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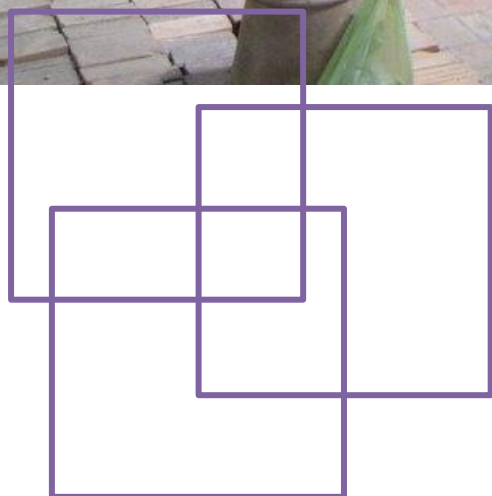


International
Labour
Organization



Value chain development for green
jobs in Asia

Volume I:
Methodological guide



Regional Office for Asia and the Pacific

Value chain development for green jobs in Asia

Volume I: Methodological guide

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Foreword

Recent decades have witnessed an increasing recognition of the urgent need to decouple economic growth and improvements in material well-being from environmental degradation and the overexploitation of natural resources.

In response to this, the International Labour Organization (ILO) has developed the concept of green jobs, broadly defined as direct employment in economic sectors and activities which reduces their net environmental impact and ultimately reduces it to levels that are environmentally sustainable.¹

The Green Jobs Initiative supports a concerted effort by governments, employers, and trade unions to promote environmentally sustainable jobs and development in a climate-constrained world. It seeks to facilitate a just transition that reflects the environmental, economic and social pillars of sustainable development. The development of this initiative has highlighted the need within the ILO for an update of its existing value chain development methodologies to better incorporate environmental sustainability issues.

Building on the ILO's extensive experience in pioneering value chain approaches to development, this guide will outline a framework for integrating the conventional, market-focused approach to value chain development with an assessment of the environmental and social outcomes generated by a given sector, with the aim of promoting employment that is environmentally, socially and economically sustainable.

Regional Office for Asia and the Pacific

¹ Developed in concert with the United Nations Environment Programme (UNEP), the International Organization of Employers (IOE) and the International Trade Union Confederation (ITUC).

Contents

Foreword.....	iii
Contents.....	v
Abbreviations.....	ix
Introduction.....	1
Methodology	1
Using the guide.....	2
Section 1. Analytical framework for green jobs value chain development	4
1.1 The green jobs concept.....	4
1.2 Decent work	4
1.3 Green growth.....	5
1.4 Green jobs value chain development	9
1.5 Green jobs value chain methodology	12
Section 2. Sector selection for green jobs	15
2.1 Defining sectors as market systems	15
2.2 Sector selection using green jobs criteria	17
Section 3. Value chain research mapping	34
3.1 Value chain overview map (processes and actors).....	34
3.1.1 Mapping processes	34
3.1.2 Mapping actors (direct, operational and supporting service providers)	35
3.1.3 Value addition/distribution	39
3.1.4 Cost/margin analysis.....	41
3.2 Qualitative mapping: value chain governance	42
3.3 Environmental impact assessment	43
3.4 Decent work mapping	47
Section 4. Value chain analysis and intervention design	49
4.1 Focussing on specific deficits and markets within the value chain system	49
4.1.1 Prioritizing environmental and social deficits within the value chain system	49
4.1.2 Assessing current and potential value chain performance.....	52
4.2 Developing a framework for finding sustainable upgrading solutions in value chain systems	55
4.2.1 Analysis of key constraints and options for intervention	55
4.2.2 The role of participation in intervention design and implementation	59
Section 5. Implementation, monitoring and evaluation	60
5.1 Developing a framework for intervention monitoring and evaluation.....	60

5.1.1 Intervention assessment and indicator development	61
5.2 Intervention monitoring and evaluation	64
5.2.1 Monitoring and adaptation during implementation	64
5.2.2 Post-implementation evaluation	65
5.3 Case studies: learning from experience within green jobs interventions	66
5.3.1 Case study 1: Brick industry (Viet Nam)	66
5.3.2 Case study 2: Glass industry (India)	69
5.3.3 Case study 3: Implementation of green policies in Malaysia	73
Bibliography	75
Annex	77

Tables

Table 1. Local environmental impact	21
Table 2. Decent work selection criteria	23
Table 3. Green growth selection criteria	24
Table 4. Current livelihood impact selection criteria	25
Table 5. Potential livelihood impact selection criteria	27
Table 6. Technical feasibility selection criteria	28
Table 7. Organizational feasibility selection criteria	29
Table 8. Potential impact assessment categories	46
Table 9. Decent work indicators (discretionary)	47
Table 10. Example aspect significant assessment (individual stage)	51
Table 11. Identification of impact hot spots	52

Figures

Figure 1. Relationship between sectors and value chain	16
Figure 2. The market system model	16
Figure 3. Sector selection examples	32
Figure 4. Initial process-based flow chart	34
Figure 5. Initial actor-based grid chart	35
Figure 6. Support service provider chart	36
Figure 7. Initial volume chart	38
Figure 8. Employment grid chart	38
Figure 9. Concept of calculation of value addition	39

Figure 10. Value addition along the supply chain	40
Figure 11. Distribution of value/revenue along the value chain.....	41
Figure 12. Example – cost calculation related to rice value chain in Cambodia	41
Figure 13. Mapping linkages	42
Figure 14. Value chain diagram incorporating environmental impacts.....	46
Figure 15. Value chain diagram incorporating decent work impacts	47

Box

Box 1. Environmental benchmarking – brick kiln performance in Asia	54
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Abbreviations

