

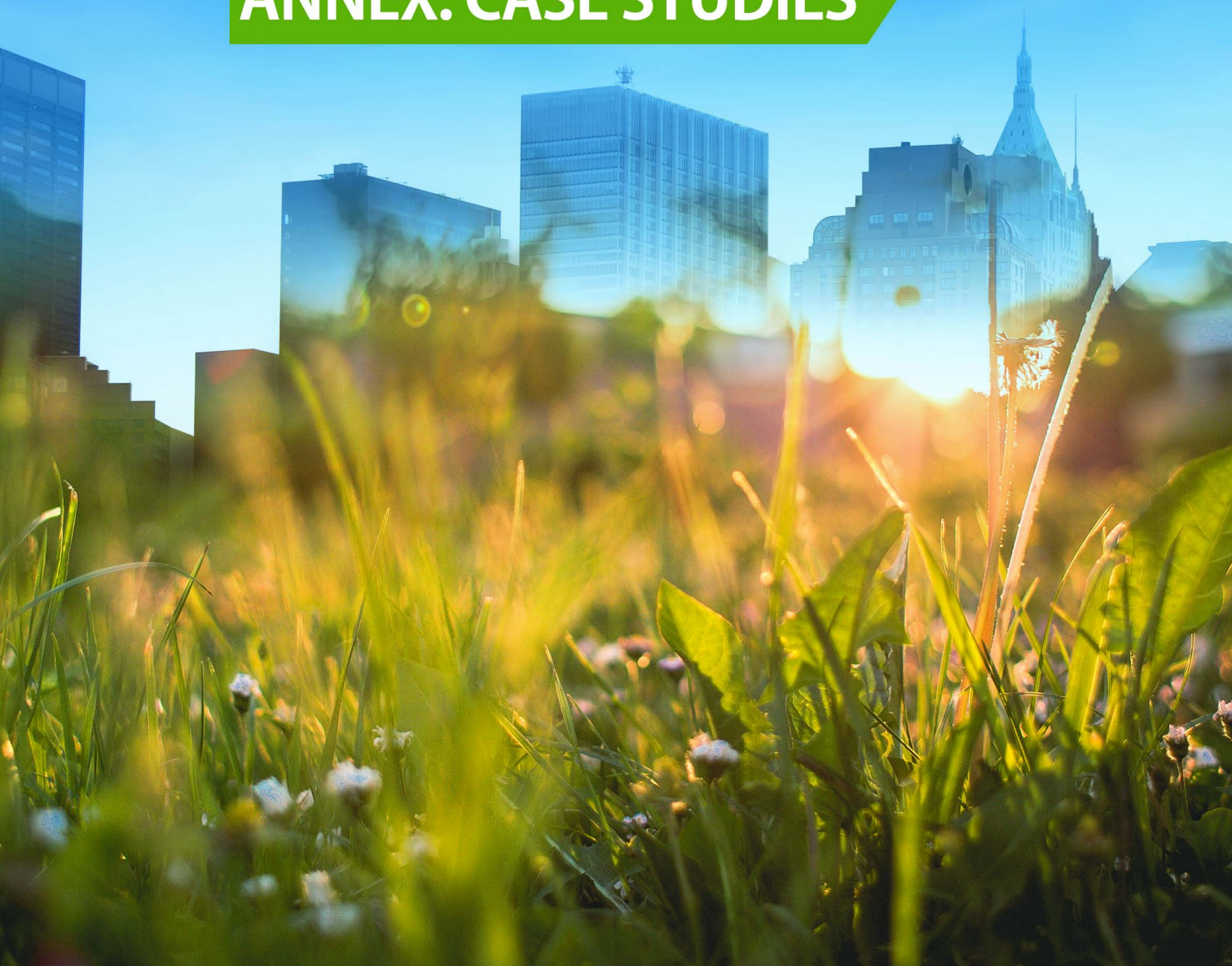


*Empowered lives.  
Resilient nations.*

# TOWARDS GREEN AND INCLUSIVE PROSPERITY

BUILDING GREEN ECONOMIES THAT  
DELIVER ON POVERTY REDUCTION

## ANNEX: CASE STUDIES



This report contributes new insights into the growing body of literature on inclusive green economy approaches as a key means for eradicating poverty and advancing the evolving post-2015 sustainable development agenda. The report draws on a range of country experiences and a series of case studies commissioned through the UNDP-DESA-UNEP Joint Programme Supporting a Green Economy Transition in Developing Countries and LDCs: Building Towards Rio+20 and Beyond, with the generous support of the Government of The Netherlands. Its non-prescriptive findings are designed to inform country-led efforts to transition to greener, more inclusive economies in ways that deliver on poverty reduction.

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**TOWARDS GREEN AND INCLUSIVE  
PROSPERITY** – BUILDING GREEN  
ECONOMIES THAT DELIVER ON  
POVERTY REDUCTION

**ANNEX: CASE STUDIES**



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# 1. INTRODUCTION TO THE CASE STUDIES

As global efforts focus on advancing the post-2015 Sustainable Development Goals agenda, including the eradication of poverty and a reduction in inequalities, a key challenge for national governments is designing and implementing inclusive green economy approaches. This involves identifying the optimal green growth strategies and initiatives for reducing poverty and achieving broader sustainable development goals. Inclusive green economy approaches address the multidimensions of poverty, including income, health, education, resilience and access.

A policy paper, “Towards Green and Inclusive Prosperity – Building Green Economies that deliver on Poverty Reduction”, has been prepared to support these efforts, which addresses the following key questions:

- Do green economy approaches automatically benefit the poor or can they negatively impact or exclude the poor?
- What are the synergies and trade-offs between green economy approaches and poverty reduction?
- How can inclusive green economy initiatives be designed and implemented to ensure that they optimize multiple development objectives?

The paper draws on and includes a synthesis of various thematic case studies on: environmental fiscal reform (EFR), employment generation programmes, sustainable ecosystem management, ecotourism, energy, waste management, and reducing emissions from deforestation and forest degradation. These case studies reflect a range of country profiles and a number of similar country experiences, and analyze how to operationalize pro-poor policy opportunities through inclusive green economy approaches. The case studies also analyze the apparent synergies and trade-offs that the themes imply as well as further challenges. Each case study highlights information on the drivers of success, gaps and additional challenges, policy implications and guidance on how to operationalize such policy opportunities, and were developed according to the following template.

## **BACKGROUND AND RATIONALE:**

- a. Why the thematic case is considered key/critical for inclusive green economy approaches that reduce poverty? What poverty dimension(s) does it address? What are some of the thematic examples, including scale of the programmes, different country contexts, challenges, and opportunities, that brought about the need for such initiatives?

**INITIATIVES DESIGN:**

- b.** What (existing or new) assessment tools are available to assess the feasibility of this thematic initiative? How were they used in select country cases including to convince decision makers?
- c.** What process tools are available (including soliciting the inputs of communities and stakeholders) in shaping initiative design? How were they used in select country cases?
- d.** What can be the different synergies and trade-offs, and how can they be assessed?
- e.** How have select country cases been designed to capture synergies and manage the trade-offs?
- f.** What are the key components of these integrated thematic initiatives to ensure inclusive green and poverty reduction approaches?

**INITIATIVES IMPLEMENTATION:**

- g.** How should implementation arrangements be designed that facilitate the multi-objective, cross-sectoral and cross-actors cooperation (including the role of government, development partners and communities) of these initiatives? What have been the positive and negative experiences with such implementation frameworks?

- h.** What are the key capacities needs to address implementation challenges and/or enhance implementation of such integrated approaches? How can be these capacities be effectively built?
- i.** How can the poor and related vulnerable groups be targeted by the goods/services of the initiatives? What has worked and what acted as constraints and bottlenecks to the poor benefitting, and how were these addressed through improved implementation?
- j.** How can these initiatives be adequately costed, budgeted and financed?

**Results:**

- k.** How can results be identified and measured? What indicators are required to measure progress? Examples from select country cases,

**Drivers and Policy Implications:**

- l.** What are the key drivers of success? Examples from select country cases,
- m.** What are the policy implications for effective design, implementation and sustainability of such initiatives? Lessons from select country cases.



## 2. DRAWING POLICY LESSONS FROM COUNTRIES THAT HAVE IMPLEMENTED SUCCESSFUL APPROACHES FOR ENVIRONMENTAL FISCAL REFORM FOR POVERTY REDUCTION

**By: Paul Steele, (formerly UNDP)**

### **BACKGROUND AND RATIONALE:**

Fiscal policy is a crucial aspect of public policy and can be used to combine environmental and pro-poor outcomes central to a green economy (OECD, 2005; World Bank et al., 2005). EFR have been applied in some developing countries and have achieved triple wins of revenue generation, environmental improvement and poverty reduction (OECD, 2005).<sup>1</sup>

EFR encompasses a wide range of policy changes including: energy and water pricing reforms to remove, for example, environmentally harmful subsidies in agriculture and energy; targeted subsidies to achieve inclusion objectives without compromising efficiency; and using taxes and charges to internalize the costs of ecosystem degradation and (industrial) pollution. Poverty can be reduced by ensuring that poor households benefit through the allocation of revenue to improve social services and through environmental health gains from reduced pollution. Public resources generated have been used to invest in the provision of quality services to the poor, but also can be applied to social protection expenditure to cushion the loss of jobs, training in new green jobs

through investment in renewable energy, energy infrastructure and efficiency during the transition to a green economy.

There are some potential trade-offs associated with EFR:

- Although environmental taxes are generally progressive and thus the price corrections introduced by them tend to be pro-poor, there is a need for careful analysis to identify impacts of EFR on particular vulnerable groups. For example, 'dirty' fuels such as coal are predominantly used by marginalized urban poor households who may not have access to cleaner fuels such as cooking gas (LNG or LPG). Increased tax on coal is thus likely to be regressive and further increase fuel poverty among such households.
- Removal of subsidies on diesel can result in kerosene (meant for the poor) being diverted to industrial and commercial uses (for adulteration of more expensive diesel with cheaper kerosene).
- Increase in import taxes on small-scale diesel generators (used extensively by informal enterprises) can increase input costs of such enterprises and can make them uncompetitive compared with more formal sector enterprises that enjoy a price advantage of cleaner fuels (such as electricity from the grid).

1. Often, green growth strategies adopt a mutually reinforcing mix of market-based instruments (e.g., EFR) and command-and-control instruments (e.g., regulations and standards), which, if planned and implemented well, can effectively achieve green economy and sustainable development goals.

## EFR DESIGN

Poorly designed fiscal instruments can distort signals, encourage inefficient and excessive use of resources and discourage innovation. The IMF (2013) highlights that, while pre-tax **subsidies** globally amount to some US\$480 billion per annum (or 0.7 percent of GNP), the amount is US\$1.90 trillion per annum (or 2.7 percent of GNP) when other hidden subsidies are taken into account.<sup>2</sup> In many oil- and gas-producing countries, consumers are subsidized to up to 10 percent of GDP. Reducing fuel subsidies, making these **transparent** and **protecting the poor communities** through targeted cash transfers can work if such interventions are designed carefully and institutions and mechanisms of transparency guarantees are in place. Withdrawal of fuel subsidies before alternative protection mechanisms are put in place results in much anxiety for all households, especially for the most vulnerable. This highlights the importance of policy timing and sequencing as well as use of EFR tools and design options for reducing regressiveness of green taxes and charges on the poor, such as through life line tariffs.

Environmental fiscal reform (EFR) requires an **understanding of macroeconomic dynamics** in order to design environmental policy instruments that can deliver significant social benefits. For example, if fiscal instruments to encourage efficient technologies in manufacturing and industry are introduced without a full understanding of the dynamic effects on industrial performance, growth and productivity, some types of firms (most typically SMEs) might be unable to adjust or transform production processes quick enough. Energy and natural resources are two sectors that require careful macroeconomic measures to cushion national policy design from external factors such as global energy

and commodity price movements. Appropriate instruments for stabilization and consumption-smoothing devices are needed. These are not easy, especially for price-takers and small countries.

EFR reform will be **influenced by a country's underlying social and cultural context**. For example, some OECD countries have used green fiscal incentives to make highly energy-efficient and carbon-neutral technologies such as hybrid and electric cars affordable. In the **UK**, a subsidy of up to GBP 5,000 was provided to car manufacturers of such cars, targeted through the 'car scrappage' scheme by linking the subsidy with buy-back of cars more than nine years old. That is, in the UK, the scheme was mainly framed as an economic recovery and transport pollution issue in order to encourage 'buy-in', while, in **Germany**, the scheme was framed within an environmental discourse about climate change (Aldred and Tepe, 2011). ERF is also influenced by short-term factors such as a fiscal crisis, environmental disasters or new political leadership.

**Building coalitions with stakeholders** at the design stage is important and can benefit from an understanding of who the beneficiaries and losers of any fiscal reforms will be. It is important to understand vested interests, manage perceptions and ensure that the losers are compensated. Different kinds of fiscal instruments will face challenges from various stakeholders that will need to be addressed for the instrument to be effective:

- For subsidy removal and taxes on natural resource extraction (e.g., fossil fuel mining, industrial fishing fleets or commercial timber processing), there may be powerful industrial players who resist reforms. However, the general public can be persuaded

2. IISD estimates subsidies to fossil fuels to be around US\$600 billion per year.

that such reforms are 'fair'. Better information and communication strategies, transparent decision-making processes and engagement of all stakeholders are essential.

- Subsidy removal or taxes on fossil fuel energy prices may negatively impact middle-class consumers as well as poor consumers and affect inflation further impacting the purchasing power of the poor, and compensatory measures that include the timing and staging of such reform may be needed to lower the burden.
- Positive subsidies, such as for renewable energy, are less controversial, although may face challenges during a period of fiscal restraint. Energy subsidies require considerable financial allocations and, over long periods, are known to sap financial resources; combined with high transaction costs, transmission and distribution losses, this has contributed to the poor state of utility operations in some countries (e.g., extensive use of unmetered water pumps in parts of **India**). This, in turn, has limited the ability of utilities to maintain their systems and to expand into new areas to meet demand. Unfortunately, subsidized fuels have often been poorly targeted or even diverted from their intended recipients, benefiting those who were never intended as targets of the subsidy programme and, again, creating huge losses without necessarily providing attendant welfare gains.

## IMPLEMENTATION OF INITIATIVES

The key players involved in the EFR process are the government, private sector, household consumers and development partners including civil society, universities and think tanks (who can play a role in supporting the evidence base, design and transparency for reform). Within these groups there are further subdivisions, such as the role of different ministries within the government or of the different

groupings within the private sector and households (including the poor and vulnerable).

The poor have typically benefited where there has been a clear commitment to use the revenues from EFR to benefit or compensate them. This has been particularly true for fossil fuel price changes where poor households have been seen as an important political constituency for the success of reforms. However, the International Energy Agency (2011) noted that of the US\$409 billion in energy subsidies in 2010 in developing countries, only US\$35 billion reached the poorest quintile of the population. Thus, while subsidies may be justified on the grounds that they benefit the poor, in reality few of those subsidies may actually reach the poor. Similarly, life line tariffs may be needed to reduce the adverse impact of environmental taxation and subsidy reform.

## MONITORING AND EVALUATION OF RESULTS

The fiscal, environmental and poverty reduction benefits of EFR can be measured. For instance, China's pollution levy system applies to over 200 different air and water pollutants and raised more than US\$1.2 billion in 2004, which is used to fund environmental protection. However, pollution has continued to worsen in many areas in **China** (GIZ, 2013). It is possible that the pollution levy might have been set too low or may have been perceived as legitimizing pollution, thus losing its effect as an incentive to change to less polluting processes. To reduce pollution, the Chinese Government is now taking steps to also increase charges on inputs, such as energy.

In **Brazil**, the government has used VAT tax revenues (ICMS-E in Portuguese) to reward states for creating protected areas. It is estimated that, in the state of

Parana, increasing the number of protected areas in the state by 158 percent has generated revenue of US\$170 million over 14 years. Overall, ICMS-E revenues were US\$200 billion in 2009 (GIZ, 2013). Criticisms of ICMS include that it is one of the most regressive taxes and that it varies significantly from state to state (see IADB, 2013).<sup>3</sup>

However, while the fiscal benefits of China's and Brazil's schemes are easy to quantify, the environmental benefits of the fiscal reforms are not so clear and insufficient attention has been paid to identifying the link between fiscal revenues and environmental outcomes.

## DRIVERS AND POLICY IMPLICATIONS

Experience shows that EFR succeeds where there has been careful management of the reforms within an inclusive political process and where reforms are tailored to a country's circumstances. Careful coalition-building and leadership can overcome the vested interests that may hamper reform.

In designing fiscal instruments, there is a need to consider property rights, because a combination of fiscal policies and ownership incentives affect policy goals such as climate change mitigation and adaptation, conservation of forests, wetlands, grasslands and other habitats for biological diversity conservation.

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*3. The use of 'polluter-pays' pricing schemes with cascading/tiered/alternating rates is considered a more 'fair' and 'effective' approach. However, many developing countries' fiscal systems are less mature, and only recently, have some countries been able to successfully implement single rate value-added taxes. The next step would be to apply differentiated pricing rates to products and services based on their 'good' or 'bad' value. However, this should be approached carefully, taking into consideration institutional capacities and readiness to adopt and implement such measures.*

# 3. ENABLING THE POOR TO PARTICIPATE IN GREEN ECONOMY TRANSITIONS: THE 'WORKING FOR PROGRAMMES' IN SOUTH AFRICA

**By: Maikel Lieuw-Kie-Song,**  
**Independent Consultant**

## BACKGROUND AND RATIONALE

Ensuring that the poor are able to participate in and benefit from shifts to greener economies remains a challenge in many countries. Many aspects of this shift are relatively capital- and knowledge-intensive and so those without access to capital or relevant skills can easily be side-lined in the process. This case study highlights the potential of Public Employment Programmes<sup>4</sup> (PEP) as a mechanism to foster the inclusion of the poor in this process.

One of the most important features of PEPs is that they are able promote inclusive growth by allowing the poor to use the factors of production that they possess to contribute to growth.<sup>5</sup> For many poor, (unskilled) labour is the main factor of production they possess and PEPs are mechanisms to enable this factor of production to be used to ensure that they are able to derive income from their labour. This interpretation does not imply that policies should not aim to give the poor access to other means of production or that they are idle. It

rather recognizes that the poor often earn very little for their labour and that, in the periods that they are idle, the income they could have potentially gained from their labour is lost forever. For these reasons, PEPs are increasingly designed to enable the poor to earn income from their labour in the periods when they would be idle or at least would earn less than they would by being employed on the PEP.

While most PEPs share this feature of providing employment for the poor, there is still huge variation among these programmes. They have been or are being implemented in a wide range of contexts, with considerable variation in their objectives and design features. While they have traditionally strongly focused on infrastructure development, this has shifted and their potential to address environmental concerns and contribute to a greener economy is increasingly being recognized. Aside from **South Africa**, which is the focus of this case study, programmes in many other countries currently have a strong focus on or contain specific components addressing environmental concerns and or transitions to a green economy.<sup>6</sup>

4. As these programmes increasingly diversify their activities to non-infrastructure-related the activities, they are increasingly being referred to as 'public employment programmes' in order to move away from the strong association that the term 'public works' has with infrastructure (Rose 2009, ILO 2010).

5. Presentation by DK Jain, now Former Joint Secretary for NREGA 2013, at *Innovations in Public Employment Programmes, A Policy Focus*, University of Cape Town/ ILO Course, Cape Town, March 2013.

6. Good examples of these are the National Rural Employment Guarantee Act and associated scheme in India, The Productive Safety Net Programme in Ethiopia, the Programa de Empleo Temporal in Mexico and the Labour Intensive Works Programme in Yemen.

This case study focuses on a cluster of labour-intensive natural resource management programmes of the South African Government that demonstrate how PEPs can be designed to enable the poor to contribute to and benefit from such a shift to a greener economy.

The first of these natural resource management programmes was the Working for Water Programme, which started in 1995 and focuses on the threat of invasive alien plant (IAP) on water resources, biodiversity and grazing in **South Africa** (see Box 1). Previously unemployed persons were employed to remove these plants in those areas where they were posing the most serious threat.

Working for Water has since spawned various additional Working for Programmes that address a range of environmental issues such as deteriorating wetlands, threats of wildfires and waste

management. These programmes still vary in their scale and impact and Working for Water is not only the oldest, but also the largest of these. Collectively, they address several issues relevant to inclusive green economy approaches, namely:

- They focus on natural resource management activities that create environmental benefits such as ecosystem services and prevention of the loss of biodiversity, as well as quantifiable direct and downstream economic benefits.
- They create employment for the poor unemployed in **South Africa** and, through this, provide them with income and a vehicle to contribute to the country's development.
- They demonstrate and highlight the linkages among poverty, the economy and the environment, thus creating awareness of this at many levels, from the poor employed in the programmes to policymakers and politicians.

#### BOX 1. INVASIVE ALIEN PLANTS: WHAT IS THE PROBLEM?

“Invasive species are causing billions of Rands of damage (hundreds of millions of US\$) to South Africa's economy every year and they are among the biggest threats to South Africa's exceptional variety of plants and animals (biodiversity). Invasive species are plants, animals and microbes that are introduced into countries and then out-compete the indigenous species.

Invasive alien plants (IAPs) pose a direct threat not only to our biological diversity, but also to water security, the ecological functioning of natural systems and the productive use of land. They intensify the impact of fires and floods and increase soil erosion. IAPs can divert enormous amounts of water from more productive uses, and invasive aquatic plants such as the water hyacinth can affect agriculture, fisheries, transport, recreation and the water supply.

Of the estimated 9,000 plants introduced into **South Africa**, 198 are currently classified as being invasive. It is estimated that these plants cover 10.1 million hectares or about 7 percent of the country and the problem is growing at an exponential rate.”

*Cited from: Working for Water information brochure <http://www.dwaf.gov.za/wfw/Docs/Books/brochure07.pdf>*

The last point is especially important in promoting a shift to a greener economy, as it highlights that such a shift is not a luxury for developing countries, but can rather contribute to its overall development goals. Apart from water availability, two other environmental concerns directly affect the poor: 1) the effects of land degradation and 2) invasive plants and the quality of grazing land. Keeping cattle on communal land remains an important economic activity in many parts of **South Africa**. But, in many areas, the quality of this communal land is deteriorating due to soil erosion and the invasion of non-edible plants that displace edible grasses.<sup>7</sup>

By addressing these two problems, the Working for Programmes are demonstrating the direct linkages between environmental concerns and poverty.

All of these programmes form part of the Environmental Sector of the Expanded Public Works Programme, a national programme to maximize direct employment creation for the poor through government expenditure. The environmental sector comprises many other programmes besides the Working for Programmes, but this case study discusses only a selection of the key Working for Programmes, as presented in the table below.

**TABLE 1. THE MAIN WORKING FOR PROGRAMMES<sup>8</sup>**

NAME	CATEGORY	FOCUS AREA & ACTIVITIES
Working for Water	Sustainable land-based livelihoods	Control of invasive alien plants that deplete water, displace native vegetation and threaten water resources, biodiversity and land used for grazing
Working on Wetlands	Sustainable land-based livelihoods	Restoration of wetlands to enable them to fulfil their important water management service, building gabions, re-vegetation and plugging drainage channels. Workers also remove alien invasive plants that use large amounts of water and suppress other plants. The area is then re-vegetated with indigenous plant species.
Working on Fire	Sustainable land-based livelihoods	Fire prevention and awareness activities, fire detection and suppression, prescribed burning, fire damage rehabilitation, resource-sharing and coordination

7. Perhaps the most serious of these is *Chromolaena Odorata*, or Triffid Weed, which is inedible for domestic cattle (and wildlife) and has rapidly spread across many areas of South Africa. In wet years, it needs to be cleared seven times a year and, in some areas, farmers have reportedly had to abandon their land as they cannot cope with the speed at which it grows (Preston 2011).

8. From the Environmental and Culture Sector Guidelines for EPWP Phase 2.



NAME	CATEGORY	FOCUS AREA & ACTIVITIES
Working for the Coast	Coastal management	Upgrading boardwalks and cleaning and rehabilitating hiking trails and coastlines; plant nurseries, rehabilitation of dunes
Working on Waste	Waste management	Cleaning and removing waste in parks, rivers, cemeteries, beaches, streets, road reserves, sidewalks, storm water pipes and drains, sports grounds, stadiums, resorts, schools, public toilets and informal settlements; waste collection and removal; greening and grass cutting in public areas; bush clearing; recycling and composting; rehabilitation of transfer stations; maintenance of landfill sites

Addressing environmental concerns using PEPs is not unique to **South Africa**, and other programmes like the Mahatma Gandhi National Rural Employment Guarantee Act in **India** (MGNREGA) and the Productive Safety Net Programme (PSNP) in **Ethiopia** also have a strong natural resources management focus and are bigger. While there are many differences in the design of these different schemes, from a natural resource management perspective, perhaps the most important one is that the South African programmes focus on a limited set of specific environmental concerns while the other programmes take an approach where a range of different activities are focused on within one area. The reasons why the Working for Programmes take this approach are discussed below.

## MANAGING TRADE-OFFS AND EXPLOITING SYNERGIES

One central trade-off to the design of these programmes is the focus on a specific environmental risk or problem. This makes them quite distinct, as the approach more common in other

programmes is to have a range of interventions in one area. A good example of this is a watershed development approach, where a range of interventions within one the geographical area of the watershed is implemented. The advantage of the focus on one specific environmental concern is that greater productivity and efficiencies can be achieved within a programme. This does not mean that the benefits of the programme are one-dimensional, though, as addressing a single environmental concern can still have a range of benefits. Working for Water uses specialized small contractors for removing IAP, which they can do very efficiently. They can also be contracted relatively simply and, from a management perspective, their productivity and progress can be measured relatively easily. The down-side of not taking a more integrated, area-based approach is that other environmental problems within the same areas are not addressed simultaneously and a separate intervention is required to address these. However, simultaneously addressing multiple environmental concerns within one area requires a much greater level of (interdisciplinary) expertise to design, manage and supervise. In



many contexts, including in **South Africa**, such interdisciplinary skills are scarce.

Another trade-off that the programmes face concerns which combination of methods for control to use. The three methods used are physical, chemical (herbicides) and biological (natural enemies of these plants) removal. Physical removal is the most labour-intensive and also the most costly, but poses the fewest long-term environmental risks of unintended consequences. Chemical control, involving the (restricted and controlled) use of herbicides, is generally cheaper, but creates less employment and introduces these chemicals into the environment, with potential negative effects for workers, communities and other species. Biological control, whereby natural enemies of the invasive plants are introduced, carries the risk of introducing another alien species into the environment with, to some extent, unknown unintended consequences. Yet, at the same time, this is the most cost-effective approach, although it also uses hardly any local labour and thus creates very little employment for the poor. In practice, all three approaches are necessary for effective control and the programmes use a carefully balanced combination of these methods.

An important advantage of these programmes is that the work is highly visible and many of the results are clear. The removal of IAP is obviously highly visible, but also stream flow in the area is often increased within weeks or months and is clear to those concerned. Similarly, the results of firefighting and even of fire prevention are clear. However, the full benefits accrue over many years and need to be factored in when overall costs and benefits are assessed.

At the same time, the Working for Programmes have quite effectively capitalized on the synergy between the labour-intensive nature of many natural resources management activities and the

need for employment creation in a country with high levels of unemployment and poverty. Working for Water achieves this by emphasizing two benefits of these programmes that resonate best with policymakers and in the overall policy space in **South Africa**: 1) the creation of employment for the poor unemployed in a country with a unemployment rate of above 25 percent and 2) the link to increasing the availability of water in a water-scarce country where water policy is high on the agenda. A specific focus was on demonstrating how these programmes could create jobs and income for the poor and increase the availability of water. This approach has persuaded the government to allocate annual budgets, which have been increasing over the last 18 years.

## BUILDING CAPACITY

Working for Water has also demonstrated innovative approaches to dealing with some of the capacity constraints. One such constraint was the lack of the specific technical skills required for implementation. In the Working on Fire Programme, workers undergo an intensive training regime on fighting and controlling fires. At the same time, the programme takes an integrated approach and also develops capacities of other stakeholders to prevent fires and empowers communities affected by fire to understand the benefits of naturally occurring fires and the potential harm caused by fires (which are more intense due to changes in ecosystems and land use).

In Working for Water, workers need to identify different IAPs and use the appropriate measures to control them. In order to address this issue, the programme has a well-established set of training interventions for workers. In addition, the programme decided to use small contractors for

the implementation and has invested significantly in the development of these contractors not only to execute the work, but also to enable them to manage their more general business affairs. Through this, it has developed a cadre of small natural resource management contractors able to implement the programme. The main concern has been that these contractors have remained quite dependent on the programme for work, as the market for such natural resource management is still limited and the government remains by far the most important client. This has also had further impacts on the selection of workers in the programme. Because workers in these programmes need to develop a set of skills, there is strong incentive for contractors to rehire workers who have already been trained and who have experience. This has resulted in many workers returning to the programme, doing work with the programme for part of the year and taking up other work, if available, in the rest of the year.

## SCALE AND FINANCING

These programmes have been and continue to be financed primarily by the South African Government through annual departmental allocations. The nature of these allocations has varied over time, but this is primarily because of changes in how the government funds its activities. There have also been cases of implementing contracts directly for private clients or agencies, but these have been limited, certainly as far as overall budgets are concerned.

During its inception, the Working for Water programme was funded through the Reconstruction and Development Programme

(RDP), which had specific funds targeted at poverty-alleviation programmes. Gradually, as the RDP was replaced by other programmes and funding approaches, these programmes were mainstreamed and funded like any other government intervention through the annual budgeting process. In the 2012-13 financial year, expenditure was approximately ZAR 2 billion (US\$250 million<sup>9</sup>), more than 95 percent of which was funded by the South African Government. Across **South Africa**, temporary employment was available to more than 100,000 poor people, 51 percent of whom were women and 56 percent youth. The good gender balance was achieved through specific targeting, a quota system of at least 40 percent women and the availability of crèches for the children of women working on the programme. On average, each person was employed for about 84 days and the average earnings per person over the period were about ZAR 6000 (US\$750)<sup>10</sup> (DPW, 2013). The total quantum of employment created was the equivalent of 35,000 full-time jobs.

Because of the high labour intensity of these programmes, one key cost factor is the wage rate paid for manual work. The programmes achieve an average labour intensity of around 40 percent at a wage rate of around ZAR 72 per day (US\$8 per day). The wage rate is determined through a special wage determination of the Department of Labour applicable to all EPWP programmes. Another, but related, factor concerning costing is the adoption of task-based payment whereby workers are paid based on work outputs, not on time. So, with respect to Working for Water, the daily wage rates are effectively task rates, whereby a task is set equivalent to a day's work. Experience has

9. The exchange rate between the South African rand (ZAR) and the US dollar fluctuates greatly. The exchange rate used for these conversions is 8 ZAR = 1 US\$, as this was the approximate rate over the 2012-13 financial year.

10. Compare: While employment is generally not for an entire year, but only for four months annually, income of participants for the months employed is around R 1500 per month, which is similar to the top range of income among the poorest 25 percent of earners in South Africa.

shown that using task-based methods can increase productivity by a factor of up to two or three. For many of these programmes, the adoption of a task-based work organization and payment model is critically important to achieving productivity and work outputs.

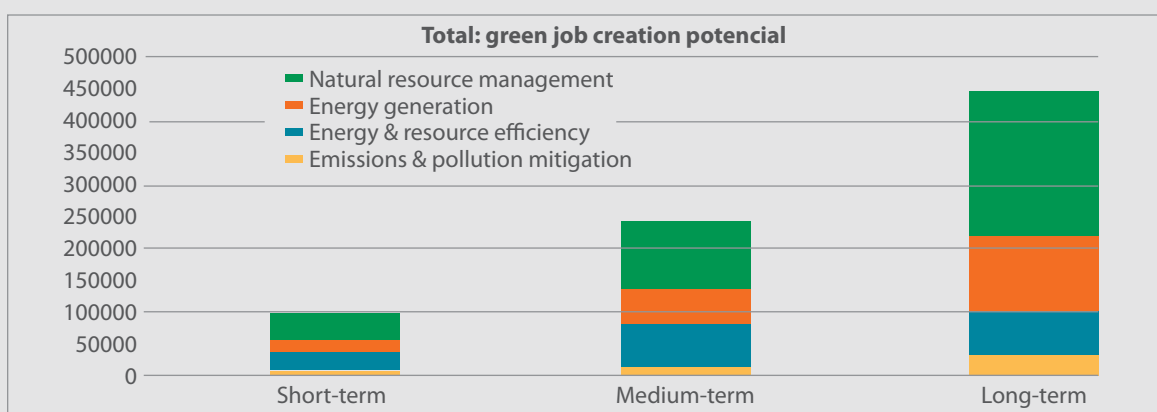
The only non-government funding that the programmes receive is funding through clients, the two most important of whom are farmers and water authorities, who have strong interests in water quality and quantity and catchment management. These typically contract Working for Water to clear IAPs. Dams play an important role in water

management in **South Africa** and the control of IAPs is an important and productive approach to the management of the catchment areas of these dams and their accompanying lakes. This has improved the quantity and quality of water.

Even though these programmes are making a difference at the national level, the potential for their continued growth remains vast. A recent study by the Development Bank of Southern Africa has shown that, in **South Africa**, the green employment creation potential of the Programmes is actually greater than that of other sectors that are generally much more closely associated with the creation of green jobs (see Box 2).

**FIGURE 1: CONCEPTUAL MODEL OF LINKS BETWEEN A GREEN ECONOMY AND POVERTY**

One of the most interesting aspects of the Working for Programmes is their enormous employment creation potential. The reason for this is that the need and market for the natural resource management services that these programmes provide are expected to keep growing, especially if there is increased shift towards a greener economy. A recent study (Maia et al., 2011) on the potential for the creation of green jobs in **South Africa** found that the greatest potential lay in natural resource management and the second greatest in energy generation. The Working for Programmes are currently the biggest natural resource management programmes in **South Africa**. It is estimated that, by 2017, they could collectively employ more than 95,000 persons on a full-time basis and that this could grow to 230,000 by 2025. Furthermore, through the biomass extracted from the Working for Programmes, there is a huge potential for green energy creation as well, the sector with the second largest potential for the creation of green jobs. Such Working for Energy programmes could create an additional 50,000 jobs over the long term.



Source: IDC, DBSA, TIPS

With a track of more than 15 years, the Working for Programmes provide a solid platform to lead such growth of the natural resource and green energy sectors in South Africa and provide an example for other countries. (Source: Maia et al., 2011)

## RESULTS, IMPACTS AND EVALUATION

The immediate outputs of these programmes such as hectares of land cleared or wetlands restored are easy to measure and this is being done on an ongoing basis, along with the direct employment benefits mentioned above. Of greater interest, but more difficult to measure, are, of course, the outcomes and impacts of these physical outputs on improved ecosystem services and the employment benefits on the lives of the poor. Considerable effort has gone into trying to assess both of these. Some results from the effects on ecosystem services are presented first.

An important challenge for these programmes is that there is limited research to build on and most of the many questions need to be researched, although the programmes have supported considerable research on many aspects, from the impacts of different types of IAPs to more efficient ways of controlling them. As a result, Working for Water is undoubtedly leading the way in developing planning tools and assessment methods to develop methods to control IAPs and to assess their impacts on ecosystem services.<sup>11</sup>

One such tool is the WFW Information Management System, which determines contract values for the clearing of land. This GIS-linked system calculates the cost of clearing land based on inputs such as the location (spatial unit/polygon), the species present, the degree of infestation and the specific area to be cleared. The WIMS can then calculate the workload for clearing the area, which forms the basis for the contract for clearing this area (CSIR, 2008). Other such tools are The South African Plant

Invaders Atlas (SAPIA), which is an electronic atlas that tracks the spread of invasive plants (Henderson, 2007), and the National Invasive Alien Plant Survey (NIAPS), which uses remote sensor technology to estimate the spread of invasive plants (CSIR, 2008).

As a result, three main threats posed by these invasive alien plants to ecosystem services have been identified, namely threats to water resources, grazing and biodiversity. Of these, the availability of surface water is the most important. And while it is difficult to continually measure the effect of clearing alien vegetation on surface water, selected research has tried to quantify this, e.g., a study by Marais and Wanneburgh (2008). Their study was based on previous results where increased surface water was measured for ecological zones that were cleared of IAPs. For the area studied, the cost of clearing was ZAR 87 million and the clearing of contributed to an estimated increase of stream flow of 46 million cubic metres per annum. When comparing the costs of clearing with the benefits of this increased water availability, a net present value of ZAR 80 million was estimated (Marais and Wanneburgh, 2008). Other recent work estimated the value of these three ecosystem services (water resources, grazing and biodiversity) and concluded that they amounted to ZAR 152 billion annually and that ZAR 6.5 billion was lost every year due to invading alien plants, but that this would have been an additional ZAR 41.7 billion had no control of these plants had been carried out. This highlights the enormous value of efforts to control these plants (De Lange et al., 2010).

11. See Lieuw-Kie-Song (2009) for a discussion of some of the approaches used in resource economics to establish the benefits of these programmes as well as academic works such as Turpie (2004), Du Plessis (2003), Blignaut et al. (2007), Aronson (2006), Van Wilgen et al. (2008), De Lange and Van Wilgen (2010), amongst others.

Several studies have also assessed the impacts of the employment created, the most detailed one having been in 2007 (CASE, 2007). At the same time, a broader body of work has looked at the impact of temporary employment and the associated income transfer. Because the employment created is generally temporary, the main finding of other work is that it is important to target the poorest to maximize the impact. In this regard, the CASE study found that, although there is room for improvement in the fairness and transparency regarding how workers are selected, the vast majority of participants could be considered poor at what was being argued as Household Subsistence Level of income<sup>12</sup> (Potgieter et al., 2004). When their household income was compared with the measure, 90 percent of Working for Water and 86 percent of Working on Fire participants had household incomes below this threshold.

The main criticisms of schemes like these still come from those who are critical of the use public employment schemes in general. A first common criticism is that these schemes tend to be ‘make-work’ programmes of low productivity and having limited useful outputs. A second criticism is that these programmes are not effective as social protection measures and have only limited impacts on poverty.<sup>13</sup> The main reasons for this are that the work provided is of limited duration and beneficiaries fall back in to the same situation that they were in before they worked in the programme. These two criticisms are in many ways two sides of the same coin and reflect one of the most important potential trade-offs in these programmes. This trade-off between maximizing productivity in terms of work outputs on the one

hand and guaranteeing ongoing income transfers to participants on the other hand, is perhaps the most difficult aspect of these programmes that implementers need to manage. The fact that these programmes can simultaneously provide outputs and provide income through employment is also the main attraction of these programmes. In practice, the challenge often lies in balancing these two objectives so that both outcomes are optimized.

The downside is that these programmes are typically not the most effective option if only one objective is of interest. If the only objective is to enhance social protection, other schemes like cash-transfers may well be more suitable. On the other hand, if the main interest is in setting clearly defined outputs, another, more focused approach may also be more effective. The attraction and challenge of PEPs lie exactly in achieving these objectives simultaneously and managing this trade-off, which requires a good design of the scheme, professional implementation and ongoing monitoring to adjust the scheme to ensure that the right balance is found and maintained, even as contexts and conditions change.

With regards to Working for Programmes, the Working for Water programme, in particular, has done an excellent job not only in ensuring productivity and useful outputs, but also in demonstrating these benefits to the economy. Although there is room for increased operational efficiencies and increased productivity in these programmes, there has been very limited criticism of the non-employment outputs of the programme.

