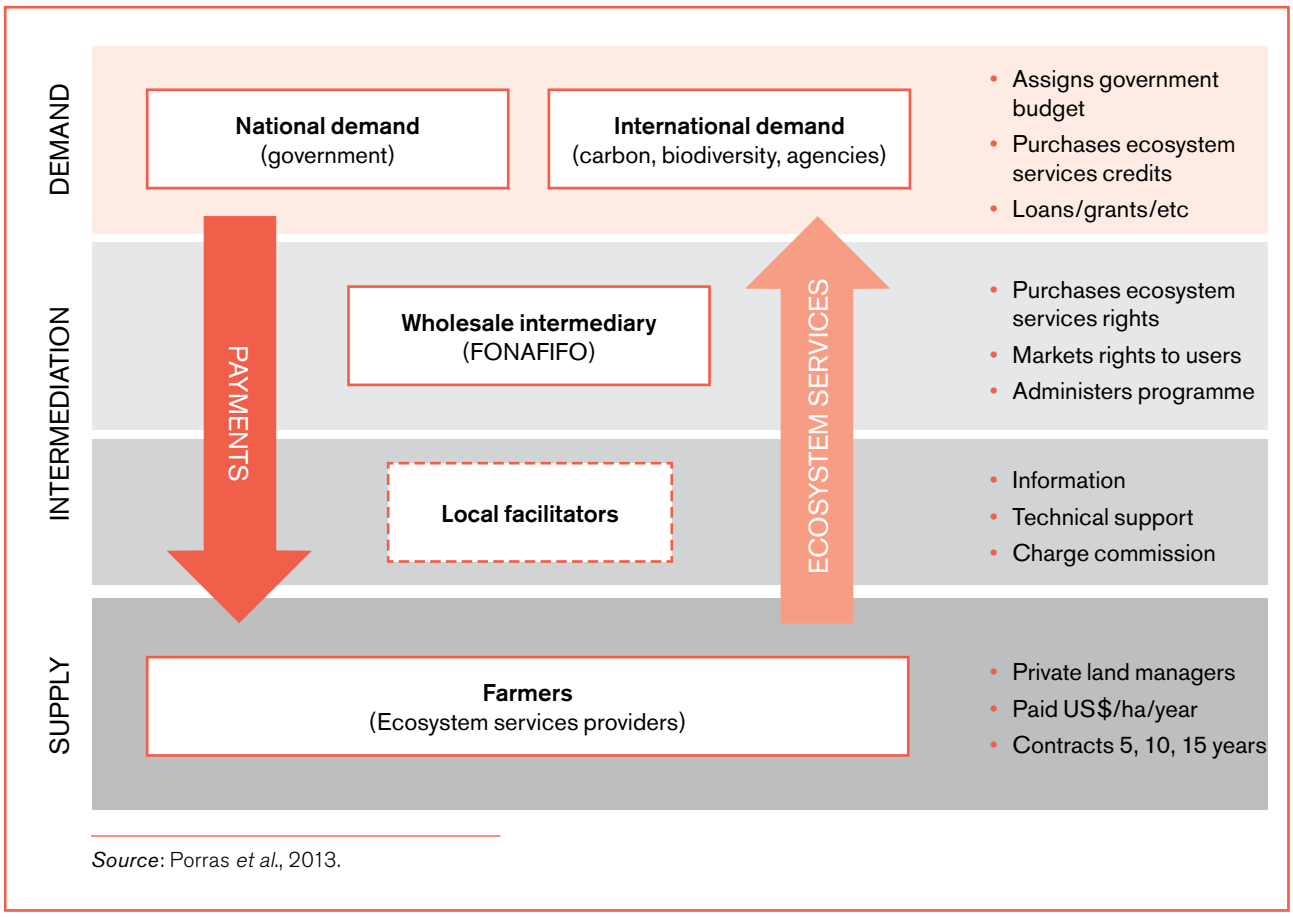
Poverty alleviation is not one of the programme's objectives. However, the social benefits in terms of rural development are continually put forward to ensure political support of the PES programme.

4.8.1 Design

The programme is a mix of rules, regulations and rewards that invite stakeholders to respond to incentives and disincentives. The legal underpinning establishes the structure by which the PES programme secures funding, how it is managed, and who is eligible to participate.

Funding sources: Funding comes from existing fees charged to fuel and water users, and agreements with private and semi-private companies. It has evolved to a mostly tax-based system. From the start of the programme, funding strategies targeted multiple sources. Initial funding came from 5 per cent of fuel tax revenues, later reduced to 3.5 per cent, and then changed to a fixed annual contribution. One-to-one

Figure 9. The structure of Costa Rica's PES programme



Source: Porras *et al.*, 2013.

watershed agreements with hydroelectric companies gave way in 2006 to an allocation from water fees (25 per cent of collected revenue goes to PES, and 25 per cent to public parks conservation areas). Biodiversity and landscape beauty are still managed as one-to-one contracts with users – for example arrangements between hotels and local conservation programmes. Income from the fuel charge averages at US$11.6m per year, and water charges brought in US$3.6m between 2007 and the first half of 2010.