BOP	best operating practices
BTK	Bulls Trench Kiln
CFC	chlorofluocarbon
CO ₂	carbon dioxide
CO ₂ e	carbon dioxide equivalent
DFID	Department of International Development
ETx	Eco toxicity
GDP	gross domestic product
GTZ	Gesellschaft für Technische Zusammenarbeit
HML	High/Medium/Low
HTx	Human toxicity
ILO	International Labour Organization
IOE	International Organization of Employers
ISO	International Organization for Standardisation
ITUC	International Trade Union Confederation
kcal/kg	kilocalorie per kilogramme
KeTTHA	Ministry of Energy, Green Technology and Water
kWh	kilowatt-hour
LCA	Life Cycle Assessment
LCI	Life Cycle Inventory
M4P	Markets for the Poor
MYR	Malaysian Ringgit
NGO	non-governmental organization
ODI	Overseas Development Institute
OECD	Organization for Economic Cooperation and Development
OSH	occupational safety and health
PM	particulate matter
PO ₄ ³	phosphate
PPP	purchasing power parity
R&D	research and development
RSPM	respirable suspended particulate matter

SDC	Swiss Agency for Development and Cooperation
SHG	self-help groups
SME	small and medium-sized enterprise
SO ₂	sulfur dioxide
SPM	suspended particulate matter
TERI	The Energy and Resources Institute
UNEP	United Nations Environment Programme
USAID	United States Agency for International Development
VOC	volatile organic compound
VSBK	Vertical Shaft Brick Kiln
VSBP	Viet Nam Sustainable Brick-making Project

Introduction

Methodology

This guide focuses on the specific challenges and opportunities for green jobs promotion in Asia. In regional terms, developing economies in Asia are now a substantial contributor to global greenhouse gas emissions, with total emissions forecast to continue increasing at a rapid rate in line with current economic growth trends.

Alongside climate change, developing Asia is also subject to a range of local and regional environmental challenges, including deforestation, land use change and degradation, air and water pollution, and overexploitation of resources. At the same time, the region continues to face a number of other key development challenges, including the generation of sustainable value-generating employment opportunities without compromising on core labour standards.

The dual environmental and social challenges facing the region demonstrate the need for an approach to value chain development that more accurately and systematically recognizes the environmental and social impacts of individual value chains, while also promoting increased employment and livelihood generation. Central to the green jobs intervention design process is therefore the identification and promotion of co-benefits – that is, interventions that promote positive outcomes in more than one of the green jobs focus areas (global environmental impact, local environmental impact, decent work and livelihoods).

The methodology is therefore designed to identify and promote opportunities for change along a number of axes (social, environmental and economic) simultaneously. For example, the introduction of new technologies or best operating practices (BOP) in resource-intensive industries may simultaneously reduce environmental impacts (through increased resource efficiency), improve decent work performance and contribute to increased competitiveness. A successful green jobs intervention is therefore one which decouples (to a greater or lesser extent) the production of a good or service from its negative environmental and social impacts, while maintaining or increasing value generated and market competitiveness within the value chain in question.

In attempting to achieve sustainable long-term change, the methodology emphasises the importance of engaging with the underlying structural factors determining outcomes within the market system. Environmental and social outcomes in developing Asia are often subject to few or no price signals (the economic incentives that drive behaviour), and suffer from insufficient or non-existent public regulation and oversight. The externalities these conditions generate disrupt the optimal allocation of resources, often leading to chronic market failures. These market failures are then frequently compounded by a range of perverse incentives generated by actors within the market system.

Reducing the environmental and social externalities generated by the value chain therefore requires not just a firm-level cost or competitiveness analysis, but an engagement with the wider business enabling environment within which competition occurs. It also requires a detailed understanding not just of the value chains' current performance, but of dynamic change in response to altered incentive structures (with the goal of reducing distortions and therefore promoting the achievement of more efficient market outcomes). In achieving this –

and in keeping with the ILO's promotion of tripartite social dialogue – the methodology therefore advocates the use of a market systems approach which involves engagement not only with firms but also with government bodies and worker's organizations, with the ultimate goal of promoting change that is both substantial and durable.

Using the guide

In line with the ILO's existing approach to value chain development, the guide is designed to be used primarily in employment-intensive sectors, with a focus on small and medium-sized industries. Amongst the sectors most likely to generate opportunities for green jobs value chain interventions include agriculture and agro-industry, energy, forestry, construction (including public works), transportation, basic industry and waste management, although the methodology is also potentially applicable to other growth and niche sub-sectors.

This publication is designed to be accessible to organizations and individuals with existing experience in value chain analysis and promotion activities. It is intended to be complementary to existing value chain development frameworks such as the Gesellschaft für Technische Zusammenarbeit (GTZ) Value-Links approach, the Department of International Development's (DFID) Markets for the Poor (M4P) approach and the United States Agency for International Development's (USAID) microlinks tools, particularly in relation to market appraisal and development activities, and can be applied in concert with these.

Structurally, the guide is divided into two volumes: *Volume I* (methodological guide) outlines the structure and key elements of the methodology, while *Volume II* (operational guide) provides further examples and practical guidance on field implementation of the methodology. The methodology can be applied to several modes of green jobs promotion, including the promotion of eco-efficient production and decent work standards within an existing sector, promotion of additional decent employment in a (potentially new) low-impact sector, and promotion of decent work within existing employment in a low-impact sector.

The green jobs value chain development methodology has been designed to facilitate effective multi-year, sector-wide value chain interventions. It is recognized, however, that the financial resources, time and skill-sets necessary to implement such projects effectively may be unavailable to many organizations, and also that for other operational or policy reasons intervening organizations and their funders may wish to apply the methodology solely to specific regional and local sub-sector value chains. This guide therefore provides guidance on the application of the methodology to two differing levels of detail: a short version (Approach A), recommending certain minimum standards in relation to impacts assessed and performance indicators selected; and a full version (Approach B) outlining the recommended approach for strategic regional and national green jobs promotion programmes (see Annex for further details).

The basic approach (Approach A) provides an accessible minimum assessment framework within which projects with limited timescales and resources can focus on the aspects of performance most relevant to their aims and objectives. Using the basic approach, the methodology may be applied to a limited number of stages or actors within an individual value chain to identify and exploit short or medium-term upgrading opportunities which are

unlikely to require multi-year and/or technical interventions, and which are unlikely to require substantial changes to the incentive structures governing the market system or wider business operating environment. On this basis, it is expected that a project undertaken using the basic approach will primarily play a narrow facilitation or brokerage role in any interventions identified in the research and analysis stage, using a range of participatory methods to maximize engagement among sector actors.