12. South Africa does not have an official poverty line and other academic references are often used to establish whether programmes reach the poor or not.

13. See, for example, McCord (2012).

With regards to specific poverty effects of the Working for Programmes, perhaps the issue here is to view these programmes not as a single anti-poverty intervention, but as one of a set of policy instruments that, together, can address the various dimensions of poverty whereby these public employment schemes provide a (limited) income transfer function. An important step here would be to better align the programme with other anti-poverty interventions so that participants can receive a range of complementary benefits simultaneously. The integration of these programmes into the Expanded Public Works Programme was one important step in this regard. This alignment of other public employment programmes in other sectors has made it possible, for example, to much more clearly locate the role of public employment programmes within the countries' overall social protection framework, as the National Development Plan has articulated (National Planning Commission, 2011).

Nonetheless, one of the more difficult questions concerns how programmes can have more systemic and long-term effects on the poor beyond income. While many of these workers gain a set of specific skills, the market demand for these skills is limited, as this type of environmental work remains largely driven by the public sector. Although many return to the programme and thus develop a long-term relationship and gain some steady, predictable income, this is also an indication of their inability to move into better, more long-term work. But this is less a criticism of these programmes than an accurate reflection of the persistent high level of unemployment in **South Africa** and the inability of the economy to create enough jobs.

Furthermore, many of the environmental benefits do not accrue directly to the poor. If, for example, they do not have access to farmland,

increased water availability for farming is of little direct benefit to them. One approach, which the programmes can implement themselves, has been to implement programmes that look at downstream benefits. For example, some invasive trees, like Black Wattle, which is also planted commercially, provide very good wood. This can be used for making furniture and, in some areas, initiatives have been established where this wood is used to produce school furniture. Similar synergistic benefits, but at a much larger scale, also exist for the generation of energy from all of the biomass of removed IAPs. It has been estimated that IAPs could generate sufficient biomass for the installation of 720 mW of power and that this could create jobs for approximately 50,000 people annually (Preston, 2011). This enormous potential has formed the basis for the introduction of the Working for Energy Programme, which is exploring ways to realize this potential.

## LESSONS FOR POLICY DEVELOPMENT AND IMPLEMENTATION

While many lessons can be drawn from the rich experience build up over the years, key lessons from the South African experience can be emphasized, highlighting some that have been challenging as well as some that have become a 'positive spiral' of programmes influencing their contexts that, in turn, has strengthened the programmes further.

One area of concern and in need for further improvement concerns the selection of participants in a manner that ensures greater transparency and fairness. The evaluations found that, while the targeting results were generally good in terms of reaching the poor, the selection processes were not always transparent and fair. Especially initially, the programme through the use



of the wage rate paid and the extent of physical labour expected, assumed by default that the poor would be self-selected. In addition, because of the specific skills required in the programmes, contractors tend to favour those who have already been trained and have done this type of work, which leads to the continued participation of many participants, some of whom may not have been the target beneficiaries. Addressing this by introducing more transparent and fair selection criteria as well as procedures is set to become an important priority for the third phase of the EPWP and will also become an important aspect for the Working for Programmes.

Another important lesson concerns the expectations and ability of programme participants to exit into other employment, particularly into other sectors of a greening economy. Unfortunately, this has been happening slowly, which perhaps also reflects the sluggishness with which green economy activities have been mainstreamed in **South Africa**. If activities such as the broader control of IAPs, sustainable land management and energy generation from biomass were to become mainstream, the skills gained in WFW would presumably become much more attractive. In such a scenario, where these green economy activities gain traction, these programmes could serve as training grounds for such work. Until then, though, exit opportunities linked to applying the skills learned will remain relatively scarce.

On a more positive note, four important positive lessons can be identified. The first lesson as a driver of success has been the consistent and professional administrative leadership of these

programmes. This administrative leadership team has been in place since 1995, is highly professional, has great technical expertise and has consistently demonstrated the importance of these programmes and articulated why they are important; in the process, it has acquired vast and invaluable experience. This, in turn, has made the team even more effective and enabled it to convincingly articulate the huge risks of not addressing some of the environmental threats that these programmes focus on. Consequently, it is now very difficult to reduce the scale of these programmes or to not act at all, even during more trying political or economic periods.

Although implementation arrangements have shifted over time, one particular strength of the programmes is that each programme focuses on a limited set of activities. This has enabled each programme and its stakeholders to specialize, rendering the programmes as a whole more efficient and sustainable.

From a policy perspective, the Working for Water Programme has been critical in developing legislation and related regulations on invasive species; in turn, this has strengthened the position of the programmes,<sup>14</sup> as it has a legislative mandate. This, along with the programmes' demonstrated effects, has solidified their position and has left little question about their role or importance. The programmes have also raised awareness about the economic importance of addressing environmental concerns, especially within government, and are thus also contributing to the shift towards a green economy.

<sup>14</sup> The relevant legislation can be found on [www.invasives.org.za](http://www.invasives.org.za). Of particular relevance are the amendments of 2001 to the Conservation of Agricultural Resources Act of 1983.

At the same time, the success of these programmes has been important in the South African Government's adoption of public employment programmes to alleviate high rates of poverty and unemployment. This has resulted in the establishment of the Expanded Public Works Programme, of which these programmes are now an integral part, and has given them a broader vehicle to access broad political support and continued funding.

## THE PROGRAMMES IN AN INTERNATIONAL CONTEXT

As already mentioned, many public employment programmes in other parts of the world also have a strong environmental focus and contribute to a shift towards a green economy. Two things stand out when the Working for Programmes are compared to these. Firstly, the relative importance given to the environmental outcomes in addition to the employment and social protection outcomes in the Working for Programmes. In comparison, MGNREGA and PSNP have a much stronger focus on the social protection aspects that can compromise the quality of the work being done. Secondly, the strong focus of the Working for Programmes on addressing specific environmental problems, which results in greater efficiency, more specific technical expertise and deeper research.

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# 4. SUSTAINABLE ECOSYSTEMS MANAGEMENT FOR POVERTY REDUCTION AND GREEN ECONOMY

**By: Erin Hannan, Independent Consultant**

## BACKGROUND AND RATIONALE

Green growth is now widely considered the path to sustainable development, but for it to be inclusive and to reduce poverty, it must be designed to maximize benefits and reduce costs to the poorest and the most vulnerable. Likewise, for an inclusive green economy to be a foundation for achieving sustainable development, it must

achieve economic growth, create employment, reduce poverty, enhance social welfare and maintain healthy ecosystems while reducing pollution and reversing degradation of environmental resources. Governments acknowledged these relationships at Rio+20 and proposed that green economy policies tailored to national contexts provide the basis for by elaborating green economy in the context of sustainable development and poverty eradication (UN, 2012:5; World Bank, 2012; OECD, 2012).

## BOX 1: DEFINITIONS

The following terms are often used interchangeably. For consistency, this case study will use 'ecosystems' and 'ecosystem services'.

**Natural Resources** are materials or substances that are found in nature, such as forests, water and soil.

**Ecosystems** include all of the living things in an area such as plants, animals and humans interacting with each other and with the non-living elements of the area such as soil, climate and atmosphere.

**Ecosystem Services** are the benefits people receive from ecosystems, including provisioning services such as food and water; regulating services such as flood and erosion control; cultural services such as spiritual values and recreation benefits; and supporting services such as nutrient cycling.

**Environment** is the complex set of physical, geographic, biological, social, cultural and political conditions that surround an individual or organism.

Ecosystems and the services they generate represent one aspect of national wealth and are drivers of economic growth, with an average 26 percent of the total wealth of low-income countries derived from them. However, this declines to 2 percent in high-income countries. Of the new wealth created globally from 1995-2005, 4 percent was derived from natural capital (OECD, 2013). From a macroeconomic perspective, it is thus evident that sustainable management of natural resources represents great potential for sustaining growth in income, employment, livelihoods and poverty reduction through investments in productive ecosystem services and biodiversity (e.g., soil, water, etc.).

The asset options available to the poor in low-income countries are often limited to their individual labour and access to natural resources and ecosystem services. Ecosystems represent principle assets for the poor by providing services that can be sources of income, food, water, energy and health. Given that poor in low-income countries are heavily dependent on ecosystems and the services they generate, investments in sustaining ecosystems are likely to support inclusive green economy approaches that reduce poverty through improvements in livelihoods, health, nutrition and security.

Yet the link between sustainable ecosystem management and poverty reduction is neither automatic nor guaranteed. Due to a combination of institutional and market failures, the poor are often excluded from the power and decisions that affect the management of local resources, including lack of legal ownership and access to resources. Similarly, the value of gains from sustainable ecosystems management or the costs incurred from unsustainable practices are not easily or immediately identifiable, recognized or acted upon. Finally, poverty is multi-dimensional and the institutional frameworks governing ecosystems are

often overlapping, competing and conditioned by different actors, interests and values.

Thus, the importance of ecosystems in developing economies points to the challenging, and often conflicting, priorities of various stakeholders concerning access, use and control of natural resources. Initial approaches to conservation established boundaries around biodiversity and did not even consider poverty aspects. But, for reasons discussed above, the conservation approach often led to costs that were borne by local communities while benefits accrued globally.

This led to the conception of integrated local development strategies, which have had currency for some time, suggesting that the protectionist ideal of conservation of the 1970s and 1980s made way for a more nuanced view that conservation and poverty reduction could go hand-in-hand, particularly at the local and community levels (Armitage, 2005; Campbell et al., 2010). A key assumption of integrated and community-based management is the potential to improve the status of the resource and to build income generation for communities through sustainable and participatory management. Several decades of experience and lessons learned have revealed a different set of problems associated with these strategies, including whether improvements in ecosystems themselves can lift people out of poverty, the presence of elite capture within participatory structures, lack of enabling environments at subnational and national levels, inconsistencies between macro and sectoral policies (i.e., agriculture subsidies) and inappropriately designed policies.

The evidence shows that ecosystems have multiple values that interact differently with the multiple dimensions of economic growth and poverty reduction. Key trade-offs are influenced

by a range of economic, political and social factors. From a poverty reduction perspective, many of these trade-offs have historically followed a win-lose trend. That is, they often challenge the basis of subsistence livelihoods to more market-based forms of production and consumption that can, in turn, challenge the notions of conservation of the resource base if interventions are poorly designed. Alternatively, the idea of increasing consumption can be attractive, but comes with another set of trade-offs within and between communities. For example, inequalities may develop depending on issues of access and benefit sharing. Furthermore, trade-offs affecting gender, youth, culture and identity are also prevalent (PEI, 2012; PEI, 2009; World Bank, 2012).

If we are to achieve green economies that reduce poverty, we need to promote an approach across sectors and themes, administrative layers and development partners. First, for realizing synergies and addressing trade-offs between poverty reduction and environmental sustainability, deliberate and complementary poverty reduction approaches in the form of integrated approaches are needed – for example, the promotion of alternative livelihoods and employment for the poor in the case where maintaining ecosystem services might limit the number of sustainable livelihoods that can be supported or the combination of environmental approaches with pro-poor approaches to achieve synergies by rehabilitating the environment while creating jobs, livelihoods and enterprises (including through the provision of access to business services, markets, and skills for the poor). Second, mainstreaming the role of ecosystem services into national development policy, planning and budgetary processes to ensure the links between poverty and the environment are positively reinforcing. Third, meeting the implementation challenge by strengthening the links between

macro frameworks (mainstreaming) and micro needs (local integrated approaches). Experience shows that sector-specific and cross-cutting/sectoral bottlenecks stand in the way of progress on poverty and sustainability (the macro–micro and cross-sectoral gaps). Effective implementation requires sustained commitment and engagement that include key sectoral and cross-sectoral ministries such as finance and planning, and domestic and external partner initiatives from the beginning to support the implementation of specific sets of solutions around a country-owned action plan.

This thematic study looks at the relationship between sustainable ecosystem management and poverty reduction primarily from a subnational perspective, given that this is where the most attention has been seen. The study will focus in the following:

- The first section will discuss issues of trade-offs, how they manifest in designing initiatives and how they can be minimized through targeted policy actions, including specific subnational or thematic interventions.
- The second section will look at a range of tools that are applicable for helping to assess, design, implement and monitor sustainable ecosystems management for poverty reduction initiatives.
- The third section will delve into specific implementation challenges that are encountered for sustainable ecosystems management for poverty reduction initiatives.
- The fourth section will look at the definition of results of implementing these initiatives and what defines them as success, how this is communicated and the consequences of implementation.
- Finally, a brief conclusion will discuss the key drivers of success and the policy implications of promoting subnational initiatives. It will also make the links to the challenging task of making green

economy and poverty reduction more prevalent across national planning objectives and macro-micro gaps.

## TRADE-OFFS AND SYNERGIES IN ECOSYSTEMS MANAGEMENT AND POVERTY REDUCTION

Recognizing what constitutes a trade-off is often the challenge of good intervention design and implementation, given the often-divergent views of different stakeholders and the interrelationships between ecosystems. Trade-offs are thus influenced by local factors, and the conditions in particular locations, and therefore are complex and subjective. Understanding the trade-offs inherent in ecosystems will enable policies and implementation to support synergies, where sustainable management of an ecosystem can benefit other ecosystems, the services they deliver or stakeholders.

The following will elaborate a few of the key trade-offs and synergies related to ecosystems:

### A) TRADE-OFFS AND SYNERGIES AMONG ECOSYSTEM SERVICES

#### *Trade-offs*

Beginning with the adoption of its Constitution in 1990, the Government of **Mozambique** embarked on a series of regulatory changes regarding ownership, access and use rights for natural resources under a guiding policy of reducing the level of absolute poverty in the country. The Constitution establishes that the state, as the owner of all natural resources, including land, has a dual obligation to develop natural resources and to set the conditions for use and access that allow its citizens to derive enjoyment or utility under specific

conditions. In broad terms, the conditions allow for use and utility rights to individuals and groups; grant priority to direct resource users without producing a zero-sum distributional outcome where certain groups or benefit at the expense of the rest of the citizens; and formally codify customary and other traditional rights pertaining to land.

Mussel harvesting on the southern coast of **Mozambique** demonstrates the challenges of the government's attempts to achieve beneficial policy outcomes for poverty reduction and sustainable natural resources. The formalization of customary systems and traditional authorities for resource management ultimately proved counterproductive to resource conservation and poverty reduction. Under the traditional system, the timing and quantity of mussel harvesting were regulated to protect the mussels stocks and to maximize the exploitation to ensure a big size for profit and consumption. Each community also set aside a common pool area for free access. However, once the traditional rights were placed under the national regulatory structure and enforcement was removed from traditional authorities, the entire set of mussel areas essentially became a free-access zone, resulting in overexploitation, loss of income and loss of a food source for the communities (Norfolk, 2004).

The high incidence of poverty among smallholder farmers in the Cotopaxi region of **Ecuador**, set in the highlands of the Andes, is attributed to environmental degradation, including loss of biodiversity from overexploitation, lack of access to markets, decreasing access to quality land resulting in low agricultural productivity, and an increase in conversion of agriculture land available for smallholder farms to non-agricultural uses. As the changes in land use continue to erode the natural resources base and limit the space available for agricultural production, smallholder farmers are

faced with persistent poverty from a lack of other livelihood opportunities and scant access to services such as health care and education (Tekelenberg et al., 2009).

### ***Synergies***

Synergies among ecosystems result from improved ecosystem services, such as upstream watershed maintenance and downstream productive output, also contribute to human well-being and improved livelihoods.

Fiji's primarily coastal population relies on marine resources for food and livelihoods, but these resources are threatened by unsustainable activities including overfishing and deforestation. A land-sea planning approach determined that investments in forest protection could improve the condition of the country's coral reef ecosystems by 8 percent to 58 percent if the remaining forests were protected rather than deforested. As a result, the Fiji Protected Area Committee is attempting to create a marine network to protect 20 percent of the land and 30 percent of the inshore waters by 2020 (Klein et al., 2010).

## **B) TRADE-OFFS AND SYNERGIES AMONG STAKEHOLDERS**

### ***Trade-offs***

The trade-offs here reflect the challenges of balancing equity and equality among all stakeholders from linking conservation of protected areas and community development activities. For example, trade-offs in the World Heritage Site of the KwaZulu Natal Wetland Park included a difference in understanding between communities and park management about the basis for restricted access to the park's resources and the alternative livelihood

opportunities provided. Communal gardens and craft groups were established as a means of food security, skills development and income generation independently from local natural resources. But the trade-offs designed to ultimately benefit livelihoods communities and natural resources were perceived differently by communities and park management, causing tensions that threatened to undermine the dual efforts for conservation and development (Dahlberg and Burlando, 2009).

Many countries have established marine protected areas (MPAs) to protect and maintain biodiversity for economic uses, including the enhancement of fishery yields for local fishers. Devolution or decentralization of management authority to local governments and communities is widely considered an effective system to achieve these multiple objectives if applied appropriately. When the Philippine Government decentralized the management of fisheries resources in the 1990s, enabling the community-based management of MPAs, it did so without complimentary policies for a national reduction in fishing effort or enforcement of community management rights. In the Balicasag MPA, the National Tourism Authority constructed a resort and non-local dive businesses started operations in the protected area, diverting revenues away from community members in the form of lost business opportunities and employment in the protected area. The biological impacts of inadequate monitoring and enforcement of fishing regulations led to a significant decline in fish abundance within the protected area and the adjacent reef (Christie, 2004).

Many dimensions of poverty affect men and women differently. Women are primarily responsible for the household, including nutrition, food security, childcare and family health. Thus, they face trade-offs in terms of their time allocation for daily activities

and in their access to resources and assets that form their activities into paid and unpaid production. For example, women in the Bamana region in **Mali** were displaced from their household gardens, where they traditionally grew indigenous plants for subsistence and some income generation, to external plots after men began growing the local plants in response to a burgeoning market for exotic forest foods. Food collection efforts were similarly diverted as women and youth began foraging for forest products that the men eventually sold in the markets rather than kept for household consumption (Wooten, 2003).

### ***Synergies***

Namibia is recognized internationally as a vanguard for establishing the legal, economic and social incentives and relationships to promote poverty reduction and the conservation of wildlife and natural resources through community-based natural resource management. Key elements of Namibia's experience include changing the legal framework for land management on private and communal lands to spur private sector and community involvement in the conservation of natural resources and to enable a more equitable distribution among these stakeholders of economic benefits resulting from conservation and improved management (ODI, 2010).

Gender is a common theme that has been identified as necessary for progress towards sustainable livelihoods, improved participation in decision-making, improved health and education, and more inclusive human rights. The Ntankah Village Women Common Initiative Group is a community organization in **Cameroon** focused on improving the economic and social conditions of the village, including HIV/AIDS care, through sustainable agriculture, forestry, hunting and biodiversity conservation and empowerment of women.

Increased on-farm production and the associated increase in incomes allow the group to provide financial assistance to HIV/AIDS patients, widows and orphans in the village (UNDP, 2012b).

A study of 135 community forestry groups in **India** and **Nepal** revealed that the proportion and socio-economic composition of women in the leadership committees improved the management performance of the respective groups, leading to improved forest conservation outcomes (Agarwal, 2010).

### **C) TRADE-OFFS AND SYNERGIES ACROSS SPATIAL BOUNDARIES**

#### ***Trade-offs***

Management of pastoral lands in the Horn of Africa relies upon the ability of pastoral peoples to move freely between rangelands and the ability to resolve conflicts and enforce decisions over access and use of resources. Going beyond a technical perspective to these characteristics, research conducted by ODI and CARE International (2012) focuses on the customary and formal institutions of pastoral livelihoods that govern management. Customary authorities and national legal frameworks involve different power dynamics that can influence social structures such as the decision-making role of tribal elders versus young herders, and priorities for pastoral communities such as seeking market integration for livestock products versus retaining traditional systems of livestock management.

A natural habitat reclamation process in the Xizhuang Watershed, in Yunnan, **China**, adversely impacted livelihoods, biomass production and soil quality over the course of the process: consolidating land available for agriculture led to intensive practices that increased pesticide



and pollution levels throughout the watershed; biodiversity and soil quality were reduced by the use of inappropriate trees species for reforestation and plantation (income generation); and, as a result, many labourers sought additional work to supplement family incomes (Jun and Jianchu, 2009).

### **Synergies**

A community-based watershed restoration programme initiated over 20 years ago by a local NGO in the Avari Basin of Rajasthan in **India** revived a traditional water collection technology in parallel with the establishment of contemporary social management structures to combat income, health and natural resource poverty exacerbated by lack of water for human and livestock consumption, crop failure and soil erosion. Approximately 1,050 villages in the region have adopted the programme (Galizzi and Herklotz, eds., 2008).

The **China** Loess Plateau Watershed Rehabilitation Project employed a variety of technical approaches in soil and water conservation and rangeland management to deliver significant environmental benefits to downstream areas and users that contributed to increased labour productivity, allowed for on- and off-farm income diversification, smoothed income and labour distribution throughout the year and expanded employment options for women (World Bank, 2008).

Under this broad heading, many of the trade-offs occur between promoting sustainable livelihoods from existing patterns of production versus the many national policies aimed at creating growth from market-oriented industries based on natural resources. This can create competition between national goals and local contexts by drawing people away from sustainable livelihoods in the anticipation of increased income and a possible exit from poverty.

The case studies lend themselves to a growing understanding that integrating policies for sustainable use of ecosystems and poverty reduction involves priorities that may result in trade-offs. These may be a function of the power dynamics or political economy perspectives of differing stakeholders. For example, the impacts on gender may be subversive and therefore have consequential impacts on household livelihoods through reduced social dividends. It is widely understood that positive gender outcomes for women result in improved household health and income levels. The interaction of policies was seen as another trade-off for poverty reduction and, while policies aimed at increasing incomes are generally positive, they can interrupt traditional livelihoods processes and exacerbate inequalities between groups. Just as national policies are based on overall benefits for the greatest number, poverty and land degradation are other issues that are seen not so much as a trade-off, but as a consequence of inappropriate targeting of these interlinked issues.

However, just as trade-offs exist, so, too, do the case studies help reveal synergies and often these synergies can have localized and expanded economic and environmental benefits. The common thread between these cases is the combined priorities and their attendant trade-offs and synergies that function within a system of governance. This system is necessary to address the causes of poverty and to improve policies that move a country towards sustainable development. However, there is often a degree of complexity to any intervention that may be affected by policies, political economies and ultimately the design of any intervention. Therefore, the establishment of green economy approaches requires a suite of tools to help unravel these key issues.



## TOOLS FOR ASSESSING, DESIGNING, IMPLEMENTING AND MONITORING SUSTAINABLE ECOSYSTEMS MANAGEMENT INITIATIVES

The previous section examined a range of trade-offs and synergies and this section will focus on the types and differences between tools that aid initiative design.

### ***Participatory Approaches***

From the perspective of understanding trade-offs and synergies, it is widely accepted that the methods used to engage with various groups must employ participatory approaches in all aspects of initiatives including deriving benefits and minimizing costs.

The use of participatory approaches has featured prominently in development planning on the premise that involving communities in aspects of development such as project design and implementation will achieve certain social and distributional outcomes including demand for government services, improved livelihoods, better service delivery, improved development outcomes by incorporating community knowledge and customary systems, and better community level management of ecosystems. Participatory techniques are further viewed as integral to addressing pro-poor issues of ownership, sustainability, human rights, increased focus on outcomes and processes, assessing the impact of policies and programmes, focusing poverty targeting and helping to develop a strong and functional civil society. Participatory methods are thus considered as the foundation for social change (Mansuri and Vijayendra, 2013).

Conversely, lessons drawn from policy-driven efforts to induce participation in local decision-making highlight three main lessons that also apply to the community and national experiences in this study: 1) participation is more effective when supported by a responsive government; 2) context at local and national levels is significant and distinct; 3) effective civic engagement does not progress as a linear or consistent process (Mansuri and Vijayendra, 2013).

The case studies described herein have employed various participatory process tools to engage communities more effectively with government, either within a decentralized governance system or as a reaction to market or government failures. Participatory tools include process approaches such as Participatory Rural Analysis (PRA), stakeholder analysis and participation in household surveys and semi-structured interviews with key informants and focus groups to gather information; these often lead to the creation of community-level institutions to participate in a decentralized governance structure and to legitimize local knowledge and customary forms of natural resource management. The emphasis on social change, sharing knowledge and learning new knowledge through participatory processes is important. However, as demonstrated through the case studies, the particular emphasis will differ throughout the fluid process of social change.

### ***Integrated Ecosystem Assessments***

These assessments capture information about ecosystem conditions and services using social, economic and environmental variables. This information is then applied to the development of future scenarios with respect to potential changes in drivers, ecosystem services and human well-being in order to formulate response options for

improved management of ecosystems for human well-being and pro-poor economic growth. These tools are often applied at the subnational and community levels.

- As part of the PEI Thailand country programme, an integrated assessment is currently underway in three sites at different watershed locations (upper, middle and lower) in Nan, Khon Kaen and Samut Songhan Provinces, respectively. Led by the National Planning Unit of the Ministry of Interior and working in close collaboration with the Ministry of Environment and Natural Resources and local provincial authorities' teams from the Thailand Environment Institute, the Thai Research Fund, Khon Kaen University and Chiang Mai University carried out the assessment. The objective of the assessment was to inform community- and provincial-level decision makers about development options that would enable economic improvement with minimal trade-offs on degradation to the environment and natural resource base. An important component included strengthening capacity of national institutions in carrying out assessments and to make use of findings to inform decision makers (PEI, 2012b).

### ***Poverty and Social Impact Analysis***

A Poverty and Social Analysis (PSI) assesses the distributional impacts of initiatives on the welfare of different stakeholders, particularly poor and vulnerable groups. PSIAs are commonly used to gather evidence to support advocacy efforts to programmatic decisions.

The following case study from Botswana demonstrates a practical example of a government's use of a PSIA to analyse the social, economic and environmental outcomes of a donor-supported

agriculture programme. The objectives of the programme were designed to increase farm output and productivity, promote food security at the household and national levels, improve incomes through access to credit and markets and provide a level of social protection to farmers from shocks of market failure and agricultural risks. Using participatory tools including PRA, focus groups of key stakeholders and individual interviews, the PSIA determined that the project did successfully reach vulnerable people and was consistent in applying its eligibility criteria. Yet the project ultimately was unable to increase grain production, which impacted food insecurity for poor and vulnerable beneficiaries. As a consequence of the opposing outcomes for household and national levels, it was determined that the agriculture programme could achieve public policy goals for improving national food security and poverty reduction in its initial design and implementation structure (PEI, 2013a).

### ***Household Surveys***

Household surveys are commonly used to establish a baseline for poverty and to analyse, monitor and evaluate poverty reduction policies and programmes by gathering socio-economic data on determinants of household behaviour and welfare. They are used to collect data on many dimensions of the household that contribute to poverty, including consumption, income, assets, employment, nutrition and health. Data from household surveys have become integral to economic and social policy analysis, development planning and policy and programme management from subnational to national levels. Many countries employ standardized systems of data collection for household surveys, including incorporation into national statistical systems.

Household surveys increasingly provide indicators to evaluate the impacts of government policies, but their use should be applied to the appropriate level of data required. For example, when applied exclusively at the scale of the household, individual or even a combination of analytical methods across a single dimension of poverty often fails to capture environmental data to fully recognize the links between poverty and the environment (UNSD, 2005; Reed, 2002).

### ***Multi-Criteria Analysis***

Multi-Criteria Analysis (MCA) accounts for preferences of multiple stakeholders, the differences in their valuation of the same costs and benefits, and thus the trade-offs expressed by their different preferences. It provides one of the most useful and increasingly common tools for integrating different types of monetary and non-monetary decision criteria into programme design and development planning. MCA has been developed to deal with situations where decisions must consider multiple objectives, which cannot be reduced to a single dimension, and thus provides a useful tool when making strategic choices between different objectives. MCA is usually clustered into three dimensions: the ecological, the economic and the social. Within each of these dimensions, certain criteria are set so that decision makers can weigh the importance of one element in association with the others. Here, monetary values and cost-benefit measures can be incorporated as one of the criteria to be considered, and weighed against the others in decision-making.

### ***Valuation of Ecosystem Services***

Ecosystem services are the conditions and processes through which natural ecosystems and

the species that comprise them sustain and assist human life. These services are natural capital that can be valued in terms of the delivery, provision, production, protection or maintenance of goods and services that people perceive to be important. The valuation of ecosystem services is a process of measuring the provision of the services; placing monetary values on the services (many of which have no easily observable market prices); and ultimately assessing the resulting trade-offs and synergies within decision-making frameworks.

As the case studies demonstrated, managing ecosystems for poverty reduction occurs among competing needs and perspectives of what to prioritize. This is complicated by the reality that the benefits ecosystems provide to people remain underestimated and therefore inadequately incorporated into planning and decision-making. In addition to lack of conventional economic valuation methods, the costs of loss or degradation of ecosystem services are undervalued, as described in some of the case studies. Differences in priorities and incomplete understanding of the relationship between ecosystems services and poverty reduction have prompted inappropriate policies and incentives that often exacerbate the dimensions of poverty through unsustainable resource use and overexploitation (Millennium Ecosystem Assessment, 2005; Polasky, 2008).

### ***Cost-Benefit Analysis***

Cost-benefit analysis (CBA) remains the most commonly used decision-making framework for assessing and comparing economic and financial trade-offs. It is the standard tool for appraising and evaluating programmes, projects and policies and is a required part of many government and donor decision-making procedures. It is also a framework into which ecosystem values can easily

be integrated. In this context, we want to consider ecosystem values alongside other project costs and benefits when we calculate profitability.

In order to bring a project's benefits and costs over time to their present value, each is discounted. Discounting is essentially the inverse of applying a compound interest rate and gives values relatively less weight the further into the future they accrue. It accounts for the fact that people generally prefer to enjoy benefits now and costs later and that any funds tied up in a project could be used productively to generate returns or profits elsewhere. In most cases, the discount rate is therefore based on the opportunity cost of capital – the prevailing rate of return on investments elsewhere in the economy.

CBA presents three basic measures of worth, which allow different projects, programmes or policies to be assessed and compared with each other:

- Net Present Value (NPV) is the sum of discounted net benefits (i.e., benefits minus costs) and shows whether a project generates more benefits than it incurs costs.
- Benefit Cost Ratio (BCR) is the ratio between discounted total benefits and costs and shows the extent to which project benefits exceed costs.
- Internal Rate of Return (IRR) is the discount rate at which a project's NPV becomes zero.

In general, a project can be considered to be worthwhile if its NPV is positive and its BCR is greater than one and if its IRR exceeds the discount rate. If there is a positive NPV and a BCR greater than one, then the project generates benefits that are greater than its costs. If the IRR is above the discount rate, then the project generates returns greater than those expected from alternative investments.

Other things being equal, the higher the NPV, BCR or IRR of a project, the more economically or financially desirable it can be considered to be. Bringing ecosystem values into these quantified measures enables them to be counted alongside the other costs and benefits considered to assess the desirability of following a given course of action. Thus, make a more informed choice between different development or investment options by considering the full range of ecosystem impacts.

### ***Environmental and Social Impact Assessments***

Environmental Impact Assessments (EIA) and Social Impact Assessments (SIA) help identify, evaluate and anticipate environmental and social effects of development projects in advance of implementation. EIAs and SIAs are designed to ensure that environmental and social considerations are incorporated to mitigate or offset adverse environmental and social impacts that could otherwise occur during project implementation.

In conclusion, this section has explored a range of tools and their application for achieving poverty reduction and environmental sustainability within the context of a green economy. While the focus on participatory methods at the outset reveals that some key lessons need to be applied to put green economy approaches into the context of local governance and community engagement, the focus should be on non-linear engagement that recognizes that circumstances change over time and that approaches need to be flexible and to build on the underlying symptoms of poverty (for example, asset ownership as opposed to the treatment of the condition, i.e., income thresholds).

## ADDRESSING IMPLEMENTATION CHALLENGES OF SUSTAINABLE ECOSYSTEMS MANAGEMENT AND POVERTY REDUCTION INITIATIVES

### *a) Who are the critical partners for the implementation of initiatives and what roles do they play?*

Critical partners for implementation of sustainable ecosystems management and poverty reduction initiatives include the following:

**Communities:** Function as beneficiaries, stakeholders, direct users and informal custodians of ecosystems. However, they are often dissociated from providing input into policies and programmes whose outcomes affect them directly. With productive assets derived primarily from ecosystems, the vulnerability and resilience of communities are inextricably linked to the health and viability of their environment. The ability of initiatives to reduce poverty through improvements to livelihoods, nutrition and health rests on functional ecosystems and their sustainable management at the community level with support from the other partners listed below.

**Local government:** As more national governments adopt decentralization, local government assumes more enforcement, budgetary and policy setting authority and thus the trade-offs inherent to multiple, and often competing, priorities and outcomes. Local governments are essentially on the ground and directly experience the impacts of national policies and initiatives to address integrated conservation and development. Due to their broad nature, national policies may run parallel to the directions local governments are taking rather than support or complement local efforts to address systemic issues and build capacities for delivery,

financing and monitoring. Local governments are needed to sustain efforts for poverty reduction and sustainable ecosystems management and, increasingly, their role is to bridge the gaps between community needs and national spending and planning policies and priorities.

**National government:** While the tangible needs for a green economy may derive from the subnational and community levels, the national government must ultimately take ownership of the transformation process by establishing a permissive policy agenda to mainstream green economy throughout the government. Local initiatives will not be sustained if the macro, or national, framework works against conservation. Hence, there is a need for mainstreaming and strengthening macro-micro links throughout government for better integration and implementation.

**Private sector:** A growing stakeholder in economic growth and development, the private sector can support a green economy through innovation and the creation of markets to help create local capacity, economic growth and development in the short and long terms. The private sector can bring resources and business practices that can help ecosystems management and poverty reduction initiatives deliver more value-addition through partnerships with communities and government; employment options; training and skills development; and product development and marketing designed to serve different population segments. As a stakeholder, the private sector will also realize impacts from the trade-offs, priorities and policies – factors that will potentially affect their bottom line.

**Civil society:** Civil society has established its ability to deliver significant advocacy and representation in development processes for communities, the

poor and the vulnerable. The extent and scope of civil society's influence on power structures and avenues to advocate vary across countries. However, a green economy transformation could also provide an inclusive platform for civil society participation across sectors and policies by supporting accountability, implementation, monitoring and transparency and by functioning as a catalyst to bring communities and government together where necessary.

#### **International donors and cooperation:**

International cooperation is an important source for finance, capacity-building, technology and regional interaction. The forms of international cooperation are also moving away from sectoral attention to more inclusive support in response to nationally driven development priorities and outcome aims. Regional cooperation is increasingly recognized as necessary for the sustainable management of ecosystems that span across geopolitical boundaries. The significant time and financial costs of support typically require consistent funding beyond the capabilities of most national and subnational governments. Thus, international cooperation initially provides most financial and capacity support and technical expertise for communities and for national and subnational levels of government. International donors also provide important and significant support at the national level for enabling frameworks and macro-micro linkages, and support to local initiatives. Gradually, the forms of support are transferred as capacities are acquired, government finance and budget frameworks absorb more of the costs through increased revenues and mainstreaming, and community-level projects incorporate an enterprise component for sustainability.

#### ***b) Are any groups or individuals likely to oppose the initiatives and how can their agreement be secured in practice?***

- Communities may perceive either negotiations or pre-determined decisions about the impact of specific trade-offs as unfair treatment or inappropriate representation.
- Elite capture, patronage or clientalism from that stand to lose rents, control of access to, or even ownership of natural resources.
- Producers, suppliers or buyers along resource-based value chains who may have to start incurring the cost of environmental externalities within the costs of goods and services.
- National governments that may focus on the initial costs rather than on long-term benefits or that resist reform, viewing sustainable resource management as a barrier to economic development.
- Local governments may promote sectoral interests or the interests of elite groups through patronage or clientalism above the interests of poor stakeholders.

In the process of engaging these stakeholders, a number of options for securing agreement and mitigating opposition exist:

- Identify trade-offs and synergies where different social groups and institutions may benefit or suffer from political decisions. The importance of context in influencing the incentives, decisions and choices of stakeholders lends itself to finding effective courses for agreement or securing expected behaviour. As the case studies have portrayed, the policy context of a country can influence decisions about natural resource use and the resulting impacts on the environment and poverty reduction (Moseley, 2002; Weaver, 2000).



- The assessment tools and methods can help identify where conflicts between stakeholders may exist, the magnitude of the costs and benefits of specific policies and initiatives, the associated winners and losers, the value of the gains or losses and how to mitigate the impacts of losses. For example, the practice of compensating traditional land owners either for loss of land or access to resources after the establishment of a protected area is a common way to mitigate losses to livelihoods for the conservation of natural resources (Cernea and Schmidt-Soltau, 2006).
- Promote advantages of policy and programme coherence and implementation for a green economy and poverty reduction through sustainable management ecosystems. The case studies of synergies particularly highlight the economic, social and environmental benefits when discrete policies and programmes realize multiple benefits and when they are purposely designed to produce either multiple outcomes or an outcome that is strengthened by the aggregate approach.
- Identify areas of inclusion that may align with the self-interest of the opposing groups or individuals. Self-interest can lead to lack of consensus and even conflict between different stakeholders regarding competing objectives for a given resource. The trade-offs, synergies and tools offer guidance on the causes and contexts in which differences arise between stakeholders and options for finding a basis from which to negotiate.

***c) What are the key capacity constraints and how should these be addressed for effective implementation of such integrated approaches? How can these capacities be effectively built?***

**Local level:** Many of the case studies employ community-based management that combines modern development theories with customary

forms of knowledge about the resource and management practices. A common challenge faced by these local management systems and institutions is how to create legal and regulatory frameworks that retain and codify customary systems rather than subordinate the enforcement abilities of the associated community institutions. The frameworks should be consistently applied and enforced throughout community and at subnational and national levels in order to support sustainable development (Techera, 2008). Communities are often required to significantly change their resource use and access patterns, which can be disruptive to short-term livelihood, food and asset patterns.

**Subnational level:** The role of subnational governments in development is changing with the recognition that national governments cannot deliver all public services and that involvement of communities and local governments is essential for development. To be relevant and effective institutions for reducing poverty and sustainably managing ecosystems, local governments require sufficient administrative, technical, financial, planning, outreach and management capacity to conduct responsibilities for local service delivery. There must be mechanisms for accountability between local institutions and their national counterparts and between local institutions, the poor and other stakeholders involved in managing natural resources. Additionally, local governments require sufficient financial resources from national and local sources to fulfil their responsibilities and the capability and authority to manage those financial resources. This can often become a source of conflict, particularly as local governments become more responsible for management of community and local infrastructure services that underpin livelihoods for many communities. In addition, local authorities need to engender local decision-making and participatory structures that

can be used to deal with the many trade-off and synergy issues that manifest locally. This requires an increasing understanding of and capacity to meet the threats to ecosystems services from a range of investment decisions; local decision-making bodies can better understand the local economic, social and environmental trade-offs with better knowledge, education, awareness, engagement and data.

**National level:** The role of national governments in articulating strategies and displaying leadership to advance green growth through poverty reduction and sustainable management of resources is vital. This is a continual process comprised of setting objectives and outcomes; understanding the theory of change behind the outcomes; implementing inclusive policies over time; incorporating social and situational context; and mainstreaming sustainable resource management and poverty reduction into policies and plans throughout government institutions, development plans and fiscal and budgetary systems. National governments set priorities for scarce public resources and identify partners and different delivery and implementation models to deliver services and value with those public resources. The case studies have elaborated differences in perceptions among stakeholders involved in natural resource use and management as well as divergent policy outcomes and impacts upon different stakeholders. National governments, therefore, also require capacities to establish legal, regulatory and policy structures and effective institutions that can drive national goals for poverty reduction and sustainable resource management and that can scale up local efforts to sustainably manage ecosystems and their benefits.