Administrative costs: From 2010 to 2012, FONAFIFO reports that its annual budget was US$29–35 million per year, of which approximately 80 per cent was transferred to farmers via the PES, and 20 per cent kept for administrative costs. Some of the costs are born by the farmers; approximately 18 per cent of the payment goes from them to pay for intermediary services.

Management: The National Forestry Fund (FONAFIFO) is the primary intermediary charged with administrating the PES programme. It signs legal contracts agreeing land use with forest owners, and monitors their compliance. In exchange for the payments, the landowners transfer the 'rights' to the ecosystem services to FONAFIFO, where they make up the wider portfolio of approved ecosystem services (ES) credits. FONAFIFO then sells these credits to its buyers. Figure 9 presents the overall structure of the programme, which is discussed in more detail below.

Eligibility criteria are published annually. Amounts and priorities mostly vary according to environmental criteria, but some social considerations (such as priority to indigenous groups) are taken into account. Agroforestry contracts target small properties. The 'wealth level' of the landowner is not considered a criterion. Contracts are for five or ten years, and are renewable. Those who meet the eligibility criteria must present a management plan (such as for protection, reforestation or agroforestry) validated by a registered forest technician and satellite photos of their property, and must complete several administrative processes. Farmers can pay an intermediate organisation to help with the application process. The average charge is 18 per cent of the PES received, which includes technical support (the government does not provide this technical support). The forest technician included in the 18 per cent must be registered, and must provide local monitoring. If official audits find outstanding issues with the contract, the forest technician is fined and can be expelled from the technician's board.

4.8.2 Poverty impacts: beneficiaries and transfers

Although the PES programme is not specifically a poverty alleviation tool, it has social and economic obligations to fulfil, as required by law. The programme is continually presented nationally as an instrument to promote rural development and wealth redistribution.

The main benefit of the PES is a direct cash transfer to landowners. Payments are made to landowners with some forest cover (minimum 1 hectare, with payments for a maximum of 300 hectares per year) on private land, and to the few remaining legally established indigenous territories (pre-Colombian ethnic groups).

Cash payments are roughly US$193 per hectare per year for reforestation and US$64 per hectare per year for protection, annually for five years. The total number of contracts between 1997 and 2014 is over 15,000. However, this is different to the total number of participants, as there can be multiple contracts, or renewed contracts for many: "The types of participants have varied enormously since the beginning of the scheme in 1997, when 44 per cent of the funds were allocated to cooperatives and/or associations. Funding for individuals and legal entities were roughly equally distributed (26 and 27 per cent respectively), and indigenous groups received only 3 per cent of funding. By 2012, almost half of the funds were allocated to legal entities; indigenous groups significantly increased their share of the funds; funding allocated to cooperatives significantly decreased (possibly suggesting a general shift from cooperatives to legal entities), and the proportion of individuals roughly remained the same" (Porras *et al*., 2013).

4.8.3 Environmental impacts

There has been no comprehensive impact assessment of the programme. Porras *et al.* (2013) summarise the main results of several studies. Between 1997 and 2012 the programme protected 961,000 hectares of forest (of which forest protection accounted for 67 per cent of contracts), and planted nearly 4.4 million trees as part of its agroforestry scheme. By 2014 it had passed 1 million hectares. In 2014, 80 per cent of contracts were for protection and 16 per cent for reforestation (some of these areas overlap so the amounts cannot be added).

The programme began a more targeted approach and directed efforts towards properties located in environmentally specific sites. Between 2009 and 2013, 57 per cent of funding was allocated to biological corridors; 6 per cent to conservation gaps; 10 per cent to areas important for water; and 17 per cent to wildlife areas. The targeting process improved the programme's ability to target lands at risk of deforestation, which was very low for the first five years of operation (Sánchez-Azofeifa *et al*., 2007).

4.8.4 Lessons

Costa Rica's PES scheme was the first national-level programme to make direct cash rewards for ecosystem services. Its legal foundations allow it to access a variety of funds, from government allocations to deals with the private sector (national and international). Despite this, the programme remains oversubscribed and underfunded. The programme uses preference criteria to allocate contracts, published annually as ways to target participants and reach their objectives. This introduces flexibility in the design and the ability to take feedback. The programme does not have an explicit social component. Most landowners in Costa Rica are relatively better off than those without land. Within this group, however, the emphasis on protection contracts further excludes those who derive livelihoods from their land (absolute protection is required to qualify). Despite being oversubscribed, land prices in Costa Rica are generally increasing, reducing the competitiveness of the PES transfer in those places where forests are most at risk of change. PES needs to work harder with other mechanisms and regulations and improve their target areas where the payment can make a change in behaviour.