The full approach (Approach B) has been designed to provide a comprehensive and credible framework for strategic sector engagement at a regional and national level. It is intended to provide the information necessary to develop complex multi-year interventions aimed at achieving systemic change at scale. Participation and engagement with market actors is more likely to be focused at a strategic level, and involve efforts not only to adapt to existing incentive structures and capacities, but to actively reshape them in order to deliver improved outcomes. It is expected that projects adopting the full assessment approach will require a greater degree of technical expertise within the project team, particularly in relation to the environmental aspects of the research and analysis stage, and in the development and implementation of interventions involving new technologies and processes.

Section 1. Analytical framework for green jobs value chain development

Summary

The purpose of this section is to provide a basic outline of the green jobs concept, including the concept of decent work, and its integration into the value chain approach to development. A summary of the five basic steps within the green jobs value chain development methodology is also provided.

Outcomes

- An understanding of the Green Jobs Initiative.
- An understanding of the concept of decent work and its role within the Green Jobs Initiative.
- An understanding of the green jobs value chain development approach, including aims and methodology.

1.1 The green jobs concept

Definition of green jobs The **Green Jobs Initiative** is a joint initiative by the UNEP, the ILO, the IOE and the ITUC. The initiative supports a concerted effort by governments, employers, and trade unions to promote environmentally sustainable jobs and development in a climate-challenged world. It seeks to facilitate a ‘just transition’ that reflects the environmental, economic and social pillars of sustainable development.

Green jobs can be broadly defined as **direct employment in economic sectors and activities which reduces their net environmental impact and ultimately reduces it to levels that are environmentally sustainable (ILO, 2011).**

Specifically, but not exclusively, this includes jobs that protect ecosystems and biodiversity; reduce energy, materials, and water consumption through high-efficiency strategies; de-carbonize the economy; and minimize all forms of waste and pollution.

Following the definition of decent work provided by the ILO (outlined in greater detail below), green jobs are also decent jobs offering offer adequate wages, safe working conditions, job security and worker rights.

1.2 Decent work

Definition of decent **Decent work** is defined by the ILO and endorsed by the

work

international community as **productive work for women and men in conditions of freedom, equity, security and human dignity (ILO, 2011).**

Decent work involves opportunities for work that: is productive and delivers a fair income; provides security in the workplace and social protection for workers and their families; offers prospects for personal development and encourages social integration; gives people the freedom to express their concerns, to organize and to participate in decisions that affect their lives; and guarantees equal opportunities and equal treatment for all.

It incorporates (but is not limited to) the ILO's core labour principles of:

- (a) freedom of association and the effective recognition of the right to collective bargaining;
- (b) elimination of all forms of forced or compulsory labour;
- (c) effective abolition of child labour; and
- (d) elimination of discrimination in respect of employment and occupation.

Decent work also includes the promotion of other ILO standards, such as occupational safety and health (OSH).

The decent work concept can serve as a coherent policy framework to the mutual benefit and improved integration of macroeconomic, investment, employment, social protection and environmental policies and objectives. Investing in green employment and taking an integrated approach to decent work presents an opportunity for reducing environmental impacts, improving the living environment and addressing poverty while increasing the competitiveness of enterprises and economies.

1.3 Green growth

Concept of green growth

The transition towards a greener economy, which entails reorienting growth to ensure that equal weight is given to the economic, social and environmental pillars when setting objectives, is of critical importance. The term green growth has emerged to encompass modern day notions of environmental stewardship and inclusive sustainable development. Green growth is defined by the Organization for Economic Cooperation and Development (OECD) as a process of “maximizing economic growth and development while avoiding unsustainable pressure on the quality and quantity of natural assets [...] harnessing the growth potential that arises from transitioning towards a green economy” (OECD, 2012).

Investment in social and human capital development are crucial to achieve sustainable development with poverty eradication whilst seizing the benefits of green growth. However, employment and social implications of a shift towards green growth will be strongly

influenced by the economic structure and the sectoral composition of economies. Key economic sectors will be affected, either because they are directly resource and climate dependent (such as agriculture, fisheries and forests), or because they are large consumers of resources or significant polluters (such as agriculture, forests, energy, transport, buildings and industry) and/or have considerable potential to reduce environmental impacts (all of the above). Indeed, the move to a greener economy will entail significant changes for labour markets and incomes. On the other hand, if the right human capital strategies are implemented together with appropriate mechanisms for social dialogue, green growth can unlock the potential of higher employment, better employment conditions and higher resource productivity, mitigating any adverse effects of structural change.

However, green growth is unlikely to occur through free, unregulated markets alone since the current price mechanism does not adequately reflect environmental costs. It is therefore essential that governments play an active role in correcting market inefficiencies by supporting investment and employment opportunities in green economic sectors and in greening the whole economy. Accordingly, governments can encourage private sector investment through a range of policy and market-based instruments which, when carefully designed and implemented, have the potential to drive the promotion of environmentally sustainable enterprises with decent jobs.

The main economic drivers for green growth taken up for analysis by the green jobs value chain development methodology are discussed as follows:

- (a) improved resource efficiency;
- (b) green products and services eco-innovation;
- (c) green certification accessing new markets;
- (d) green business development services and finance; and
- (e) green rules and regulations.

Improved resource efficiency

Green growth implies a reduction of environmental impact through the achievement of a higher degree of resource efficiency (i.e. energy and material efficiency) in the production of goods and services. Because resource inputs represent an important production cost for industries, measures aimed at supporting enterprises improve their environmental and resource efficiency have the potential to help boost their competitive advantage and profitability, improve the sustainability of their growth, and stimulate job creation. This can have ancillary positive effects throughout the supply chain. As such, the greening of enterprises can also lead to greater energy security and reduced costs through increased productivity, thereby potentially contributing to poverty alleviation efforts, notably in industrializing countries.

Adopting environmentally sound practices and technologies at the enterprise level can be part of a strategy to maintain or improve

competitiveness, both in terms of cost-savings, and the opening of new market niches.