***d) To what extent and how can the poor households and communities and other vulnerable groups be targeted by the implementation of the initiatives? What has worked and what acted as constraints and bottlenecks to the poor benefiting and how were these addressed through improved implementation?***

The solution to the challenge of implementing initiatives for poor households and vulnerable groups is proper and effectively targeting. Participatory and inclusive methods, such as Participatory Rural Appraisals and household surveys, are commonly employed to identify poor households and to design appropriate policies and interventions. Yet a range of constraints and bottlenecks can impede the achievement of equitable results to pro-poor outcomes linked to environmental sustainability. Ideally, participatory methods draw upon local knowledge and local institutions – customary and government – and civil society to identify poor households and communities. But so much depends on the depth of analysis and links to the right groups within often powerful and culturally derived power structures.

Some of the constraints found include differences in targeting methods and criteria for establishing eligibility levels that can overlook vulnerable households; powerful actors who can still sway targeting in the direction of their family and patronage interests; lack of coordination and understanding of targeting methods by surveyors that can misidentify or overlook households; methods that are not understood or accepted by stakeholders; and methods that are too expensive to deploy or insufficiently budgeted to have the anticipated reach.



For example, the Sepik Wetlands Management Initiative (SWMI) in Papua, New Guinea, covers a 1.5-million hectare area of land primarily managed under customary ownership. The initiative provides sustainable harvesting of crocodile products as an alternative to subsistence farming and hunting. Even with successful income generation and protection of crocodile and other habitats within the wetlands, the Initiative regularly conducts participatory rural appraisals to understand the composition and status of the wetlands and local communities and to adjust activities when necessary. As a result, revenues from sustainable harvesting have also been directed to local education, conservation and health projects (UNDP, 2010).

***e) How can these initiatives be adequately costed, budgeted and financed? What are the implications for prioritizing aid or donor finances? Have initiatives succeeded without external financing? How were these implemented?***

The financial, human and technical resources involved in local-level natural resource management and ecosystems-based approaches are significant initially and in the long term, depending on the activities involved and progress toward intended outcomes. However, the combination of economic, social and environmental benefits that are possible from ecosystem services provides options and guidance for costing, budgeting and financing initiatives. The assessment tools described earlier provide options to quantify, value and cost the different forms of benefits. Many of the community-level examples described in this thematic study have demonstrated that, over time, community and ecosystem management systems can become self-supporting through management and governance experience coupled with income generation, enterprise development and market

integration established through national policies and subnational decisions where decentralization guides governance for natural resource use and poverty reduction. However, community-based costs can be initially high and require a longer-term commitment to support the technological, budgetary and participatory and knowledge capacities necessary for sustainable management.

Financing options include direct national revenue sources such as taxes, fees or charges on resource use, payment for ecosystem services, earnings from state-owned enterprises or state lands, or equivalent sources in fiscally decentralized, subnational circumstances. Again, the mix of ecosystem services and the potentially associated revenue streams may provide different options for financing.

The prevalence of community-based natural resource management (CBNRM) throughout developing countries reflects the willingness of governments, donors and implementing partners to include localized projects within development agendas. The World Bank has spent approximately US\$85 billion on local participatory development, including CBNRM, over the past decade alone (Mansuri and Vijayendra, 2013). Of course, the range of donors and partners supporting CBNRM is diverse, but this figure indicates that many developing countries try to use direct support from their partners to fund localized projects. This has been necessary to fund environmental and community development projects. But it is not consistent with the green economy approach that requires a greater focus to upstream policymaking and implementation processes of government.

As national governments assert more direction over the course of development, with input and influence from the local level, donors are beginning to align aid and finances accordingly. Certain

components of initiatives will still require direct support from donors; establishment of temporary external structures (outside of the government system); staff positions that are not defined within budgeted staffing levels; and organizational structures. Long-term, wide-scale ecosystem restoration can be difficult to sustain without ongoing, dedicated finances.

## RESULTS

Without a doubt, the most specific focus on results is at subnational or local community level, where it seems a great deal easier to measure results. This seems primarily due to the great focus on rural development, on the one hand, and environmental projects, on the other, and due to the lack of upstream integrated policymaking. The results presented in the case studies were generated from a combination of assessment tools and valuation methods outlined in Section 2 in order to identify changes in social, economic and environmental conditions from the standpoint of localized interventions, which are often also affected by national policies.

Results of initiatives to reduce poverty through sustainably managing ecosystems can be identified and measured through the choice of indicators. At the macro level, there is a lack of indicators that link the social and environmental outcomes, so integrated solutions are primarily the domain of local institutions. Therefore, indicators should correspond to the multiple dimensions of poverty and the interrelationships of ecosystems; be easily understood and based on accessible data; be relevant (to ecosystems and poverty reduction); and build into policies and initiatives early in the process to address current and future management issues. A key consideration

is to reconcile the disparity between policy or management expectations (often short-term) and the longer timeframe required to identify or restore healthy ecosystems.

A study of the socioeconomic factors of communities in **Papua New Guinea** and **Indonesia** (Cinner, 2005) employed a set of seven social and economic indicators to determine which factors influenced the decision to use exclusive marine tenure as a form of common property resource management. The evidence showed that communities organized around exclusive marine tenure were located farther from markets, relied more on fishing and exhibited lower migration and higher incidences of conflict over marine resources than communities using other marine tenure systems. This is important to the resiliency of coastal communities against social change and to governance, as fishery resources may alternate between those that are subsistence-based or those that are market-based, depending on needs.

The results and policy information available from this particular study relate to conflicts and clarification of authority in countries attempting to reconcile and codify traditional and formal systems over common property management and enforcement rights. They complement the results from the Balicasag community-managed marine-protected area in **the Philippines**, where biological and social indicators revealed gaps in the country's fishery decentralization process that impacted community livelihoods and fishery stocks.

The subnational integrated planning process in the three Thai provinces of Nan, Khon Kaen and Samut Songhan devised a scoring system to ascertain the depth of poverty and environment linkages that were captured by the indicators and incorporated into development plans. The scoring

system initially had no information on poverty or environment, but such information was eventually linked and addressed in the plans. Stakeholder consultations revealed acknowledgement of the livelihoods links between maintaining healthy fish stocks through mangrove forest protection. Thus, specific actions for mangrove management were prioritized for inclusion in the development plans (PEI Thailand).

The view that the various cases reviewed in this paper highlights is that the general indicators of poverty reduction – such as change in income levels, change in income distribution, change in diet or nutrition, access to productive resources and the like – appear to dominate the more difficult measurement of ecosystem services. While conservation objectives took precedence in projects designed to protect areas of ecosystems, indicators of social development appeared to be less prominent than community access, although both issues were moderated by cultural and political factors. This presents an immediate problem, as the reconciliation of trade-offs and the identification of synergies become a narrative of good design and not an outcome of project implementation. There needs to be better integration of data and indicators of success. The various tools and approaches used need to be applied to achieve integrated outcomes that require a better focus to linked poverty and environment indicators.

This data approach, which is practiced only partially, is needed for a couple of reasons. The first is that, at the household level, the available set of environmental and ecosystem services is currently not well-measured. Implementation of the suggested data approach would make it easier to detect how these non-income assets actually change over a period of time. Household sustainability indicators to demonstrate the

connection between ecosystem services and poverty are lacking. In addition, because many ecosystem services are measured on spatial scales, these need to be linked to the concept of resilience or the ability of a community or ecosystem to withstand external shocks (environmental, social, economic).

Results become clear over varying timeframes and circumstances and therefore we need to realize that results within a project timeframe may not be realistic in relation to specific environmental factors and external influences. The policy implications for measuring results are therefore also critical at the policy level, as governments must confront multiple dimensions of poverty and their attendant linkages to ecosystems and resource use at the local level must be accounted for in national policies. If there are no specific budgetary commitments, it is difficult for national policy goals promoting supply-side effects to translate into local poverty reduction and to produce beneficiaries. Thus, it is essential to use available tools and valuations that can trace the poverty reduction impacts of changes in national policies that are aimed at the sustainable management of ecosystems.

## CONCLUSION

The relationship between ecosystems and the shift towards a green economy are clearly synonymous with sustainable development. The shift to a green economy must ensure that the long-term benefits of ecosystems can be harnessed without perverse incentives, exploitative political economies and continuing externalities from underpricing. To date, the reliance on local-level results is not being exponentially reproduced to overall positive trends for sustainability. Natural resources and

ecosystem services in particular remain key ingredients for long-term development goals for developing countries.

The local-level case studies in this paper have shown the complexity of trade-offs. Stakeholders do not perceive trade-offs equally, so policies will likely have positive or negative effects when viewed from different stakeholders' perspectives, as in the case studies of **South Africa** and **The Gambia**.

The case studies further demonstrate that local and subnational actions have largely provided the experience, and assumed the risk, of identifying and minimizing trade-offs between the environment and poverty reduction. But, ultimately, national governments must provide the strategic leadership and institutional approach to acknowledge the distinctions underlying trade-offs, as these guide short- and long-term interventions and policies.

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# 5. INCLUSIVE GREEN ECONOMY AND ECOTOURISM AS AN APPROACH FOR POVERTY REDUCTION

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## BACKGROUND AND RATIONALE

Ecotourism is a critical approach worth consideration in development of a practical toolkit for inclusive green economy methods to reduce poverty. For example, ecotourism is essential to poverty reduction because of the advantages received by poor populations from its growth as an industry, provision of employment, as well as social, economic and environmental profits from investments in sustaining biodiversity and ecosystem services. However, the link between ecotourism and poverty reduction is not automatic. Deliberate and complementary poverty reduction policies integrated in ecotourism design and implementation are required for ecotourism to directly result in poverty reduction.

The union between ecotourism and poverty reduction is supported by the shared principles with inclusive green economy. Specifically, these principles include sustainable development and inclusive green growth.

For instance, inclusive green economy is considered “one of the important tools available for achieving

sustainable development and that it could provide options for policymaking but should not be a rigid set of rules. We emphasize that it should contribute to eradicating poverty as well as sustained economic growth, enhancing social inclusion, improving human welfare and creating opportunities for employment and decent work for all, while maintaining the healthy functioning of the Earth’s ecosystems” (United Nations, 2013). In other words, it provides “pathways for bringing together the social, economic and environmental objectives of sustainable development in ways that can benefit poor and vulnerable groups and reduce inequality” (PEP Working Group, 2013).

Therefore, sustainable development is an all-encompassing concept, defined as “development which meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development, 1987). Consequentially, it stands to reason that inclusive green growth is a concept to operationalize sustainable development by sustaining growth, preventing irreversible environmental damage and keeping costs manageable (World Bank, 2012).

Ecotourism tiers to inclusive green economy in a similar manner, that is, as a functional approach. Ecotourism is a tool to operationalize green



economy. Implementing a green economy can be achieved through many platforms, such as livelihoods, agriculture, water and sanitation, renewable energy and ecotourism. Thereby, ecotourism represents one component of a green economy recipe for poverty reduction.

True ecotourism contains three components: a) nature-based travel, b) education/interpretation and c) sustainability across social, economic and environmental dimensions (Bustam, Buta and Stein, 2012). However, to be considered ecotourism and a tool to implement green economy, the products and services delivered must be 'green' in their delivery.

Ecotourism is recognized the world over for its growth in the overall global tourism industry since its origins in the 1970s. Up to this time, mass tourism dominated the tourism industry; however, after the arrival of ecotourism, a shift emerged in the tourism industry revealing a continual growth in the ecotourism market. For example, the global growth of tourism indicates that in 1950 there were 25 million tourist arrivals; while in the 1990s, tourism (i.e., receipts and arrivals) grew globally at a rate of 7 percent per year up to 10 percent in 2004 (The International Ecotourism Society, 2006). In contrast, since the 1990s through the 2000s, ecotourism has been growing 20-34 percent per year (The International Ecotourism Society, 2006).

Employment data also serve as an indicator for the growth of tourism. For instance, the tourism industry represents the largest business sector in the world economy and is responsible for over 260 million jobs (i.e., one in every 11 jobs) (UNWTO, 2013).

In 2011, the tourism industry reached a record of international tourist arrivals, 982 million, and an increase of 4.6 percent from 2010; while receipts

grew by 3.8 percent to US\$1,030 billion (World Tourism Organization UNWTO, 2012). The impact of ecotourism on the tourism industry is evidenced by ecotourism commerce securing 7 percent of the international market in 2011. Estimates charted ecotourism growing to 25 percent of the global tourism industry receipts in 2012, taking the value of the sector to US\$473 billion a year (Shum, 2010).

In addition, the philosophy of ecotourism has recently led to a variety of new terms such as community-based tourism and pro-poor tourism, which focus on the notion that tourism can and should benefit conservation and host communities (The International Ecotourism Society, 2012). Interestingly, within the development of sustainable tourism are initiatives to mainstream sustainability within the global tourism industry by applying the principles and practices of ecotourism to mass tourism (e.g., hotel chains, urban tourist attractions, ski resorts, golf courses, beach resorts) (The International Ecotourism Society, 2012).

Unlike mass tourism, ecotourism focuses on benefits to communities, socially and economically, as well as environmental conservation. This is also true of community-based and pro-poor tourism. Community-based tourism "seeks to strengthen institutions designed to enhance local participation and promote the economic, social and cultural well-being of the popular majority" (Broham, 1996). While pro-poor tourism generates net benefits for the poor that are greater than the costs associated with the tourism initiative (Bennet, Roe and Ashley, 1999). These forms of tourism constitute an ecotourism approach aimed at operationalizing inclusive green economy for poverty reduction.

For example, ecotourism supports two aspects of inclusive green economy, namely, growth in income and employment through investments

in sustaining biodiversity and ecosystem services. Such initiatives lead to wealth creation (i.e., creating something new or increasing what we have) from investment in natural capital, as evidenced by biodiversity conservation (i.e., maintaining what we already have) occurring in tandem with ecotourism, which results in livelihoods, traditional skills (e.g., handicrafts, subsistence use of resources) and welfare improvements. Subsequently, such wealth creation leads to increased natural capital through better management of scarce resources (e.g., conservation agreements), increased productivity by influencing behaviours (e.g., biological productivity), encouragement for green technologies (e.g., energy efficiencies) and improvements on welfare (e.g., gender equality) (World Bank, 2012). Lastly, human capital is also invested in through ecotourism initiatives by the provision of jobs, labour markets, empowerment and investment in conservation.

Implementation of ecotourism through an inclusive green economy lens has addressed numerous poverty dimensions. For example, the direct benefits of ecotourism for poverty reduction include provision of employment, livelihoods, income and empowerment. Such benefits derived from ecotourism have led to indirect benefits that include social justice for disadvantaged groups, giving way for improved living standards (e.g., assets, water, electricity, toilet, cooking fuel) as well as positive impacts to education (e.g., years of schooling) (Klugman, 2010) and health (e.g., disease control through improved sanitation). However, the relationship between ecotourism and poverty reduction is not certain. To accomplish these benefits, targeting the poor, securing their involvement and providing them access is critical.

In practice, there are countless examples of ecotourism initiatives with positive impacts on poverty reduction. The following country case

studies highlight effective implementation of ecotourism across a swath of countries from a small island developing state (SIDS) (i.e., **Vanuatu**) and least-developed countries (LDC) (i.e., **Lao** and **Nepal**) to developing countries (i.e., **Ecuador**, **South Africa** and **Thailand**).

- **Vanuatu** is a SIDS in the South Pacific Ocean and the location of the Nguna-Pele Marine and Land Protected Area (MLPA) network, which was founded in 2002. Given a long history of communal land tenure and marine resource sustainability concerns, 16 indigenous communities collaborated to develop the Nguna-Pele MLPA, spanning more than 3,000 hectares. This network provides biological conservation while implementing ecotourism for poverty reduction of the local villagers. Specifically, the communities provide village-stays and turtle-tagging projects for ecotourists. A community and visitor tag and release programme for sea turtles has provided the community economic benefits through sponsorship fees as well as evident conservation benefits to the turtles. In addition, since the inception of the network, the average incomes of the villagers have doubled as they have shifted from fishing to ecotourism as an alternative livelihood activity (United Nations Development Programme, 2012).
- Listed among the LDC by the United Nations Conference on Trade and Development, the People's Republic of **Lao** is home to the Nam Ha Ecotourism Project, which began in 1999. This initiative was established with the intention of creating a community-based ecotourism model to alleviate local pressures on the ecosystem, generate income and employment for the poor in the local communities and provide replication throughout **Lao**. Extensive education targeted at policymakers has allowed the local stakeholders to collaborate to create regulations

(e.g., cooperative agreements, permits, fees) that protect the resources from which the ecotourism venture generates a profit. Services provided by this initiative include treks to ethnic villages and the National Protected Area (NPA); these have had numerous positive impacts for environmental conservation and poverty reduction. For instance, the reduced pressure on the natural resources of the NPA has led to a new valuation on the resource, from exploitation to conservation, as more revenue is generated from conservation. The initiative created jobs for hundreds within the communities. Communities benefit from the fees charged for accommodations and services, which go directly to village development (Harrison, 2007).

- Also listed as a LDC, **Nepal** developed the District Partners Programme/Sustainable Tourism Development Programme in 1999, which provides trekking opportunities on a community trail. The initiative originally began as a result of the Government of Nepal's ninth five-year plan to develop tourism and alleviate poverty. The Simikot Trail in Humla was selected for the evident need of the local people. Of the 56 people who lived along the trail, all were poor: from landholders who worked their land and provided trekking services, to the landless and poorest of the poor who worked as casual labourers. While the main focus of the initiative was capacity-building for communities, policy and planning were also influenced with the Appreciative Participatory Planning and Action practices with community-based organizations (CBOs) that helped make a more supportive framework for pro-poor strategies. This initiative led to social and economic benefits for local community members. Specifically, CBOs that were mobilized in the local communities for increased involvement and earnings from the

informal sector (i.e., mule driving and porter work, vegetable growers, craftsmen) serve as a main livelihood for some (Saville, 2001).

- The developing country of **Ecuador** is home to the Kapawi Ec lodge and Reserve, developed in 1995. After what began as a private venture where the land was leased and revenues went to the local Achuar communities, the Kapawi Ec lodge and Reserve was given to the Achuar people to manage and operate in 2008. In addition to accommodations, the Achuar provide community visits, adventure tours, cultural tours and wildlife viewing. This venture has alleviated poverty and promoted conservation. For example, there are three locations for business operations, employing 32 Achuar. Communities depend on income generated from lodge-related activities (e.g., handicrafts and food), which constitutes most of their income base and receive quarterly payments from lodge revenues, which are used for communal expenses. In addition, the communities designated protection for more than 618,000 hectares surrounding the lodge (United Nations Development Programme, 2012).
- In **South Africa**, the Pro-Poor Tourism Pilots Programme was implemented in 2002. The initiative was developed to create linkages that involve the local poor that also make business sense to the company. To do so, the programme created close collaboration with five companies as pilot sites in the form of designing linkages and implementation as well as communication with the formal sector to develop awareness and expertise of pro-poor strategies in tourism. Local communities provide accommodations at two lodges, hunting guide services and cultural tours. Additionally, communities have a commercial partnership with the formal sector (i.e., lodges) that allows them to draw wages and provides new business opportunities. In complement, the

initiative created linkages to increase the supply chain between the formal and informal (i.e., poor) sectors (Ashley, Poultney and Hayson, 2005; Poultney and Spenceley, 2001).

- Thailand is the location of the Koh Yao Noi Community-Based Ecotourism Club, which was founded in 1995. The Club deployed ecotourism to reverse social and environmental impacts created by large-scale commercial trawlers in local fishing grounds. Illegal fishing by these trawlers destroyed the environment and threatened local livelihoods. The Club, offering home-stays and fishing expeditions, led the government to enforce the existing law and protect local rights. This directly benefited 35 local families, with indirect benefits for over 4,000 more. Specifically, 10 percent of all ecotourism income goes to community funds that support conservation and community initiatives. Ongoing community skills development (e.g., planning, accounting) is provided. The community development, involvement and ownership of the Club resulted in increased community cooperation and participation, which includes new roles and the provision of a voice for local youth, women, elderly and disadvantaged minorities. Improved natural resource management has resulted in increased environmental awareness and commitment among local hosts and guests (Asker, Bronyak, Carrard and Paddon, 2010).

## INITIATIVES DESIGN

When it comes to design, there are clear synergies and trade-offs between policy priorities that need to be thought of and addressed when designing. Synergies and trade-offs centre on ecosystem services, ecosystems and people, as well as people.

### **Synergies and trade-offs between ecosystem services.**

Ecotourism-initiated conservation of natural resources over development and exploitation provides a clear synergy with ecosystem services that benefit the poor who rely on these resources. Specifically, provisioning services such as food, water and fuel are provisions used and needed by many rural or remote poor populations. In contrast, overuse of local resources, as well as other negative impacts from ecotourism such as air, noise and aesthetic pollution, solid waste and littering, vandalism and damage to natural and cultural heritage, have debilitating consequences for natural resources, resulting in trade-offs. These impacts include deforestation, alteration of ecosystems, contribution to climate change, loss of biodiversity, lack of biological productivity, as well as damage to population dynamics and behavioural adaptations. For example, the villagers of the Nguna Pele MLPA rely for subsistence on the fisheries that inhabit the reef surrounding their islands. The surrounding reef was experiencing several threats from overuse and the influx of invasive, exotic species. By protecting and developing conservation management techniques, the ecosystem provides subsistent resources for these remote and poor people.

### **Synergies and trade-offs between ecosystems and people.**

When uniting people with ecosystems for ecotourism implementation, synergies and trade-offs exist. For instance, ecotourism provides primary or alternative livelihoods and a means for diversified incomes. This is evident for the Achuar people, who depend on the Kapawi Ecolodge for their income (i.e., 84 percent of their income is generated from the ecolodge). Another illustration of this synergy is the Nam Ha Ecotourism Project, which has allowed community members to diversify their livelihoods, resulting in an increase in quality of life (e.g., ability

to purchase household items and pay school fees) as well as increased access of the tourism market by women, who can earn more money by selling food to tourists. Counter to these synergies, there are trade-offs related to ecotourism initiatives. Such trade-offs may include a) loss in livelihoods and income from restrictions placed on land uses and natural resource extraction, b) reduced health resulting from loss of access to natural-based foods and c) loss of employment ensuing from changes in requirements for labour force under modifications in land uses.

### Synergies and trade-offs between people.

Implementing ecotourism also results in synergies and trade-offs between people. Specifically, multi-stakeholder participation is a common policy priority and leads to economic synergies. These include provision of earnings and linkages. Earnings are provided through partnership with multiple stakeholders, such as wages from employment, earnings from selling goods and services (e.g., food, crafts, guide services), collective income (e.g., profits from community-run enterprises), dividends from a private sector partnership (e.g., concession or lease agreement), land rental paid by an investor, user fees for passing through a village and charitable donations. For example, the Achuar people in **Ecuador** use collective income from the Kapawi Ecolodge, while pro-poor ecotourism in **South Africa** is based on dividends from private sector partnership. Specifically, the local community retains 14.5 percent of ownership in the Rocktail Bay and Ndumu Lodges, with a 20-year lease and 12.5 percent share in lodge operations (Poultney and Spenceley, 2001). Lastly, the Nam Ha Ecotourism Project has user fees built into a permit system for guided treks to the NPA. Additionally, linkages are made through multiple partnerships. These relationships increase the supply chain for sales to ecotourism enterprises and tourists (i.e., products,

services) by the poor, through the development of goods and services (e.g., crafts, food, music, guiding, and transportation). Linkages are present in the Pro-Poor Pilot Programme, where connections were made between the formal and informal sectors of ecotourism on the basis of provision of procurement services. For example, formal sectors have procured liquid petroleum gas, construction of a new deck and invasive vegetation clearing.

While design synergies abound, trade-offs from these policy priorities are also evident. For example, economic trade-offs consist of conflicts with other livelihoods, volatility, leakages and inequity. Conflicts with other livelihoods occur when an ecotourism project limits the ability of the poor to perform their primary livelihoods (e.g., during same season). In addition, the ecotourism industry is inherently volatile. Demand for tourism changes due to many reasons, including political instability, safety issues (e.g., crime, weather) and trendiness of the destination. Furthermore, leakages from imported goods, profits and salaries that leave the local economy also contribute to negative impacts. Lastly, inequity in benefits occurs by not providing a range of livelihoods that satisfy the needs of the local people, failing to distribute benefits effectively and spreading benefits to more powerful interests than the poorest groups or those that rely on natural resources.

Community capacity-building also leads to social synergies. These consist of increased well-being and influence as well as reduced vulnerability. Examples of increased community and individual well-being include improvements in health, education/training and other capacities (e.g., sense of control, increased pride and self-confidence) as well as improvements to socio-cultural status through community recognition. In addition, community capacity-building leads to greater influence of the

poor over policy and institutional environments (e.g., new status, info, skills) and the ability to create demand for improved assets (e.g., education, health). Subsequently, capacity-building also yields an increase in the value attributed to minority cultures by national policymakers. Moreover, capacity-building reduces vulnerability among the poor by fitting initiatives with long-term priorities (e.g., buffers against hard times) and supporting existing livelihood goals (e.g., economic security, cultural life, health).

This is evident in **Nepal** with the District Partners Programme/Sustainable Tourism Development Programme. This initiative improved sanitation by installing toilets in Humla along the community trail used for ecotourism and commerce, which reduced the incidence of disease, while improvements to the trail increased communication between communities, improved transportation for commerce and less reliance on human-powered porters as reliance on pack stock increased. In addition, donations to the local monastery support the local religious culture by financing structural developments and large celebrations, which has led to pride and appreciation of the culture among the monks and villagers. Moreover, the planning framework used by this initiative (i.e., Appreciative Participatory Planning and Action) gave the local poor a voice and empowered them to more effectively communicate their needs to policymakers and decision makers. Lastly, ecotourism, along the community trail, provided alternative incomes to the local poor that allowed them to pay for food in deficit months so that they were less vulnerable to starvation during periods of drought and crop damage.

Social trade-offs also exist and centre on the disruption of social networks. For instance, sexual exploitation, commodification, stress, crime and child

labour lead to family disintegration, increased use of drugs or alcohol and displacement and threatens long-term security by undermining economic security, self-determination and health. In addition, elite capture resulting from the wealthier and more powerful groups having the ability to access jobs and finance small, micro-enterprises (SME) is an evident trade-off of ecotourism. Moreover, other potential social trade-offs include: a) increased land prices resulting from an increased demand for land; b) loss of cultural heritage or commodification of culture from abandoning or selling traditions; c) loss of control or flexibility over local development options when easements or long-term contracts specify a narrow range of management alternatives or community land owners and landless do not become involved; d) skewed local power structures or power base from inequity in benefits distribution; and e) increased competition from markets that lead to marginalization of weaker groups. The selected country case studies have deployed varied methods to identify and benefit from such synergies while minimizing potential for existing trade-offs. For example, in order to maximize economic synergy, the Pro-Poor Pilots Programme developed linkages between the formal and informal sectors that included product development and market access (i.e., community tour) and procurement (e.g., laundry, petroleum gas, fuel wood, crafts, greeting cards, construction, organic produce, recycled soap, chemical supplies, furniture suppliers). The implementation of this initiative not only targeted the poor, but also educated people about the procurement process of the formal sector (i.e., product development) and facilitated their access to benefits and partnerships.

To minimize economic trade-offs through livelihood conflict, the District Partners Programme/Sustainable Tourism Development Programme in **Nepal** developed several SMEs to provide



tourism products (i.e., vegetable farming, apricot wine making, poultry farming, hotel and teashop management, livestock and cultural shows) in line with current primary livelihoods. This initiative reflects community capacity-building in ecotourism design by providing the poor with product development and implementation training, access to investment funds and the opportunity for income diversification that complements primary livelihoods. In **Vanuatu**, volatility was mitigated through an invasive species eradication programme. The invasive crown-of-thorns starfish (*Acanthaster planci*) was about to experience an outbreak in population, which would have decreased the hard coral cover. Knowing that ecotourism is based on the resource-base, they employed a 'land and sea clean-up campaign' that collected over 10,000 starfish and 53,000 African snails. This initiative reflects the use of ecosystem management to conserve the ecotourism resource-base and thereby to preserve the profit-generation of ecotourism implementation.

In an effort to maximize community capacity-building, **Vanuatu** focused on conservation initiatives to support ecotourism, which led to social capital-building. The tripling of involvement in community development projects demonstrates this. Also, improvements to social equity are apparent in the empowerment of women to participate in conservation committees and to serve in leadership roles as well as the provision of activities for youth who are no longer in school (e.g., clean-up projects). These efforts showcase the significance of pro-poor involvement and participation in ecotourism implementation for broad social benefits.

To diminish trade-offs associated with the disruption of social networks, **South Africa** developed a partnership with Mpukane Trust for a new diving lodge that strengthened relationships between formal and informal sectors while providing

economic security and self-determination as long-term benefits. Moreover, long-term security was ensured, as no displacement occurred and the local community retained their authenticity through selective cultural tours.

Efforts to minimize environmental degradation while maximizing the marriage of conservation and livelihoods are evident in the Nam Ha Project, which helped market and advocate for the NPA as well as raise the awareness about its conservation benefits at provincial and national levels. This changed values and there was a shift from poaching to preserving wildlife as people begin to appreciate tourism-related revenue. Also, conservation policies were enforced and conservation zones established to allow for sustainable multiple use.

These synergies and trade-offs can be assessed using a multiple attribute trade-off analysis. This method obtains social and economic value judgements from stakeholders on trade-offs of different synergies (e.g., commodification of culture and high tourism revenues) to yield relative importance of impacts (Economic Analysis Section, 2007). The application of monetary valuation of ecosystem services can complement these analyses. Such practice is commonly described as an integrated ecosystem assessment. This form of assessment examines the present physical resources and subsequent ecosystem services (e.g., vegetation cover providing landslide protection) that lead to social and economic benefits (e.g., health and safety). Valuations (i.e., monetary or non-monetary) are assigned to trade-offs of different ecosystem management scenarios. To assess feasibility of an ecotourism venture, there are many assessment tools available. These tools concentrate on providing the understanding to know how to allocate funding as well as to identify community needs and tourism demands. Brass (1997) advances



a nine-step process to accomplish this by weighing the costs and benefits of potential tourism operations in the Community Tourism Assessment Handbook (CTAH). The Nam Ha Ecotourism Project used a trade-off analysis similar to the CTAH to assess current costs of existing threats (e.g., slash-and-burn agriculture, harvesting of non-timber forest products (NTFP), wildlife hunting, timber harvesting, road construction) related to ecological integrity of the Protected Area.

To ensure meaningful and effective participation of communities and stakeholders in shaping ecotourism design initiatives, the Appreciative Participatory Planning and Action (APPA) approach is most commonly used. This method is an inquiry and planning process intended to foster effective community action. It is practiced through an iterative process to a) discover strengths and resources; b) envision short-term and long-term futures; c) design an action plan for development and environmental conservation that limits long-term dependency on external funding sources or technical support; and d) motivate community participants to act immediately and on their own (Pretty, Guijt, Scoones and Thompson, 1995). For instance, the District Partners Programme/Sustainable Tourism Development Programme used APPA to generate participatory and positive plans for improving participation. This process enabled communities to better communicate their goals and plans to governmental entities.

It is important to note that there is not one right system to generate public involvement; it will be different for every community and scenario. Therefore, a set of rules assessing the appropriate level of public involvement or mechanism is too confining. However, one method is recommended for assessing the impact of community involvement. This method is based on the following

characteristics of involvement (Smiley, de Loe and Kreutzwiser, 2010):

- Planning goals: development of a decision-making partnership; consideration of local impacts; urgency of completion and implementation; consistency across jurisdictions.
- Nature of the planning problem: accessibility of pertinent information; geographic scale of impacts; alternative solutions.
- Number of participants: diversity of needs and interests to be represented.
- Potential for participant learning: experience with pertinent information; time and resources available to support learning.
- Integrity, willingness and commitment of participants: degree of respect for decision-making process and for other participants; extent ongoing involvement in decision-making and/or implementation is possible.

The District Partners Programme/Sustainable Tourism Development Programme in **Lao** exemplifies the application of this method. Specifically, assessment of this group's community involvement reveals the following:

- Planning goals: improved community organization as well as formation and strengthening of CBOs; membership mobilized to participate in community and personal development activities.
- Participant learning: business plans created and funding approved, which improves understanding among villagers of options available and processes for accessing funds.
- Number of participants: diversity in minority involvement accomplished (e.g., women-only CBOs).
- Planning problem: strengthened local non-government organizations (NGOs) with improved capacity to conduct social mobilization and assist farmers to establish new enterprises.

- Willingness: government employees more aware of the issues involved in sustainable tourism and prepared to advocate for it; improved capacity of local government to interact with CBOs/NGOs and support in community development.

## INITIATIVES IMPLEMENTATION

Implementation of ecotourism design consists of understanding the key partners involved, the challenges faced and steps to resolve these challenges, as well as consideration for financing of operations.

There is a host of critical partners necessary for ecotourism implementation that consists of stakeholders at multiple levels. For instance, governments play a variety of roles, from leading agencies to supporting communities. Because they set the policy context, they have a strong influence. The private sector consists of tourism providers and should be involved in an advisory or support role for product development, marketing, investment and operation. Local NGOs and international development agencies are important in most ecotourism initiatives. They typically provide funding and technical support. The poor ought to be involved in all initiatives as individual producers, employees, casual labourers and operators of SMEs as well as members of communities. Lastly, community organizations play a role in the development of products based on commonly owned goods, negotiation of a community stake with other stakeholders, receipt and distribution of collective income as well as representation of community views to others (e.g., government).

Among these critical partners are some groups and individuals who may oppose the initiatives. For

instance, government authorities may not be fully supportive unless they can understand the financial benefits. They may need to be courted throughout the planning process. Additionally, the formal sector may not wish to create linkages with the informal sector for fear of loss of tourist demand. Their agreement may be secured in practice by assessing the feasibility of the ecotourism initiative. The private sector may be oppositional if it was not involved in planning. A simple solution for practice is to ensure its involvement. Also, residents who were not part of decision making with imposed access restrictions to PAs where they practice subsistence use of resources may disagree about new ecotourism initiatives. To garner their agreement, provide alternatives, make concessions and include them in planning. Lastly, underrepresented or marginalized groups may not see the value of the initiative, as their standard of living is based on survival. Secure their agreement by involving them in planning and arrive at achievable benefits for this group that do not conflict with their primary livelihoods.

Bearing in mind implementation effectiveness, consideration for capacity constraints and mitigations is warranted. In ecotourism implementation, capacity constraints include social, natural and physical ones. Even though financial capacity constraints are evident, these will be discussed later.

Social capacity constraints involve a lack of skills and understanding of ecotourism. This includes understanding of tourists and of how the industry works, business skills, standards for community-run SMEs and community organization (e.g., managing common resources, distributing benefits). However, these constraints can be effectively mitigated through education and training. For instance, education ought to be provided at the basic level (i.e., defining tourists and the industry, investment

principles such as ‘start small’ and ‘reinvest with profits’), with training focused on technical business support to improve quality, reliability of supply, transport links and organization.

Those constraints relevant to natural capacity consist of a lack of market power due to no ownership or control over resources of market value, which translates into no bargaining power with investors. The building of natural capacity for efficient ecotourism implementation requires consideration for land ownership and tenure. With ownership, landowners are less likely to be excluded from opportunities; however, communities often sell their land to outside developers, which shifts their role from that of could-have-been decision makers to that of industry workers. The concept of land tenure provides a remedy to natural capacity constraints related to land ownership. Specifically, tenure allows for access rights due to historical use or concession. Natural capital can thereby be built by strengthening local tenure rights over land, water, wildlife, cultural heritage and other ecotourism assets. Planning gain is one such tool to implement this strengthening. This practice is deployed to encourage local impacts to the poor by requiring external investors to include community involvement in their proposals (e.g., common property resources for the benefit of the community through ecotourism initiatives). Thus, tenure gives the poor market power as well as the edge to negotiate and secure ecotourism benefits. Lastly, physical capacity constraints include a lack of necessary transportation and communications infrastructure to meet ecotourism needs, a condition often prevalent in impoverished areas. To mitigate this constraint, physical capacity (e.g., roads, airports, utilities) should receive consideration as part of the ecotourism initiative planning and can be reinvested in by the local government or through donor support.

With reflection for capacity constraints addressed, inquiry into how to negate constraints to public participation remains unresolved, specifically with respect to the poor and other vulnerable groups. Inherently, some groups are unintentionally targeted with initiative implementation (e.g., women in the creation of handicrafts and food); others have assets to work with (e.g., land or tenure with a viable commodity). However, some groups will need to be pursued (e.g., poorest of the poor). In **Ecuador**, an inclusion policy was developed to provide the opportunity for women and people with disabilities to gain employment at the ecolodge. This endeavour allowed employment for six women and one disabled person. In addition, the Nam Ha Ecotourism Project successfully initiated an Ethnic Minority Participation Programme to encourage ethnic minority participation in conservation and development activities: in 2006, 20 percent of guides were women and 95 percent were members of ethnic minorities.

While these inclusion programmes illustrate effectiveness in garnering participation by the poor and other vulnerable groups, there are constraints to the benefits that these groups receive from ecotourism. These include: a) lack of government support to involve the poor; b) lack of commercial viability; c) leakages; and d) lack of fit with existing livelihoods. However, each of these recognized constraints is negated through a solution already implemented by the country case studies.

- Lack of government support to involve the poor. In **Nepal**, this was recognized as a limiting factor to successful ecotourism implementation. The District Partners Programme/Sustainable Tourism Development Programme strengthened the local government to create proactive support for involvement of the poor in two ways. First, the development agency placed two expatriate

staff in the government tourism office to assist in creating mechanisms within the national tourism industry for involvement of the poor. Second, the Sustainable Tourism Network is used as a platform for lobbying and networking to improve government support of pro-poor ecotourism initiatives.

- Lack of commercial viability. A viable product and market in a thriving destination without political instability and minimal safety issues are needed to ensure commercial viability. Realizing that there was not much product availability in the local villages, the Pro-Poor Tourism Pilots Programme relied on existing lodges to provide the market for community products. For instance, community members supply handicrafts and food to the lodges. In addition, the community provides hippo-tours for lodge guests and receives from the lodges fixed monthly fees and additional money if hippos are spotted. Moreover, the lodge sponsors transportation for cultural performances at the lodges.
- Leakages. These occur when foreign exchange earnings generated by ecotourism are repatriated back to the country of origin. To ensure that this did not occur in **Ecuador**, the Achuar developed linkages. Specifically, product markets were developed for local suppliers to sell products to the eco-lodge and tourists (i.e., produce, fish). Similarly, in **Lao**, the Nam Ha Ecotourism Project provided linkages for SME merchants to sell services to tourists (e.g., transport, food, water, guides, and handicrafts).
- Lack of fit with existing livelihoods. Because ecotourism provides earnings that can conflict with primary livelihoods, it must be viewed as an alternative. Given that farming and business travel coincide with ecotourist visitation in **Nepal**, local ecotourism suppliers chose to diversify their agricultural production and develop local marketing connections so they could still supply

produce to the formal sector and not sacrifice their time in marketing to tourists.