5 Discussion and conclusions

We set out to analyse the key elements of national programmes that target environmental and social outcomes in Asia, Africa and Latin America in terms of governance structure, impact and their potential for upscaling. Our key questions were in terms of the choice of the instrument (conditional social transfer or payment for ecosystem services), and the opportunities and challenges for combining objectives and for upscaling through overlapping agendas.

5.1 Main lessons from practice

We looked at eight national or regional programmes that explicitly combine environmental and social objectives (see Annex for a summary of the programmes' impacts). The lessons learned from these experiences feed into the overall discussion of conditional social transfers and payments for ecosystem services. We find that while trade-offs occur, the likelihood of reaching poor people and protecting the environment increases if both objectives are clearly stated from the outset. Lukewarm approaches where either objective is just an 'add-on' are more likely to have a low impact and divert resources. Targeting and conditionality are useful mechanisms to increase permanence, but parallel measures are also needed when working in fragile ecosystems and/or with ultra-poor households.

5.2 Conditionality

We looked at the most recent literature on the use of 'conditionality' in payments for ecosystem services and conditional social transfers. While their objectives are different, CSTs and PES are similar in design. They are relatively new market-based instruments that try to increase impact by a more targeted approach (conditional payments). The main link to both instruments is the emphasis on conditions to change behaviour (such as stop cutting trees, send children to school) as a step towards achieving specific objectives (protect forests, improve human capital). The main difference is that the conditions attached to CST are expected to benefit the person or the household, while the conditions attached to PES are expected to improve the impact on others by better ecosystem management (i.e. externalities).

They have been criticised on similar grounds, for example payments can create rent-seeking behaviours, or create disincentives (such as not conserving the environment without PES, or to not seek employment without conditional cash transfers). As with CSTs, conditionality and targeting play a key role in PES. These two conditions set them apart from other instruments, like integrated conservation and development projects, unconditional cash transfers and universal subsidies.

5.3 Are poor people better off?

The potential for programmes to effectively reach and help poor people are linked to three key factors: 1) targeting, in order to find the right people (working with local governments and communities is key); and 2) using the right incentive or mix of incentives, recognising that in in some situations poor people may have higher priorities than making conditional behaviour changes for policy objectives.

Pro-poor benefits will not happen by accident: they require careful design. Programmes with a clear and explicit criteria for targeting participants are more likely to succeed at reaching those most in need, and minimising exclusion error. With the exception of Costa Rica, the programmes we analysed in this study are on a massive scale. The chances of national criteria being applied on the ground effectively will depend on the degree to which local governments and communities are engaged with and understand the long-term objectives of those programmes, and are able to self-monitor. This has implications for transaction costs, both financial but also in terms of time. Multi-sectoral approaches (for instance involving social and agriculture departments) will require new strategies to work together, for example by creating a semi-autonomous agency to manage the programme like Bolsa Floresta in Brazil, and reduce 'desk-hopping', as still happens in Bangladesh.

The level of the benefit transfer is an efficient way to promote self-targeting. The relatively low wage level in the Indian programme, for example, means that the middle-poor will try other sources of jobs if they can. But a low payment is not enough to guarantee that the programme will be pro-poor. For example, low payments for forest protection may be acceptable for landowners who do not depend on these forests for their livelihoods, but not for those who derive their main income from their land, as is the case in Costa Rica and to a certain degree in Mexico. Using a variety of instruments in the same programme, like cash transfers, training, jobs, and food benefits is more complicated to manage, but is also more realistic, by understanding that people have different needs that affect their behaviour, and it is often the poorest who are the most limited in what they can do, as experience in Ethiopia shows. In Bolsa Floresta in Brazil, new evidence shows that it is this combination package that is more likely to secure the long-term impact of the programme.

5.4 Is there a positive impact on ecosystems?

The pathway to achieving environmental impacts are through changing behaviour (such as promoting alternative activities to deforestation, or fishing during certain periods) and through promoting direct interventions (such as removing invasive alien species from waterways, or building terraces to reduce sedimentation and soil erosion). Generally, programmes with a strong social component (like those in Ethiopia, India or Bangladesh) have a direct impact on the ecosystems through the directed work they do. There is clear evidence of a substantial number of terraces built as well as works on watershed rehabilitation. What is less clear, however, is the permanence of these investments in the long term once social transfers are phased out (such as when participants 'graduate', or are no longer dependent on the programme for food, as in Ethiopia). In the Philippines, for example, there are concerns about how to ensure the survival of planted seedlings if the payment is per planted tree, potentially incentivising people to let their seedlings die and get paid to plant more. Lessons on how to deal with these situations can be found in programmes with a strong focus on ecosystem services, like in Costa Rica or Mexico, where important advances have been made in monitoring permanence and leakages.