Green products and services eco-innovation

Governments can help to create an enabling environment for sustainable enterprises by implementing regulatory and fiscal measures which promote demand for green products and services and drive green investments, in particular for small and medium-sized enterprises (SMEs). A well-designed legal and regulatory framework, coupled with supportive demand-side policies can encourage the uptake of **eco-innovations**: technologies, products, and services that reduce environmental impact, improve resource efficiency, and minimize pollution.

Green certification accessing new markets

Developing official certification systems for environmentally-friendly businesses can assist governments promote sustainability improvements while increasing the visibility of green products and services available on the market. In this way, such initiatives as standards and labels may comprise an effective strategy for steering enterprises and self-employed workers toward socially and environmentally responsible behaviour, while creating and expanding new market opportunities. Governments can incentivize green certification schemes through the introduction of awards and ratings programmes aimed at stimulating investments in the greening process.

Green business development services and finance

SMEs often face challenges in becoming more environmentally sustainable and grabbing the benefits of a green economy due to limited information, budget constraints and lack of in-house technical expertise. In this context, green business development services can play a key role in linking green business partners and in greening the value chains. Green business development services refer to a wide range of support provided to small enterprises designed to enhance environmental performance with the broader purpose of contributing to economic growth, employment generation and poverty alleviation. These services can encompass a variety of activities, including training, financial and technical assistance, coaching, and consulting/advisory services, aimed at delivering cost savings and efficiency improvements in the areas of raw materials, energy and water usage, recycling and the management of greenhouse gas emissions, among others. In addition to supporting green public initiatives and green businesses, governments can publicize information on how businesses interested in environmental sustainability initiatives may obtain funding from banks and commercial lending institutions.

By combining policy instruments such as market-based instruments, regulations, public investment, procurement policies and awareness-raising, governments can support enterprises and create an enabling environment which promotes the adoption of green workplace practices, investments in new green products and services and job creation. These instruments can impact a variety

Green rules and regulations

of factors involved in ensuring environmental quality, including fuel efficiency, renewable energy, increased energy efficiency, material efficiency and final demand. Such tools can include:

- **Market-based instruments** such as taxes, charges, tradable permits, guaranteed prices, subsidies, grants, rebates and loans on favourable terms can stimulate technological innovation and competitiveness, providing incentives for private investment and for the greening of enterprises. On one hand, taxes related to environmental issues can address consumption and production (and inputs in production), whilst existing subsidies on water, energy and raw materials which impede environmental efficiency in enterprises can be modified or reduced. On the other hand, targeted subsidies, such as tax credits and feed-in-tariffs, can also help to promote transitions to more environmentally sustainable modes of production by encouraging the use of clean energy and low-carbon technologies.
- **Regulatory instruments** include environmental norms, standards, emissions abatement policies, quotas and mandates, as well as national/regional laws and regulations. Regulations can take a variety of forms, but are mainly **command and control** in nature, i.e. implemented via legislation that sets the standards for such activities and designates relevant authorities as responsible for monitoring compliance (although in some instances compliance may be self-reported by industry). Renewable portfolio standards, such as those which mandate that electricity suppliers acquire a minimum amount of power from renewable energy sources, serve as one important example.
- **Public investment** is another tool that can help to facilitate green growth and green jobs. Public procurement policies, for example, enable governments to favour product designs which are more environmentally sound. This can play a strong role in influencing particular value chains and encouraging the private sector towards a green transition, playing a complementary role to larger market-based mechanisms. Public investments of this nature may involve direct financial support to private green research and development (R&D) efforts or strengthening public research in that direction.
- **Information-based instruments** such as green standards, eco-labelling and public information campaigns can raise awareness on the benefits of environmental improvements while stimulating demand for green products and services. The establishment of supporting institutions can assist enterprises in meeting standards and obtaining certifications. **Voluntary initiatives** undertaken by industry, such as certification for businesses which meet certain environment criteria, can also be endorsed by government and supported with appropriate incentives to catalyze private investment.

1.4 Green jobs value chain development

Adapting the value chain approach for green jobs promotion

The value chain approach takes as its unit of analysis **the full range of activities that are required to bring a good or service from its conception to its end use**. Detailed value chain analysis can provide us with a range of tools with which to understand the actors, processes and relationships within a given value chain, and provide a basis upon which to make evidence-based recommendations for interventions.

The green jobs value chain development methodology seeks to integrate the conventional market-focused approach to value chain development with an assessment of the environmental and social outcomes generated by a given sector, with the aim of promoting employment that is environmentally, socially and economically sustainable.

The importance of co-benefits

Central to the Green Jobs Initiative is the concept of co-benefits, the achievement of positive and mutually reinforcing outcomes across several focus areas. By design, the *Value chain development for green jobs in Asia* actively promotes co-benefits, for example, a value chain intervention in a small-scale industrial cluster could simultaneously generate global environmental benefits (reduced greenhouse gas emissions), local environmental benefits (reduced particulate emissions) and decent work benefits (improved worker safety), whilst also improving quality, profitability and growth prospects.

Some environmental benefits may be coterminous with improved productivity or competitiveness – for example, increases in energy and resource efficiency through improved working practices may also reduce input costs and improve quality, thus enhancing competitiveness. Other benefits may not accrue directly to the participants in a value chain, but may (in the nature of environmental outcomes as public goods) accrue to external actors.

Facilitating a just transition

The purpose of the Green Jobs Initiative, and within this the green jobs value chain approach, is to reduce the environmental impact of existing value chains, and promote new, more sustainable economic activities with a view to facilitating a gradual “just transition” to an economy that delivers both viable livelihood opportunities and improved environmental and decent work outcomes.

Green jobs in Asia: opportunities and challenges

Although per-capita carbon emissions in developing Asia remain low, the region is now a substantial contributor to global greenhouse gas emissions, with total emissions forecast to continue increasing at a rapid rate in line with current economic growth trends. Alongside climate change, developing Asia is subject to a range of local and regional environmental challenges, including deforestation, land use change and degradation, air and

water pollution, and overexploitation of natural resources.