Further consideration of ecotourism implementation leads to financial planning. Effective implementation necessitates that initiatives be costed, budgeted and financed, all of which are often constraints to implementation. This requires preparation in the form of a business plan. Business plans should include not only a marketing description that analyses the target consumer market and existing supply and demand (Bustam and Stein, 2010a), but also a financial description that includes the capital cost projects as well as revenue and expense projections and viable financing options (Bustam and Stein, 2010b).

In terms of financing, the lack of credit and capital is a common constraint among ecotourism initiatives. However, communities can annul such constraints through partnerships as well as independently. Initiatives can be financed through donations, government subsidies, private company grants or financial assistance from NGOs. However, communities and NGOs looking to full financing for ecotourism ventures typically fail after the financial support ends. Under these conditions, communities become accustomed to receiving funds even without financial success of the initiative. In contrast, successful projects typically have some level of community financial investment with some sort of external funding at the start.

Communities can invest in such initiatives by expanding access to micro-finance as well as by slowing the pace of ecotourism development. Specifically, access to micro-finance can be achieved by establishing savings and credit opportunities within communities, while avoiding crash development of ecotourism allows for less reliance on outside investments.

## RESULTS

Monitoring the effectiveness of ecotourism delivery in meeting identified goals and objectives is imperative for adaptive management of the future project. There are a number of frameworks available to determine the success of poverty reduction through ecotourism; these include certification and assessment.

Ecotourism certification is used to oversee and guide the sustainability efforts of ecotourism operators, with a focus on dissuading negative impacts. Various ecotourism certification programmes, through a formal audit process, prove that operators follow pre-established sustainability practices that encompass socio-cultural, economic and environmental dimensions (Bustam et al., 2012). For example, Smart Voyager, Rainforest Alliance and Best ECO Lodges are just a few of the many certification programmes available worldwide. Specifically, Smart Voyager is a programme initiated by Conservation and Development, an Ecuadorian citizen's group, to reduce environmental impacts. They certify operations across Latin America that meet conservation standards. The Rainforest Alliance certifies global operators based on sustainability standards that focus on ecological, social and economic benefits. Lastly, Best ECO Lodges selects operations that meet eco-friendly requirements for accommodations.

To conduct an assessment, there are a number of suitable tools. However, the Toolkit for Monitoring and Managing Community-Based Tourism has the most holistic view across all sustainability dimensions, includes relevant indicators for poverty reduction, demonstrates the entire evaluation process and allows for customization to meet various needs (Twining-Ward, 2007). This process

focuses on environmental, socio-cultural, economic and community involvement impacts.

Many indicators can measure progress. However, there is not one blueprint for replication at each location, as there are variances in scenarios and needs. Some of the key indicators that consistently emerge throughout the country case studies include:

- Benefits to the local culture: In **Nepal**, donations from tourists to the Namkha Khyung Zong Monastery helped support religious culture. Interest by tourists in the monastery led to pride and appreciation of the culture among monks and villagers.
- Job opportunities and expansion of business opportunities: The Pro-Poor Tourism Pilots Programme in **South Africa** created 50 permanent jobs for local people in the formal sector and more than 60 casual labour jobs. In **Lao**, four new, private eco-guide service units were launched in connection with the NPA. These projects illustrate the outcome of targeting poor populations through pro-poor strategies that yield partnership development and a multi-level approach to planning.
- Vulnerability: In **Nepal**, the development of SMEs reduced vulnerability by allowing hotel and campsite owners to contribute to their primary household income by paying for food in deficit months. This enabled them to be less vulnerable to starvation during periods of drought and crop damage. Again, focusing on benefits to the poor allowed for income diversification that complements primary livelihoods and illustrates proper planning and collaboration among stakeholders.
- Gender equity and social inclusion: The Ethnic Minority Participation Programme initiated in

**Lao** enabled women to shift from spending one to two days collecting bamboo and rattan shoots as well as one day transporting these to the market with profits of US\$1 to US\$2 per day, to spending two to three hours preparing tourist meals and earning US\$3 to US\$6 without leaving the village, thus allowing them to spend more time on childcare, household work or economic activities. This initiative exemplifies the significance of targeting particular marginalized groups by providing access to markets and opportunities for business development.

- Health and safety: In **Nepal**, sanitation was improved by building toilets along the community trail. Access to water improved due to trail improvement and access to health care was improved by the development of new health posts. Such improvements reveal a focus of addressing the needs of the poor and this was achieved by providing them with the platform to speak for their needs.
- Revenue generation: In **Lao**, 18 percent of all revenue goes to the villages, with 8 percent of the total revenue going to village development funds. From 2001 to 2005, gross revenue of US\$137,794 was collected while US\$9,485 went directly to the villages. Such dispersal of funds reflects not only core values in revenue sharing, but also commitment and collaboration of the poor to earning the funds and deciding how community financial needs will be met.
- Local earnings: Income generated from ecolodge-related activities in **Ecuador** totalled 83.95 percent of all income generation. Local suppliers also benefit by selling their products to the ecolodge. Such earnings reveal proper planning on behalf of the Achuar people to ensure that income generation is fruitful and continues; they also provide access to ecotourism markets for those not directly linked to the ecolodge.
- Forest conservation: In **Lao**, communities work with the NPA authorities to create cooperative agreements that define stakeholder responsibilities in protecting resources where ecotourism is based (e.g., provide guidance on harvesting NTFPs, prohibit unlicensed hunting, set aside tracts of village-managed forests as sanctuaries). These agreements reflect not only commitment and collaboration of stakeholders, but also multi-level planning between the local community and the Lao government as well as partnership development between these stakeholders.
- Infrastructure: Trail improvements in **Nepal**, improved horse and mule travel, which opened communications. Donations collected by the monastery are used for renovations and new buildings. Taxes on grazing and tourists are invested in trail maintenance. These improvements reflect the needs of the poor, which were achieved by giving a voice in decision-making.
- Access to investment funds: Community support funds are available to CBO members in **Nepal**. A Venture Capital Fund (i.e., group collateral loan system) was established and six applications were approved. Some credit and savings groups have been formed. These accommodations provided to the poor and allowed them access to funds and the formal ecotourism market.
- Community organization and cohesion: In **South Africa**, communities have a commercial partnership with the formal sector and with the tribal authority (i.e., shares in lodge ownership and operations), resulting in community-wide benefits. This example illustrates the significance of targeting the poor in decision-making, giving them a voice in these forums as well as fostering partnerships across ecotourism sectors.



The development of a successful ecotourism initiative must include the development of a timeline. As previously mentioned, there are no cookie-cutter approaches to the appropriate length of time for development, as all ventures are different. However, practitioners recommend supporting projects with a time frame of three to five years because tourists typically do not begin to regularly visit a developed project before the third or fourth year of implementation.

Across the spectrum of implemented ecotourism initiatives, there are apparent drivers of success. The most common drivers are: a) commitment and collaboration; b) transparent revenue-sharing process; and c) proper planning.

For instance, in Thailand, the Koh Yao Noi Community-Based Ecotourism Club fostered commitment and collaboration by developing partnerships and strategic networks. The Club is a result of partnership between two organizations that support communities in the development of SMEs. These organizations assisted community members in conducting community-based research projects, using research tools to determine the feasibility and development of tourism.

The Nam Ha Ecotourism Project shows how to provide transparent revenue-sharing processes. For instance, the following project revenues are distributed: provincial tourism department tax (5 percent), village development fund (8 percent), provincial tax on income (10 percent) and Nam Ha NPA trekking permits (4 percent).

Lastly, proper planning involves multi-level actions. These include establishing commercial viability, product development, marketing, planning,

policy and investment as well as integration with mainstream products to make new products and services marketable.

Complementary to these key drivers of success are institutional arrangements that result in greater effectiveness. Specifically, the development of partnerships at multiple levels yields collaboration and communication for increased effectiveness. For instance, there are many things that only governments can do. Therefore, a leading role for government is critical, particularly with support for policy changes. Additionally, the poor are often excluded from decision-making processes and when institutions leave their priorities unrepresented in decisions. Thus, the poor need to be organized at the community level in order to engage effectively. An external party is essential to bind and support efforts of others as well as to help with sustainability; this is frequently an NGO. Donor support of tourism plans is essential. Engagement of the private sector is imperative for the provision of technical advice to develop skills, marketing links and commercial expertise. It should participate in product and market development to ensure commercial practicality. These multi-level partnerships are essential institutional arrangements for the effectiveness of initiatives.

Just as institutional arrangements play a role in ecotourism initiative effectiveness, so do policy implications for effective design, implementation and sustainability. For example, policy implications gleaned from the country case studies reveal three-fold results.



To begin with, poverty issues must be made a leading variable for pro-poor ecotourism. Ecotourism is often touted as the panacea for sustainable development, but, in practice, not all ecotourism ventures consider poverty or community development. For a pro-poor approach to ecotourism to be effective, poverty needs to be the lead driver of the initiative, possibly over and above economic and environmental benefits. In addition, the focus needs to go beyond community benefits where elite capture is possible, and must include solving poverty issues for equitable benefits for the poor populations. The Nam Ha Ecotourism Project illustrates this dimension effectively, as the project is a core part of national policies for rural development. Specifically, ecotourism plays a significant role in national development, as evidenced by reference in the National Growth and Poverty Eradication Strategy, the Sixth National Socio-Economic Development Plan (2006–2010), the National Tourism Strategy, the National Ecotourism Strategy and Action Plan (2006–2010) and the National Biodiversity Strategy to 2020.

In addition, decision-making systems may need improvement. For instance, a supportive policy and planning framework is needed in the form of regulations and incentives to strengthen the bargaining power and to improve working conditions of the poor. Such enabling policies and frameworks target the poor and give them voice as well as provide links to communicate local messages to decision makers and to give the poor access to business services, markets, jobs and skills while facilitating their access to financial benefits.

The need for decision-making system reform was evident in **Nepal**. To turn this advantage around, the District Partners Programme/Sustainable Tourism Development Programme built the social capacity of local government personnel by providing training in

APPA and inclusion of disadvantaged groups. Now, planning decisions are no longer made exclusive of public opinion, requiring governments to be more responsive to community needs.

Moreover, a multi-level approach to initiative planning and delivery is warranted. Specifically, effective initiatives illustrate success at three levels: a) destination; b) national; and c) international. This dimension is exemplified in **Ecuador**, as the Achuar established a) the destination level through partnerships with the informal sector (i.e., 20 local suppliers), b) the national level by organizing their 64 communities under a NGO that manages all community projects and c) the international level by obtaining international recognition for conducting tourism that reduces biodiversity impacts, as evidenced in certification from Smart Voyager, Rainforest Alliance and Best ECO Lodges.

## CONCLUSION

Ecotourism, as an industry, has experienced a short, but iterative history, arriving at a place where, in practice and principle, it is being applied to achieve sustainability, community development and poverty reduction while simultaneously being mainstreamed into broader tourism markets. It is a growing industry and has shown its pedigree as a top economic performer the world over.

This paper examined ecotourism initiatives from six countries to analyse the effectiveness of ecotourism as a suitable approach to reduce poverty through an inclusive green economy lens. Apparent in each country case study is the effectiveness of ecotourism as a driver for social, economic and environmental change in the affected, local communities and, in some cases, beyond.

Specifically, the Nguna-Pele MLPA in **Vanuatu** focused on conservation initiatives to support ecotourism that led to social capital-building; improvements to social equity are also apparent in the empowerment of women. These efforts showcase the significance of pro-poor involvement and participation in ecotourism implementation for broad social benefits.

In **Lao**, the Nam Ha Ecotourism Project expanded job and business opportunities by targeting poor populations through pro-poor strategies that yielded partnership development and a multi-level approach to planning. In addition, this initiative addressed gender equity and social inclusion by targeting minorities through the Ethnic Minority Participation Programme. This effort provided access to markets and opportunities for business development. Lastly, cooperative agreements with the NPA authorities and revenue-sharing systems allowed for commitment and collaboration across stakeholders as well as multi-level planning between the local community and the Lao government and partnership development between these stakeholders.

The District Partners Programme/Sustainable Tourism Development Programme in **Nepal** developed several SMEs to provide tourism products that illustrate community capacity-building in ecotourism design by providing the poor with product development and implementation training, access to investment funds and the opportunity for income diversification that complemented primary livelihoods and reduced their vulnerability. In addition, improvements to sanitation and the trail allowed for better health, safety and communication, which exemplify how to address the needs of the poor by providing them with a voice.

The Kapawi Ecolodge in **Ecuador** provided income generation for the Achuar people as well as local suppliers, which provided access to the ecotourism market across the various levels of community. Revenue-sharing with the Achuar communities also provides an opportunity for the local people to address their fiscal needs.

In **South Africa**, the Pro-Poor Pilots Programme developed linkages between the formal and informal sectors that included product development, market access and procurement. This initiative not only targeted the poor in its implementation, but also provided education about the procurement process of the formal sector and facilitated their access to benefits and partnerships. Also, communities have a commercial partnership with the formal sector and with the tribal authority (i.e., shares in lodge ownership and operations), resulting in community-wide benefits, illustrating the significance of targeting the poor in decision-making, giving them a voice in these forums as well as fostering partnerships across ecotourism sectors.

The Koh Yao Noi Community-Based Ecotourism Club fostered commitment and collaboration by developing partnerships and strategic networks. The Club is a result of partnership between two organizations that support communities in the development of SMEs. In addition, involvement and ownership of the Club increased community cooperation and participation, which include new roles and the provision of a voice for local youth, women, and the elderly and disadvantaged minorities.

These examples make it clear that ecotourism is a worthwhile approach for inclusive green economy methods to reduce poverty. However, it is important to be mindful of the tenuous link between ecotourism and poverty reduction. The implementation of ecotourism does not guarantee poverty reduction. Thus, deliberate poverty reduction policies need to be integrated into ecotourism design and implementation to ensure their greater effectiveness.

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# 6. DRAWING POLICY LESSONS FROM COUNTRIES THAT HAVE IMPLEMENTED SUCCESSFUL APPROACHES FOR INTEGRATING POVERTY REDUCTION AND GREEN ENERGY ACCESS

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## BACKGROUND AND RATIONALE

As highlighted in the Rio + 20 Outcome Document ‘The Future We Want’, green economy approaches contribute to eradicating poverty as well as sustained economic growth, enhancing social inclusion, improving human welfare and creating opportunities for employment and decent work for all, while maintaining the healthy functioning of the Earth’s ecosystems. Adopting green economy approaches entails sustained economic growth and increased access to services and infrastructure as a means of reducing poverty and improving quality of life and addressing energy poverty is an intrinsic part of this transition. Energy is an important input to all sectors of the economy, fuelling agriculture, industry, transport and social services such as education and health and there is strong empirical evidence that no country has developed or reduced its poverty significantly without available, affordable and secure energy carriers.

This paper explores at how provisioning modern energy services<sup>15</sup> through renewable energy<sup>16</sup> as a

green economy approach contributes to poverty reduction and sustainable development. The purpose of this paper is to map the interactions between energy access strategies and poverty reduction outcomes in a manner that can inform inclusive green economy policies and generate a guide that can help policymakers adapt this approach to their own contexts. On the basis of empirical evidence, it examines under what conditions and to what extent access to modern energy services can lead to poverty reduction and what are the opportunities created and expected trade-offs between the synergies between modern energy and poverty reduction.

This paper has five sections. It starts with a brief overview of the current energy access situation and the global agendas. This is followed by a summary of the nexus between poverty and lack of access to energy, enumerating the main benefits of bringing clean, modern energy to the poor as well as the bottlenecks to growth that lack of modern energy means for them. This is followed by an outline of the synergies and possible trade-offs between modern energy services and various aspects of inclusive green economy approaches in terms of improved well-being and poverty reduction, employment growth and climate change mitigation. The paper

15. Modern energy services are defined as household access to electricity and clean cooking facilities (e.g., fuels and stoves that do not cause air pollution in houses). <http://www.iea.org/topics/energypoverty/>, accessed 26 July 2013.

16. Renewable energy is the energy derived from natural processes (e.g., sunlight and wind) that are replenished at a faster rate than they are consumed; it includes energy derived from solar, wind, geothermal, hydro and some forms of biomass sources. <http://www.iea.org/aboutus/faqs/renewableenergy/>, accessed 26 July 2013.

then presents an overview of the current ways of measuring energy access and how they link with poverty reduction. This is followed by examples of national strategies that have expanded energy access for the poor while achieving large-scale poverty reduction. Finally, the last section summarizes the main conclusions of this review.

## GLOBAL ENERGY ACCESS SITUATION AND AGENDA

Globally, major advances were made in expanding energy access during the last two decades: 1.7 billion people (equivalent to the combined population of **India** and sub-Saharan Africa) received electrification and 1.6 billion people (equivalent to the combined population of **China** and the **United States**) secured access to less-polluting nonsolid fuels (SE4ALL, 2013). Most of this took place in the developing

countries of **India, Indonesia, Brazil, Thailand, South Africa** and **Ethiopia**. Yet this advancement was offset by population growth and, moreover, was unequally distributed geographically. In South Asia, progress has been uneven. In sub-Saharan Africa, the electrification rate has been consistently lower than the rate of population growth. Most of the incremental electrification took place in urban areas (1.7 percent annual growth), twice the rate in rural areas (0.8 percent). Similarly, the access rate in urban areas with respect to non-solid fuel use was 1.7 percent of the population annually, while rural areas lagged behind with an annual average growth rate of 0.6 percent (SE4ALL, 2013). Despite this, even in urban areas of sub-Saharan Africa and South Asia, large populations living in slums and informal settlements remain unconnected to electricity and many more are without access to clean-combusting fuels or stoves.

### BOX 1. ENERGY POVERTY FOR POOR PEOPLE

For poor people, not having access to modern energy services means not having proper heating, efficient lights, water pumps or agro-processing equipment, which affects agricultural and economic productivity and livelihoods; it also means not being able to keep shops open in the evenings, fearing accidents when children read with kerosene wick-lamps and, in most cases, ending the day at sundown. In summary, not having affordable and efficient energy services is a barrier to the most basic development.

At this juncture, the number of people waiting to make a transition to modern energy services is huge. Eighty-five percent of the 1.2 billion non-electrified population live in rural areas, with 87 percent concentrated in sub-Saharan Africa and **South Asia**. For cooking, the access deficit amounts to 2.8 billion people who primarily rely on solid fuels. About 78 percent of that population lives in rural areas and 96 percent are concentrated in sub-Saharan Africa, eastern Asia, southern Asia and south-eastern Asia

(SE4ALL, 2013). In sub-Saharan Africa as a whole, more than 650 million people – about 76 percent of the region's inhabitants – rely on traditional biomass for heating and cooking and 70 percent do not have access to electricity (REN 21, 2013). And these regions correspond to those with the largest numbers of chronically poor people. In Asia, while **China** has shown a huge increase in access to grid power, four million Chinese in rural areas still lack access to modern energy. **India** is home to more than 290

million people (25 percent of the population) who lack access to electricity and 66 percent of Indians use traditional biomass as their primary source of energy (REN 21, 2013). Globally, one billion people

are served by health facilities without electricity and more than 50 percent of children in the developing world go to primary schools without any access to electricity (Practical Action, 2013).

## BOX 2. FUTURE OUTLOOK

The world economy is set to grow fourfold by 2050 and energy demand and energy-related carbon dioxide (CO<sub>2</sub>) emissions will more than double. As per IEA's New Policies Scenario, global energy demand will grow 36 percent by 2035. Fossil fuels – oil, gas and coal – will continue to dominate energy use, accounting for 74 percent of the world's primary energy mix, with modern renewable energy, starting from a relatively small base, growing from 7 percent in 2008 to 14 percent by 2035. Following this path will have huge consequences: through 2035, the global energy supply infrastructure will require an investment of US\$33 trillion, almost two thirds of which is in non-OECD countries. If these investments are not used for climate-friendly technologies, emissions will continue to increase and be 53 percent higher in 2035 than in 2010. To maintain present levels of consumption, many countries will need to more than double their expenditure on imported oil and gas (UNF, 2012). The poor in developing countries, who contribute least to climate change, are likely to suffer the most from these trends and are least equipped to deal with it. In 2030, a majority of the world's population will still lack access to modern energy (UNF, 2012).

In the last few years and particularly since the launch of UN Secretary General's Sustainable Energy for All initiative, national governments have been trying to balance the demands of three broad objectives in the energy sector: providing energy security to ensure economic stability and growth; reducing energy poverty by ensuring access to electricity and clean-combusting fuels and equipment for the poor; and managing greenhouse gas emissions from energy. The World Energy Council has called this the 'energy trilemma' of how to achieve an appropriate balance between these sometimes-conflicting objectives (Pachauri et al., 2013a). The SE4ALL initiative will engage governments, the private sector and civil society partners globally to achieve three major goals by 2030: ensure universal access to modern energy services; reduce

global energy intensity by 40 percent; and increase renewable energy use globally to 30 percent. There is a growing recognition that clean energy technologies and energy-saving options with low lifecycle greenhouse gas emissions are necessary to sustainably meet future energy needs. These measures, by tackling inefficient and polluting sources of energy, generally also help mitigate the local environmental problems associated with energy use.

## MODERN ENERGY SERVICES AND POVERTY REDUCTION

Poverty is intrinsically linked to energy in that most of the 2.8 billion people relying on traditional biomass<sup>17</sup> for cooking and the 1.2

17. Traditional biomass refers to solid biomass that is combusted in inefficient and usually polluting, open fires, stoves or furnaces to provide heat energy for cooking, comfort and small-scale agricultural and industrial processing, typically in rural areas of developing countries (REN 21, 2013).

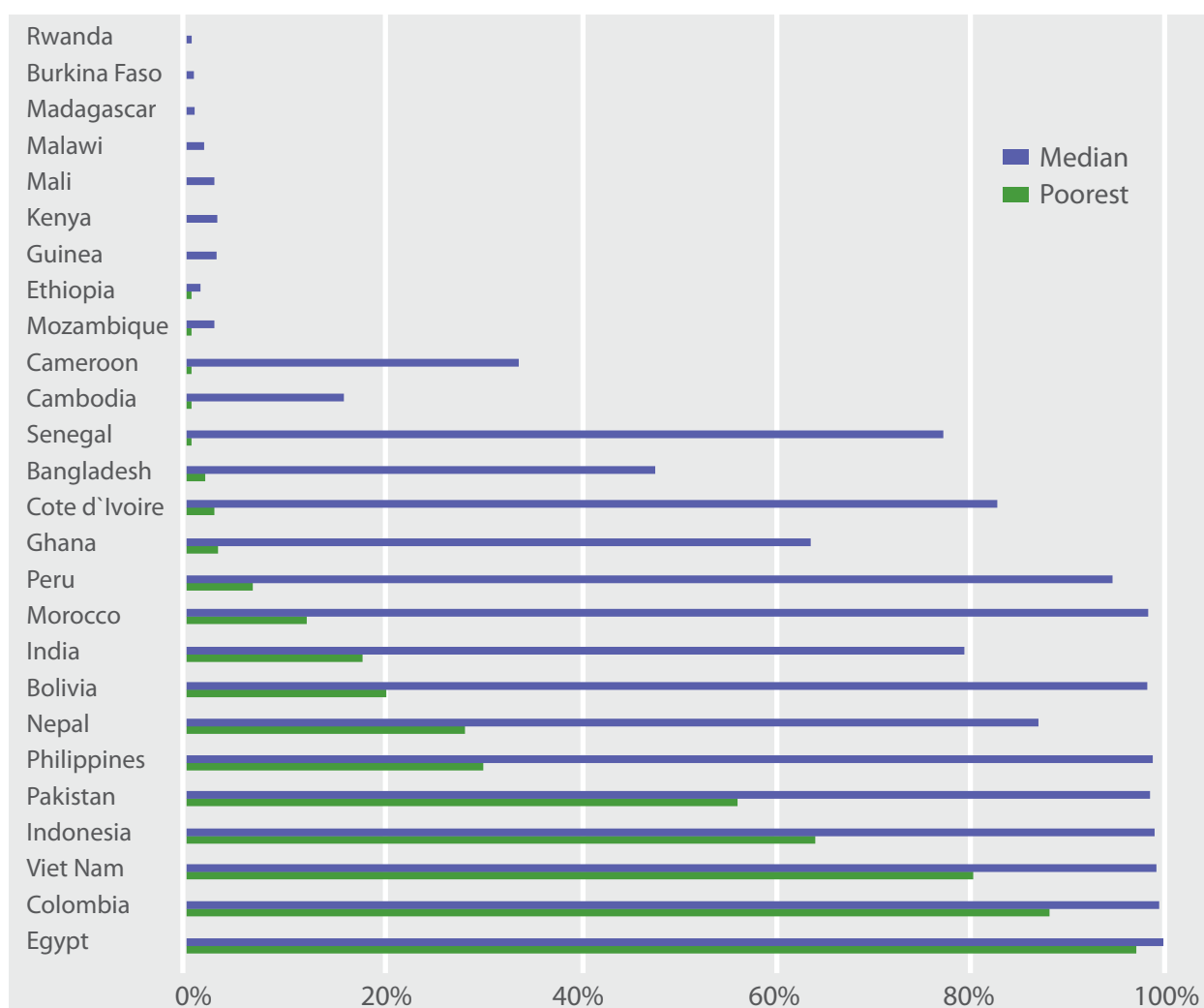


billion without access to electricity are poor (SE4ALL, 2013; IED, 2007). A billion people, most of them poor, are served by health facilities without electricity and more than 50 percent of children in developing countries go to primary schools that are not electrified (Practical Action, 2013). In developing countries and more in rural areas, women play a significant role in energy systems with their subsistence and productive tasks, including fetching fuel, fodder and water for homes and engaging in micro-enterprises. With climate change and concomitant natural resource degradation, the burden of depleting energy sources falls disproportionately on

women and girls. Implications are far-ranging, starting from the inordinate amount of time and effort spent in fuel collection and resultant missed opportunities for employment, education and self-improvement, to indoor air pollution caused by smoke from burning biomass as a cooking fuel and to unhealthy work places.

Lack of access to modern energy sources is a result and a cause of poverty. The poor are less likely to have access to electricity and clean cooking fuels: mostly, they are geographically dispersed, far from urban areas, and cannot be easily connected to existing electricity grids or

**FIGURE 2: HOUSEHOLD ACCESS TO ELECTRICITY FOR THE MEDIAN AND POOREST WEALTH QUINTILES**



distribution networks for modern fuels like LPG. The access issue is compounded by the fact that rural populations, typically based on agriculture, have limited disposable income to finance the initial costs of grid connection, wiring and the monthly payments of energy bills. The result is that resource-constrained utilities find the costs of extending grids prohibitive and investments unattractive and risky. The lack of access to energy services (that can potentially fuel growth), in turn, makes it difficult for the poor to pull themselves out of poverty, thereby perpetuating the cycle. Without access to the services that modern energy enables, poor people remain trapped in low-productivity subsistence tasks. This inability to improve livelihoods and living standards results in poor people remaining unable to afford improved energy technologies and other critical assets and inputs that could enhance their incomes and welfare. Data from 21 countries showed that lack of access to modern energy is most acute for the poorest households. Figure 1 shows that, for all countries, households in the median wealth quintile have far better access to electricity than those in the poorest quintile (Pachauri et al., 2013a).

## ACHIEVING ENERGY ACCESS AND POVERTY REDUCTION GOALS: SYNERGIES AND TRADE-OFFS BETWEEN DIFFERENT POLICY PRIORITIES AND DESIGN CHOICES

One of the world's main priorities is to reduce poverty along a number of dimensions as enshrined in the Millennium Development Goals.

Over the last two decades, some of the most populous countries have made great strides in poverty reduction: the percentage of population living on US\$1.25 a day declined from 17.2 percent to 6.1 percent in **Brazil**; from 60.2 percent to 13.1 percent in **China**; and from 49.4 percent to 32.7 percent in **India**. Between 1990 and 2008, the number of people whom **China** lifted out of poverty is remarkable: 510 million (UNDP, 2013). In spite of this, 1.14 billion people in continue to live on less than US\$1.25 a day globally.

Since energy poverty is correlated strongly with income poverty and is most acute for the poorest households in rural areas, addressing energy poverty can be viewed as a strategy to address poverty in its multiple dimensions. Access to electricity (along with appliances to use it), improved cooking technologies and mechanical power can help people to escape from persistent poverty (Pachauri et al., 2013a; UNDP, 2012) and allows income opportunities through new jobs and enterprises, improving existing jobs and livelihoods, enabling improved health and education services and improving opportunities and quality of life, particularly for women.

Synergies include green economy policy actions and are achieved when the effect on the energy and poverty reduction goals point to the same direction. Nevertheless, this often involves trade-offs. For example, energy poverty reduction strategies such as subsidized distribution of fossil fuels to the poor will contribute to greater emissions by expanding use of such fuels.

### BOX 3. OFF-GRID POWER FOR SUB-SAHARAN AFRICA

The World Bank, in 2006, undertook a Technical and Economic Assessment of Off-Grid, Mini-Grid and Grid Electrification Technologies, costing a variety of conventional and renewable energy-based power generation technologies (World Bank, 2006, quoted in Centre for Global Development, 2009). It concluded that renewable energy is more economical than conventional energy for off-grid generation of less than 5 kW – exactly the sort of power currently needed by most people who do not have access to modern energy. Renewable energy is also potentially the cheapest source of power for mini-grid generation. Conventional power generation still holds the advantage for large-scale needs, but, for much of sub-Saharan Africa, off-grid and mini-grid generation is necessary to meet the needs of a sparsely distributed population and to enable businesses to widen their geographic spread, especially smaller businesses that.

## SYNERGIZING CLEAN ENERGY ACCESS WITH POVERTY REDUCTION

This section examines how expanding energy access contributes to poverty reduction and to climate change mitigation, two critical elements of green economy approaches.

Renewable energy technologies and supportive energy policies promise to improve living standards and health in low-income areas, particularly in off-grid situations. Cost-effective solutions include clean biomass and off-grid solar photovoltaics, with low operating costs and flexible, small-scale deployment options, which can contribute to a transition towards more inclusive, greener economies. These are a carbon-free energy source in their operation and therefore a climate-friendly solution. These technologies can: leverage local resources; usually be sited close to load centres, reducing the need for costly grid extension; and help governments decrease dependency on fossil fuel imports, thereby reducing national debt and improving trade balances. In most currently unserved locations, off-grid options are increasingly

recognized as a low-cost, clean and sustainable option (see Box 3).

The full poverty reduction potential of energy access depends on the availability of three types of energy: energy for cooking; electricity for lighting and to power household and commercial appliances; and mechanical energy to power equipment for agriculture and other productive activities (e.g., irrigation) and to transport goods and people. In expanding energy access, policy choices may mean trading off between those policies that expand energy access that improves living conditions (e.g., energy for lighting) and those that enable productive activities (e.g., energy for water pumping and irrigation). While the first make a direct and more immediate contribution to better living standards and offers social dividends, the second enable sustained poverty reduction and economic development. The following paragraphs describe how energy access strategies synergize with various aspects of poverty reduction and inclusive green economy approaches.

## ENERGY ACCESS, EMPLOYMENT AND POVERTY REDUCTION

Studies have shown that renewable energy technologies are currently more labour-intensive than fossil fuel technologies, with solar PV technology accounting for the highest number of job-years per GWh over the lifetime of the facility (IRENA, 2011). By technology, the largest number of jobs, about 1.38 million, is currently in the biofuels value chain – mostly in cultivating and harvesting feedstock, with Brazil's sugarcane-based ethanol industry being the largest biofuels employer. Large-scale renewable energy electricity and biofuels for transport industries provide a variety of jobs related to the manufacture, installation and maintenance of power-generating units. REN 21 (2013) placed employment from renewables at over 5.7 million, including direct and indirect employment (REN 21, 2013), from 2009 to 2012. Most jobs are currently in a small number of major economies, i.e., those of **China, Brazil, Germany, India** and the **United States**, countries that have long-term policy support for renewable energy and significant national markets for the technologies.

Most future projections estimate gross employment (direct and indirect jobs) effects of up to 20 million jobs by 2030. The sector as a whole has witnessed consistent growth: the global demand for renewable energy continued to rise during 2011 and 2012, supplying an estimated 19 percent of global final energy consumption in 2011 and the total renewable power capacity worldwide exceeded 1,470 GW in 2012, up about 8.5 percent from 2011 (REN 21, 2013). At least 138 countries had renewable energy targets by the end of 2012. As of early 2013, renewable energy support policies were identified

in 127 countries, more than two thirds of which were developing countries or emerging economies (REN 21, 2013). In view of these supporting policies, the growth rates are projected to continue, which points to a likely growth in potential for employment as well. There is, however, no estimate of how many of these jobs are likely to go to the poorest.

In general, jobs in installing, operating and maintaining renewable energy systems in off-grid sectors and small cooking solutions tend to be more local and hence more likely to directly benefit the poor (UNEP, 2008). Selling, installing and maintaining small solar home systems in rural **Bangladesh** provide livelihoods directly for as many as 70,000 people and 80,000 indirectly. An estimate from the Renewable Energy for Rural Economic Development (RERED) project in Sri Lanka<sup>18</sup> shows that the project generates employment in the construction, operation and maintenance of mini-hydro projects. Each project

**TABLE 1. ESTIMATED DIRECT AND INDIRECT JOBS IN RENEWABLE ENERGY, BY INDUSTRY (IN 000S)**

TECHNOLOGIES	GLOBAL
Biomass <sup>a</sup>	753
Biofuels	1,379
Biogas	266
Geothermal <sup>a</sup>	180
Hydropower (small) <sup>b</sup>	109
Solar PV	1,360
CSP	53
Solar heating/cooling	892
Wind power	753
<b>Total<sup>c</sup></b>	<b>5,745</b>

18. The Energy Services Delivery Project (ESD, 1997-2002) and Renewable Energy for Rural Economic Development (RERED, 2002-2011) were implemented in Sri Lanka to expand energy access through off-grid and grid-connected RE solutions by making commercially viable delivery channels and microfinance available.

generally employs eight to 11 local people during construction, providing 3,600 to 4,950 person-days of local employment. Each project also employs three to four people for maintenance, generating another 90 to 120 person-days of employment per month. In addition, the 106,116 solar home systems installed under RERED created about 477,000 person-days (19,300 person-months) of employment (UNDP, 2012). Grameen Shakti in **Bangladesh**, which operates a small loans scheme that enables poor households to buy a solar system though training local youth and women as certified solar technicians, aims to create 100,000 jobs in the renewable energy and related businesses.<sup>19</sup>

Energy-based projects are known to foster the creation of thousands of rural enterprises that supply electricity and ensure the maintenance of equipment. For example, in **Cambodia**, 600 to 1,000 rural SMEs supply electricity to some 60,000 households (UNCTAD, 2009). Other examples of how decentralized energy systems can create jobs and incomes for the poorest are the multifunctional platforms promoted in various African countries and Barefoot College. In **Burkina Faso**, UNDP worked with the government to implement the National Multifunctional Platform Programme in the fight against poverty.<sup>20</sup> The multifunctional platform consists of a diesel engine and various associated tools: grinding mills, huskers, alternators, battery chargers, pumps, welding stations and carpentry equipment. It can also be used to distribute water and electricity. This simple machine assists women with long and laborious chores and allows them time to generate new income streams. The multifunctional platforms are installed and maintained by independent artisans. Results range from women saving time and engaging in self-

improvement (the installation of platforms was followed by a 10 percent increase in literacy rates in 14 villages), increased agricultural production and employment for millers, welders, repairpersons, etc. To date, 431 platforms have been installed in eight regions in **Burkina Faso** and 600,000 people, among them 24,000 women, benefit directly from the platforms. Barefoot College, started by the Social Work and Research Centre in **India**, regularly trains 180 mostly illiterate women from **India** and other developing countries in solar electrification. The model has proved that illiterate and semi-literate men and women can fabricate, install, use, repair and maintain sophisticated solar units through basic knowledge-sharing and hands-on practical training.<sup>21</sup>

## ENERGY SECURITY AND REDUCING DEPENDENCE ON FOSSIL FUELS

Increasing energy supply from renewable sources reduces the risks from rising and volatile prices for fossil fuels, diversifies the energy mix and produces macroeconomic savings. Most developing countries are net oil importers and face a constant threat of rising and volatile prices for fossil fuels. UNEP (2011) reported that oil accounted for 10 percent to 15 percent of total imports for oil-importing African countries and absorbs over 30 percent of their export revenue on average, with countries like Kenya and **Senegal** directing more than half of their export earnings to energy imports (UNEP, 2011). Investing in renewable sources that are available locally could enhance energy security.

Dependency on fossil fuels, particularly oil, invites macroeconomic shocks that translate into vulnerability, especially for the poor. A 2007

19. <http://www.greeneconomycoalition.org/glimpses/grameen-shakti-bangladesh>

20. <http://www.undp.org/content/undp/en/home/presscenter/articles/2010/04/21/la-plateforme-multi-fonctionnelle-allge-les-fardeaux-de-la-femme/>

21. <http://www.barefootcollege.org/solutions/solar-solutions/>

UNDP study showed that households in Asia were spending 74 percent more on their energy needs in 2005 than in 2002. They paid 171 percent more for cooking fuels, 55 percent more for lighting fuels, 67 percent more for electricity, 33 percent more for petroleum-based agricultural inputs and 120 percent more for transportation (UNDP, 2007). Higher oil prices increase input costs for primary sectors like agriculture (where there is a need for materials such as oil-based fertilizers and fuel for equipment), thereby increasing the overall cost of living. Renewable energy, by displacing the use of oil, kerosene and diesel, can attenuate these trends.

### **CLEANER ENERGY OPTIONS FOR COOKING, HEATING AND LIGHTING: HEALTH, EDUCATION AND WELL-BEING**

Compared to traditional fossil fuel-based options, clean energy offers a number of quality-of-life outcomes for users. Most of households, especially in rural areas in developing countries use traditional stoves range from three-stone open fires to brick and mortar models and ones with

chimneys. For the 2.8 billion people who rely on biomass energy, collecting biomass for cooking is a frequent, arduous task. The burden of this falls disproportionately on women and the implications are many and well documented (Ezatti et al., 2002; Smith et al., 2002 and 2004; WHO, 2006, 2009 and 2011; ADB, 2007; GACC, 2011). Women and girls spend a huge amount of time and effort collecting traditional fuels, a physically draining task that can take from two to 20 or more hours per week (UNDP, undated). Biomass fuel collection often entails walking long distances carrying heavy headloads and safety hazards. Household air pollution caused by burning of biomass in inefficient cook stoves with poor ventilation contributes to respiratory illness and a range of other diseases, including cataracts and possibly cancer (Ezzati, Saleh and Kammen, 2000; Bruce, Perez-Padilla and Albalak, 2002; Smith, 2000; Smith et al., 2000a; Parikh et al., 2001; WHO, 2006; Kammen, Bailis and Herzog, 2002, in World Bank, 2011). Currently, smoke from cooking fuels is estimated to account for nearly two million deaths, more than 99 percent of which occur in developing countries (WHO and UNDP, 2009).

### **BOX 3. OFF-GRID POWER FOR SUB-SAHARAN AFRICA**

The multiple benefits of access to modern energy at the individual and household levels include (Pachauri, 2013a):

- Reduced drudgery of daily chores, particularly for women, including collecting water, gathering firewood and preparing food. In Bhutan, women spend 28 minutes per day less collecting fuel wood and men 21 minutes less, as a result of having electricity (ADB, 2010).
- Improved health by reducing exposure to harmful pollutants emitted as by-products of traditional cooking practices.
- Increased opportunities for employment to establish new enterprises and to improve productivity of existing ones. In **South Africa**, within five years, electrification increased female employment outside the household (Dinkelman, 2011). Rural electrification in **Bangladesh** increased household income by 12 percent through improving farm and non-farm income (Khandker et al., 2009).
- Improved education. Electrification in rural **India** increased school enrolment by 6 percent for boys and 7.4 percent for girls and extended weekly study time by more than an hour (Khandker et al., 2012).