5.5 Are they viable for upscaling?

By making the connections between poverty and the environment explicit, most of these programmes have managed to achieve both social and environmental impacts in places where these issues are in competition with each other (that is, there are a lot of poor people and an environmental problem).

The sheer size of these programmes means that their impact on ecosystems can be, and is, significant in the aggregate. Key challenges across the programmes are similar to any programme of this scale: technical capacity, delays in transfers and reporting, lack of strong monitoring and evaluation, and staff turnover. While it is important to acknowledge that trade-offs exist, that should not be a deterrent to implementing pro-poor investments with clear environmental objectives.

The experience from this review provides invaluable lessons on how to upscale the socio-environmental agenda from individual projects to the national level; and likewise, how to better implement national objectives that deliver benefits on the ground.

5.6 Next steps

Over the next two years IIED's environmental economics team, under Shaping Sustainable Markets, will explore the potential for combining PES and CSTs as a form of conditional socioenvironmental transfer at the national level. We will take a three-step approach:

Theory-driven research: a thorough literature review, presented in this document, identifies the current state of PES and CSTs. We will also look at research partners and possible case studies in India, Indonesia, Bangladesh, Ethiopia, South Africa, Mexico, Brazil and Costa Rica. We will bring in lessons from other programmes as well, for example China.

'Ground-truthing' through field research: where and how have similar approaches been used and to what effect? We will prepare in-depth, targeted country case studies to explore social and environmental effectiveness and financial sustainability at ministerial levels.

Stakeholder engagement: intensive engagement with practitioners, researchers and policymakers to share lessons on what works and what does not. An international workshop will enable researchers and policymakers to share lessons, while a co-publication will summarise practical lessons for upscaling.

References

Ahmed, AU, Quisumbing, AR, Nasreen, M, Hoddinott, JF and Bryan,E (2009) Comparing food and cash transfers to the ultra poor in Bangladesh. International Food Policy Research Institute, Washington DC. http://tinyurl.com/zxl5f4m.

Alatorre-Troncoso, A (2014) Mexico's national payments for ecosystem services programme: in the wrong place at the right time. MSc dissertation, Imperial College London. www.iccs.org.uk/wp-content/uploads/2011/10/AlatorreTroncoso_Andrea_ConSci_2014.pdf.

Albers, J (2012) Managing marine protected areas through incentives to local people: the case of Mnazi Bay Ruvuma Estuary Marine Park. Environment for Development, Gothenburg. http://tinyurl.com/zv3yeuk.

Alix-Garcia, J, Aronson, G, Radeloff, V, Ramirez Reyes, C, Shapiro, E, Sims, K and Yañez Pagans, P (2014) Environmental and socioeconomic impacts of Mexico's Payments for Ecosystem Services Program. International Initiative for Impact Evaluation (3ie), New Delhi. www.3ieimpact.org/evidence/impact-evaluations/details/231.

Andersson, C (2009) Impacts of the Productive Safety Net Program in Ethiopia on livestock and tree holdings of rural households. Environment for Development and Resources for the Future. www.rff.org/files/sharepoint/WorkImages/Download/EfD-DP-09-05.pdf.

Arnold C, with Conway, T and Greenslade, M (2011) Cash transfers: evidence paper. Department for International Development, London. www.gsdrc.org/document-library/cash-transfers-evidence-paper.

Bakkegaard, R and Wunder, S (2014) Bolsa Floresta. In: Sills, EO, Atmadja, SS, De Sassi, C, Duchelle, A, Kweka, D, Aju Pradnja Resosudarmo, I, and Sunderling, W. (eds) *REDD+ on the ground. A case book of subnational initiatives across the globe.* CIFOR. www.cifor.org/redd-case-book.

Barrientos, A and Hulme, D (2010) Just give money to the poor: the development revolution from the global south. Kumarian Press.

Bonell, M and Bruijnzeel, LA (eds) (2005) Forests, Water and People in the Humid Tropics. Cambridge University Press.

Bonita, M (2013) Policy paper: improving Philippine forest policy: ten-point agenda for enhancing the National Greening Program. *Ecosystems & Development Journal* 4(1). http://ojs.edjournalonline.com/index.php/edjournal/article/view/7.

Börner, J, Wunder, S, Reimer, F, Bakkegaard, RY, Viana, V, Tezza, J, Pinto, T, Lima, L and Marostica, S (2013) Promoting forest stewardship in the Bolsa Floresta programme: local livelihood strategies and preliminary impacts. CIFOR. http://tinyurl.com/jusptzx.

Calder, I (2005) The blue revolution: land use and integrated water resources management. Earthscan Publications.

Calder, IR and Aylward, B (2006) Forest and floods: moving to an evidence-based approach to watershed and integrated flood management. *Water International* 31(1). http://tinyurl.com/j8sexsk.