Accepting the premise that developing Asia will follow the broad development trajectory of other countries (including for example increasing urbanisation and continuing increases in manufacturing and services as a percentage of gross domestic product (GDP) and total employment relative to agriculture) the purpose of green jobs interventions should not only be to address currently predominant sectors of the economy, but also to intervene in growth sectors to facilitate the reorientation of the growth path of Asian economies onto one that is more environmentally and socially sustainable.

Despite the obvious challenges, many countries in developing Asia possess dynamic, high growth economies with a demonstrated capacity for innovation. There is also an increasing recognition of the importance of promoting greener industries among national and regional policymakers, both as a source of employment growth and wealth generation, and as a contributor to improved environmental outcomes.

Green jobs sector focus

Given its dual focus on improved environmental and decent work outcomes, the green jobs value chain development approach is intended to focus primarily on those sectors of the economy with the greatest direct environmental and labour rights impact.

While the prominent role of capital intensive industries such as large-scale mining, electricity utilities and oil refining, chemicals, primary metals processing (such as steel and aluminium), and pulp and paper production in overall energy use, carbon emissions and waste generation is recognized, these industries represent a relatively small percentage of total employment, and are often more effectively engaged using methodologies other than value chain analysis. The green jobs value chain development initiative is therefore targeted primarily at dual impact (high employment/high environmental impact) sectors, with a primary focus on small-scale and informal economic activities. Amongst the sectors most likely to generate opportunities for green jobs value chain interventions on this basis are:

- agriculture and agro-industry;
- energy;
- forestry;
- construction (including public works);
- transportation; and
- basic industry (e.g. brick-making, recycling).

These sectors together account for the large majority of employment in developing Asia, and provide significant opportunities for green jobs value chain development activities.

Green jobs value chain approach	The purpose of the green jobs guide is to integrate within the value chain approach the assessment of environmental impacts in a systematic fashion, ensuring that the measurement and improvement of environmental outcomes is central to, rather than an adjunct of, the value chain development process.
Moving beyond green sectors	A range of methodologies currently exist for value chain promotion in developing countries, many of which can readily be applied to existing and potential low-impact sectors (such as renewable energy). Rather than focusing specifically on the promotion of a narrow range of low-impact sectors, the green jobs guide instead advocates engagement with existing (high environmental impact) value chains. Similarly, conventional value chain projects and associated methodologies frequently focus on the identification and promotion of niche and/or dynamic sectors and sub-sectors over engagement in the patient, incremental process of research, analysis and intervention necessary to improve the performance of established industries. Rather than focusing primarily on, for example, niche export-led growth strategies, the green jobs guide seeks to identify and engage with established domestic and regional value chains, especially those which exhibit robust and relatively stable market demand.
Applying a markets-based approach	As a markets-based approach, the green jobs development methodology recognizes that understanding markets and the structural factors determining market outcomes is key to understanding (and improving) environmental and decent work performance. The existence of environmental and social externalities distorts the market and disrupts allocative efficiency. By incorporating an analysis not only of economic but also social (decent work) and environmental outcomes, the methodology outlined in this guide seeks to provide the information necessary to internalise these externalities, improving market functioning. It also attempts to avoid the growth bias often implicit in many previous value chain development methodologies, focusing instead on improving productivity and the distribution of benefits within a given value chain, while recognizing that both market opportunities and the resources available to satisfy them are inherently finite.
Green jobs, value chain development and governance	Environmental outcomes, as public goods, are often subject to weak or no price signals. This leaves them subject to a range of market distortions and failures, and highlights the crucial role of governance – whether community, company, local or national government – not only in facilitating value chain development within a market system, but in actively shaping the market system itself, both in terms of demand creation, and active regulation and enforcement in order to drive improvements in overall environmental performance. The green jobs value chain approach therefore identifies local and

national regulatory agencies and government bodies as key players in successful green jobs project development and implementation, and recognises the potentially crucial role their effective functioning plays in achieving successful and sustainable project outcomes.

Recognizing that forms of public regulation and regulatory administration can frequently have perverse consequences for social and environmental outcomes, it advocates the adoption of better—rather than simply more—regulation, emphasising the importance of credible mechanisms of oversight and enforcement, and a consistent focus on outcomes within policy-making.

The role of social dialogue in value chain development

The ILO defines social dialogue as “all types of negotiation, consultation or exchange of information between representatives of governments, employers and workers, on issues of common interest relating to economic and social policy” (ILO, 2009). Social dialogue can be seen as consisting of three stages of dialogue intensity:

1. **exchange of information:** no developed discussion or action on the issues concerned;
2. **consultation:** engaging in more in-depth dialogue; and
3. **negotiation:** takes place at many levels; parties have to engage in a dialogue to overcome differences and reach an agreement; can provide a solid foundation for formal tripartite meetings and national level social dialogue.

By facilitating improved communication and cooperation between value chain stakeholders, social dialogue at all levels can play an important role in the value chain development process. This guide therefore advocates a participatory approach to value chain development, focusing on engaging government, workers’ organizations and employer bodies to together work towards the achievement of sustainable green jobs outcomes.

1.5 Green jobs value chain methodology

Promoting green jobs

In the context of simultaneously promoting decent work, green jobs promotion can be achieved through several different avenues, including:

1. reduction of environmental impact and promotion of decent work within an existing sector (e.g. switch to cleaner fuels in light industrial production, and promotion of ILO core labour standards);
2. promotion of additional (decent work) employment in a (potentially new) low-impact sector (e.g. production of solar lanterns or fuel-efficient cookers); and

3. promotion of decent work in existing employment in a low-impact sector (e.g. promotion of ILO core labour standards in the recycling sector).

The potential green jobs outcomes generated by these methods of green jobs promotion will differ according to a range of factors including location, sector selection and capacity constraints.

In each of the scenarios outlined, the focus of value chain research, analysis and intervention activities will potentially differ considerably; in the case of the first scenario, for example, value chain development activities may be undertaken across the full range of areas (including decent work, environment and upgrading/market competitiveness); in the case of the second scenario, activities may focus on upgrading strategies with a view to increasing overall sectoral employment (assuming existing positive decent work and environmental outcomes); and in the case of the third scenario, research, analysis and intervention activities may focus largely on decent work deficits and strategies for sustainable improvement of decent work outcomes.