Cleaner fuels and efficient stoves can significantly ameliorate this situation. Currently, there are about 828 million people using improved stoves in developing countries out of a total solid fuel population of three billion people (which includes coal and charcoal). This would amount to roughly 166 million households using these relatively inexpensive improved stoves with 116 million in **China**, over 13 million in the rest of East Asia, 20 million in South Asia, seven million in sub-Saharan Africa and over 8 million in Latin America and the Caribbean (World Bank, 2011). Global estimates suggest that between 0.6 and 1.8 million premature deaths could be averted in 2030, if universal access to clean-combusting cooking is achieved by then (Riahi et al., 2012; Pachauri et al., 2013a).

Specific analysis for **Nepal, Kenya** and **Sudan** shows that successful interventions, including a shift to LPG and to cleaner burning and efficient stoves, can offer internal rates of return ranging from 20 percent to 400 percent (Malla et al., 2011, cited in Pachauri et al., 2013a). Another study estimates that, for a typical South Asian household, the benefits of switching exclusively to improved cookstoves or from biomass to LPG amounts to about US\$30 (Rs. 1,429) per year (World Bank, 2011).

A study led by WHO (WHO, 2006) estimated the costs and benefits of selected household energy and health interventions for 11 developing countries from 2005 to 2015, based on two main intervention approaches (reducing exposure through changing from solid fuels to cleaner fuels and reducing exposure through a cleaner-burning and more efficient improved stove) and three specific interventions (LPG, biofuels (ethanol) and a chimneyless ‘rocket’ stove<sup>22</sup>). It compared the

economic costs of investing in new cookstoves – including the expense of fuel, programme costs and capital costs for technology – to their corresponding benefits, such as reduced health care expenses, productivity gains, time savings and improvement of the environment, and found that, if these countries switched to 50 percent coverage of ICS, the results would be:

- Reduction in acute lower respiratory infections, chronic obstructive pulmonary diseases and lung cancer
- More illness-free days and deaths avoided
- Time savings from reduced needs to survey fuel areas and collect fuel, as well as quicker cooking times
- Avoided deforestation
- Avoided carbon dioxide and methane emissions

The study concluded that the benefit-to-cost ratio of investing in improved cooking devices was extremely high, with an investment of US\$650 million producing US\$105 billion in benefits per year.

The other major energy use in rural areas is for lighting. Lighting energy needs in poor households are met mainly by paraffin wax candles, kerosene lamps and electricity. Lighting through kerosene lamps provides a poor quality of light. A kerosene wick lamp or a candle provides just 11 lumens compared with 1,300 lumens of light from a 100-watt incandescent light bulb and 900 lumens of light provided by a 60-watt bulb (Practical Action, 2010). As a result, those without access to electricity must endure light levels that are insufficient for safe work, study or recreation. Kerosene fumes are harmful and cause discomfort and eye, nose, throat and lung infections, respiratory problems;

22. A rocket stove is an innovative clean and efficient cooking stove using small diameter wood fuel that is burned in a simple high-temperature combustion chamber containing an insulated vertical chimney that ensures complete combustion before the flames reach the cooking surface.



they are also the cause of accidental fires, especially when children are around. It does not help that such substandard lighting is also expensive: rural households spend as much as one fourth of their household budgets on fuel for illumination (Adkins et al., 2010). In Africa, 110 million households – at the lowest income level – spend more than US\$4 billion a year on kerosene-based lighting, which is costly, inefficient and a safety and health hazard (IFC World Bank, 2010, cited in UNEP, 2011). As against this, renewable energy lighting options include biogas plants, SPV panels, wind energy systems and micro hydro power can provide lighting without connecting with the centralized, fossil fuel-based grid electricity, resulting in reduced consumption of kerosene and batteries and improved local air quality. So far, approximately 48 million domestic biogas plants have been installed since 2011 for rural electrification, the vast majority of these in **China** (42.8 million) and **India** (4.4 million) and smaller numbers in **Cambodia** and Myanmar (REN 21, 2013).

### CLIMATE CHANGE MITIGATION

As mentioned before, with the world economy set to grow fourfold by 2050, energy-related carbon dioxide (CO<sub>2</sub>) emissions will more than double. Coursing down the same path will mean that emissions will continue to increase and, by 2035, emissions would grow to 35 gigatonnes and be 53 percent higher than in 2010. The bulk of this will come from the emerging economies.

Investing in climate-friendly, renewable energy technologies offers synergies with national, regional and global climate change mitigation policies and contributes towards decoupling economic growth from CO<sub>2</sub> emissions. RET deployment is a concrete mitigation action, since it avoids additional

emissions from fossil fuel energy generation. They are also an adaptation measure, since access to this form of energy is likely to enhance the economic and social resilience of rural communities, whose livelihoods could be affected by climate change.

Taking the cooking energy sector specifically, open fires and primitive stoves, the most widely used cooking devices in developing countries, are inefficient at converting energy into heat for cooking; the amount of biomass cooking fuel required each year can reach up to two tonnes per family. Further, where demand for local biomass outstrips the natural re-growth of resources, depletion of forest resources and local environmental problems result. There is evidence that biomass fuels burned in traditional ways contribute to a build-up of greenhouse gases (Bailis, Ezzati and Kammen, 2007; Venkataraman et al., 2010; World Bank, 2011), as well as other climate forcers, including black carbon, in the atmosphere. In developing countries, about 730 million tonnes of biomass are burned every year (WHO, 2006), amounting to more than one billion tonnes of carbon dioxide emitted into the atmosphere. It is estimated that the new generation of advanced biomass cookstoves would reduce emissions by about 25 percent to 50 percent. While some of this reduction might not be counted toward CO<sub>2</sub> reduction because it derives from sustainable biomass, a substantial fraction could come from the biomass resources contributing to resource depletion. These figures do not even count household heating (World Bank, 2011).

## TRADE-OFFS BETWEEN EXPANSION OF CLEAN ENERGY FOR ACCESS AND POVERTY REDUCTION

While energy access strategies are seen to contribute towards incomes and livelihoods, these linkages are not realized automatically and always, which can require a trade-off between the two policy action areas. First, complementary interventions, in sectors other than energy, are essential for access to modern energy to contribute to poverty reduction. At the most basic level, access to energy needs to be coupled with the availability of infrastructure to use it. For instance, the impact of electricity that is used by a pre-existing irrigation system is likely to be far greater than electricity supplies where the irrigation system has still to be built. Similarly, access to modern energy is known to improve community services such as health care and street lighting. However, in some countries, fewer than one half of all health facilities have access to electricity and access levels are lower in rural areas (Practical Action, 2013). In sub-Saharan Africa, just 35 percent of primary schools have electricity access, compared with 48 percent in South Asia and 93 percent in Latin America (Pachauri et al., 2013a). Even for households that have a connection or physical access to a source of modern energy, irregular, unreliable, interrupted and at times adulterated supplies have a negative impact on their welfare and productivity, a disadvantage pronounced more for marginal and vulnerable groups. The Energy Plus approach of the UNDP emphasizes that energy access activities need to be mainstreamed within wider developmental efforts to maximize their ability to help the poorest (UNDP, 2012). This means that energy access strategies will contribute to poverty reduction only when coupled or preceded by a host of infrastructure development activities. Studies have shown that bundling services together helps reduce the high transaction costs

from servicing a myriad of dispersed end-users and enhances the welfare and developmental impacts of projects. A study focusing on middle-income economies noted that the addition of a fourth service provides a marginal benefit about seven times greater than the addition of a second service (Reiche, Covarrubias and Martinot, 2000, in UNCTAD, 2009). On the converse, unless it can be ensured that necessary infrastructure is in place, the impact of energy access on poverty reduction will at best be limited. In addition, other complementary inputs and pre-conditions, such as access to markets, access to capital, availability of information and skills training, need to be in place for the poor to benefit from improved energy services. By itself, energy is capable of making only a beginning in rural transformation and poverty reduction (Ramani et al., 2003). Beyond that, other inputs are necessary to bring about more profound changes.

At the community level, a trade-off or constraint involved with clean energy dissemination is the low purchasing power of the poor, which affects penetration of clean energy technologies/fuels and in turn limits the potential livelihood transformation that can result from renewable energy (vicious cycle of energy poverty). The issue is compounded by the fact that the credit markets are insufficient to offer capital to the poor to make low-carbon energy choices. A classic example is the advanced biomass manufactured cookstoves, which offer higher efficiency, safety, lower emissions and durability. However, these cookstoves are generally several times more expensive than locally made improved stoves, which are inexpensive at less than US\$10 each and sometimes even less than US\$5. These artisan-made stoves provide relatively good performance when new, but performance degrades quickly with use. Because switching to less-polluting cookstoves and fuels may result in lowering

fuel collection time rather than reducing cash expenditures, markets for such products are slow to develop. People's affordability and willingness to pay for modern fuels and technologies depend on whether and how much people currently pay for fuel; in many cases, modern fuels cost significantly more than people are currently paying or can afford. Furthermore, significant initial payments (e.g., for improved cook stoves or biogas digesters) and/or the need to buy in bulk (e.g., LPG) present major obstacles to the poor.

Addressing the challenge of ability to pay for energy services is rooted in the political economy issues of the need for governments to provide some form of financial support for the poorest people. Energy subsidies require considerable financial allocations over long periods. Unfortunately, subsidized programmes are known to create a drain on financial resources, which, combined with high transaction costs, transmission and distribution losses, has contributed to the poor state of utility operations in a number of countries (e.g., extensive use of unmetered water pumps in parts of **India**). This, in turn, has limited the ability of utilities to maintain their systems and to expand into new areas to meet demand. Unfortunately, subsidized fuels have often been poorly targeted or even diverted from their intended recipients, benefiting those who were never intended as targets of the subsidy programme and, again, creating huge losses without necessarily providing attendant welfare gains. Notwithstanding the multiple issues in administering them, some sort of financial support to lower investment costs for the poorest consumers is likely to be essential in coming years. Subsidy reform or removal needs to contain measures to protect or compensate the poorest people for any negative impacts. Alternatives to subsidies, such as cash transfers, can also be considered to enable chronically poor

people to access modern energy services (Pachauri et al., 2013).

Another trade-off is that clean energy options are not necessarily the most preferred ones. Clean energy technology options are likely to gain traction only if they meet users' preferences and needs. There are at least two elements to consider here. First, rural households use different energy services at the same time. This suggests that, even if a household makes a transition to a clean energy technology, other traditional options will continue to be used as well. In **China**, households are seen to use a solar cooker, biogas plant and coal- and residue-burning stoves, all in combination. Even though more than 97 percent of the Chinese villages and 96 percent of the rural population are connected to the electrical grid, a reliance on biomass for cooking and heating continues. In many cases, existing methods meet multiple objectives, so providing a replacement that meets only one of these objectives will prove unacceptable. For example, in the South African rural electrification programme, some communities did not switch to electric cooking stoves even when these were provided for free, as they relied on the coal stoves not just for cooking, but also for heating.

## MEASURING RESULTS: MEASURING ENERGY POVERTY AND ITS SYNERGIES WITH POVERTY REDUCTION

The notion of energy poverty has its roots in multidimensional poverty, a measure of the number and intensity of overlapping human deprivations in health, education and standard of living, a problem afflicting an estimated 1.57 billion people, or more

than 30 percent of the population of the 104 countries studied for the Human Development Report 2013 (UNDP, 2013).

In the last decade or so, there has been considerable discussion about energy poverty and energy access (Pachauri and Spreng, 2003; Pachauri, S. et al., 2004; Pachauri, 2011; Sagar, 2005; Buzar, S., 2007; Kanagawa, Makoto, Nakata and Toshihiko, 2008; Bazilian, M. et al., 2010, 11 and 12; Pereira, M.G. et al., 2010; IEA, 2009, 10 and 11; Nussbaumer et al., 2011, Nussbaumer, 2012; IEA, UNDP and UNIDO, 2010; Pachauri et al., 2013a). According to World Energy Outlook 2011, a household is said to have energy access when it has reliable and affordable access to clean cooking facilities, a first connection to electricity and then an increasing level of electricity consumption over time to reach the regional average. The initial, minimum level of electricity for rural households is assumed to be 250 kilowatt hours (kWh), which could power a floor fan, a mobile telephone and two compact fluorescent lights for five hours per day (IEA, 2011). This definition does not include other categories, such as energy to power businesses, public buildings (e.g., schools and medical centres) and the agricultural sector, all of which are critical to development. Subsequently, the definition proposed by the AGECC took a staggered approach to defining energy access and breaks it down into incremental levels of basic human needs, productive uses and modern society needs. 'Basic human needs' is the level that is used for forecasts of costs for universal energy access. This includes "electricity for lighting, health, education, communication and community services (50-100 kilowatt hours per person per year)" and "modern fuels and technologies for cooking and heating (50-100 kilograms of oil equivalent of modern fuel or improved biomass cook stove)." 'Productive uses' includes "electricity, modern fuels and other energy

services to improve productivity", "agriculture: water pumping for irrigation, fertilizer, mechanized tilling", "commercial: agricultural processing, cottage industry" and "transport: fuel". At the highest level are the 'modern society needs', which include "modern energy services for many more domestic appliances, increased requirements for cooling and heating (space and water) and private transportation, with an electricity usage of around 2,000 kilowatt hours per person per year."

The currently prevalent notions of energy access can be summarized as "a lack of access to adequate, reliable, affordable and quality energy carriers and technologies to meet the basic needs of lighting, cooking, heating, cooling, communications and livelihoods". Access to energy is a question of degree or level of access, rather than an absolute yes/no question (Pachauri et al., 2013a).

Several measures of energy poverty have been proposed. The more common among them can be classified as: physical availability of an energy carrier (for example, the electrification rate and the use of clean-combusting fuels and stoves); minimum amount of physical energy necessary for basic needs such as cooking and lighting; type and amount of energy that is used for those at the poverty line; households that spend more than a certain percent of their expenditure on energy; and the income point below which energy use and or expenditures remain the same, implying that these are the bare minimum energy needs.<sup>23</sup>

In the last few years, a few composite indicators have also been developed that deal with a mix of energy carriers and technologies. These are multitier frameworks based on the attributes of people's energy supply and the services they use based on that supply.

23. <http://www.energyfordevelopment.com/2010/06/energy-poverty.html>

- (a) The Energy Development Index (EDI) developed by the IEA is a macro-level indicator that measures the level of development of a country's energy system, including household-level and 'community-level' indicators, and derives from four indicators: per capita commercial energy consumption, per capita electricity consumption, share of modern fuels in residential energy use and share of population with access to electricity.
- (b) The Poor People's Energy Outlook Report 2010 suggested a multidimensional and multitier framework for defining energy access, which includes household electricity, cooking/heating applications and mechanical power as the three dimensions, each of which is measured on a five-point scale ranging from the lowest level of access to the highest.
- (c) The Multidimensional Energy Poverty Index (MEPI) was developed by the Oxford Poverty and Human Development Initiative and measures the incidence of energy poverty and its intensity. It includes indicators for a range of energy services such as cooking, lighting and communications (Nussbaumer et al., 2011; Nussbaumer, 2012). In contrast to other tools, it focuses on quantifying energy deprivation rather than on energy access. Measuring electricity-related deprivation, for example, it considers access to services that electricity offers, such as entertainment, education and communication, in addition to electrification rate, a supply-side parameter. Indeed, access to electricity or to modern fuels is of limited use if the user cannot pay for the fuel or invest in the appliance to deliver the desired service.
- (d) Most recently, the SE4ALL global tracking framework has adopted a binary tracking of energy access as its starting point, using two

measures: electricity access defined as 1) the availability of an electricity connection at home or the use of electricity as the primary source for lighting and 2) access to modern cooking solutions, defined as relying primarily on non-solid fuels for cooking (SE4ALL, 2013).

## EVIDENCE FROM NATIONAL STRATEGIES FOR SCALING UP CLEAN ENERGY AND ACHIEVING POVERTY REDUCTION GOALS AND A GREEN GROWTH

This section presents examples of three national energy access programmes that demonstrate a transition to a green economy. These cases have expanded energy access for the poor and underprivileged in a manner that contributes to the national poverty reduction agenda.

### THE BRAZILIAN RURAL ELECTRIFICATION PROGRAMME: INCORPORATION OF ENERGY ACCESS INTO POVERTY-ALLEVIATION PROGRAMMES <sup>24,25,26,27</sup>

The Government of **Brazil** has been investing in rural electrification programmes, especially in isolated areas, recognizing that energy access is central to reducing poverty and hunger, improving health, literacy and education and raising the living conditions of women and children. The federal Programme for Energy Development in State and Municipalities began in 1994 to reach isolated regions that do not have grid coverage, mainly through PV systems and locally available renewable sources. Prior to the reform process of the Brazilian electricity sector, the electricity concessionaires were implementing scattered programmes of

24. <http://luzparatodos.mme.gov.br/luzparatodos/asp/default.asp?id=1>

25. [http://energy-access.gnesd.org/index.php?option=com\\_content&view=article&id=104:energy-access-programme-in-brazil-lighting-for-all-&catid=3:projects&Itemid=24](http://energy-access.gnesd.org/index.php?option=com_content&view=article&id=104:energy-access-programme-in-brazil-lighting-for-all-&catid=3:projects&Itemid=24)

26. <http://www.sustainableenergyforall.org/actions-commitments/country-level-actions/item/30-luz-para-todos>

27. Fuchs and Pachauri, undated.

rural electrification in areas with higher population concentrations and better purchasing power. The 1990s saw the creation of a regulation agency that established rules of the market and encouraged investment in the expansion of transmission lines and power plants, including renewable energy sources. It also set standards for low-income consumers, with differentiated tariffs and a timetable for universal care/universal access by 2015.

In 2003, the government programme *Luz para Todos* (Light for All) was launched to universalize all Brazilians' access by 2010. The programme is seen as an integral part of the government poverty-alleviation policy *Bolsa Família*.<sup>28</sup> The estimated investment was US\$12 billion, with no counterpart on the part of the beneficiary. The main objective of Luz para Todos is social inclusion through access to electricity supply. Implemented by the Ministry of Mines and Energy, Luz Para Todos had the ambitious goal of providing universal access to electricity to the 12 million people who lived without it, including 10 million in rural areas. It was expected that, besides accelerating universal access to electric energy, Luz para Todos would generate about 115,000 indirect and direct jobs. It also electrified about 50,000 schools without electricity and installed water pumps in areas vulnerable to drought.

Electrification goals were fixed per concessionaire and per municipality through the indication of the year in which the electricity universalization should be concluded, to be undertaken by the local electric utility that works on Annual Programmes for Service Expansion. For this, the concessionaires make use of heavily subsidized government funding, with 86 percent of funding applied to grants (72 percent federal and 14 percent state and municipal) and 14

percent of funding provided by the concessionaires, and pass some of the costs onto the customers with a net impact of 8 percent of their funding. The concessionaires must provide electricity to every citizen who requests this service, always and whenever the household to be connected has its land tenure regularized or is in the process of regularization.

Since Luz Para Todos was implemented, 15 million Brazilians have gained access to electricity. The percentage of rural households with electricity increased from 71 percent in 2000 to 92.6 percent by 2010. Other reported benefits include: improved school activities at night reported by 40.7 percent of people interviewed; increased job opportunities for 34.2 percent; improved health care services availability for 22.1 percent; and increased family income for 35.6 percent. Asset ownership increased; the number of purchased televisions jumped to 79.3 percent and the number of purchased refrigerators rose to 73.3 percent. The quality of life and living conditions improved for 89.3 percent of those people interviewed following the provision of electric power.

A study conducted between 2000 and 2004 covering 17,102 electrified households and 2,885 un-electrified households revealed that, over the years when electrification took place, poverty dropped significantly (Pereira et al., 2010). The quantum of energy poverty drop in electrified households was much higher than the drop in non-electrified households, indicating that access to electric energy was an important factor in reducing energy poverty, although it was not the only one. There was also a significant drop in the number of persons who did not have the minimum availability

28. *Bolsa Família* is a Brazilian Government social welfare programme that attempts to reduce short-term poverty by direct cash transfers and to fight long-term poverty by increasing human capital among the poor through conditional cash transfers. By February 2011, the programme covered 26 percent of the Brazilian population



of energy to guarantee an adequate livelihood.

Major success factors include:

- Political priority to rural electrification programmes since the 1960s
- Integration of the energy access programme into the government's broader policy of social support for poverty alleviation
- Continued government commitment (through several government changes) supported by public investment and strengthening of programme budgets from 1995 to 2009
- Effective mechanisms for targeting subsidies exclusively to poor families in need, thus ensuring highly efficient public expenditure
- Combining grid power with use of renewable energy sources, especially for securing inclusion of isolated areas. Citizens are assisted in installing solar and biogas power systems in their homes, especially in the thinly spread, small localities deeper in the Amazon, by providing necessary information and equipment.
- Involving citizens in the electrification process. Only local citizens can identify the specific requirements of each location. The construction work is performed by energy distributors and by rural electrification cooperatives. The preponderant role is played by the concessionaires at the local level together with civil society, acting in the implementation of the programme through specific projects.

### REDP NEPAL: A HOLISTIC APPROACH TO DEVELOPMENT

Launched in 1996 as a pilot project, Nepal's Rural Energy Development Programme (REDP) is a joint project of Government of **Nepal**, the United

Nations Development Programme and the World Bank.<sup>29</sup> REDP introduced decentralized renewable energy services to the most remote populations of **Nepal**, which has one of the lowest rates of per capita electricity consumption in the world. Working towards poverty reduction, livelihood promotion and environmental protection, the Programme has been effectively providing reliable, low-cost electricity to rural communities and has decreased indoor air pollution. It operates at the community, district and national levels. It focuses strongly on capacity development, community mobilization and livelihoods enhancement, using community-managed micro hydro systems as an entry point for holistic development of remote rural communities.

As of December 2010, the Programme had installed 307 micro hydro systems, 3,000 solar home systems (SHSs), 6,811 toilet-attached biogas plants and 14,255 improved cookstoves.<sup>30</sup> The Programme has promulgated the government's Rural Energy Policy (2006), which has adopted good practices and lessons learned from REDP. REDP's development benefits include an average increase of US\$121 (8 percent) in annual household incomes due to electricity access; 40 new businesses created per district following the installation of a micro-hydropower system, compared with only 4 established prior to electricity access; reduction of average annual household spending rates on energy to US\$19, compared to US\$41 spent by non-electrified households; and twice as much on education by electrified households than by non-electrified households (UNDP, 2011; Legros, 2011).

A study carried out by Winrock International using pre-project baseline data (collected in 1996) and field data collected from 2,000 households in REDP

29. The Rural Energy Development Programme (REDP) was completed in 2011, after which Renewable Energy for Rural Livelihood (RERL) was being implemented from 1 April 2011, with a primary focus on enhancing rural livelihood. It is a joint project of Government of Nepal, the United Nations Development Programme and the World Bank.

30. [http://www.rerl.org.np/phase3/uploads/progress/file/Progress at a Glance\\_20110108090102.pdf](http://www.rerl.org.np/phase3/uploads/progress/file/Progress%20at%20a%20Glance_20110108090102.pdf)



project areas showed that household incomes in real terms increased by an average of 52 percent in communities over the 10-year period that REDP was active in the region (Winrock International, undated). This is 6 percent higher than the 46 percent growth in household incomes in the country as a whole during this same time period. The number of houses below poverty (less than Rs 50,000 income per year) dropped from 59 percent to 54 percent and the percentage of the very poor households (less than Rs 10,000 income per year) decreased from 15 percent to 12 percent. The number of women involved in some kind of enterprise among the families included in the survey increased from 400 to 700 during this time.

Key success factors that helped synergize the energy access with poverty reduction impacts are:

- A clear recognition of poverty alleviation, livelihood promotion as principal objectives of the programme
- A catalytic role by the national government in supporting decentralized energy services by providing funding, developing the necessary infrastructure for these expansions and enacting several enabling policies to facilitate the process
- Systematic leadership building in the energy sector, focusing on the capacities to develop policies and programmes at the central level; implement and monitor energy programmes at the local government level; and plan, execute and manage their own development among rural communities
- Access to electricity is an 'entry point' for REDP programmes. A host of other initiatives, including training and skills development, income-generating activities, forestry, biogas and poultry farming, are implemented to enhance rural development benefits in remote villages.
- A community-based approach and decentralized institutional framework that strengthens the local governance ensure the long-term sustainability and feasibility of scaling up rural energy services. Enlisting self-governing institutional mechanisms for inclusive participation and empowerment based on a decision-making process that is transparent and builds consensus, REDP successfully mobilized communities, built their capacity and motivated and encouraged male and female community members to participate equally in the development process.

### RURAL ELECTRIFICATION IN GHANA<sup>31</sup>

Starting from a base of 23 percent access rate in 1985, **Ghana** successfully increased its electrification levels to 54 percent in 2005 and 72 percent in 2010. The national electrification drive in **Ghana** started in 1985 with the Northern Electrification and System Reinforcement Project (NESRP), which aimed to connect all communities with a population above 500 in 1989 to the national grid. Alongside, it aimed to promote productive uses of electricity; encourage the development and establishment of local indigenous industries to create employment; increase productivity; and enhance activities in other sectors of the economy such as agriculture, health, education and tourism. The National Electrification Scheme (NES) Policy was instituted in 1989 to extend reliable electricity supplies to all communities over a 30-year period (1990-2020).

Starting with financing from African Development Bank in 1987 (and others later), the NESRP project supplied grid electricity to all regional capitals except the Upper West regional capital. Its success

31. Abavana (undated), Vanderpuye (2010) and Pachauri et al. (2013a).

led to the launch of the National Electrification Scheme (NES) in 1990, which, within a 30-year timeframe, aimed to provide electricity access to about 4,200 settlements with populations of 500 or more. The NES was pursued through various discrete projects. Prominent among these were the Northern Electrification Project and the Self-Help Electrification Project (SHEP) introduced by government to encourage communal participation and the self-help developmental initiatives of communities and to support the main NES.

SHEP was a nationwide scheme that was introduced as a policy framework under which communities could advance their electrification projects ahead of the dates indicated in the NES by meeting agreed criteria for community contributions to the project implementation. SHEP aimed to connect to the national grid ahead of their respective scheduled dates any communities that were within 20 kilometres of an existing 33 kV or 11 kV network that had procured low-voltage poles for the network within the community and that had a certain minimum number of premises wired and ready to receive power.

The government's obligation was to provide the materials and assume responsibility for the construction work required for the connection. This connected 2,350 communities in just 10 years after the launch of the NES plan, reaching 40 percent of all communities with a population exceeding 500 in 2000 and achieving an electrification rate of over 70 percent by 2010. Electrification brought about improvements such as increased use of modern electrical appliances (with a 40 percent rise in asset ownership); a surge in ownership of mobiles phones or access to mobiles phones and fax machines; and

an increase in household income.

Key success factors include:

- Continued commitment of the national government to rural electrification, supported by a long-term goal and backed by resource allocations
- A simultaneous emphasis to improve local economic growth and energy delivery carried out in a multisectoral manner as part of composite services involving health, education, sanitation and other components
- Involvement of the communities in the electrification process

## KEY DRIVERS OF SUCCESS AND POLICY IMPLICATIONS FOR ENERGY ACCESS STRATEGIES

Providing energy for all is a major global challenge in the coming decades. Access to electricity, together with the assets and resources that enable its use in a transformational way, improved cooking technologies and mechanical power can all help people to escape from persistent poverty. Energy access pathways that will help transition towards a green economy will need to include the following elements:<sup>32</sup>

- Expanding electricity coverage and distributing clean-combusting fuels and equipment to populations not yet served. Meeting minimum standards of access to clean sustainable energy can yield significant returns for people's health,

32. Adapted from Pachauri (2013a), Barnett (2010) and Bonn (2011).

household income and the broader economy through higher productivity. Embedding a gender perspective will accelerate achievement of these goals.

- Improving the ability of the poorest people to afford these when they are available, which can be achieved sustainably when energy service delivery is combined with or embedded within other infrastructure development activities.
- Enhancing the reliability (total duration of interruptions during the scheduled hours of supply) and availability (the actual hours of supply received in a given day for a given season) of energy services.
- Improving productivity of resource use by reducing waste, limiting over-use and increasing overall economic productivity through options such as the use of LEDs for lighting.

Experience from countries shows that these can be achieved simultaneously through a set of coherent and coordinated actions at various levels. At the political economy level, this calls for:

- High-level, long-term commitment by government political leadership, including the allocation of sufficient funding to support the delivery of energy services for the unserved
- A legal and regulatory framework that provides a minimum level of energy access for all poor and encourages investment in pro-poor energy access strategies
- Pro-poor green economy targets and indicators to guide policy decisions and achieve results
- Investments and capacity-building support to change the focus of energy sector strategy from minimalism (meeting basic energy needs) to sustainable livelihoods (energy services plus resources required to use them productively)
- Investments in energy services for public services that are critical for well-being and that catalyse

poverty reduction, such as health and education. At the same time, synergies are best realized when policies across sectors and at different levels of governance (for example, national and provincial) can be harmonized.

## DESIGNING ENERGY ACCESS INITIATIVES

**Make energy service delivery a national development priority.** The governments of developing countries must make expanding access to modern energy services a national development priority. This must be supported through the allocation of sufficient funding to support the delivery of energy services from appropriate sources and at affordable rates. In most of northern Africa, the extension of nearly universal access over the last 30 years has been achieved partly because country governments have accorded high priority to universal access (Pachauri et al., 2013b). Other examples include the electrification policies of **Botswana, South Africa, Brazil** and **Fiji**, which, despite several administration changes, continued to accord high priority to rural electrification. Government needs to provide a legal and regulatory framework that encourages investment in pro-poor energy access strategies. This includes reform of tariffs, tariff structures, regulatory structures and subsidy systems (including creative cross-subsidization) as well as capacity-building of key actors at national and local levels.

**Ensure coherence and coordination between energy and other sectoral policies.** There should be a multisectoral approach that builds on the interlinkages among the energy, food security and poverty reduction sectors as well as the influence of trade, investment and climate policies (Bonn, 2011). A successful attempt on a multisectoral approach

was the Senegalese CIMES/RP, a mechanism created by Senegal's Rural Electrification Agency that facilitates access to energy services in rural areas, including by identifying possibilities of supporting or exploiting synergies with other sectors (e.g., water, education, health, telecommunications, gender, agriculture and environment). It established a multisector committee (CIMES/RP) that looked into maximizing the productive and social uses of electricity to increase the benefits of electrification programmes in rural areas. At the national level, the committee is composed of representatives from the key ministries involved in rural areas (energy, industry, economic planning, education, health, agriculture and fisheries) as well as from associations of rural councils, business bureaus, the national utility company, the rural electrification agency (ASER) and several NGOs. CIMES also supports a wide range of stakeholders to heighten their awareness of the linkages between energy and development and assists in the identification of energy components in poverty reduction strategies (UNCTAD, 2009; ESMAP/World Bank, 2008).

**Ensure policy coherence at various levels of governance.** National, subnational and provincial actions must complement and strengthen each other. REDP in **Nepal**, for example, strengthens the capacity of the decentralized governance system in infrastructure service delivery, including energy. In sub-Saharan Africa, countries such as **Rwanda, Kenya, Ethiopia** and **South Africa** are making progress in promoting micro-hydro schemes (MHP) that are suitable for isolated grids that provide electricity to rural villages and feed into public grids. In these countries, decentralized renewable technologies have been mainstreamed into regional and national policy documents. Due to the small-scale character of MHP projects, MHP sector development not only relies on good national-level policies, regulations, capacities and

financing schemes, but also needs to incorporate the local level effectively. A good practice of how to increase governance capacity and coordination between different government institutions is to support the set-up of local energy plans, as has happened in **Madagascar**. By including local governments in the energy infrastructure planning process, awareness, capacities and accountability for successful implementation of energy policies can be strengthened (GTZ and EUEI, 2010).

## IMPLEMENTING ENERGY ACCESS INITIATIVES

### **Change in energy sector strategy from minimalism (meeting basic energy needs) to sustainable livelihoods (Energy Plus).**

Conventional approaches to providing access to modern energy services for people living in poverty focus on providing energy services to meet basic energy needs, which are mainly for domestic consumption (i.e., lighting, cooking and heating). This 'minimalist' approach to energy access, in most cases, will not be enough to enable poor households to escape poverty. For the poor to use energy services to raise their incomes and improve their livelihoods, complementary interventions are necessary. These include investments to build capacities, to improve access to information and markets and to promote business development services and capital. UNDP has called the coordination or co-investment in energy access with other interventions the 'Energy Plus' approach (UNDP, 2012).

**Combine multiple options for expanding access.** Given the scale and nature of the current access gap in electrification, electricity will need to be provided through a combination of centralized and decentralized energy technologies and systems.

The critical question is not which of these solutions should be adopted, but how these solutions should be combined for maximum reach and cost effectiveness. The optimal choice for each country would be driven by the availability of resources, the regulatory and policy environment, the capacity and the relative costs of each of these solutions.

### **Prioritize non-electricity energy services.**

While electricity-producing technologies dominate, the importance on non-electrical RE technologies must not be underestimated in relation to affordable energy services to the poor. As such, electricity is not the most appropriate form of energy for cooking (which accounts for the largest part of energy consumption in developing countries), nor is it the quickest or the most cost-effective way of providing energy services to the poor, except for densely populated urban habitations. The social and health implications of cooking with traditional biomass on inefficient cookstoves in poorly ventilated kitchens are well known. Providing clean modern energy services to poor communities will require the expansion of choice of energy options, including conventional and non-conventional sources.

### **Engage local actors as appropriate.**

Communities need to be involved in planning to ensure that energy services are appropriate, socially acceptable and sustainable. People understand their own resources and social set-up best and can anticipate likely challenges in implementation. Community participation can help reduce costs (Khennas and Barnett, 2000) by contributing labour, encouraging the rich to shoulder the bulk of the costs and enabling economies of scale through encouraging more people to participate in projects in remote locations; community involvement can be critical to ensuring that systems are looked after and used in the long run. Finally,

as seen in REDP and the rural electrification efforts in **Ghana** and **Brazil**, community cooperation on a common platform increases the involvement and accountability of local representatives by assigning them key responsibilities, which ensures a degree of social sustainability. At a more basic level, local involvement is also crucial to ensure that the introduction of products meets people's needs. Early cookstove projects may have adopted good designs from an engineering and design perspective, but have sought little feedback from end-users. This has sometimes resulted in products that were seemingly effective, but could not withstand harsh conditions on the ground (e.g., dust, wind, wood of varying size, etc.) or were incompatible with cooking practices and food preparation by users (Mukhopadhyay et al., 2012).

### **Provide energy services for public services.**

Public services that are critical for poverty reduction, such as health and education, require access to modern energy services. There is a correlation between human development outcomes (e.g., maternal mortality) and access by such facilities to modern energy services (Practical Action, 2013). Investment in these social sectors (e.g., building clinics and schools) can include an energy supply (usually a stand-alone system) when there is no alternative energy supply available, such as the electricity grid.

**Partnerships and roles:** An appropriate institutional framework for expansion requires the respective actors to do what each does best. Governments and development partners serve as facilitators and must support the 'doers', i.e., the implementing organizations and private sector. As facilitators, they should finance 'common goods' that serve a variety of ends, including research and development and product development; promotion and market development; capacity

development; policy dialogue; and advocacy. Energy projects and programmes, along with the private sector, should act as efficient, effective suppliers of energy products and services. The private sector will manufacture, sell and install the products profitably and on a large scale. NGOs and community-based organizations (CBOs) should take the lead in support functions, including promotion, awareness-raising and provision of oversight. Specifically, the following roles are envisaged:

**(a) International organizations and development organizations can play a fundamental role in raising public awareness about global threats and trends, setting the global agenda, establishing and implementing multilateral policies and agreements, supporting national policymaking and the achievement of development plans and monitoring key indicators of development and sustainability. The role of international and development organizations includes:**

- Developing an evidence base for the nexus between sectors (energy and other sectors), including good practice examples, across the nexus and exploring multiagency cooperation involving groups responsible for global assessment reports
- Supporting national policymaking and the achievement of multisectoral development plans and monitoring key indicators of development and sustainability
- Promoting energy sector projects that promote productive uses of energy through targeted measures including business development and marketing support (for example, providing loans to meet investment costs for new enterprises)
- Increasing collaboration between the public sector, business and finance and civil society, including proactive and innovative financing arrangements to achieve water, energy and food

security

**(b) National governments and development partners should:**

- Incorporate explicit energy access commitments into national development strategies on national energy access targets and investments
- Develop sector-wide capacity among programme-implementing agencies, the private sector (including technology suppliers and service providers), financial institutions and civil society organizations
- Ensure that energy access programmes support the overall national development strategy
- Develop the capacities of all key stakeholders

**(c) Local authorities and utilities should:**

- Ensure coordination in planning processes responsible for energy and other sectors
- Prioritize capacity-building to achieve a nexus among energy, water and food security and related areas
- Develop clear national roles and responsibilities and facilitate intersectoral cooperation to achieve more sustainable water, sanitation, health and food security impact and to manage natural disasters

**(d) Civil society (communities, NGOs, media) can:**

- Raise awareness about nexus solutions through local organizations and media campaigns and use of social media
- Encourage communities to be more involved in the planning and management of decentralized options for energy, poverty reduction, food security and water systems
- Undertake cooperative, stakeholder-driven assessments of resource supply and demand to



help inform policymakers and the public

- Oversee transparent and sustainable resource allocation and the fulfilment of the human right to food, water and sanitation

## MEASURING RESULTS

From a green economy perspective, the conventional, binary definitions ('having access' vs. 'not having access': electrification rate and the use of clean-combusting fuels and stoves) and indicators provide a rather incomplete picture of energy access. First, numbers on access to electricity, for example, do not reveal the quality of supplies, which is often poor, especially in rural areas; furthermore, variables such as connection times, supply disruptions, outages, the value of lost output, voltage quality, frequency stability and the need for on-site generation that influence the use of electricity are typically missing from data on energy access (Barnes et al., 2010).

Second, these indicators do not account for the role

that energy plays in operating businesses and micro and small enterprises (MSE), a critical contributor to family incomes in most cases. Adequate, affordable and reliable energy access can improve the productivity and efficiency and thereby growth potential of MSEs (Bensch et al., 2012). The IFC estimates, for instance, that a reliable power supply could increase annual job growth in low-income countries by 4 percent to 5 percent (cited in Pachauri et al., 2013a). The Poor People's Outlook 2012, which focused on energy for productive uses, showed that MSEs such as street-side stalls, small garages and tailors and each MSE has its own specific set of energy needs if it is to survive and thrive. Improved energy services can allow new or improved products and services to reach customers and improve efficiency and returns for the enterprise. Reliability, quality and cost of energy supplies are critical success factors to enterprises – but only when coupled with access to markets, social networks and a business proposition that has sufficient demand (Practical Action, 2012). By not including an indicator on how energy is used for livelihoods and enterprises and thus how energy impacts poverty reduction, these definitions omit an important aspect of 'energy access'.

### BOX 5. ENERGY SERVICES: BIGGEST CONSTRAINT FOR PRIVATE SECTOR IN AFRICA

A 2009 analysis of the World Bank's database of enterprise surveys conducted between 2001 and 2008 with over 5,000 businesses in Africa showed that the lack of infrastructure, particularly of a reliable source of power, is a huge constraint on private sector activity. More than half of all private sector firms rank infrastructure as their worst constraint. Firms that are able to compensate for lack of electricity by using generators are able to survive better than firms that do not have a generator (Centre for Global Development, 2009).