Coll-Black, S, Gilligan, D, Hoddinott, J, Kumar, N, Seyoum Taffesse, A and Wiseman, W (2013) Targeting food security interventions: the case of Ethiopia's Productive Safety Net Programme. Ethiopia Strategy Support Program. http://tinyurl.com/zvrf8vj.

Coral Reef Alliance (2008) Effective MPAs. www.coral.org/

Corbera, EC, González Soberanis and Brown, C (2009) Institutional dimensions of payments for ecosystem services: an analysis of Mexico's carbon forestry programme. *Ecological Economics* 68 743-761.

DENR (2014) Engagement of the local government units in the National Greening Program. Department of Environment and Natural Resources, Quezon City, Philippines. http://forestry.denr.gov.ph/pdf/FMBTB6.pdf.

DENR (2015) National Greening Programme annual accomplishment. http://ngp.denr.gov.ph/index.php/site-administrator/ngp-accomplishment-report.

DENR, National Greening Program commodity roadmap CY 2013-2016. http://ngp.denr.gov.ph/index.php/site-map/ngp-commodity-road-map-2013-2016.

Department of Environmental Affairs, Working for Water: social development. https://www.environment.gov.za/projectsprogrammes/wfw/socialdevelopment.

Devereux, S (2009) Social protection instruments: what's on the menu? In: IDS (ed.) *UNICEF Social Protection Training Course.* Institute of Development Studies, Brighton.

Dreze, J (1 July 2015) The digging-holes myth. *The Indian Express*. http://indianexpress.com/article/opinion/columns/the-digging-holes-myth-2.Fiszbein, A Author(s)

Fiszbein, A, Schady, N, Ferreira, F, Grosh, M, Keleher, N, Olinto, P and Skoufias, E (2009) Conditional cash transfers: reducing present and future poverty. World Bank. https://openknowledge.worldbank.org/handle/10986/2597.

Ghosh, J (5 February 2015) India's rural employment programme is dying a death of funding cuts. *The Guardian.* http://tinyurl.com/mc6m5zy.

Gilligan, DO, Hoddinott, J and Seyoum Taffesse, A (2008) An analysis of Ethiopia's Productive Safety Net Program and its linkages. International Food Policy Research Institute, Washington DC. http://tinyurl.com/gu7t4vx.

Government of Bangladesh (2012) National Fisheries Week 2012. Department of Fisheries, Dhaka.

Government of India (2014) Report to the people: Mahatma Gandhi National Rural Employment Guarantee Act, 2005. Ministry of Rural Development, New Delhi. http://nrega.nic.in/netnrega/writereaddata/circulars/report_people_eng_jan_2014.pdf.

Government of South Africa (2011) South Africa Working for the Environment. Department of Environmental Affairs, Pretoria.

Habib, ABMZ (2014) Determination and implementation of an action plan for development and sustainable management of national fish hilsa. Paper presented (in Bengali) at the Planning Commission workshop, Dhaka, 5 June 2014.

Haldar, GC and Ali, L (2014) The cost of compensation: transaction and administration costs of hilsa fish management in Bangladesh. IIED.

Islam, M, Mohammed, EY, and Ali, L 2016. Economic incentives for sustainable hilsa fishing: An analysis of the legal and institutional framework. Marine Policy, vol. 68: 8-22.

Israel, D and Arbo, M (2015) The National Greening Program: hope for our balding forests. Philippine Institute for Development Studies. www.pids.gov.ph/policynotes.php?id=5470&pubyear=2015.

Jaitley, A (28 February 2015) Budget 2015: MGNREGA gets more funds from Narendra Modi government. *The Economic Times*. http://tinyurl.com/zjob5qe.

Kaimowitz, D (2004) Useful myths and intractable truths: the politics of the links between forests and water in Central America. In: Bonell, M and Bruinjzeel, LA (eds) *Forests, Water and People in the Humid Tropics.* Cambridge University Press.

Kakwani, N, Veras Soares, F and Son, HH (2005) Conditional cash transfers in African countries. UNDP International Poverty Centre. www.ipc-undp.org/pub/IPCWorkingPaper9.pdf.

Lachica, A (2014) Philippines: degraded forest rehabilitation and sustainable forest management in the Philippines. In: 'Workshop on Degraded Forest Rehabilitation and Sustainable Forest Management'. DENR Forest Management Bureau, Kunming, China. http://tinyurl.com/j2dg9n3.

Laurans, Y, Rankovic, A, Billé, R, Pirard, R and Mermet, L (2013) Use of ecosystem services economic valuation for decision making: questioning a literature blindspot. *Journal of Environmental Management* 119, 208-219.

Liu, Y and Barret, C (2013) Guaranteed employment and the poor: the Mahatma Gandhi National Rural Employment Guarantee Scheme. International Food Policy Research Institute, Washington DC. www.ifpri.org/publication/guaranteed-employment-and-poor.