Although the guide will follow a linear format corresponding most directly to the first scenario, elements of this guide are designed to apply to all potential avenues of green jobs promotion, and users are encouraged to adapt the methodology provided to the specific context of their individual green jobs projects (see *Value chain development for green jobs in Asia – Volume II: Operational guide* for further guidance).

The green jobs value chain methodology

The green jobs value chain development methodology consists of four principal steps:

Step 1. Sector selection process

Step 2. Initial value chain analysis and mapping

Step 3. Further analysis and intervention design

Step 4. Intervention monitoring and evaluation

Step 1: Sector selection process

Step 1 will provide a methodology allowing the evidence-based selection of economic sectors for green jobs value chain development, using the core criteria of global and local environmental impact, decent work impact, livelihood generation/economic growth impact, and technical and organizational feasibility to identify and rank potential sectors for intervention.

Step 2: Initial value chain analysis and mapping

Step 2, the initial value chain analysis and mapping process, will identify the individual unit processes involved in a value chain from conception to end use, and provide an assessment of actors, values, relationships, governance structures, and environmental and decent work deficits for each unit process and for the value chain as a whole.

Step 3: Focused analysis and intervention design

Step 3, the further analysis and intervention design stage, will use the data generated in the initial analysis phase to identify and prioritize sections of the value chain for further research and analysis. It will examine key causal processes, constraints and opportunities at a unit process and system-wide level, and using a participatory approach develop and test options for intervention to improve overall green jobs outcomes.

Step 4: Monitoring and evaluation

Step 4 will involve the identification of targets, indicators and appraisal mechanisms, and ongoing monitoring and evaluation of the value chain interventions, including tracking project progress and assessing proximate and long-term impact. It will generate guidance and learning outcomes to be integrated back into the value chain development process, and, where relevant, prepared for further internal and external dissemination.

Section 2. Sector selection for green jobs

Summary

The purpose of this section is to identify sectors that have the potential for value chain development for green jobs promotion through a four-stage process:

1. Identification of scope of analysis
2. Selection of criteria and sub-criteria
3. Data collection and analysis
4. Value chain ranking and selection

Sectors are selected on the basis of a number of criteria including: a) environmental outcomes (local and global); b) decent work outcomes; c) potential for job and income creation; and d) technological and organizational feasibility.

Outcomes

- A sub-sector that complies with green jobs selection criteria (incorporating decent work and gender).
- An initial assessment of the (sub-)sectors' growth potential in terms of job and income creation, and correspondence to the organization's technical and organizational capacities.
- Indicators for further monitoring and evaluation.

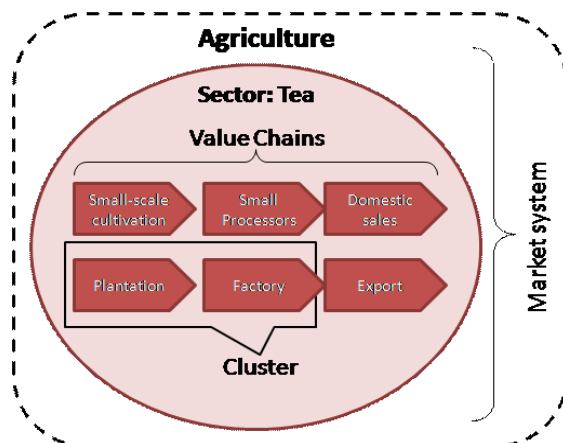
2.1 Defining sectors as market systems

Following the definition adopted in previous ILO value chain development publications, the term sectors refers to economic activities which generally share the following characteristics:

- (a) core transactions that are similar in product and processing;
- (b) businesses that share certain supporting functions with each other; and
- (c) specific rules and regulations that govern the way businesses do business.

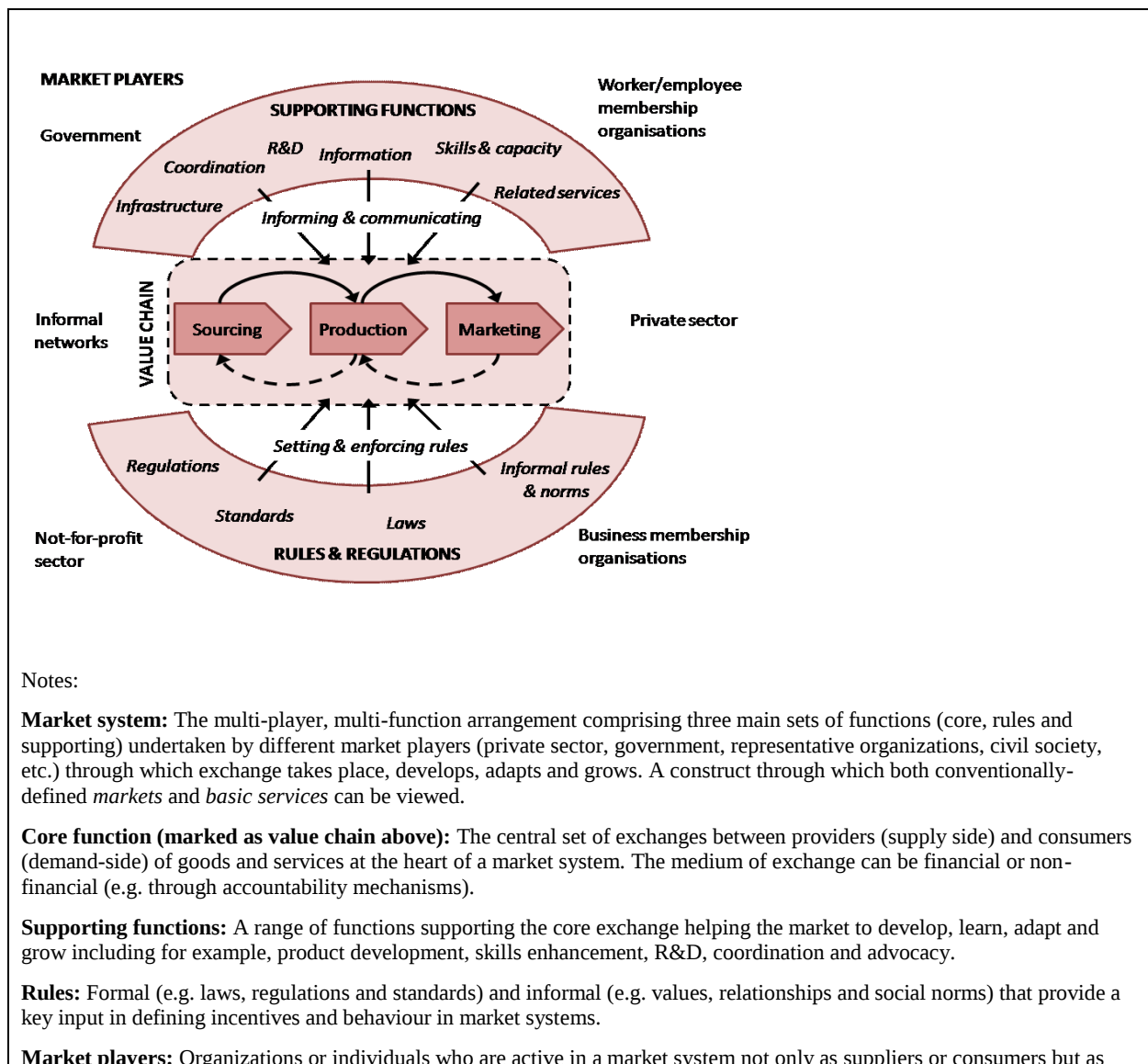
A sector or sub-sector may contain numerous individual value chains. The graphic in figure 1 below provides a basic diagrammatical outline.