By not including an indicator on how energy is used for livelihoods and enterprises and thus how energy impacts poverty reduction, these definitions omit an important aspect of ‘energy access’.

Perhaps the most serious limitation from a green economy perspective is that they fail to reflect the extent to which energy production and consumption activities may be drawing down natural capital and the effects of those activities on employment, resource intensity, emissions and the environment. Energy poverty needs to be viewed as a diverse set of symptoms rather than as a singularly defined issue.

Holistically measuring energy poverty would need to incorporate, along with a measure of the scarcity of energy service itself, two critical elements; 1) the implications of the energy scarcity on other sectors, such as agriculture, industry, water supply, health services and education for the poor; and 2) how and to what extent current energy use pattern draws down on natural capital and the environment. A suggested way forward would combine the following elements:

- A definition of pro-poor green economy targets and indicators to guide policy decisions
- In lieu of having a measurable set of indicators and supporting data to enable the measurement of progress and analyse policy trade-offs and synergies, some measureable indicators drawn from the commonalities in national strategies between good practice examples. Energy sector strategies most synergistic with poverty reduction goals, for example, need to reflect:
  - o Alignment with strategic development objectives and clear articulation of poverty reduction and underprivileged sections, such as women and disadvantaged groups, in energy sector goals
  - o Recognition of energy access in national development strategic documents such as PRSPs
  - o Clear targets for major green indicators, including green jobs; energy intensity; energy efficiency; level of CO2 emissions; afforestation; share of eco-agricultural products; recycling; green exports; and green partnerships
  - o Quantitative targets for green economy outcomes related to energy access, including population to be covered by renewable energy; share of renewables in national energy mix; direct and indirect employment potential from renewables; level of waste, recycling, reuse and recovery; biofuels, etc.
  - o Current strategies for engaging local actors and for strengthening local governance systems
- Establishment of procedures as part of the planning system to analyse and disseminate the interconnectivity among policies in the energy sector, environment, climate change, poverty reduction and trade. Determining what policy considerations need to be integrated and what can be handled within sectors will be important for efficient realization of a more coherent approach.

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# 7. DRAWING POLICY LESSONS IN INTEGRATING POVERTY REDUCTION AND GREEN ECONOMY IN WASTE MANAGEMENT

**By: Martin Medina, Independent Consultant**

## BACKGROUND AND RATIONALE

Sustainable waste management is an important component in a green growth strategy. As developing countries urbanize and their economies continue to grow, lifestyles and consumption patterns tend to change. Urban, increasingly middle-class populations in many developing countries are generating more and more wastes. Manufacturing and services generate growing amounts of wastes as well. Between 2000 and 2050, the world population is projected to grow by 50 percent, global economic activity by 500 percent and global energy and materials use by 300 percent. This will put additional pressure on the earth's resources and environment, already under significant stress.

During the 1992 Earth Summit, world leaders declared that "a principal cause of the continued deterioration of the global environment is the steady increase in materials production, consumption and disposal." Rio+20 affirmed that green economy policies in the context of sustainable development and poverty eradication should promote sustained and inclusive economic growth and sustainable consumption and production patterns (UN, 2012). Economic systems in developed and developing countries need to transition from a largely linear

model of consumption and production to a more sustainable one (see Figures 1 and 2). Not surprisingly, the richer the person/country, the more waste that tends to be generated, reflecting a higher level of consumption. The average US resident generates 3.5 kg/person/day, while the residents of some African cities generate less than 200 gr/person/day (The World Bank, 2012). Thus, a positive correlation exists between per capita income and waste generation (see Table 1 and Figure 3). **China** is today the world's largest generator of solid wastes, having surpassed the United States a few years ago (see Figure 4). This reflects not only the higher levels of domestic consumption, but also the economic activities to produce items that are exported to the rest of the world. The industrialization that spearheaded the economic development in **China** manufactured products for export in order to take advantage of the country's lower production costs. Waste management costs in the developing world are also lower than in the developed world. Many cities in the developing world are still struggling to provide waste collection and disposal to their populations (see Table 2). Uncollected and improperly disposed wastes create several problems, such as air, water and land pollution and risks to human health and the environment. A more environmentally sustainable waste management in the developing world is urgently needed. Waste management, recycling and composting are seen as vital not only



for community health, environmental sustainability and quality of life around the world, but, more importantly, also for the poor communities in the developing world.

The transition from a linear model to a more sustainable one requires appropriate policies,

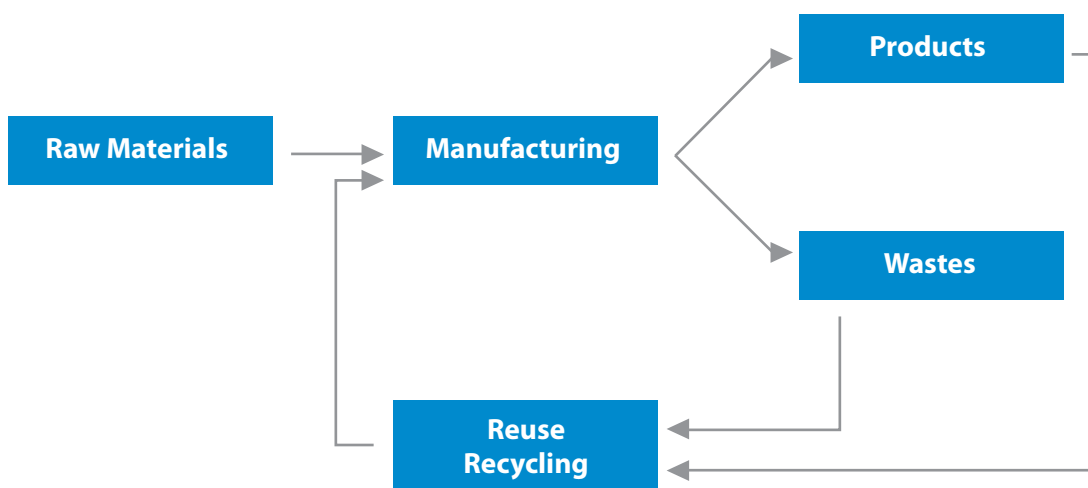
regulations, demand from (and awareness of) consumers, a culture of CSR, competitive industry (especially competition from globalization), the media, civil society and activists, litigation etc., all of which may encourage firms to move to a circular economy.

**FIGURE 1: LINEAR MODEL OF CONSUMPTION AND PRODUCTION**



Source: Medina, M. (2007)

**FIGURE 2: SUSTAINABLE MODEL OF PRODUCTION AND CONSUMPTION**



Source: Medina, M. (2007)

Policymakers in the developing world often want to transform their waste management systems into ones that resemble those prevalent in the developed world. Thus, they often acquire the equipment and technology commonly used in the latter. But the developing world requires different solutions. The physical characteristics of the cities, the resources available and even the waste generated differ markedly from those in rich countries. Waste management technology commonly used in Europe, the US and Japan is often inappropriate to the conditions prevalent in the developing world. Equipment often fails and requires costly, imported spare parts and expertise is sometimes unavailable locally. Further, poverty in the developing world is widespread. Using more sophisticated technology will not result in a more sustainable waste management and could even increase poverty. Poverty must also be considered. The poor often endure sporadic or non-existent waste collection and inappropriate final disposal. But the poor can be – and in some cities already are – part of the solution. A crucial component in improving waste management systems in developing countries should integrate the existence of a large informal waste sector and its linkages to poverty. According to World Bank estimates (2006), the informal waste sector (IWS) provides a livelihood to about 1 percent of the urban population in the developing world. Thus, about 15 million people worldwide survive by working with waste. Many IWS workers are low-income, vulnerable individuals, such as children, women, the elderly, the disabled, the unemployed and migrants. Traditionally, IWS workers have been considered a problem and most often have been repressed and their activities declared illegal. Over the past two decades or so, a re-thinking of the IWS in the developing world has been taking place: more and more, it is recognized that the IWS, instead of being a problem, can be part of the solution

and of a strategy to achieve sustainable waste management. It is increasingly evident that, with the proper supportive policies in place, the IWS can make significant contributions to a country's green growth and reduce poverty. The Appendix presents recent evidence of this in several countries. In **Brazil**, for instance, the working and living conditions of the country's scavengers have improved, poverty and child labour have been reduced and its industry has become more competitive by recycling wastes rather than by using virgin raw materials.

## MAJOR TRENDS IN WASTE MANAGEMENT

The following constitute the major trends that have an impact in waste management decisions:

Stabilization of resource use and waste generation in developed countries – The waste generation rates (measured in kg/capita/day or in lb/capita/day) in the developed world show a trend towards stabilization or slow growth. Figure 3 shows that the consumption levels and the amount of resulting wastes are higher in developed countries than in developing ones. This reflects the maturity in their economic systems as well as their slow or declining population growth.

Decoupling efforts – Developed countries are improving resource efficiency, dematerialization, prevent waste and maximize reuse/recycling ('upstream issues') so that economic growth does not translate into a commensurate rise in waste generated.

Rapid increase of resource use and waste generation in developing countries – Waste generation rates and total waste generation are increasing fast in the developing world due to economic growth and urbanization. Growth in waste generation will be the fastest in Africa and Asia (see Figure 4).

Developing countries still struggling with conventional waste management – Many cities in the developing world, particularly in South Asia and sub-Saharan Africa, do not collect all wastes generated and only a fraction receive proper final disposal (see Table 3). Thus, many developing countries focus more on ‘downstream issues’ to improve collection, transportation, recycling, processing and landfilling.

Waste generated in developing countries is changing – More waste tends to be produced as consumption and production increase. Industrialization tends to increase the generation of hazardous and non-hazardous industrial wastes. Waste composition is also changing: it is slowly becoming less organic. Even so, the waste generated in developing countries is likely to continue to be highly organic in the next few decades (see Table 4).

### **WASTE MANAGEMENT AND ENVIRONMENTAL SUSTAINABILITY**

Waste management has a direct impact on the environment:

- The extraction of materials and their processing for human consumption requires large amounts of water and energy and the process can contribute to habitat destruction, degrading ecosystems.
- Uncollected and improperly disposed waste pollutes the air, land, and water.
- Uncollected and improperly disposed waste can cause floods in urban areas by blocking drains and canals and can become breeding grounds for communicable diseases.
- The decomposition of organic waste in dumps/landfills generates methane, a potent GHG, thus contributing to climate change. The World Bank estimates that, worldwide, garbage dumps and

landfills generate 11 percent of the anthropogenic emissions of greenhouse gases (Cointreau, 2008).

### **WASTE MANAGEMENT AND THE LINKS TO POVERTY**

Two significant linkages between waste management and poverty can be highlighted.

**1)** The poor tend to suffer most from inefficient waste management in the developing world. Slums and low-income settlements often lack waste collection. High- and middle-income residents in the developing world can easily mobilize resources, lobby the authorities and use their contacts in government to demand waste collection and other services. If the municipality does not provide the service, they can pay for it with their own money. Slums and irregular settlements often do not pay property taxes, so municipalities refuse to serve them. As a result, the poor end up with sporadic or no waste collection at all. A deficient or non-existent waste collection system affects the poor in several ways. Low-income residents may be forced to dispose of their waste however they can: discard it onto the streets, vacant lots and their backyards or into drainage ditches, streams and bodies of water. Alternatively, they can burn it. Uncollected waste can clog drains, causing floods, particularly during the rainy season. If it blocks the flow of streams, stagnant water can be a breeding ground for mosquitoes and other vectors of various diseases, such as malaria.

Alternatively, wastes may end up in open dumps – legal and illegal – which is the most common disposal method in the developing world. Open dumping of solid wastes generates various environmental and health hazards. The decomposition of organic materials produces methane, which can cause fire

and explosions, and contributes to climate change. The biological and chemical processes that occur in open dumps produce strong leachates, which pollute surface and groundwater. Fires periodically break out in open dumps, generating smoke and contributing to air pollution. In the Mexican city of Tampico, on the Gulf of Mexico coast, for instance, a fire burned for over six months at the local open dump. Fires at open dumps often start spontaneously by the methane and heat generated by biological decomposition. Dump managers in some cities deliberately set periodic fires at the dumps in order to reduce the volume of the wastes, which allows more wastes to be disposed there and thus extends the life of the dumps. Human scavengers may also cause intentional fires, since metals are easier to spot and recover among the ashes after the fires than among piles of mixed wastes. Food leftovers and kitchen wastes attract birds, rats, flies and other animals. Animals feeding at the dumps may transmit diseases to humans living in the vicinity. Biodegradation of organic materials may take decades, which may limit the future use of the land on which open dumps are located.

Waste processing and disposal facilities, such as hazardous waste dumps and incinerators, are mostly located in the poorest neighbourhoods in developed and developing countries (Wapner, 2002). Thus, the poor face higher risks to their health associated with wastes than residents of middle- and high-income areas.

Since the land around open dumps is undesirable – which makes it cheap or free – the poor often settle around them. Living around a garbage dump harms their health. Even though researchers have neglected this, there is some evidence of higher mortality and morbidity rates among populations that have regular contact with waste. The World Bank estimated the life expectancy of communities

surrounding the dumps in the outskirts of Mexico City to be 53 years, compared to 67 years in the general population. A study conducted at a dump community in Port Said, **Egypt**, found that the infant mortality rate was 1/3 (i.e., one death of an infant under one year of age out of every three live births), which is several times higher than the rate for the region as a whole. The prevalence of enteric and parasitic diseases among the community was much higher than that for the region. An epidemiologic study of a community around a dumpsite in **Manila, Philippines**, found an incidence of 35 different diseases – including tuberculosis, anthrax, poliomyelitis and cholera – higher than in the general population.

Therefore, upgrading waste management in low-income neighbourhoods would likely reduce morbidity and mortality rates and generally improve the health of those neighbourhoods. This could translate into significant savings in health care. Better waste management would also reduce the likelihood of flooding, potentially saving lives and property. Although reliable data is lacking, the improper management of wastes likely affects the health of hundreds of millions of individuals worldwide. Providing proper waste management to all should be a high priority in the development agenda.

**2)** The second link between waste and poverty derives from the fact that millions of poor individuals make a living from waste worldwide. The single-most significant opportunity to reduce poverty and improve waste management systems in developing countries refers to the existence of a large informal waste sector. The IWS provides a livelihood to about 1 percent of the urban population in the developing world. Thus, about 15 million people worldwide survive by working with waste (see Figure 7). Many IWS workers are low-income, vulnerable individuals, such as children,

women, the elderly, the disabled, the unemployed and migrants. Traditionally, IWS workers have been considered a problem and have most often been repressed while their activities have been declared illegal. Over the past decade or so, a re-thinking of the IWS in the developing world has been taking place: more and more, it is recognized that the IWS, instead of being a problem, can be part of the solution and of a strategy to achieve sustainable waste management. It is increasingly evident that, with the proper supportive policies in place, the IWS can make significant contributions to a country's green growth while reducing poverty. For example, the IWS handled one third of the city's waste in Cairo; 15 percent to 59 percent in New Delhi, **India**; 30 percent in Jakarta, **Indonesia**; and 10 percent to 20 percent in **Brazil**. A study conducted in **China, India, Sri Lanka** and **Thailand** estimated that the IWS reduced waste arriving at the disposal sites by 30 percent to 45 percent (ILO, 2011). As discussed in the Annex, a national programme in **Brazil** in support of the informal recycling sector reduced the number of children working as scavengers by 45,000; those children now attend school. And the country's National Association of Waste Pickers received the National Human Rights Award from the Brazilian Government for its work in reducing poverty among waste pickers.

### THE INFORMAL WASTE SECTOR AND THE POTENTIAL FOR SUSTAINABLE POVERTY REDUCTION

The IWS includes the following categories of activities related to solid wastes:

**Informal waste collection** – In some areas, often low-income neighbourhoods not served by municipal waste collection service, entrepreneurs provide this service. Informal collectors charge a pick-up fee to residents. Collectors use pushcarts,

donkey carts, horse carts and motorized vehicles to transport the waste. In Male, Maldives, informal collectors pick up most of the wastes generated by the population. Sometimes, collectors recover the recyclables in the waste and sell them for reuse or recycling. By combining waste collection and recovery of recyclables, people engaged in this can earn high incomes. In Ciudad Netzahualcoyotl, near Mexico City, informal collectors earn five times the minimum wage – more than factory workers.

**Informal recovery of recyclables** – This is the most common activity through which people recover materials from waste for reuse or recycling. In English-speaking areas, these people are known as 'scavengers', 'waste pickers', 'rag pickers', 'salvagers', 'reclaimers' or other terms. Many other words are used to denote this activity, depending on the country and language. Recovery activities occur in any area where waste accumulates, such as on the streets or on vacant land, in bodies of water, at open dumps and in landfills. In recent years and in many countries, incorporation of waste pickers into recycling programmes that involve separation at the source is becoming more common. Many people engage in the recovery of recyclables as a full-time activity, but others do it part time, while still others recover recyclables as a side activity to increase their income. For example, municipal collectors in many cities salvage recyclables during their waste collection routes. As many as 100,000 scavengers recover recyclable materials in Guangzhou, **China**.

**Manufacturing activities** – Some enterprising individuals or groups engage in manufacturing activities that use materials recovered from waste as raw materials. By adding value to waste materials, they can earn higher incomes than by just recovering and selling recyclables. A wide variety of items is manufactured from waste, such as pots and pans made from melted aluminium cans, roof tiles

made from plastic waste and cleaning mops made from textile waste. The transformation of organic waste into compost also falls into this category.

**Provision of services** – Individuals or groups can also engage in the provision of waste management services. The most common services provided are street sweeping and cleaning of facilities such as bus stations.

There is a link between these categories and the potential for poverty reduction. From a business perspective, it makes sense to diversify.

If a cooperative or a microenterprise depends on recycling income only, it is vulnerable to changes in the prices of recyclable materials. The global economic crisis of 2008, for instance, reduced demand for recyclables and prices dropped by 50 percent. The scavengers who recovered recyclables suffered a drop in income as a consequence. But the groups and microenterprises that had other sources of income, such as manufacturing products from waste, were not affected as much. Experience shows that engaging in two or more of these four activities can greatly increase individuals' incomes (see Figure 8).

**TABLE 1: SOLID WASTE GENERATION AND INCOME**

<b>1) Developed Countries – High-Income</b>
<ul style="list-style-type: none"> <li>• Population – 1.0 billion</li> <li>• Waste Generation Rate: 1.4 kg/capita/day</li> <li>• 566 million tonnes a year</li> </ul>
<b>2) Developing Countries – Middle-Income</b>
<ul style="list-style-type: none"> <li>• Population – 3.0 billion</li> <li>• Waste Generation Rate: 0.81 kg/capita/day</li> <li>• 986 million tonnes a year</li> </ul>
<b>3) Developing Countries – Low-Income</b>
<ul style="list-style-type: none"> <li>• Population – 2.4 billion</li> <li>• Waste Generation Rate: 0.59 kg/capita/day</li> <li>• 569 million tonnes a year</li> </ul>

Source: Sandra Cointreau, 2007. *The Growing Complexities and Challenges of Solid Waste Management in Developing Countries*, The World Bank, September.

**TABLE 2: WASTE COLLECTION/DISPOSAL AND INCOME**

	Waste collection	Proper disposal
Low-income countries	40%	5%
Middle-income countries	60%	30%
High-income countries	100%	100%

Source: Sandra Cointreau, 2007. *The Growing Complexities and Challenges of Solid Waste Management in Developing Countries*, The World Bank, September.

**TABLE 3: WASTE COLLECTION BY REGION**

Region	Waste Collection
OECD	97%
MENA Countries	85%
LAC Countries	78%
Europe and Central Asia	78%
East Asia and Pacific	78%
South Asia	64%
Sub-Saharan Africa	45%

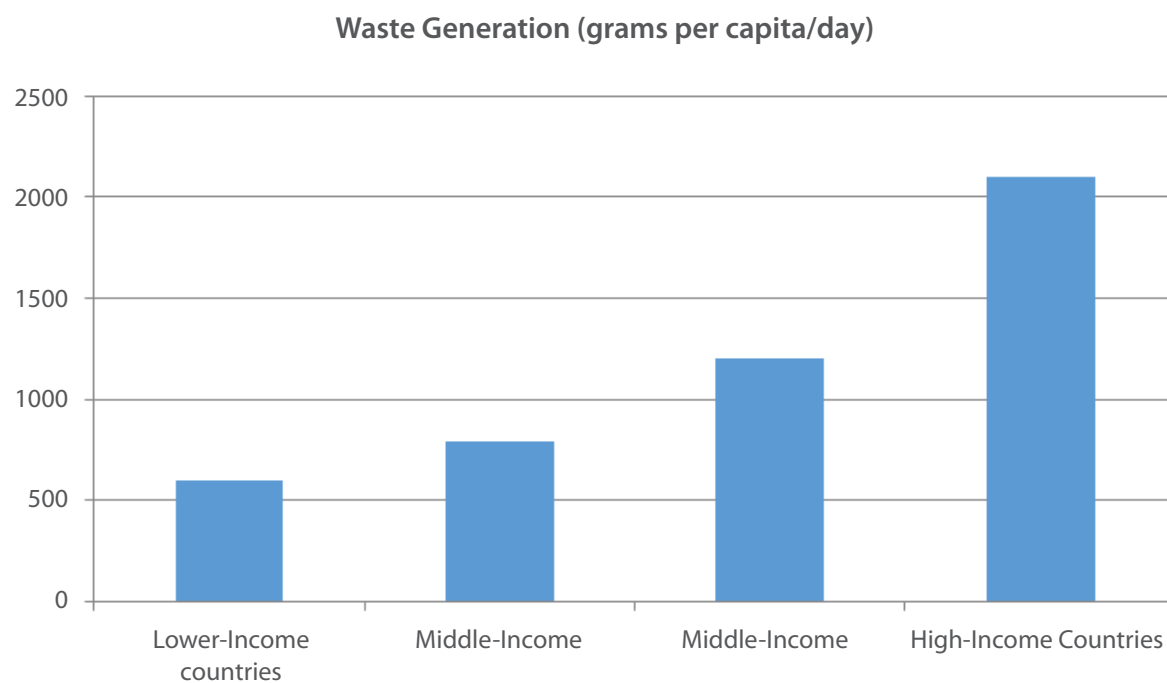
Source: *What a Waste: A Global Review of Solid Waste Management*. The World Bank, 2012.

**TABLE 4: ORGANIC CONTENT IN WASTE, SELECTED CITIES**

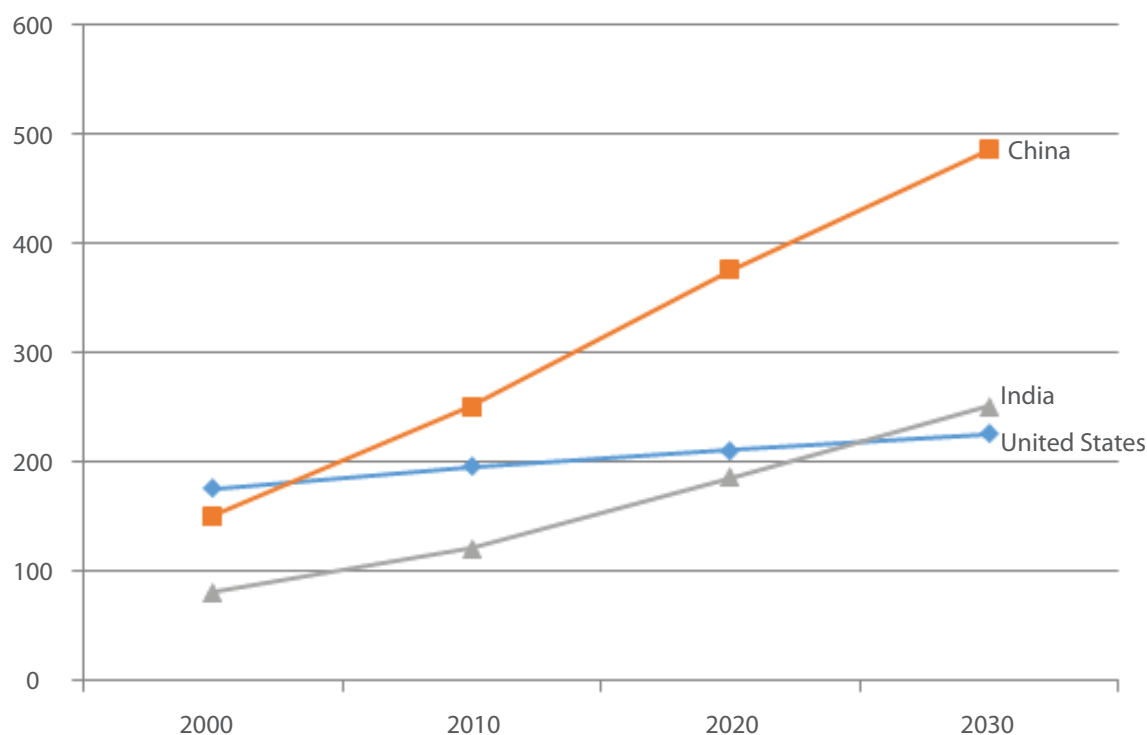
City	Organic Content in Waste
Tokyo, Japan	30%
US cities (average)	31%
Jakarta, Indonesia	74%
Indian cities (average)	75%
Ibadan, Nigeria	76%
Kathmandu, Nepal	80%
Dhaka, Bangladesh	84%

Source: Medina, M. 2007. *Co-Benefits of Waste Management in Developing Countries*. Washington, DC: USEPA.



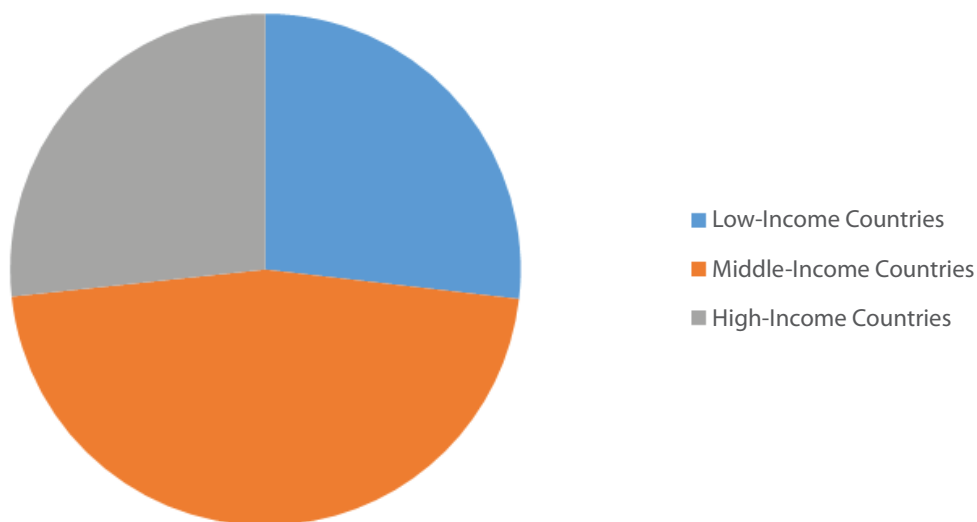
**FIGURE 3: WASTE GENERATION (GRAMS PER CAPITA/DAY)**

Source: *What a Waste: A Global Review of Solid Waste Management. The World Bank, 2012.*

**FIGURE 4: PROJECTED WASTE GENERATION (MILLIONS OF TONNES/YEAR)**

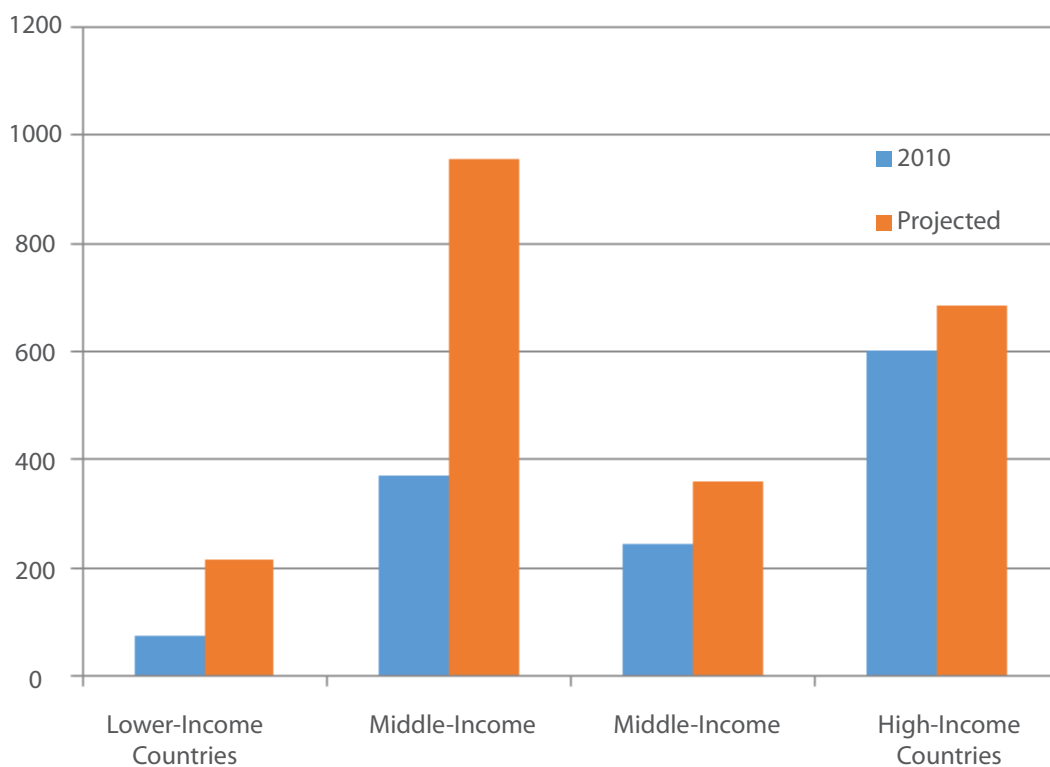
Source: *What a Waste: A Global Review of Solid Waste Management. The World Bank, 2012.*

**FIGURE 5: WASTE GENERATION (MILLIONS OF TONNES/YEAR)**

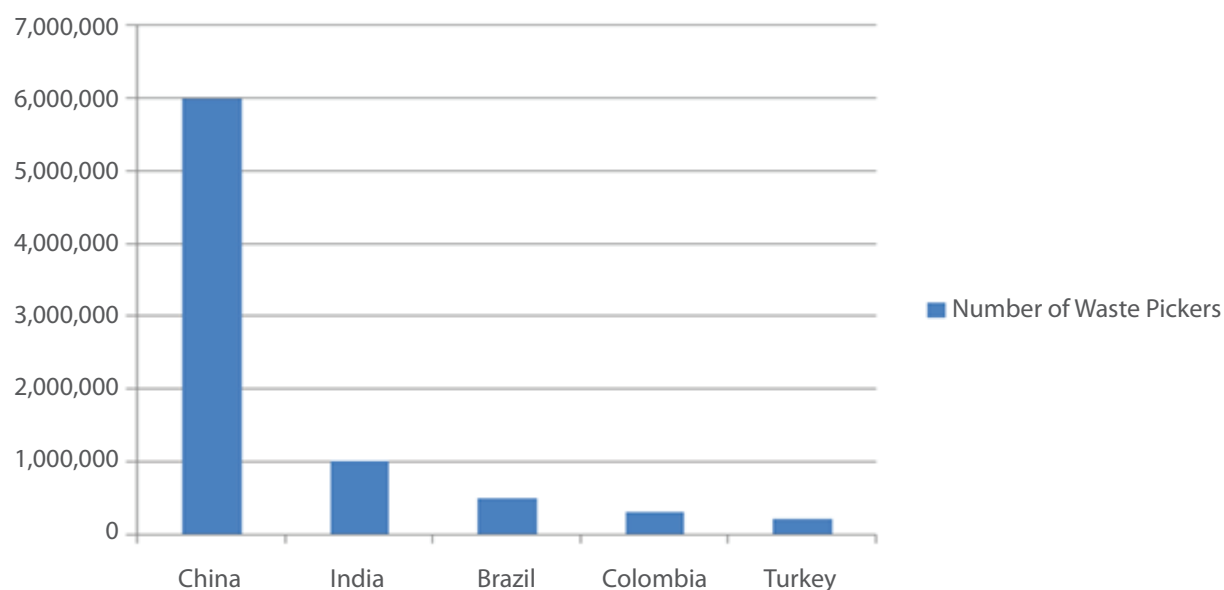


Source: *What a Waste: A Global Review of Solid Waste Management*. The World Bank, 2012.

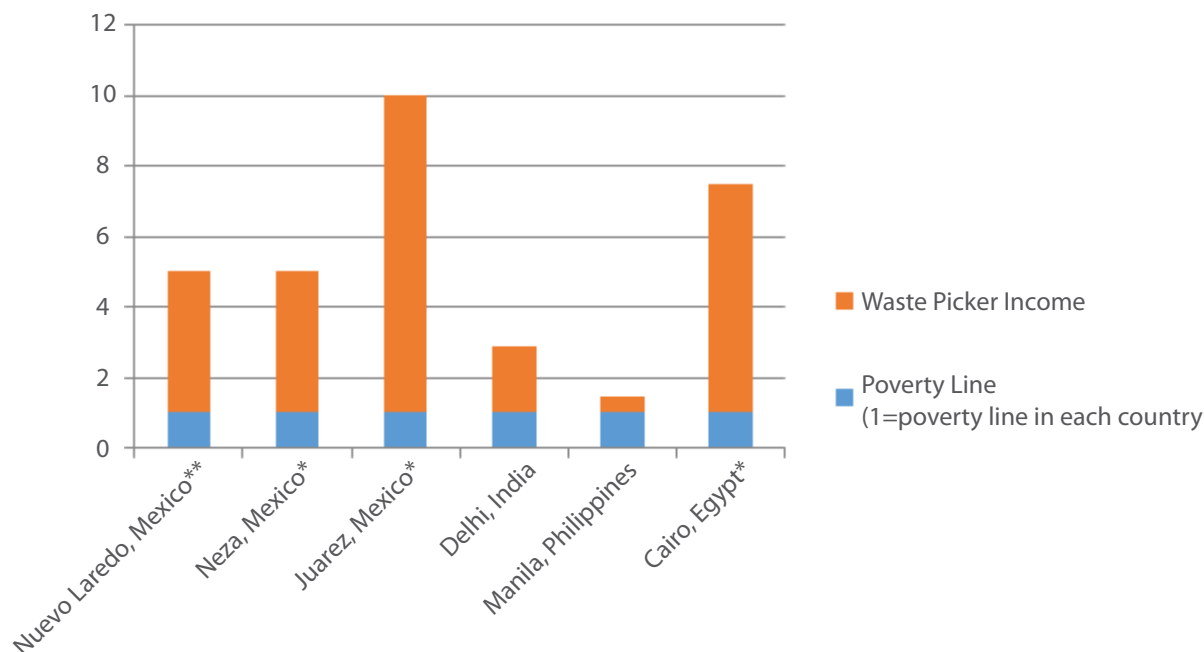
**FIGURE 6: PROJECTED TOTAL WASTE GENERATION IN COUNTRY GROUPS BY INCOME (MILLIONS TONNES/DAY)**



Source: *What a Waste: A Global Review of Solid Waste Management*. The World Bank, 2012.

**FIGURE 7: ESTIMATED NUMBER OF WASTE PICKERS IN SELECTED COUNTRIES**

Source: Medina, M. 2008. *The Informal Recycling Sector in Developing Countries: Asset or Liability?* GRIDLINES. Washington, DC: The World Bank.

**FIGURE 8: SCAVENGER INCOME AND POVERTY LINES IN SELECTED CITIES**

\* Income from waste collection and sale of recyclables

\*\* Income from sale of recyclables segregated at the source

Source: Medina, M. 2008. *The Informal Recycling Sector in Developing Countries: Asset or Liability?* GRIDLINES. Washington, DC: The World Bank.

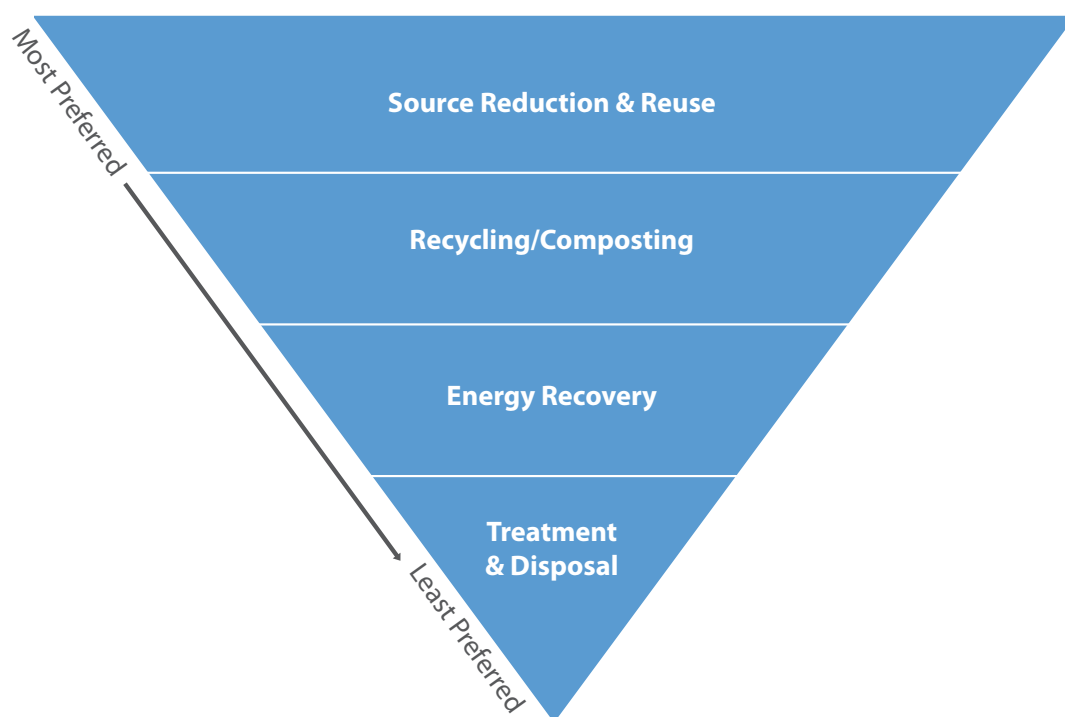
In order to handle growing volumes of waste, appropriate policy frameworks need to be enacted and implemented. There is consensus that the approach to waste management most compatible with an environmentally sustainable development is called 'integrated waste management'. This approach consists of a hierarchical and coordinated set of actions that reduces pollution, seeks to maximize recovery of re-usable and recyclable materials and protects human health and the environment (see Figure 9). Integrated waste management aims to be socially desirable, economically viable and environmentally sound. The integrated waste management approach, however, should be adapted to the local conditions when implemented in the developing world.

Integrated waste management comprises: waste prevention, re-use, recycling, composting, incineration and sanitary landfilling.

## WASTE PREVENTION

Waste prevention is given the highest priority in integrated waste management. This is a preventive action that seeks to reduce the amount of waste that individuals, businesses and other organizations generate. By not creating waste, fewer collection vehicles and fewer refuse collectors would be needed; fewer and smaller waste handling facilities would be required; and the life of the landfills would be extended. Society, as a whole, would benefit from the successful implementation of a waste prevention programme. It is possible to prevent the generation of waste by promoting the use of refillable bottles, reusable, repairable and longer-lasting products and by manufacturers making lighter products and packaging.