Macmillan, S (12 January 2015) The ultra-poor: a pioneering technique is helping the hardest to reach. *The Guardian*. http://tinyurl.com/huvc9pp.

Marais, C and Wannenburgh, AM (2008) Restoration of water resources (natural capital) through the clearing of invasive alien plants from riparian areas in South Africa: costs and water benefits. *South African Journal of Botany* 74(3) 526-537.

Matin, I (2000) Targeted development programmes for the extreme poor : experiences from BRAC experiments. Imran Matin Research and Evaluation Division, Bangladesh Rural Advancement Committee.

Matin, I and Hulme, D (2003) Programs for the poorest: learning from the IGVGD Program in Bangladesh. *World Development* 31(3) 647-665.

Mitchard, ETA, Meir, P, Ryan, CM, Woollen, E, Williams, M, Goodman, L, Mucavele, J, Watts, P, Woodhouse, I and Saatchi, S (2012) A novel application of satellite radar data: measuring carbon sequestration and detecting degradation in a community forestry project in Mozambique. *Plant Ecology & Diversity* 6(1) 1-12. www.tandfonline.com/doi/abs/10.1080/17550874.2012.695814.

Mohammed, EY (2012) Payments for coastal and marine ecosystem services: prospects and principles. IIED. http://pubs.iied.org/17132IIED.html.

Mome, M, personal communication. September 2014.

Muñoz-Piña, C, Guevara, A, Torres, JM, Braña, J (2008) Paying for the hydrological services of Mexico's forests: analysis, negotiations and results. *Ecological Economics* 65(4) 725-736.

Muñoz-Piña, C, Rivera, M, Cisneros, A and García, H (2011) Retos de la focalización del Programa de Pago por los Servicios Ambientales en México. *Revista Española de Estudios Agrosociales y Pesqueros* 228 87-112. http://tinyurl.com/jxbow2t.

Pascual, U, Phelps, J, Garmendia, E, Brown, K, Corbera, E, Martin, A, Gomez-Baggethun, E and Muradian, R (2014) Social equity matters in payments for ecosystem services. *BioScience* 64(11) 1027-1036.

Porras, I, Barton, D, Miranda, M and Chacón-Cascante, A (2013) Learning from 20 years of payments for ecosystem services in Costa Rica. IIED. http://pubs.iied.org/16514IIED.html.

Porras, I and Neves, B (2006) South African Working for Water project profile. IIED, Watershed Markets. www.watershedmarkets.org/documents/South_Africa_Working_for_water.pdf.

Rahman, MA, personal communication to EY Mohammed. 14 February 2013.

Rahman, MA *et al.* (2012) Hilsa fishery management in Bangladesh. In: *Status of Fishery and Potential for Aquaculture Regional Workshop.* The WorldFish, Bangladesh and South Asia Office, Dhaka.

Ranada, P (22 June 2014) Rethinking the National Greening Program. *Rappler.* www.rappler.com/move-ph/ispeak/60948-rethinking-national-greening-program.

Rattan, L (2014) Soil conservation and ecosystem services. *International Soil and Water Conservation Research* 09/2014 6(3) 36-47. www.researchgate.net/publication/275219100_Soil_conservation_and_ecosystem_services

Rodríguez, LC *et al.* (2011) Towards a unified scheme for environmental and social protection: Learning from PES and CCT experiences in developing countries. *Ecological Economics* 70(11) 2163-2174.

Roe, D (31 March 2014) What we know about how biodiversity and poverty are linked: the good, the bad and the ugly. www.iied.org/what-we-know-about-how-biodiversity-poverty-are-linked-good-bad-ugly.

Ryan, CM, Williams, M and Grace, J (2011) Above- and below-ground carbon stocks in a miombo woodland landscape of Mozambique. *Biotropica* 43(4) 423-432.

Salafsky, N (2011) Integrating development with conservation: a means to a conservation end, or a mean end to conservation? *Biological Conservation* 144(3) 973-978. www.fosonline.org/resource/mean-end-to-conservation.

Sánchez-Azofeifa, A, Pfaff A, Robalino JA, Boomhower JP (2007) Costa Rica's Payment for Environmental Services Program: intention, implementation, and impact. *Conservation Biology,* 21(5) 1165-1173.

Sandford, J and Hobson, M (2011) Leaving no-one behind: Ethiopia's Productive Net and Household Asset Building Programmes. World Bank. http://tinyurl.com/zp6xj2f.

Tiwari, R, *et al.* (2011) MGNREGA for environmental service enhancement and vulnerability reduction: rapid appraisal in Chitradurga district, Karnataka. *Economic and Political Weekly* 46(20) 39-47. www.lse.ac.uk/asiaResearchCentre/_files/epwArticle14052011.pdf.

Turpie, JK, Marais, C and Blignaud, JN (2008) The Working for Water programme: evolution of a payments for ecosystem services mechanism that addresses both poverty and ecosystem service delivery in South Africa. *Ecological Economics* 65(4) 788-798.