Figure 1. Relationship between sectors and value chain



Source: The Springfield Centre, 2008.

Figure 2. The market system model



regulators, developers of standards and providers of services, information etc. This therefore may include organizations in the private and public sectors as well as non-profit organizations, representative organizations, academic bodies and civil society groups.

Source: The Springfield Centre, 2008.

Defining sectors as market systems

Economic sectors as defined above are part of wider **market systems**, consisting of the following components:

1. **core transactions** (value chain), in which businesses trade products and services against payment (monetary) or other products and services (real);
2. **supporting functions** that ensure smooth business transactions, such as coordination mechanisms, information channels, knowledge and skills capacities, R&D facilities, etc.;
3. formal and informal **rules and regulations** that govern the way in which business make transactions, such as market standards and requirements, government laws, certifications, etc.; and
4. **market players**, such as businesses, government, service providers, informal networks, business membership organizations, unions, development organizations, etc.

The value chain approach is a sector-specific approach

The value chain approach is a sector-specific approach, and is designed primarily to apply to discrete sub-sectors and value chains rather than entire industries, for example, in designing and implementing a programme for green jobs promotion within the recycling industry, the value chain approach would be applied to a specific value chain (e.g. paper, plastics, metals, etc.) within the industry. A study of the entire industry would therefore require several individual value chain assessments.

2.2 Sector selection using green jobs criteria

Sector selection determines green jobs outcomes

The application of a careful and systematic sector selection process is one of the key determinants of overall project success. The selection of sectors for green jobs sets the foundation for subsequent value chain initiatives. A careful and well-designed sector selection strategy is vital because the choice of sector or sectors defines the scope of possible green jobs outcomes.

The sector selection process

The goal of the sector selection process is the identification of the greatest potential improvements in environmental sustainability and decent work promotion achievable within the resource, technical and other constraints facing the implementing organization(s).

The following section will explain how to select sectors for value chain development initiatives following four principal steps:

Step 1. Identification of scope of analysis

Step 2. Selection of criteria and sub-criteria

Step 3. Data collection and analysis

Step 4. Value chain ranking

Sector selection requires clear aims and objectives

A precondition of the value chain selection process is that the implementing agency or agencies already possess **clear and well-defined aims and objectives** for their interventions, and are able to articulate these both internally and externally. Where these extend to prior selection of sectors, this may obviate the need to undertake a more developed sector selection process; however, it is advised that even in these cases an appraisal is made of the suitability of the sector relative to other potential sectors. Note also that the sector selection process (as within value chain development more generally) is an iterative process, and earlier stages can and should be revisited on the basis of further information.

For further practical guidance on assessment tools for sector selection please see *Value chain development for green jobs in Asia – Volume II: Operational guide*.

Step 1: Scope of analysis

Determine geographical scope of analysis

The first step within the sector selection process is the **identification of the geographical scope of analysis**.

Within the green jobs value chain method there are three possible levels of geographical scope:

1. macro (international);
2. meso (national); and
3. micro (regional/cluster).

The initial terms of reference for the project scope will be derived from the existing aims, objectives and capabilities of the implementing organization(s), and may be defined either by scale (for example micro-level only, within a national or regional boundary but otherwise undetermined) or location (specific regional, or national location). Identification of scale is an important initial step as it provides the basis on which to generate the list of sub-sectors to be assessed in subsequent stages of the sector selection process, and allow meaningful comparisons between those (sub-)sectors identified.

Note that the **scales provided are intended to be indicative only**, and do not necessarily refer to the form of business organization engaged (micro, small or medium-scale) or the absolute scale of the overall project (for benchmarking and comparative purposes, organizations undertaking a number of separate value chain projects may wish to assign precisely defined geographic or non-geographic parameters for each category, and assess accordingly).

Nevertheless, **identification of scale using the categories above will begin to determine the range of actors to be engaged** – for example macro- and meso-level interventions will likely involve greater engagement and/or cooperation with national bodies and agencies – the level of secondary data available, the wider

operational context and the range of possible project outcomes (e.g. focusing on micro-level interventions may make access to carbon finance unfeasible).

Note that geographical scope should also assess **proximity of value chain actors** – for example, a regional value chain may involve actors dispersed over a relatively wide area, or may follow a cluster pattern with individual value chain actors tightly grouped in a given area.