**FIGURE 9: WASTE MANAGEMENT HIERARCHY**



## RE-USE

Once the waste prevention programme has been implemented, the next priority in an integrated waste management approach involves promoting the re-use of products and materials. Re-use consists of the recovery of items to be used again, perhaps after some cleaning and refurbishing. Re-using materials and products saves energy and water, reduces pollution and lessens society's consumption of natural resources compared with the use of single-application products and materials.

## RECYCLING

After the re-use of materials and products, recycling comes next in the integrated waste management hierarchy. Recycling is the recovery of materials for melting them, re-pulping them and reincorporating them as raw materials. It is technically feasible to recycle a large amount of materials, such as plastics, wood, metals, glass, textiles, paper, cardboard, rubber, ceramics and leather. Besides technical feasibility and know-how, demand determines the types and amounts of materials that are recycled in a particular region. Areas with a diversified economy and industrial base usually demand more different

types of raw materials that can be recycled. In many African countries, artisans also constitute a significant source of demand for waste materials. African artisans and micro-entrepreneurs manufacture consumer products from waste materials, such as sandals, lamps, pots and pans. Table 5 shows the countries with the highest recycling rates. These are nationwide rates, but, at the community level, it is possible to achieve higher rates: in Cairo, **Egypt**, and **Bali, Indonesia**, some programmes have achieved recovery rates of 80 percent.

Recycling can render social, economic and environmental benefits. Factories that consume recyclable materials can be built for a fraction of the cost of building plants that consume virgin materials. Recycling saves energy and water and generates less pollution than obtaining virgin raw materials; this lowers operating costs (see Table 6). Recycling reduces emissions of greenhouse gases as well (see Table 7). Recycling also reduces the amount of waste that needs to be collected, transported and disposed of and extends the life of disposal facilities, which saves money for the municipalities. Recycling can result in a more competitive economy and a cleaner environment and can contribute to a more sustainable development.

**TABLE 5: COUNTRIES WITH THE HIGHEST RECYCLING RATES IN 2012**

Country	Recycling Rate
Switzerland	52%
Austria	49%
Germany	48%
Netherlands	46%
Norway	40%
Sweden	34%
United States	32%

Source: BBC, 2012.

In the developing world, municipalities usually lack recycling programmes. That does not mean, however, that recycling does not exist. Informal recycling is common throughout Africa, Asia and Latin America. Scavengers are part of the IWS; they carry out the bulk of recycling of municipal waste. Scavengers salvage recyclable materials on the streets, before collection crews arrive, at communal refuse dumpsters and illegal open dumps, as well as at municipal open dumps and landfills.

Scavenging provides an income to unemployed individuals, recent migrants who have been unable to find employment in the formal sector, women, children and elderly individuals. Many scavengers can be considered as a vulnerable section of the population. Nevertheless, due to their daily contact with garbage and their often ragged appearance, scavengers are typically associated with dirt and squalor and are considered as undesirables – and sometimes even as criminals. Public policy generally considers scavengers as a nuisance or a problem to be eliminated.

IWS workers' activities reduce GHG emissions by the energy savings involved in recycling and by reducing final disposal and avoiding production of methane, CO<sub>2</sub> and other carbon gases. A study found that the IWS in New Delhi reduced GHG reductions by 962,133 tonnes of CO<sub>2</sub> equivalent each year. That represents more than 350 percent in GHG emissions reductions than the largest waste-to-energy plant in New Delhi (the Timarpur-Okhla Plant). The IWS constitutes the largest provider of recyclable materials to industry in many countries: 85 percent in Cairo, **Egypt**; 70 percent in **Chile**; 90 percent in **Brazil**; and 85 percent in **India**.

Despite the stereotypical view of scavengers as being marginal and the poorest of the poor,

a growing amount of evidence demonstrates that they often are not. Scavenging supplies raw materials to industry and, therefore, has strong linkages with the formal sector. In some cases, these linkages have existed for centuries, such as in the paper industry. In developing countries today, scavengers still play an important role in supplying wastepaper to the paper mills. Scavenging can also save foreign currency by reducing imports of raw materials. Alternatively, if industrial demand is stronger in a neighbouring country, scavenging can become a source of foreign currency by exporting the materials recovered by scavengers.

When scavengers organize themselves in microenterprises or scavenger cooperatives or form public-private partnerships (PPPs) with municipalities, they can achieve a decent standard of living and improve their working conditions, resulting in grassroots development. There is a growing number of successful micro-enterprises in African, Asian, and Latin American cities; scavenger cooperatives and PPPs provide low-cost waste management services to municipalities. In South America alone, more than 1,000 scavenger cooperatives exist. (See the Appendix for descriptions of successful recycling programmes in **Brazil, Colombia, Mexico, Argentina, the Philippines, and Bangladesh**.) Most of these are member-based organizations and thus can directly benefit the poor.

The structural causes of scavenging are underdevelopment, poverty, unemployment and the lack of a safety net for the poor, as well as industrial demand for inexpensive raw materials. These factors are likely to persist in the near future. Therefore, a public policy that supports scavenging activities would be humane and make social, economic and environmental sense.

**TABLE 6: ENVIRONMENTAL BENEFITS FROM SUBSTITUTING SECONDARY MATERIALS FOR VIRGIN RESOURCES (%)**

Environmental benefit	Aluminium	Steel	Paper	Glass
Reduction of energy use	90-97	47-74	23-74	4-32
Reduction of air pollution	95	85	74	20
Reduction of water pollution	97	76	35	–
Reduction of mining wastes	–	97	–	80
Reduction of water use	–	40	58	50

Source: Cowles L., 1986.

**TABLE 7: RECYCLING AND CLIMATE CHANGE**

Material	Saved CO2 emission in recycling compared with virgin manufacture (tonne/tonne)	Saved 'hidden flow generation' in recycling compared with virgin manufacture (tonne/tonne)
Copper	13-19.7	346.04
Aluminium	4.6-12.4	36.15
Steel	0.9-1.3	7.85
Plastic		1.7-4.7
Paper and cardboard	1.3-1.7	1.04
Glass	0.6	2.17

Source: ISWA, 2009.



## COMPOSTING

Composting, which recycles nutrients by returning them to the soil, is the process of aerobic biological decomposition of organic materials under controlled conditions of temperature, humidity and pH; the result of this process is a soil conditioner that can be used in landscaping, agriculture and horticultural projects.

As Table 4 illustrates, over 50 percent of the waste generated in the developing world tends to be highly organic. When organic waste is sent to dumps and landfills, it decomposes and generates methane, a potent greenhouse gas. But if organic matter is recovered and composted, it can reduce the volume of waste, produce compost, diminish the generation of methane and extend the lifespan of dumps. When composting is conducted under controlled conditions, it does not generate odours and does not attract flies or other animals. Composting can also reduce poverty.

As detailed in the Annex, Waste Concern, a local NGO, created a community-based composting programme in Dhaka, **Bangladesh**, and, in 2006, was the first composting project in the world to receive Clean Development Mechanism (CDM) funds. The composting CDM project processes 700 tonnes of materials/day and created nearly 1,000 jobs for low-income individuals. Households that participate in the project separate their organic waste and deliver it to the Waste Concern collectors, who transport it on bicycle carts to the nearest composting site. The resulting compost is blended with chemical fertilizer and sold to farmers. Thus, composting can create jobs, reduce poverty and protect human health and the environment.

## INCINERATION

In an integrated waste management approach, incineration occupies the penultimate priority, after waste prevention, re-use, recycling and composting have been undertaken. Incineration is the burning of waste under controlled conditions, usually carried out in an enclosed structure. Incineration could include energy recovery.

Waste generated in developing countries, however, usually does not allow energy recovery, due to the high level of moisture and high content of organic matter. Experience with incineration in developing countries has been mostly negative. Incinerators built in Africa, Asia and Latin America did not function as promised. In Lagos, Nigeria, incinerators were built at a cost of US\$10 million. The moisture content of waste was so high that fuel had to be added to maintain combustion, which increased costs significantly. The incinerators never operated normally, one was abandoned and the other was turned into a community centre. Similar experiences have been observed in **India, Mexico, the Philippines, Indonesia** and **Turkey** (Kirov, 1982; Cointreau, 2006). Therefore, incineration of MSW has failed in many cities of the developing world.

Widespread adoption of incinerating recyclable materials could reduce the amount of materials waste pickers could recover, thereby reducing their income and perhaps increasing their poverty. Nevertheless, incineration should remain an option for some hazardous materials, such as medical wastes.

## SANITARY LANDFILLING

Final disposal of wastes at sanitary landfills is given the lowest priority in an integrated waste management approach. A sanitary landfill is a facility designed specifically for the final disposal of waste in ways that minimize the risks to human health and the environment associated with solid waste. Sanitary landfills commonly include one, two or three different liners at the bottom and sides of the disposal area in order to prevent leachates from polluting nearby surface waters or aquifers. Liners also prevent the underground movement of methane. Waste arriving at landfills is compacted and then covered with a layer of earth, usually every day. This prevents animals from having access to the organic matter to feed. Sanitary landfills can also include other pollution control measures, such as collection and treatment of leachate, and venting or flaring of methane. It is possible to produce electricity by burning the methane that landfills generate.

## INITIATIVES DESIGN

A major challenge in pursuing green growth consists in reconciling the competing economic development aspirations of rich and poor countries in a world economy that is facing climate change, energy insecurity and environmental degradation. Developed countries have pursued environmental protection efforts that have resulted in halting further deterioration of the environment and some have improved resource efficiency and reduced air, water and land pollution. A green economy can meet this challenge by offering a development path that reduces carbon dependency, promotes resource and energy efficiency and lessens

environmental degradation. As economic growth and investments become less dependent on liquidating environmental assets and sacrificing environmental quality, rich and poor countries can attain more sustainable economic development.

### How Can Poverty Be Included in a Green Growth Strategy?

The proposed model includes five steps (see Figure 8). Each step is briefly described below.

#### Step 1) Poverty is Multidimensional: Determine its dimensions and indicators

One of the main goals of green growth is the reduction in poverty. The first step in the proposed model is the determination that poverty is multidimensional. Income is only one dimension of several that need to be considered. Other significant dimensions of poverty are quality of work, empowerment, physical safety and ability to go about without shame. When studying poverty in a population, other dimensions should be considered in addition to income. UNDP uses the Multidimensional Poverty Index with 10 indicators in three areas: health, education and living standards. This is particularly important when analysing waste pickers and other IWS workers. Since many of them can earn an income above the poverty line, it might be concluded that they are not poor. But, seen from a multidimensional perspective, IWS workers often face serious risks to their health and have low educational levels and low living standards. Using a deprivation alone may not represent poverty, but using an index provides a more accurate picture of poverty.

## Step 2) Conduct a Baseline Study

Once it has been established that several dimensions should be included in the measurement of poverty among IWS workers, a baseline study should be conducted. In order to reduce poverty, we need a good understanding of the magnitude of poverty and its dimensions. Most countries do not collect official statistics on the IWS and often the availability of quantitative data on this population is either unavailable or is of poor quality. In order to design and implement a poverty reduction programme, it is necessary to know how many people work in the IWS as well as their degree of multidimensional poverty. Again, it is recommended that studies use a modified version of UNDP's Multidimensional Poverty Index with its 10 indicators in three areas: health, education, and living standards. But even if no multidimensional poverty is used, it is necessary to collect data on variables such as education, income, health and standard of living in order to determine a set of indicators and to measure progress.

It is recommended that the following indicators be included as well:

- Formation of associations, microenterprises, cooperatives or public-private partnerships
- Empowerment: access to information, social inclusion/participation and local organizational capacity

In most countries, IWS workers are 'invisible' and their problems ignored. But a better and more widely disseminated understanding of their conditions can mobilize society. For example, a 1998 UNICEF national study of the waste picker population in **Brazil** found that more than 45,000 children worked as waste pickers and that 30 percent of them had no schooling at all. The public reaction was such that the Brazilian Federal Government had

to create a programme to reduce poverty among waste pickers and to support their inclusion in waste management plans (see the Annex for a more detailed analysis of the Brazilian experience).

## Step 3) Develop a National Policy Framework

Once a better understanding of the magnitude of poverty and its various dimensions is obtained, it is possible to design a National Policy Framework. The framework should include the overarching principles, procedures and guidelines for reducing poverty and improving waste management for green growth. The specific goals, instruments and activities of this policy will vary from country to country. Nevertheless, a national policy will likely seek to:

- Reduce poverty in its various dimensions
- Improve working and living conditions of waste workers
- Improve efficiency on the use of water, energy and materials
- Reduce emissions of greenhouse gases
- Improve collection, transport, processing and final disposal of wastes
- Minimize pollution associated with waste management
- Maximize the productive use of wastes by reuse, recycling and composting
- Improve industrial competitiveness by supplying recyclable materials of good quality and reasonable cost

A combination of market-based and command-and-control instruments can be used. A ban on the disposal of hazardous wastes at municipal waste landfills is an example of the second. An example of a market-based approach would involve paying households per kilogramme of compost that they make from their own organic waste at their homes. Many developed and some developing countries

have set targets for waste reduction, reuse and recycling (see Table 8 for some examples).

Many developing countries lack a national green growth policy and most developing countries have not designed a national policy for improving waste management and reducing poverty. Therefore, countries need to link these areas in order to create more synergy among them.

#### Step 4) Create a National Programme on Poverty Reduction and Waste

Understanding the macro-micro links is important. There is a growing number of grassroots initiatives, community-based programmes, cooperatives and microenterprises in the developing world. As discussed in the Annex, Colombian scavengers created the world's first grassroots scavenger movement in the 1980s, but national-level support

**TABLE 8: TARGETS FOR WASTE REDUCTION, REUSE, AND RECYCLING IN SELECTED COUNTRIES AND REGIONS**

Country/Region	Targets	Target Year
<b>Italy</b>	163 kg per capita per year by 2007	Attained in 2002
<b>Japan</b>	Reduce municipal waste generation by 5%; keep the rate of increase in industrial waste below 12%	2010
	Increase recycling rates from 11% to 24% for municipal waste and from 41% to 47% for industrial waste	2010
	Reduce the amount of landfill disposal by 50% (for municipal and industrial wastes)	2010
<b>Singapore</b>	Increase the recycling rate from 44% to 60%	2012
<b>South Africa</b>	Reduce municipal waste by 30%; keep the rate of increase in industrial waste below 10%	2010
	Increase the recycling rate from 10% to 50% (for municipal and industrial wastes)	2010
	Reduce the amount of landfill disposal by 60% for municipal waste and by 30% for industrial waste	2010
<b>Thailand</b>	Reduce total waste generation by 30%	2009
<b>UK</b>	Increase the rate of recycling/composting of general waste from 25% to 30% and then to 33%	2010, 2015
	Reduce the amount of landfill disposal by 15%	2005
<b>USA</b>	Reduce municipal waste by 35%	2008
<b>EU</b>	Recycle 60% of packaging waste	2008
	Reuse or recycle 80% of end-of-life vehicles (recovery rate 85%)	2006
	Reuse or recycle 85% of end-of-life vehicles (recovery rate 95%)	2006
	Recycle 80% of waste electrical and electronic equipment	2008

Source: Ministry of the Environment, Government of Japan. 2006. *Issues Paper Senior Officials Meeting on the 3R Initiative 6-8 March 2006, Tokyo, Japan*: Ministry of the Environment, Government of Japan.

has been lukewarm. **Brazil**, on the other hand, created a national programme on poverty and waste and is now the world leader in linking poverty, waste and the informal recycling sector. Therefore, support at the national level can make a big difference, guide local decisions and mobilize resources in support of local efforts.

In preparing a national programme, it is recommended to consider the following:

- Ensure broad-based support for the process and the implementation of the resulting plan
- Ensure that all stakeholders are involved, including officials, the public, community groups, NGOs, the private sector and the informal sector. Interministerial coordination and collaboration are also very important for policy decision, financing, implementation and monitoring/evaluation.
- Involve women, as the critical service users, in the process
- Establish clear objectives and targets
- Ensure that the target level is affordable
- Focus on the short-term (Action Plan) as well as on the long-term (strategy or vision)
- Define opportunities for, as well as barriers and constraints to, improvement
- Measure key data to provide a sound basis for decision-making
- Ensure that the Action Plan is practicable and covers organizational and operational aspects
- Test innovative ideas in pilot projects prior to full implementation
- All residents should have access to waste management services, regardless of whether they live in an irregular settlement or whether they pay property taxes

All key stakeholders should participate in the design of a National Programme on Poverty Reduction and Waste. Therefore, a multi-stakeholder approach

is recommended. The public agencies involved in waste management and poverty reduction should be invited to participate, as should be representatives from industry, the informal waste sector, NGOs and academia.

A growing number of countries and cities now consider the informal sector as a potential partner.

**Brazil** is one of the world's most advanced countries in incorporating poverty reduction into a national waste management programme. The Brazilian Federal Government created a national programme linking the IWS and solid waste, naming it the Waste and Citizenship Programme (WCP).

WCP seeks to:

- Reduce poverty among IWS workers
- Create a conditional cash transfer programme in order to reduce child labour in the IWS
- Legalize IWS activities
- Support the creation of IWS organizations and provided credit for their activities
- Make the IWS a legitimate stakeholder in the waste management system
- Maximize recycling, particularly with segregation at the source

In order to be considered as a partner, the IWS needs to be organized. The main organizational forms are community-based organizations, cooperatives and microenterprises. Municipalities can then create public-private partnerships with those organizations. More and more countries are realizing the development potential of working with the IWS.

**The Philippines**, for instance, created a national programme to include the informal recycling sector in waste management activities. **Tunisia** enacted an extended producer responsibility programme for packaging; as a result, the informal sector became involved in the collection of materials

and soon after the amount of materials collected increased and the cost per tonne decreased. The Mexican bottling industry created a national PET recycling programme that incorporates the waste pickers into its supply chain in order to improve their working and living conditions. Waste Concern, a **Bangladeshi** NGO, created a highly successful community-based composting programme in Dhaka that processes 700 tonnes/day and created 1,000 jobs for former waste pickers. **Indonesia** was the first country in the world that legalized the informal recycling sector. Jakarta has a programme that pays waste pickers for the materials that they recover for recycling. The Annex describes these experiences in greater detail.

The main synergies in waste management combine development potential, creativity and entrepreneurship in the informal sector with a policy framework that facilitates the inclusion of the IWS in waste management. Technical assistance is crucial, as are grants and loans, which can be provided by foundations, development banks, private industry or the government. Improved waste management will contribute to a better health, particularly among the poor, as well as lower pollution levels. It can also create jobs, alleviate poverty and reduce child labour (by instituting conditional cash transfer programmes that address the needs of the poor and children in terms of income, education and health). Recycling and composting activities conserve natural resources and reduce society's ecological footprint and reduce emissions of greenhouse gases. By consuming inexpensive recyclables as raw materials, industry would be more competitive. Thus, the proposed model would be economically viable, socially desirable and environmentally sound.

### Step 5) Monitoring and Evaluation

Monitoring progress in achieving the goals and conducting periodic evaluations are essential to assessing the success of the programme and to making any necessary corrections. UNDP's 'Handbook on Planning, Monitoring and Evaluating for Development Results' (available at <http://web.undp.org/evaluation/handbook/>) is a useful tool.

The following indicators could be used to measure progress:

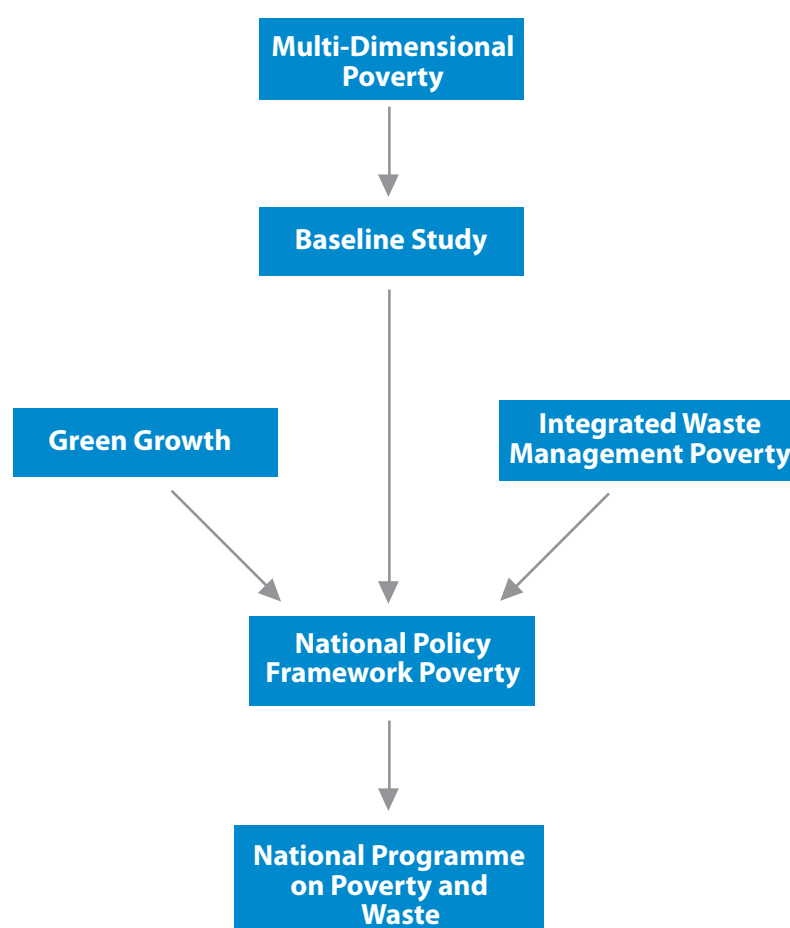
- \* Resource consumption rate (material use in kilogrammes per capita)
- \* Waste generation rates (kg/capita/year, overall and by economic sector)
- \* Percentage of waste being collected
- \* Percentage of waste that is reused or recycled
- \* Percentage of the population served by waste management
- \* Index of multidimensional poverty among IWS workers
- \* Index of multidimensional poverty in low-income areas
- \* Income of IWS workers
- \* Health of IWS workers
- \* Number of children working in the IWS
- \* Education of IWS workers
- \* Standard of living of IWS workers
- \* Percentage of virgin material displacement in production
- \* Percentage of materials diverted from landfills
- \* Reduction in greenhouse gas emissions due to avoided landfilling
- \* Percentage of waste disposed in landfills
- \* Extent of capture, recovery and/or treatment of polluting emissions such as leachate and landfill gas

A number of instruments can be used for monitoring and evaluation: formation of committees in which IWS workers are members; surveys; and annual reports on programmes.

No single country has implemented all of the components in this model, but **Brazil** has

implemented a national policy framework and a national programme. Countries interested in integrating poverty reduction and green economy in waste management would benefit from the lessons learned so far. Some of the most relevant case studies from Africa, Asia and Latin America are discussed in the Annex.

**FIGURE 10: ILLUSTRATIVE MODEL FOR MAINSTREAMING POVERTY REDUCTION AND IMPROVED WASTE MANAGEMENT**





## INITIATIVES IMPLEMENTATION

Key stakeholders need to be involved in the implementation of the initiative. International organizations can play a significant role in promoting the integration of poverty reduction and green economy in waste management. In fact, the World Bank and the Inter-American Development Bank have realized this and now actively support, whenever feasible, the integration of pro-poor IWS into waste management programmes. The World Bank has been instrumental in promoting the social inclusion of the IWS in waste management activities at the national level. The World Bank provided technical assistance for the inclusion of the IWS in the Philippine's Ecological Waste Management Law. The World Bank was also very active in the creation of Brazil's conditional cash transfer programme, which has significantly reduced child labour and poverty among the country's waste pickers. The International Finance Corporation (IFC), part of the World Bank, played an important role in the incorporation of waste pickers into Mexico's PET recycling programme. The Bank convinced decision makers of the need to consider the IWS as a stakeholder. The initiative has been funded by a combination of federal government and private funds. The World Bank funded the country's conditional cash transfer programme.

National governments play a crucial role. In **Brazil**, for instance, several agencies of the Federal Government and the Brazilian Development Bank have supported WCP. Large, private companies have also become partners of WCP, as have some foundations and non-profit organizations. WCP encouraged the creation of the world's largest waste picker movement, with about 500 member organizations throughout the country. Private sector partners have provided valuable moral and financial support to WCP, particularly to the IWS.

Large Brazilian and multinational companies, such as Petrobras and Coca-Cola, have supported WCP as part of their corporate social responsibility. CEMPRE, a foundation that is funded by the private sector, has strongly supported WCP and the Brazilian IWS by researching relevant topics, supporting the creation of waste picker cooperatives and making data available to various stakeholders.

**The Philippines** has a large and dynamic IWS. Linis Ganda, a recycling programme described in the Annex, is highly successful in promoting the social inclusion of waste pickers, reducing their poverty and promoting the segregation at the source of recyclable materials. But the national government refused to consider the IWS as a potential partner. This changed when the World Bank convinced the national government of the desirability of working with the IWS. So far, some local governments have been reluctant to consider the IWS as a potential partner in managing wastes. Many local governments prefer to work with large, private sector companies when awarding waste management contracts and upgrading their waste management systems.

In the countries analysed in the Annex, the main partners have been governments, NGOs, the private sector and, in the case of the programme in **Bangladesh**, the Clean Development Mechanism, which funded it. A potential source of significant revenue is the reduction of greenhouse emissions by composting waste in the developing world, as composting can create jobs and reduce emissions of methane at a low cost.

The groups likely to oppose the initiative are the local governments and the middlemen that purchase the materials collected by the waste pickers. Local governments prefer to award contracts to large companies; they are often reluctant to work with

the IWS. Waste pickers can work with the IWS only if they get organized and can prove that they are reliable partners. The low incomes among waste pickers are often the result of middlemen's exploitative practices: middlemen pay low prices to waste pickers and sell the materials to industry at a considerable mark-up, usually earning large profits.

If waste pickers organize into cooperatives, microenterprises or public-private partnerships, though, they can bypass the middlemen, thus earning higher incomes. The poor and vulnerable can be targeted by making sure that waste pickers and other IWS workers are specifically mentioned in the initiatives and that they are legitimate stakeholders that can participate in the decision-making process.

External financing is usually needed, particularly for technical assistance to the government and to strengthen IWS organizations. But when the authorities allow the IWS participation, it can be a powerful incentive for entrepreneurs to mobilize community resources in order to take advantage of those opportunities. Large generators of greenhouse gases could buy carbon offsets to support recycling and composting in the developing world as a lower-cost option to reduce their ecological footprint.

A potential trade-off from making the transition to an integrated approach may include an initial loss in economies of scale already established in extraction (such as mining and the oil industry), which could have implications for the manufacturing industries, perhaps in terms of increased cost of goods in the short to medium terms. This potential temporary loss has not been estimated yet. Nevertheless, it is expected that – as the new systems get mainstreamed and the markets mature – the costs of goods would stabilize (ILO, 2011).

## RESULTS

Research has demonstrated the significant role that the IWS plays in the large economies of the developing world. In the Brazilian recycling system, waste pickers recover about 90 percent of the post-consumer wastes that are recycled by industry. Their recycling activities save municipalities money because they reduce the amount of wastes that need to be collected, transported and disposed of. In the absence of IWS activities, municipalities would have to invest in more collection vehicles, fuel, maintenance, salaries and benefits for more employees and larger processing and disposal facilities. Recycling also conserves natural resources, reduces pollution, saves energy and water and protects the environment.

The WCP has resulted in a reduction of poverty, child labour, empowerment and improvements in self-esteem, working conditions and collective action in order to get ahead as a whole; it has created more than 500 member-based organizations (waste picker associations and cooperatives). IWS activities are now legal and waste picking is recognized as a professional activity (part of the Brazil's code of occupations) (Medina, 2010).

The world's largest IWS likely exists in **China**. Chinese researchers estimate that up to six million IWS workers make a living by collecting waste materials for recycling in the country, where industry demands various types of recyclables, such as paper, cardboard, metals, plastics and glass. Waste pickers play an important role in supplying industry with inexpensive raw materials. More research on the IWS in **China** and other developing countries would be desirable.

The success of initiatives that integrate poverty reduction and green economy in waste management can be measured by the reduction in poverty among waste pickers, which would have to be monitored.

Results of an initiative can become clear in as few as one to two years.

## DRIVERS AND POLICY IMPLICATIONS

Traditionally, the existence and growth of the IWS have been driven by economics. Waste pickers, informal waste collectors and other IWS workers engage in those activities in order to make a living. They may have no other alternatives to survive. Thus, widespread poverty, unemployment and the lack of a safety net for the poor ‘pushed’ them into the IWS. Their alternative would likely have been starvation. On the other hand, urbanization has concentrated larger numbers of people and growing amounts of wastes.

Industry and other productive activities need a wide range of raw materials. Industry in developing countries shows a strong demand for recyclable materials due to their low cost. The main factors that account for the lower prices of secondary materials are the following. First, materials recovered from waste often include impurities. Even when materials are segregated at the source, extraneous items can be found, such as tags, traces of glue, and moisture. Virgin materials are thus more homogeneous than secondary materials. Second, most developed countries have created recycling programmes that produce large amounts of secondary materials. But supply of these materials usually exceeds domestic demand, so a large percentage of materials must be exported and sold in international markets. Third, many materials can be easily recycled and

transformed into new products. But there are constraints in recycling some materials, such as paper. Paper is made from vegetable fibres, most commonly wood. Each time paper is recycled, the fibres break and become increasingly shorter. As a result, paper and cardboard can be recycled only two to four times. Fourth, recycling requires less energy and water than processing virgin materials, thus lowering industry’s operating costs. Fifth, the recovery of materials in developing countries relies on a large numbers of scavengers, who lack the organization and power to have an impact on prices (Medina, 2011).

As a consequence of these factors, underdevelopment, urbanization and growing industrialization have created a large and dynamic IWS in the developing world.

Informal waste activities have long been linked to industry because they made economic sense: they provided an income to poor individuals while supplying low-cost raw materials to industry. Environmental considerations were not a factor in industry’s decisions to recycle wastes. But that changed in the 1970s, with the birth of the environmental movement. Environmental ministries and new environmental laws and regulations were created in order to prevent pollution, conserve natural resources and protect the environment. Recycling was then seen as a green and desirable activity. Developed countries enacted legislation that created recycling programmes and forced their residents to recycle their wastes. Developing countries, on the other hand, still rely on the informal recycling sector.

Long ignored, IWS workers are organizing in many countries. They have created local, regional and national associations in order to defend their rights and educate society about their work. They have

also created a Latin American association of waste pickers and are lobbying their governments and global society for recognition and their right to work. Academic research has highlighted not only the economic, social and environmental benefits of the IWS, but also the problems and what remains to be done. Research has analysed success stories, their policy implications and the need to enact supportive programmes and legislation. Further, an increasing number of private sector companies have decided, often through their corporate social responsibility programmes, to support the waste pickers in their supply chains. Because of mounting evidence, the World Bank and the Inter-American Development Bank now support the social inclusion of the IWS into waste management and poverty reduction programmes.

Two other, more recent drivers are significant in integrating poverty reduction and green economy in waste management: social inclusion and climate change. Historically, waste pickers have been marginalized, looked down by the rest of society and, in some cases, discriminated against due to their often ragged appearance and daily contact with garbage. In **India**, for instance, waste pickers are usually from the lowest castes. Religion can also play a role: in Islam, contact with garbage is considered an impure activity. As a result of this exclusion, waste pickers have been commonly prevented from participating fully in the economic, social and political life of the societies in which they live. There is now increasing global emphasis on the social inclusion of marginalized groups in order to create a more just world. Including previously marginalized groups in the development process is also good economics: it would improve the groups' standard of living and the groups would contribute their energy and skills for the benefit of the rest of society.

Climate change could be one of the most significant challenges that humanity has ever faced. As previously mentioned, the decomposition of organic wastes generates greenhouse gases. Recycling of inorganic materials – such as plastics, metals, and glass – saves energy and helps reduce emissions of greenhouse gases. Thus, waste management can contribute to a less carbon-intensive development.

At the national level, the key drivers of success of the Brazilian experience have been: a UNICEF study that highlighted the plight and neglect of Brazilian waste pickers; the personal commitment of the former Brazilian President Lula da Silva; an active participation of the Brazilian private sector and non-profit sector; and the creation of the National Movement of Waste Pickers, which has been active in educating the public on its activities and in convincing the authorities of the benefits of their work and why the IWS should be supported.

In the other countries analysed in the Annex, the drivers of success have been motivated NGOs, government leaders and technical assistance from development banks and international organizations. Their success can be replicated by implementing the proposed model.

## KEY MESSAGES

- Integrated waste management can contribute to achieving green growth by reducing society's ecological footprint.
- Waste generation in some developing countries is rising very fast.
- The improper management of wastes generates pollution and greenhouse gases and can harm human health.

- Most countries have not integrated poverty reduction and green economy into waste management decisions.
- It is possible to reduce poverty and improve waste management in the developing world. Cities can improve waste collection and recycling rates affordably. They can also supply inexpensive materials to industry, thus improving their competitiveness.
- The most significant opportunity to reduce poverty in waste management consists in including the informal sector in waste management systems.
- Commitment at the highest levels of government makes a big difference in integrating poverty and waste management. Luiz Inácio Lula da Silva, former President of **Brazil**, became personally involved in supporting the country's scavengers. As a result, **Brazil** is today at the forefront in the social inclusion of informal waste sector workers.
- When informal waste workers organize and are supported, it is possible to create jobs, reduce poverty, conserve resources, protect the environment, save cities money and improve industrial competitiveness.
- In order to harness the development potential of the informal waste sector, external support in the form of technical assistance, training, funding and credit is often necessary. Support can come from government, the private sector, NGOs and communities.
- Segregation at the source is the best way to reduce health risks, raise the income of scavengers and generate high-quality recycling materials.
- Scavenging is one of the worst forms of child labour. Conditional cash transfers have successfully reduced it.
- Poverty is multidimensional and should be measured as such. A baseline study should be conducted in each country order to better understand the informal waste sector and how to address each dimension and indicator.
- Even though waste management is a municipal responsibility, national governments should provide a national policy framework that incorporates green growth goals with an integrated waste management strategy that guides and reinforces local decisions.
- A national programme for poverty and waste could be designed and implemented in order to reduce poverty and improve waste management.
- Efforts to reduce poverty and improve waste management should be monitored and evaluated periodically.

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## APPENDIX: DEFINITIONS AND COUNTRY EXPERIENCES

**Green economy** – UNEP defines a green economy as one that results in “improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities” (UNEP, 2010). In its simplest expression, a green economy is low-carbon, resource-efficient and socially inclusive.

**Composting** – Biological decomposition of organic materials by microorganisms, mainly fungi and bacteria. The process requires moisture and oxygen and results in a humus-like material that can be used as soil conditioner in gardening, horticulture and agriculture.

**Decoupling** – Ability of an economy to grow without the usual negative environmental impact and without a commensurate increase in waste generation

**Dematerialization** – Efforts to reduce the amount of materials to satisfy society's needs, for example, by making lighter bottles/containers for products

**Downstream waste management issues** – Part of waste management that focuses on the collection, transport, processing and final disposal of wastes

**Extended producer responsibility (EPR)** – Policy that makes manufacturers responsible for the entire lifecycle of the products and packaging that they produce

**Greenhouse gases (GHG)** – Greenhouse gases, various types of gases that trap the sun's energy in the atmosphere



**Hazardous waste** – Materials that, due to their chemical or physical characteristics, such as toxicity or flammability, pose significant risks to human health and the environment

**Incineration** – Burning of waste materials under controlled conditions in a facility built for that purpose. Incineration reduces the volume of materials and can generate usable energy.

**Informal sector** – Various income-generating activities that are often unregulated, unrecorded in the official economic statistics and untaxed. The urban poor often engage in informal sector activities, such as scavenging, street vending and home-based work.

**Integrated waste management** – Set of coordinated actions that seek to manage wastes in a socially desirable, environmentally sound and economically viable manner

**Life-cycle analysis** – The examination of a product's total environmental impact, from its design, extraction of raw materials, manufacture, transportation and use to its final disposal

**Municipal solid waste** – Materials and items discarded by households, schools, markets, restaurants and various institutions

**Open dump** – Site for disposing of solid wastes in an open, uncovered area that lacks pollution controls

**Organics** – Organic matter in waste that can decompose biologically. In some countries, human excreta are mixed with solid wastes, thus posing serious risks to human health.

**Poverty** – Multidimensional condition in which income is one dimension. Other significant dimensions of poverty are quality of work, empowerment, physical safety and ability to go about without shame.

**Recyclables** – Generic term for materials in waste that can be reused or recycled

**Recycling** – Collection and recovery of waste materials to be reprocessed and incorporated as raw materials for new products. This usually involves repulping (for paper), melting (for metals and glass) and extruding (for plastics).

**Reuse** – Recovery of items or materials to be used again for its original purpose, possibly after some slight modification, cleaning or repair. For example, refillable glass bottles can be washed and reused a number of times.

**Sanitary landfill** – Facility specifically designed and built to dispose of wastes in a way that minimizes pollution and risks to human health and the environment

**Solid waste** – Discarded solid materials resulting from production and consumption processes

**Upstream waste management issues** – Part of waste management that focuses on waste prevention by, for example, extending the life of products or reducing the amount of materials in products

## I) BRAZIL

Brazilian scavengers, popularly known as catadores, and have been traditionally looked down by the rest of society and were often harassed by police. Public policy on scavenger activities had a turning point in the late 1990s. In 1998, UNICEF published a study on child labour among catadores, which found that over 45,000 children nationwide worked as scavengers and that 30 percent of them had no schooling at all. This study and the public reaction to it were deeply embarrassing to the Brazilian federal government. The government reacted quickly and, later in 1998, it created the Waste and Citizenship Programme, WCP



(Lixo e Cidadania in Portuguese), the first programme of its kind in the world. The programme included: i) the closure of open dumps in the country over a number of years; ii) the legalization and recognition of the work performed by catadores; iii) their participation in integrated waste management programmes at the national and state levels; iv) the incorporation of catadores into public-private partnerships; v) the No More Children in Dumps National Campaign in order to eradicate child labour in scavenging, particularly in open dumps; and vi) the National Training Programme for catadores in order to strengthen their organizations.

The WCP programme was funded partly by a loan from the World Bank. Its component to eliminate child labour in scavenging included the incorporation of catador families into a conditional cash transfer programme (Bolsa Escola in Portuguese, later renamed Bolsa Familia). In this programme, families with children working in recycling receive a monthly stipend with the condition that their children attend school and see a medical doctor regularly, paid by the government. The cash received monthly by the parents proved a powerful incentive to keep their children at school. By the end of 2005, the programme had enrolled more than 46,000 catador children, sending them to school and thus dramatically reducing child labour. This is the most successful programme in the world in reducing child labour in scavenging. Due to population growth, however, a 2009 study estimated that about 20,000 children nationwide still worked in scavenging.

Two federal government actions in support of catadores are particularly important. In 2002, the government legally recognized the work of the catadores and created a category for them in the country's Classification of Occupations. In December 2009, the government instituted a tax credit that industry can claim by consuming recyclable materials purchased

directly from cooperatives of catadores. This should be a powerful incentive for industry to buy materials from cooperatives, thus bypassing the middlemen, which could result in higher earnings for the co-ops.