Uraguchi, ZB (2011) Social protection for redistributive justice: socio-economic and political drivers of vulnerability to food insecurity in Bangladesh and Ethiopia. In: *International Conference on Social Protection for Social Justice.* Institute of Development Studies and Centre for Social Protection, UK.13-15 April 2011. http://tinyurl.com/zzwr8yd.

Viana, VM (2008) Bolsa Floresta (Forest Conservation Allowance): an innovative mechanism to promote health in traditional communities in the Amazon. *Estudos Avançados* 22. www.scielo.br/pdf/ea/v22n64/en_a09v2264.pdf.

Wong, G (2014) The experience of conditional cash transfers: Lessons for REDD+ benefit sharing. CIFOR.

Wunder, S (in press) Revisiting the concept of payments for environmental services. *Ecological Economics*.

WWF (2006) Working for Wetlands, South Africa. World Wildlife Fund, Pretoria.

Abbreviations and acronyms

3ie	International Initiative for Impact Evaluation
BF	Bolsa Floresta
CCT	Conditional cash transfer
CONAFOR	National Forestry Commission of Mexico
DENR	Department of Environment and Natural Resources
DFID	Department for International Development
DoF	Department of Fisheries
ES	Ecosystem services
FONAFIFO	National Forestry Fund
GIZ	German Corporation for International Development
HSNP	Hunger Safety Net Programme
IAP	Invasive alien plant
INGO	International non-governmental organisation
LGU	Local government unit
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
NREGA	National Rural Employment Guarantee Act
NGP	National Greening Program
PSAH	Payments for Hydrological Environmental Services
SDR	Sustainable development reserve
UNICEF	United Nations Children's Emergency Fund
WfW	Working for Water

Annex: summary of PES/CST programme impacts

COUNTRY	FACT FILE	PROGRAMME	MAIN OBJECTIVE	SUMMARY OF IMPACTS
India	Landmass: 3mn km2 Population: 1.252 billion GDP per capita: $3,800 Gini coefficient: 33.9	India Mahatma Gandhi Rural Employment Guarantee Act (MGNREGA) Started 2005	Enhancing livelihood security in rural areas by providing at least 100 days of guaranteed wage employment per financial year, to every household whose adult members volunteer to do unskilled manual work – as well as providing improved assets in rural areas, including for natural resource management	MGNREGA is the first ever law globally to guarantee waged employment on such a large scale. Most evidence on the quality of MGNREGA investments is positive (Dreze, 2015). The low (but guaranteed) wages are pro-poor (middle to better-off household will try for better options), suggesting that self-selecting under these conditions works well. However, states could better ensure pro-poor impact by introducing further targeting for rationing, when not enough funds exist to satisfy demand. The strong emphasis on water and soil conservation in poorest areas has a positive impact on agricultural productivity
The Philippines	Landmass: 300,000km2, distributed among 7,107 islands Population: 98.4mn GDP per capita: US$4,400 Gini coefficient: 43	National Greening Program (NGP) Started 2010	Aims to plant 1.5 billion trees in 1.5 million hectares across the Philippines from 2011 to 2016, but the true goals of the NGP are much broader. It plays a central role in reducing poverty while promoting food security, environmental stability, and biodiversity conservation	Programme works on private and public land. It is a well-funded large-scale programme with problems common to programmes of its size, especially delays in funding and mismanagement of transfers. Although protected areas are included, there is a clear emphasis on commercial species (timber, fuelwood) as a means to generate revenues, and unclear long-term monitoring has generated criticism from environmental organisations. Despite claiming social impacts, an important limitation of the programme is the lack of explicit criteria of how to reach local participants to ensure these social objectives are met
Bangladesh	Landmass: 130,168 km2 Population: 157mn GDP per capita: US$2,000 Gini coefficient: 32.1	Hilsa Fisheries Management Action Plan Started 2003	Primary goal is to conserve hilsa and associated biodiversity, but also to improve the socioeconomic conditions of affected fishers in or near the sanctuary areas	The lengthy government administration chain needed to distribute food incentives to fishers has low reported transaction costs but is time consuming. There have been concerns regarding equity and political interference in the distribution of compensation, elite capture and high levels of inclusion and exclusion error. Impact on the ecosystem is difficult to measure due to the resource's open access, and the absence of a counterfactual study. A new stage of the programme puts stronger emphasis on these impacts by making the payments for ecosystem services component explicit