In reaction to the WCP programme and the government's outreach to catadores, they created in 1999 the Movimento Nacional dos Catadores de Materiais Recicláveis (MNCR), a national federation of scavenger groups and organizations. MNCR represents 500 catador associations and cooperatives with 60,000 members from throughout the country. MNCR is perhaps the most active national association of scavenger groups in the world. MNCR has a national committee as well as five regional ones. The regional committees may include groups from one or more states. The national committee and some state committees hold annual national meetings and events. MNCR's main objectives are to represent catadores' views and interests to the rest of society, educate the public on the benefits of their work and incorporate catadores into recycling and waste management programmes.

One of MNCR's highest priorities is the promotion of separation of recyclables at the source, called coleta seletiva in Portuguese. Catadores could be integrated into source separation programmes, thus reducing the health risks of their contact with mixed wastes, improving their productivity and increasing their earnings.

MNCR organizes annual events and conventions as well as occasional national marches and rallies to bring attention to their problems. One of their annual events is called Grito dos Excluídos, which can be translated as Cry of the Excluded. The response to these events from the rest of Brazilian society has been mostly positive. MNCR has quickly become a household name in the country and has received support not only from the government, but also from the private sector and various foundations. They have

received financial support from Petrobras, the state oil company, the Caixa Economica Federal, a national bank, Natura, a cosmetics company, and the AVINA Foundation, among others. MNCR maintains an informative web page in Portuguese at <http://www.mncr.org.br/>.

The legalization and recognition of the recycling activities performed by catadores has translated into clear benefits. In 2006, the country's National Bank for Social and Economic Development (BNDES) created a programme to make loans to scavenger cooperatives for projects to improve infrastructure, acquire equipment, provide technical assistance and train catadores. As of January 2010, the bank had approved 57 loans totalling over US\$17 million. An evaluation of this programme conducted in 2009 revealed significant benefits to the cooperatives and its members: as a result of the loans received, the volume of the material collected increased by 20 percent and their capacity to process recyclables by 25 percent. Among the social benefits, 82 percent reported improvements in family relations, 80 percent improvements in hygiene, 80 percent responded that their diet had improved, and 70 percent expressed that their housing conditions were better.

MNCR received another important benefit in 2008: after five years of negotiations, it received a loan from the Caixa Economica Federal to build two housing complexes in the city of São Paulo for some of its members.

In 2009, MNCR received the National Human Rights Award from the Brazilian Government for its work in reducing poverty among catadores. But perhaps the most significant recognition of their work is the meeting that MNCR has had every year with the former president, Luiz Inacio da Silva, popularly known as Lula. **Brazil** is the only country in the world where the president meets regularly with scavengers.

The Brazilian private sector also supports catadores. CEMPRES (Compromisso Empresarial para Reciclagem), a non-profit industry association, has prepared an educational kit for scavengers and NGOs to help them in the creation of scavenger co-ops. CEMPRES publishes a monthly newsletter and manages a data bank on MSWM as well as a scrap broker hotline that answers questions about recycling. Coca-Cola, Mercedes-Benz, Nestle, Pepsi-Cola, Dell Computers and Procter and Gamble, among other companies, support CEMPRES financially.

As of early 2010, CEMPRES had assisted in the creation of 360 new cooperatives of catadores, which created about 10,800 jobs. CEMPRES's success has encouraged efforts to create similar programmes in **Argentina, Costa Rica, Mexico** and **Uruguay**.

The AVINA Foundation is the only donor organization in the world that has an initiative to support scavengers. It funds projects in several Latin American countries. Last year, the Foundation donated over US\$9 million to MNCR and 24 cooperatives of catadores in 10 Brazilian states, benefiting 1,500 individual members and creating 6,500 new jobs.

Catadores have formed hundreds of scavenger associations and cooperatives in **Brazil**. Many catadores complain about government regulations and the high taxes that cooperatives must pay. Scavenger associations are subject to fewer strict regulations and lower taxes. Not surprisingly, the number of scavenger associations has been increasing over the past few years.

ASMARE (Associação dos Catadores de Papel, Papelão e Material Reaproveitável), founded in 1988, was one of the first catador groups in the country. Originally created by 14 homeless scavengers with assistance from the Brazilian Catholic Church, it now has 250 members, 55 percent of them women. ASMARE recycles 450 metric tonnes of paper a month, mostly

cardboard, plastics and metals segregated at the source at schools, businesses, residences and office buildings. The volume of work nets members up to six times the Brazilian minimum wage. Higher incomes have translated into better working and living conditions for its members.

The Coopamare co-op in São Paulo collects 100 metric tonnes of recyclables a month, earning its members US\$300, twice the minimum wage in **Brazil**. By comparison, half of the country's labour force earns less than US\$150 a month. The success of scavenger associations and co-ops such as ASMARE and Coopamare has encouraged an explosion in the number of cooperatives of catadores. In Rio alone, 14 co-ops exist with 2,500 members. In Porto Alegre, scavengers were incorporated into the municipal curbside recycling programme, reducing overall costs and serving 79 percent of the city's 1.1 million residents.

For the first time in the country's history, the municipality of Diadema, in the São Paulo metropolitan area, began in 2005 to pay catadores per tonne of recyclable materials that they recover in the city. Catadores are paid the same amount per tonne that private collection companies receive for collecting mixed wastes from the city.

The catadores have a significant impact on the country's society, economy and environment. Several hundred thousands of them supply 90 percent of the materials that Brazilian industry recycles. Because of catadores' activities, **Brazil** has the highest recovery rate of aluminium cans in the world: 96 percent. No studies have been conducted, however, to estimate the economic or environmental impact of catadores' recycling activities.

The Brazilian experience in incorporating the informal recycling sector into waste management programmes demonstrates that several factors were

important for improving the working and living conditions of catadores. First, external assistance from the Catholic Church, various foundations and the private sector was crucial to help catadores organize. Second, UNICEF's involvement, including especially its study, was also important in calling the government's attention to the problem. Third, the formation of a national association of catadores and their lobbying and educational campaign allowed their efforts to be coordinated and focused on changing repressive policies and regulations towards catadores. Fourth, a friendly president can bring about significant changes in government policy to support scavengers. The Brazilian experience demonstrates that incorporating scavengers into recycling and waste management programmes can create jobs, reduce poverty, improve industrial competitiveness and protect the environment.

## II) COLOMBIA

Colombian waste pickers organized the first national scavenger cooperative movement in the world. The Fundación Social, a non-governmental organization, assisted waste pickers in the formation of cooperatives between 1986 and 2000. Faced with the loss of their livelihoods due to the construction of a new sanitary landfill in the city of Manizales, the Foundation helped 150 displaced families to form a cooperative. This successful effort encouraged the Foundation to assist waste pickers in other cities to also create cooperatives. In 1991, the Fundación Social launched its National Recycling Programme, which soon grew to include over 100 waste picker co-ops throughout the country.

The Foundation awarded grants and loans for specific projects and provided the co-ops with legal, administrative and business assistance as well as free consulting services. In 1998, the Foundation donated and made loans to the co-ops for over US\$800,000.

With the Foundation's support, waste pickers created national, regional and local associations of cooperatives. The Bogota Association of Recyclers, for example, represents 24 cooperatives with 4,500 members. The National Association of Recyclers assists any group interested in creating a co-op. The major goals of the Association consist in raising awareness of their problems and how their work benefits society and in improving the working and living conditions of Colombian scavengers.

The co-ops represent a wide variety of working conditions: some use pushcarts to transport materials, while others use horse carts or pickup trucks. Some co-ops, such as the Cooperativa Reciclar, in Cartagena, recover materials at the local dumps. Others follow established routes along city streets, retrieving items from containers placed at the curbside or from materials littered in public places. Still other co-ops take part in source separation programmes, collecting recyclables from households, offices, commercial establishments and small industries, sometimes under formal contracts.

Cooperatives created regional marketing associations, which allow them to sell recyclables at higher prices. Co-op members report a higher standard of living and improvements in empowerment, self-esteem and self-reliance compared to when they worked individually. Colombian waste pickers recover and sell over 300,000 tonnes of recyclables each year, mostly paper, glass, scrap metals, plastics and organics.

There are also 10 independent cooperatives. Cooperativa Recuperar, based in Medellin, is one of the most successful co-ops in **Colombia** and Latin America. It has over 1,000 members, 60 percent of them women. They earn 1.5 times the minimum wage and are affiliated with the Colombian system of socialized medicine. Members can receive loans and scholarships from the co-op and have life and accident insurance. Recuperar carries out three types

of activities. First, it offers solid waste services, such as collection of wastes and of source-separated recyclables. The co-op signed a contract with the city of Guarne for collecting, transporting and disposing of the wastes generated in the town. In 1996, Recuperar earned 30 million Colombian pesos and the contract saved the city 5 million pesos (approximately US\$30,000 and US\$5,000, respectively). The co-op operates a materials recovery facility, which recovered 5,000 tonnes of recyclables in 1998. Second, Recuperar provides cleaning and gardening services to the local bus terminal, private companies, public spaces, local fairs and conventions. Third, the co-op offers its members as temporary workers that can be hired by public or private organizations to perform various activities.

### III) ARGENTINA

Even though scavenging has existed in **Argentina** for over 100 years, in recent years the number of scavengers has increased significantly. The country's 2002 economic crisis caused massive unemployment. The unemployed had few alternatives to make a living. One of those alternatives was scavenging. Consequently, a large number of waste pickers, locally known as cartoneros, can be seen on the streets of many cities. In Buenos Aires alone, the number of cartoneros has been estimated at 25,000 and the number of people dependent on these activities at 100,000.

The currency devaluation of 2002 made imports – including raw materials – prohibitively expensive. Factories preferred to buy inexpensive waste materials recovered by cartoneros. Thus, the economic crisis and unemployment forced people to scavenge while providing local manufacturers powerful economic incentive for switching to recovered materials. There are currently over 14 cartonero cooperatives in Buenos Aires. Cooperativa El Ceibo, located in the capital's residential area of Palermo, has received the

most attention. The co-op has 102 members, most of them women. They have signed an agreement with the city government to provide services to an area covering 93 city blocks. Co-op members collect recyclables separated by participating residents at their homes. Therefore, the materials are relatively clean and the risks to residents' health are minimized. Further, source-separated materials also command a higher price. The city of Buenos Aires enacted a law in 2002 legalizing scavenging, recognizing the work of scavengers and supporting their activities.

#### IV) MEXICO

PET is commonly used to make soda and water bottles. Recycled PET is used to make new PET bottles with 10 percent to 20 percent recycled content. A 2010 life cycle inventory in the US found that, for every pound (454 grams) of PET that is recycled, energy use is reduced by 84 percent and greenhouse gas emissions by 71 percent.

**Mexico** is the second largest consumer of PET plastics in the world, after the US. This high level of consumption and the lack of recycling programmes in the country created disposal problems. PET bottles were often discarded everywhere in **Mexico**, ending up on the streets, roads and even in rural areas. The Mexican Government invited bottlers operating in **Mexico** to clean up their act voluntarily or to face regulatory action.

Mexican bottlers decided to create a nationwide PET recycling programme. They created Avangard, a private company, to purchase discarded PET from various sources, clean it, process it and then sell it for recycling. For several years, they sold recovered PET to **China**, where it was recycled. Then, in 2008, they decided to close the loop by recycling the PET within **Mexico** so that it could be used to make new PET soda and water bottles.

Mexico's PET recycling programme has created income opportunities for thousands of waste pickers who recover discarded PET bottles on the streets, waste disposal sites and other places. Avangard is one of the first private companies in the world to create a programme to improve the working and living conditions of scavengers in its supply chain. The main reason for scavengers' low incomes is the fact that middlemen pay low prices to scavengers. Avangard has decided to purchase PET directly from scavengers, eliminating the middlemen. Thus, scavengers can get higher incomes. Avangard has also financed both a programme to reduce child labour and a materials recovery facility where scavengers can work in better conditions. They also promoted the creation of a day-care centre for children of scavenger families and the formation of cooperatives. This programme is profitable and renders social and economic benefits as well.

#### V) THE PHILIPPINES

The Metro Manila Women Balikatan Movement, a non-governmental organization, created an innovative programme named Linis Ganda. Balikatan is Tagalog for 'shoulder to shoulder', emphasizing their willingness to work with the government to protect the environment. Linis Ganda is Tagalog for 'clean and beautiful'. Linis Ganda took advantage of the positive aspects of a previous system of itinerant collection and scavenging while improving it.

Originally developed as a formalized system of scavengers and itinerant buyers of recyclables working for middlemen in the city of San Juan, the programme is now composed of cooperatives. In 1983, the Balikatan Movement, headed by Ms. Leonarda Camacho, started organizing junk shops and households for the collection of recyclables. Inspired by recycling and composting programmes that she observed in Switzerland, Ms. Camacho tried to adapt the Swiss approach to the Philippine reality.



Balikatan conducted an educational campaign for the separation of dry waste (recyclables) and wet waste (basically, kitchen and food waste) among households and commercial establishments, informing them of the waste collection schedule, location and telephone numbers of participating junk shops. Balikatan also made arrangements with homeowners' associations for the entry of the collectors into gated communities on fixed days of the week.

Balikatan facilitated the granting of loans to junk shops and discussed with users of waste materials possible new materials that could be recycled. The Linis Ganda programme established a network of itinerant collectors, called "Eco Aides", who were given I.D. cards, green T-shirts and green pushcarts. There are two categories of Eco Aides: land-based and river-based. Land-based Eco Aides roam the streets and housing complexes, buying recyclables from households salvaging materials from garbage dumped in streets and back alleys, on fixed routes, Monday through Sunday.

Today, there are cooperatives in each of the 17 cities and towns that comprise Metro Manila. In this programme, each Eco Aide has a fixed route in which he/she purchases source-separated recyclables at households and schools. Eco Aides wear green uniforms and use green pushcarts, bicycles and boats. The cooperatives include 897 middlemen, each working with several Eco Aides. The co-ops can obtain low-interest loans and collateral-free loans from the Philippine Department of Trade and Industry as well as from the Land Bank (Medina, 2000). Linis Ganda plans to start composting operations and biogas recovery from market and slaughterhouse wastes in the near future.

More than 2,000 Eco Aides purchase 15,000 tonnes of source-separated recyclables per month from

nearly 300,000 households (approximately 20 percent of the total number of households) in MM. Eco Aides visit households once a week and schools twice a month. They buy various materials from households and mostly paper from schools. Their income ranges from 50 to 500 Filipino pesos (approximately US\$2 to US\$20) a day. Their earnings are higher on Sundays, when they work in wealthy neighbourhoods. In 2004, from a collection of about 210,000 tonnes of materials, they earned 268 million pesos (US\$10 million). Linis Ganda's activities also save 18 million pesos a year for the municipalities (US\$660 thousand). The programme recycles nearly 10 percent of wastes generated in Metro Manila at no cost to the government.

River-based Eco Aides collect recyclables floating on the San Juan River from small, single-person boats called bancas. Women comprise approximately 30 percent of the more than 100 river-based Eco Aides in the San Juan River. These Eco Aides usually earn higher incomes during the rainy season, as that is when strong streams wash away more materials.

Over the last few years, Linis Ganda has grown rapidly. Previously, each Eco Aide worked for a privately owned junk shop. Cooperatives can borrow money from banks to fund their operations at low rates (6 percent) without collateral. The breakdown of the recovered materials is as follows: paper, 28 percent; plastics, 25 percent; bottles and cans, 18 percent; and miscellaneous (wood, rubber, metals, etc.), 11 percent.

Linis Ganda has been highly successful in providing a stable income to Eco Aides; in supplying raw materials to industry and artisans; in helping clean the San Juan River and streets; in providing an extra income to households; and in reducing the pressure on waste collection and disposal services. The work of Eco Aides and independent collectors also has

environmental benefits. Recycling reduces water use, energy use, water pollution, air pollution and mining waste, compared with the use of virgin materials.

Besides Linis Ganda, numerous independent collectors work in other areas of Metro Manila. They have their own pushcarts or boats and working capital; they are not associated with any group, are not organized and do not have fixed routes. There are no estimates of their number or of the quantity of recyclables that they recover. However, informal observations made in several areas of Metro Manila suggest that the number of independent collectors is probably higher than that of Eco Aides. Many independent collectors do not have pushcarts; instead, they use plastic bags to store the recovered items, such as aluminium cans and Styrofoam cups. There are opportunities to incorporate these independent collectors and scavengers into formal programmes, similar to Linis Ganda.

## VI) BANGLADESH

As shown in Table 4, the waste generated in Dhaka, **Bangladesh**, is highly organic. With a population of nearly 7 million, the city only collects about 40 percent of the total waste generated. Uncollected and improperly managed organic waste is a source of pollution and disease. It can also clog drains and cause floods. But, if it is properly managed, it can become a resource.

In 1995, Waste Concern, a local NGO, created a community-based composting programme in order to improve organic waste management by using simple, low-tech, low-cost and labour-intensive methods. In 2006, Waste Concern was the first composting project in the world to receive Clean Development Mechanism (CDM) funds. Organic waste, if left uncollected or sent to an open dump or landfill, generates methane, a potent greenhouse gas. Composting reduces the generation of methane.

The composting CDM project processes 700 tonnes of materials/day and created nearly 1,000 jobs for low-income individuals. Households separate their organic waste and deliver it to the Waste Concern collectors, who transport it on bicycle carts to the nearest composting site. The resulting compost is blended with chemical fertilizer and sold to farmers.

With UNDP support, Waste Concern is creating an international composting training centre in order to promote composting.

Thus, composting can create jobs, reduce poverty, and protect human health and the environment.

## VII) TUNISIA

Post-consumer packaging was a significant problem in **Tunisia**. Discarded items such as bottles, cans and cartons could be commonly seen littering the roads and public spaces. In order to address the problem, the country's National Agency for the Protection of the Environment (ANPE) in 1997 created the ECO-lef programme, a national system for the recovery and recycling of post-consumer packaging.

Initially, the programme signed contracts with two private companies, which installed 470 bins throughout the country. Residents could voluntarily deposit their discarded packaging into those bins. The contents from each bin would be collected and taken for sorting and recycling. The result, however, was low public participation and a high collection cost per tonne. ANPE decided to take advantage of market forces by paying individual collectors per kilo of discarded packaging. ANPE helped set up collection depots with a scale, a baler and a storage area. As of mid-2010, there were 313 collection depots in the country. This system has provided income opportunities for about 11,000 people who have formed over 1,900 microenterprises.



The system has been so successful that, in 2011, ANPE introduced extended producer responsibility schemes for the collection, treatment and recovery of plastic packaging as well as for some e-waste, batteries, lubricating oil, oil filters and tires.

ECO-lef, with the collaboration of the informal collectors, collected 15,800 tonnes of plastic packaging waste for recycling in 2008. Depending on the type of polymer, 70 percent to 90 percent of collected plastic is captured by the system.

ECO-lef demonstrates that extended producer responsibility programmes can be successfully implemented in developing countries. The informal sector involvement in the collection of waste created income opportunities for disadvantaged individuals, increased total collection and reduced collection costs.

## VIII) SIERRA LEONE

**Sierra Leone** is one of the world's poorest countries. From 1992 to 2001, the country suffered a devastating civil war from which it is still recovering. As a result, its waste management systems face significant challenges. The World Bank estimates that, nationwide, only 45 percent of waste generated is collected. The country has no sanitary landfills. Collected wastes are taken to open dumps throughout the country. Uncollected wastes are thrown into vacant land or bodies of water or burned in the open. Therefore, most waste does not receive proper final disposal and thus pollutes the environment, creates breeding grounds for animals that could transmit diseases clogs drains and causes floods.

Waste management in the country has traditionally suffered from the lack of a legal framework, a weak transportation system, the scarcity of financial and qualified human resources, low worker productivity

and use of equipment that requires foreign spare parts and is difficult for local mechanics to repair.

In Freetown, the country's capital and largest city, only 37.8 percent of the waste is collected and transported to the dumpsites. The dumpsites are surrounded by slums, a fact that poses pollution risks to rivers and the ocean. Often, human excreta are mixed with solid wastes. In order to improve waste management in the country, the Government of **Sierra Leone** has taken significant steps to provide a clear strategy and guidance for the cities. The country's new Integrated National Waste Management Policy – released in October 2012 – intends to minimize the generation of hazardous wastes and to properly manage all hazardous waste that is generated.

The policy:

- Establishes a national programme for providing technical assistance, planning assistance and financial assistance to local governments in Municipal Solid Waste Management (MSWM)
- Promotes the establishment of resource recovery systems
- Promotes the reduction, recycling, reuse and treatment of solid waste
- Promotes education of the general public and training of MSWM professionals in waste prevention, recycling and proper disposal
- Encourages the development of waste reduction and recycling programmes through planning assistance, technical assistance, grants and other incentives
- Requires municipalities to develop and implement source separation, resource recovery and recycling
- Encourages local governments to pursue a regional approach to solid waste management

Not later than 18 months after the policy is effective, a National Health Care Waste Management Plan and a National SWM Plan must be prepared.

The new Integrated Waste Management Strategy comprises four programmatic areas:

*A) Waste minimization*

*B) Promotion of waste recycling and reuse*

*C) Promoting environmentally sound waste disposal*

*D) Extending waste disposal service coverage.*

Programme area A refers to reducing unsustainable consumption patterns and, as such, requires national-level policies. Programme area B requires collaboration of local authorities with the local informal sector. Programme area C requires the collaboration of local and national authorities based on appropriate and sustainable legal instruments and their effective implementation. Programme area D involves joint programming, with the formal and informal sectors playing a key role. Efforts in this area need to consider income-based differences in ability to pay.

The Integrated National Waste Management Strategy for **Sierra Leone** includes policy objectives for MSWM, health care waste management, liquid waste management, industrial waste management, hygiene and sanitation, and for institutional, legal and regulatory frameworks. The main goal of the Strategy was to achieve a 50 percent recycling rate by the end of 2014.

# 8. REDUCING EMISSIONS FROM DEFORESTATION AND FOREST DEGRADATION (REDD+) PROGRAMMES FOR INCLUSIVE GREEN ECONOMY MECHANISM AND POVERTY REDUCTION

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## BACKGROUND AND RATIONALE

Forests are more than sources of timber for construction and renewable energy. Forests support the livelihoods of local tenants and resource users in addition to a variety of economic sectors. As watersheds, they provide filtration for drinking water and irrigation and function as collection surfaces that feed the rivers driving hydropower installations. Forests are also dense havens of biodiversity for fish, plants, and wildlife; their natural beauty is ideal for recreation and creates demand for ecotourism. A small part of that biodiversity, forest-derived non-wood products, is uniquely valuable for its nutritional and medicinal attributes. Finally, forests actively capture and maintain carbon stores. Thus, they are an important tool for combatting climate change and moderating extreme weather events.

As an ecosystem and a productive asset, the management of forests is intrinsically linked to the social, economic and environmental well-being of the communities and countries that they supply. Reducing Emissions from Deforestation and Forest

Degradation (REDD+) programmes can provide a balancing force among this confluence of impacts, creating forestry sectors that embody an inclusive green economy mechanism for poverty reduction. In addition to their direct benefits to industry, forest-supplied services provide employment for local communities and indigenous groups. Incentivized conservation programmes like REDD+ help ensure the durability of all of these benefits.

In times of crisis, forest resources are a safety net that the global poor rely on for food, energy and income. The majority users of forest services in this context are women; this adds a well-defined gender dimension to the potential for causing disproportionate harm or for leveraging cost-effective gains. Sanitation and food preparation duties often fall on women; when income or markets prove insufficient, the responsibilities remain. In such times, women look to forests for food, fuel and clean water. Yet their capacity to bring their specific needs and concerns to institutional recognition is comparatively underdeveloped. That underdevelopment means increased returns on capacity investments. New efforts to protect forests could see those returns realized or they could bar access to an important

last resort. The former accelerates poverty reduction and economic development, while the latter exacerbates gender inequalities.

Woodland assets continually produce an immense wealth of public and private goods. Nevertheless, economic incentives often motivate the liquidation of these areas for short-term private gain. Deforestation not only destroys a productive asset, but also re-releases all of the previously stored carbon back into the system. Payment for Ecosystem Services (PES) approaches to averting deforestation offer financial recognition of the opportunity costs of maintaining forests intact as well as compensation for the many services that forests provide. PES programmes were at first project-centred and supported through municipal or national grants. Such local and national PES programmes have often focused on protecting watersheds as a cost effective alternative to water filtration installations.

A natural evolution of the PES model, REDD projects tend to be much larger in the scope of their funding, geography and time and political/policy engagement. An important point differentiating REDD from PES is the integrated consideration of programme impacts on the socio-economic well-being of programme participants. REDD also incorporates payments for additional services like biodiversity protection, sustainable management of forests and maintenance of carbon stocks. A further extension, termed REDD+, adds positive change to the REDD model through incentivized afforestation and reforestation.

Because of their innate links to poverty reduction, economic production and environmental sustainability, REDD+ projects can epitomize a green economy approach to sustainable development. However, the ultimate distribution of costs and

benefits depends on successful management of the trade-offs between conservation and livelihood outcomes. This paper aims to identify some common trade-offs and challenges that have been identified in case studies of PES and REDD+ projects. The applicability of these lessons learned extends to many other conservation programmes that also aspire to the inclusive green economy ideal.

## INITIATIVE DESIGN

*“Greening the forestry sector implies managing it and investing in it as an asset class that produces a wide range of benefits to society.” (UNEP, 2011)*

In order to attain conservation goals, PES programmes must at least meet transaction and opportunity costs taken on by resource managers in limiting withdrawals. Simultaneously, they need to enforce recognition of the needs and rights of the local populace to access ecosystem services. Reducing unconstrained withdrawals from forest resources decreases the ability of people to use them for their livelihoods. Without adequate support for building alternate sources of livelihood support, programmes risk trading environmental degradation for increased harm to the most disadvantaged sectors of society. In providing that support, planners must be aware of the programmatic choices that influence the trade-offs and synergies between the conservation and livelihood benefits drawn from forest commons.

## DECENTRALIZATION OF MANAGEMENT AUTHORITY & LOCAL RULE-MAKING FLEXIBILITY

One of the primary synergies between forest conservation and sustainable livelihood development lies in the engagement of local people

in the management of forests. Local autonomy in rule-making is a strong driver of positive outcomes for carbon storage and livelihoods. Furthermore, not only does local participation in rule-making contribute to sustainable forest outcomes, but lack of local participation actually undermines it. Local rule enforcement is a critical facet of local management. It is positively linked to forest regeneration, even with high levels of firewood extraction. Such enforcement proves more effective when local groups are engaged in rule-making processes. In the Maya forest in **Mexico**, community-managed forests are much less likely than government-protected areas to harm local people by denying them resource rights. At the same time, they still return equal or better conservation outcomes (Bray et al., 2008). In the Indian Himalayas, decentralized management allowed forests to be maintained at a much lower cost per hectare, significantly boosting efficiency (Somanthan, 2009).

### **BENEFIT-SHARING: LINKING ELIGIBILITY, CONTRACT DESIGN AND TRANSACTION COSTS**

The choice between offering individual and collective contracts has implications for how benefits are distributed and influences REDD+'s power to motivate change in land use patterns (Mahanty et al., 2013). Individual contracts increase the direct incentives for landowners to participate, but are costly to administer and risk excluding participants who are unable to afford transaction costs. Where suitable local institutions exist, group contracts have lower transaction costs for all parties and tend to promote formation of social capital, but such contracts have greater risk of being captured by elites. Brazil's Proambiente programme successfully merged the two approaches by making contracts with groups of farmers but providing actual payments to individual households (Bartels et al., 2010).

An analysis of three PES schemes in Viet Nam showed how high transaction costs, coupled with difficult eligibility requirements, risked deepening inequalities despite achieving positive conservation outcomes. The poorest of households are those that are least likely to be represented in official land records; strict tenure requirements effectively prevented this group from benefiting from commoditization of ecosystem services while still restricting their access to the forest (To, 2012). One discussion of the Angai Villages Land Forest Reserve in Tanzania proposes effort-based rather than output-based payment criteria if land use and ownership do not coincide (Mustalahi, 2012).

## **INITIATIVE IMPLEMENTATION**

### **DISTRIBUTIONAL AND PROCEDURAL EQUITY**

The inclusion of local people is critical to the achievement of livelihood goals of REDD programmes, in addition to broader objectives linked to poverty reduction and equity. For maximum benefit, local people must be the main contributors in defining their rights and obligations toward managing environmental risks.

The contrasting experience of two PES programmes in the rainforests of **Bolivia** and **Brazil** highlights the importance of including forest users throughout the life of the programme (Pereira, 2010). By bringing in local people after the design phase and limiting their involvement to approval of a pre-designed programme, designers can inadvertently impose impossible restrictions on extraction that undermine essential local respect for the programme.

Additionally, setting extraction limits and payment systems in a top-down manner can create a management system inattentive to entrenched

local inequalities. These imbalances are then exacerbated by the unaddressed bias in decision-making and distributive processes, which might at first glance be seen as inclusive.

Even with meaningful incorporation of local input, equity at the sub-community level is not a foregone conclusion. Allowing influence or compensation to flow according to wealth, class, age, ethnicity, religion or gender is contrary to the livelihood improvements that REDD+ aims to provide. For example, impediments like a membership fee or land ownership or bank account requirements could result in selecting poorer forest users out of partnerships to their detriment. Some countries have gone so far as to expand engagement of poor and marginalized populations through a poverty-aware targeting strategy. Other successful methods are the addition of socio-economic evaluation criteria to REDD+ applications and the relaxing of land size limitations for indigenous groups (Peskett, 2011).

### CRITICAL PARTNERS AND THE POTENTIAL FOR PUSHBACK

Community stakeholders and indigenous organizations frequently oppose REDD+ projects on the grounds that they lack safeguards for environmental justice. While their concerns are many and nuanced, a significant number boil down to the centrality of powerful incentives to deny local access to ecosystem services. Meanwhile, many perceive a lack of a similarly inherent counterbalance to protect forest users' needs and rights. Even where programmes are well considered, the fear remains that the livelihood benefits depend on inconstant governmental good will, while the costs do not. For example, the often-insecure tenure status of forest users creates an opportunity for elites to capture PES payments, shouldering forest users with the burdens

of conservation without any of the benefits. Others fear that the size and importance of the potential cash flows may push countries to recentralize forest governance, reversing the attendant gains. Still another concern is that that long-term commitments to maintaining forest cover might lead to decreased infrastructure investment, reinforcing regional underdevelopment.

### PARTICIPATION CHALLENGES

A fully inclusive, ground-up design process is needed to address forest users' concerns and ensure procedural and distributional equity in REDD+ programmes. Consultations are needed to determine the true cost and limitations of conservation and to build in satisfactory safeguards and compensation for negative externalities.

Integrating local participation into the management of protected forests in **Bangladesh** provided insights into the importance of local input in the institutionalization of participation (Hoque, 2012). Although these are not explicitly PES or REDD projects, forest users take on management responsibilities in return for a small share of timber sales and rights to extract fuel-wood and other non-timber services from formerly protected areas. Local partnerships with co-management institutions have resulted in significant gains in forest regeneration and livelihood improvements. However, criticism remains that forest users are still unable to influence decision-making, in part because they had little part in creating the institutional structure mediating their participation. This results in organizations bearing limited representation of, and accountability to, local forest users. As a result, the local population bears a disproportionate burden from forest conservation, mainly due to an uncompensated decrease in access to ecosystem services and employment opportunities.

## **ASSESSING SOCIAL OPPORTUNITY COSTS**

Without assessing the costs that arise from the loss of social and cultural benefits caused by changes in land use patterns, REDD+ projects risk encouraging leakage from culturally driven carbon use and diminishing successes with respect to social progress and poverty reduction goals. The opportunity costs used to set payment levels are generally expressed in terms of dollars per hectare. The figure is arrived at through consideration of the most profitable use of land, but cannot comprise highly valued, yet non-monetizable benefits. This leads to unaddressed opposition to conservation efforts and risks potential disruption of social ties that local deforestation institutions rely on for enforcement.

A case study in remote Honduran Miskito communities revealed that community values and practices pivot around forest use, which has strong ties to cultural autonomy and cultural identity (Plumb et al., 2012). Most agriculture is undertaken for subsistence and not for market purposes, and communities lack significant transportation infrastructure, making meaningful opportunity cost analysis problematic. Although some activities are clearly undertaken for income generation, community members focus on cultural rather than economic values when asked about why they are important. In indigenous subsistence settings, monetary incentives may not be the dominant driver of land use decision-making. Attempting to influence culturally driven carbon consumption solely through monetary payments may lead only to displacement to other areas. This need to identify non-market values reinforces the importance of participatory programme design.

## **COLLABORATIVE CAPACITY DEVELOPMENT**

Investment in the capacities of civil society and governmental organizations to leverage local participation may help create the legitimacy needed to allay some opposition to REDD+ (Larson, 2011). Support is needed to establish transparency mechanisms that encourage local feedback. In addition, forest and environmental governance institutions need the capability to enforce regulations and resolve conflict. For public engagement to be effective, isolated and marginalized groups need investments directed at improving their understanding of their rights and their ability to undertake procedures for redress. As has been discovered in Tanzania, even very high-quality institutional structures for public participation can be hampered by a lack of knowledge and ability on the part of forest users to claim their rights (Rantala, 2013). Examples from Bolivian communities suggest that confusion about rules, rights, boundaries and the scope of collective action is a common cause of conflict. In essence, when individuals perceive a failure of communal rights, it may drive them to maximize their own benefit without regard for the welfare of a 'broken' system (Cardona, 2012). Contradictory rules and community power imbalances easily motivate breakdowns; however, misinformation and limited capacity to claim rights are just as influential and can pose relatively low-hanging fruit to address.

## **GENDER EQUITY**

Programmes for forest conservation present powerful synergies with gender equality goals. As in any sector with inclusive green economy opportunities, gender equity improvements reduce poverty by directly benefiting half of the population. Men reap indirect benefits as well, due to the increased economic production stemming from women's human capital investments. Often the majority group interacting



with the forest, women have the potential to improve the efficiency, efficacy and sustainability of conservation efforts. Conversely, REDD+-motivated conservation can improve women's empowerment by more meaningfully engaging them in poverty reduction efforts. Differences in gender roles and responsibilities extend to forest uses, which creates differentiated knowledge about the forest itself. Consequently, those differences result in gender-specific access requirements and create unequal hardships when those needs are violated.

Community forest groups have previously shown gender disparities in participation in decision-making and in the sharing of costs and benefits of conservation efforts. A case study of several such groups in **India** and **Nepal** showed that, despite having a disproportionately small share in management processes, women still play a role in patrolling the forest and firefighting. In addition to the direct costs of conservation (time and group dues), women also bear the significant burden of having to travel further to gather wood for cooking.

Where income is generated from deforestation prevention, it is typically distributed to males. This is often because these groups require membership fees; it is the men who tend to control household expenditure, so it is the men who pay the fees and are therefore considered members. Even when membership dues are not a factor, women's attendance in community forestry groups tends to be limited by the time requirements imposed by gendered divisions of labour. A similar outcome arises when benefits are distributed on a per-household basis; the payments tend to go to the men.

The primary challenge to engaging women consists in addressing asymmetries of power. Regulations requiring a minimum level of female participation in decision-making bodies have met with some success

(Lewark et al., 2011). In some cases in **Nepal**, there are even examples of forest committees exclusively run by women. These rare instances showed improved outcomes for forest sustainability, financial management and integration of gender-sensitive policies. Nevertheless, in looking at African and South American community forestry groups, it is clear that an even gender balance is best (Mwangi et al., 2011). This is perhaps because including men and women helps alleviate imbalances in technology access and sanctions authority while also incorporating the knowledge and needs of men and women. This, in turn, increases the chances of sustainably improving livelihoods while also providing the broader poverty reduction benefits attendant to reinforcing gender equity.

Even when women are included in meetings, social expectations may prevent them from expressing their views. While it is good to encourage their participation, it is also important to realize that women are subject to a system of power relations; foisting roles onto them in ignorance could carry an unknown social price. Holding separate women's groups outside of plenary meetings has helped to encourage women to provide input without also requiring them to take norm-defying steps that they are not ready to take.

Providing training and economic support helps increase women's bargaining power in decision-making processes. Interviews of female forest users in Nigeria show a high correlation between the amount and frequency of training and participation in forestry management activities. In addition, respondents expressed strong demand for additional training, but stated that time constraints kept them from attaining it (Agbogidi et al., 2009).

Unfortunately, the development of country REDD+ documents is often marked by very limited consideration of gender issues and a lack of

involvement by women in decision-making processes (Peach Brown, 2011). REDD+ strategies need to go beyond vague statements about the need for equality and to try to establish specific mechanisms and strategies to address power imbalances that exclude women and women's issues.

Without being able to compensate for differences in negotiating power, even when women's input is successfully documented, it risks being ignored, as happened during the establishment of the Derema corridor conservation project in Tanzania (Rantala, 2013).

## DRIVERS AND POLICY IMPLICATIONS

### SIGNALLING READINESS – VOLUNTARY FOREST CERTIFICATION

A comparison of two Peruvian REDD+ cases has suggested that voluntary forest certification schemes could be an indicator of the presence of transparency and accountability in governance institutions – important prerequisites to successful implementation (Pettenella, 2012). These mechanisms support the inclusive aspects of REDD+ that are critical to the equitable distribution of costs and benefits of the conservation scheme.

In a comparative analysis of voluntary forest certification standards, no one standard stands out as having comprehensive coverage of social, conservation and sustainable forest management criteria. One Peruvian project is using a combination of standards in order to better meet the requirements of carbon offset purchasers. It participates in the Forest Service Council (FSC), the Climate, Community & Biodiversity Alliance (CCBA) and the Verified Carbon Standard (VCS) certification systems. FSC certification provides best practices

in sustainable forest management, but its scope does not include important poverty alleviation and carbon monetization concepts needed for triple-wins. Despite the extra cost, the biodiversity and community engagement criteria in CCBA and the monitoring and reporting of GHG benefits from VCS have been helpful in demonstrating the quality of the green economy approach to investors.

### DATA QUALITY

Through an investigation of combined conservation development projects with win-win, win-lose and even lose-lose outcomes, researchers identify several factors that can contribute to either success or failure in trade-off management (Tallis, 2008). Among the most important are high-quality data describing the costs and benefits of different services. Changes in ecosystems take time and long-running data collection is needed to create a solid link between land use and service degradation. Further information is needed to concretely demonstrate that degraded services negatively impact livelihoods, reinforce poverty and erode gender equality.

Understanding how benefits of ecosystem services flow between groups and regions is a prerequisite to knowing what would be needed to compensate the conservation of natural resources. Such knowledge is also key to understanding the redistributive consequences of PES, REDD+ and any other natural resource conservation projects hoping to drive poverty reduction.

### ENABLING CONDITIONS

This paper highlights some of the most critical trade-offs contributing to successful inclusive green economy outcomes for REDD+ projects. Leveraging local management and social institutions has special implications for establishing mechanisms that help

ensure procedural and distributional equity. Without incorporating an inclusive aspect into planning and management phases, the needs and rights of local people to access ecosystem service become vulnerable. Furthermore, participation has to be compared against local demographics on a variety of criteria (gender, age, income, race, ethnicity, religion, etc.) in order to assure that local engagement is succeeding.

While not exhaustive, the prerequisites presented here are a significant part of ensuring the just and equitable distribution of REDD+ project benefits. Heeding the necessity of truly inclusive and meaningful local engagement provides balance across many conservation sectors, not only among groups and individuals, but also among the three facets of an inclusive green economy: poverty reduction, economic development and environmental sustainability.

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**TOWARDS GREEN AND INCLUSIVE  
PROSPERITY** – BUILDING GREEN  
ECONOMIES THAT DELIVER ON  
POVERTY REDUCTION

**CASE STUDIES**