Ethiopia	Landmass: 1.2mn km2 (66% arid to semi-arid) Population: 80mn GDP per capita: US$1,300 Gini coefficient: 3	Productive Safety Net Programme (PSNP) Started 2005	Largest social protection programme operating in sub-Saharan Africa outside of South Africa. Designed to provide employment for 5 days a month to food-insecure persons during agricultural lean seasons to support public works programmes, including watershed management	The PSNP shows that it is possible to build a single government-led programme using multiple funding streams and multiple implementation organisations. This helps with long-term planned (rather than emergency) support. There have been challenges of scale and capacity. Participants are expected to 'graduate' from the programme. Understanding social context is key to target the type of benefit transfer: jobs or unconditional support. Communities are key participants in the design and implementation of this programme. Targeting has improved as communities learn how to apply the guidelines to their own context.
South Africa	Landmass: 1.21mn km2 Population 53.2mn GDP per capita: US$11,300 Gini coefficient 63.4	'Working for' programme Started 1995	Combined objective of jobs and environmental improvement. Inclusive green growth pushed forward by the environment authorities through a series of joint environmental/social protection job schemes such as the 'Working for Water' and 'Working for Wetlands' schemes	The 'Working for' umbrella programme has been very effective at combining environmental objectives with providing jobs. Different individual components target the ecosystem threat or geographic issue, underpinned by a social development model. Many biophysical and hydrological studies show the programme's impact. One constraint is securing sustained impact after the activity has taken place. The programme is government-led and the bureaucratic process often results in delays in payments and contract approvals, which can be especially harmful for vulnerable groups
Brazil	Landmass: 8.46mn km2 Population: 200mn GDP per capita: US$11,700 Gini coefficient: 52.9	Bolsa Floresta Started 2006	Conserving forests and improving the welfare of residents in selected sustainable development reserves (SDRs) of the State of Amazonas in the Brazilian Amazon	Bolsa Floresta has been effective in securing multiple sources of funding, strong government presence, private sector engagement and international initiatives like REDD+. Being privately run allows more effective management than government programmes, although transaction, operational and monitoring costs are high, due to remoteness and expanse of area. Significant efforts are made to include local communities in monitoring and taking responsibility for the programme. The BF cash payment is reported to be one of the most important benefits beneficiaries receive. The mix of benefits (health, education and sustainable livelihoods) might do more than cash payments to improve lives in the communities. Replicating this low-value, uniform-across-households transfer may be more challenging in settings with more competition for land use (Börner et al., 2013)

Mexico	Landmass: 1.94mn km2 Population: 122mn GDP per capita: US$15,400 Gini coefficient: 48.1	Payments for Hydrological Ecosystem Services (PSAH) Started 2003	Primary objective is to offer payments for environmental services generated by forest ecosystems in a way that compensates landowners. Modified in 2006 to include poverty alleviation	This long-term programme has clear sources of income based on a legal mandate and rules that promote accountability. It is improving its targeting of environmental impacts, reaching areas more at risk of deforestation. However some suggest a bias to pay those already engaged in good practices rather than landowners who are likely to deforest. It works on both private and communal land (ejidos). The introduction of social benefits was a requirement to make the programme politically acceptable. Some argue that Mexico can reach social and environmental goals (Alix-Garcia et al., 2014), and others that linking them may lead to achieving neither (Salafsky, 2011, Alatorre-Troncoso, 2014)
Costa Rica	Landmass: 51,060km2 Population: 4.87mn GDP per capita: US$12,500 Gini coefficient: 49.2	Payments for Ecosystem Services Started 1997	Aims to conserve and increase forest cover through cash payments to private landowners and indigenous groups	This was the first national-level programme to make direct cash rewards for ecosystem services. Its legal foundations allow it to access funds both from government and private sector (national and international). However, it is oversubscribed and underfunded. The programme uses preference criteria to allocate contracts. This introduces flexibility in the design and the ability to take feedback. There is no explicit social component, and most landowners are relatively well off. However, the requirement of absolute forest protection excludes those who derive livelihoods from their land. Land prices in Costa Rica are increasing, reducing the competitiveness of the PES transfer where forests are most at risk of change. PES needs to work stronger with other mechanisms and regulations and improve their target areas where the payments can make a change in behaviour

While policymakers juggle policy objectives, budgets and votes, protecting the environment rarely gets the same political traction as poverty reduction. But as the Sustainable Development Goals are introduced, governments will need to tackle both these issues simultaneously. This paper looks at ways to combine economic instruments that tackle both social and environmental objectives at the same time. It looks at eight countries in Africa, Asia and Latin America using payments for ecosystem services (PES) or conditional social transfers (CST) at a national level to alleviate poverty and address environmental problems – from guaranteed employment to improve soil in India, to compensation during seasonal fishing bans in Bangladesh. It examines the challenges, the opportunities and the lessons for upscaling these policies in the new era of Sustainable Development Goals.

IIED is a policy and action research organisation. We promote sustainable development to improve livelihoods and protect the environments on which these livelihoods are built. We specialise in linking local priorities to global challenges. IIED is based in London and works in Africa, Asia, Latin America, the Middle East and the Pacific, with some of the world's most vulnerable people. We work with them to strengthen their voice in the decision-making arenas that affect them – from village councils to international conventions.

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