Determine conceptual scope of analysis

Alongside spatial boundaries, there is a need to **define conceptual boundaries** (i.e. levels of aggregation and boundary limits) in relation to value chains considered for selection.

The general definition of economic sectors, sub-sectors and value chains outlined above still leaves open a number of practical questions in relation to the definition and delineation of value chains for appraisal. Specifically, to what extent are different product categories and market channels within a sub-sector in themselves considered to represent different value chains, or aggregated within a single overall value chain? And within individual value chains, where should the analytical boundaries be drawn between those activities judged to be integral to the production of a given good or service, and those activities (ordinarily at each end of the value chain) which are judged to be outside.

These questions are often an issue of emphasis and incorporate assumptions about the nature of the goods or services considered, requiring an implicit consideration of the centre of gravity in economic, environmental and social terms within each value chain considered. The answers are also likely to be determined to a large extent by the resources available to the intervening organization(s).

Determining scale of analysis

Alongside geographical and conceptual scope of analysis, it is also important to **specify the scale of the value chains** which the project intends to engage with. The overall scale of the value chain is important because it determines the time and resources required to undertake initial assessment and engagement, and potentially affects the potential for scaling-up/crowding-in activities in the post-pilot phase of intervention. If scale (e.g. number of operators, number of employees, revenue, volume) is the principal factor in determining scope of analysis – rather than, for example, a discrete focus on a given region or locality – then this may be assessed in concert with both the geographical and conceptual scope, with the latter criteria adjusted accordingly.

Step 2: Selection criteria

This guide identifies **six major criteria** as central to the green jobs value chain development process. These are:

1. environmental impact (global);
2. environmental impact (local);

3. decent work promotion potential;
4. livelihood generation/economic growth potential;
5. technological feasibility; and
6. organizational feasibility.

Selection of sub-criteria

To guide data collection, each major criterion can be further divided into a **range of sub-criteria**, based on the aims and objectives of the intervening organization/s, the ease of data collection and benchmarking, the level of detail required, and the time and resources available. Illustrative examples of potential sub-criteria within each criteria are provided below, at varying (optional) levels of detail (note that the sector selection process may involve only a small number of the potential sub-criteria under a given criteria heading). While the selection of individual sub-criteria and indicators is at the discretion of the intervening agency, the methodology requires that **at least one sub-criterion should be identified and assessed for each of the six major criteria listed**, and preferably several.

Developing sub-criteria:

1. Global environmental impact

The most commonly-recognized global environmental impacts relate to emissions to the atmosphere – primarily emissions relating to climate changes but also including emissions associated with ozone depletion and acidification. Alongside **atmospheric emissions**, it is recognized that a range of further environmental aspects with international impacts may potentially exist, including emissions to cross-boundary water bodies such as rivers, oceans and aquifers, land-use change and degradation with cross-boundary implications, and threats to internationally important habitats/ecosystems and species (biodiversity); to avoid duplication these are captured within the local environmental impact criteria. It is also recognized that emissions to the atmosphere (including oxides of sulphur and nitrogen) may also have a range of local environmental impacts which should be taken into consideration.

Note that the following sub-criteria and indicators are not exhaustive, and should be used selectively, taking account of data availability (especially in the sector selection phase), project resources and the aims and objectives of the intervening organization.

2. Local environmental impact

The potential environmental impacts of a given industry are far more wide-ranging at the local level. Below in table 1 is provided a list of common **local environmental aspects** and associated (potential) impact indicators, for use both within the sector selection process, and in subsequent value chain research and intervention processes. As with the global environmental impact indicators provided above, the following sub-criteria and indicators are not exhaustive, and should be used selectively (and supplemented where necessary by further project-specific indicators) according to the specific requirements of the project.

Table 1. Local environmental impact

Aspect	Potential indicator
Emissions to air	Emissions of particulate matter (PM) (TSP/PM10/PM2.5)
	Emissions of volatile organic compounds (VOCs)
Emissions to water	Emissions of compounds of P, K and N (kg PO ₄ ³⁻ e)
	Emissions of chemicals (e.g. organophosphates, dioxins) (kg)
	Emissions of heavy metals (e.g. Pb) (kg)
Emissions to soil	Emissions of chemicals (e.g. organophosphates, dioxins) (kg)
	Emissions of heavy metals (e.g. Pb) (kg)
Waste	Volume of solid waste generation (kg)
	Volume of waste recycled/reused (%)
Water use	Volume of water used (l)
	Water use per unit of output
Energy use	Volume of fossil fuel use (Kg/MJ)
	Fossil fuel use (Kg/MJ) per unit of output
Land use/ degradation	Area of land use (hectares)
	Land use per unit of output
	Level of tree cover (m3)
	Level of vegetation cover (m3)
	Level of suspended PM (SPM/TSS)
Biodiversity	Rate of habitat loss (%)
	Rate of population decline (%)

3. Decent work

The Green Jobs Initiative aims to promote employment that is both environmentally and socially sustainable. The **identification of decent work deficits** is therefore a key aspect of the sector selection process, allowing the intervening organization to prioritize those sectors with the greatest potential for improved decent work outcomes (as with the environmental impact criteria, the individual indicators used will be determined by a range of factors including data availability, resource constraints and the aims and objectives of the intervening organization).

At a country-level, these should be correlated to the greatest extent possible with the priorities outlined in the relevant **Decent Work Country Programme** (ILO, 2013) document. Decent Work Country

Programmes negotiated between the ILO and its constituents (government, employers and workers' organizations) provide an orientation for projects as to which selection criteria match best with a country's Decent Work Agenda. By placing a value chain initiative for a sector within the framework of Decent Work Country Programmes (which reflect the constituents' development priorities), the initiative may potentially also find it easier to generate support and create linkages with other development initiatives.

The following table 2 sets out a range of **potential decent work indicators** (grouped under the different elements of the ILO Decent Work Agenda) for use both in the sector selection process, and during the research and implementation phase.

Table 2. Decent work selection criteria

Decent Work Agenda element	Indicator
Adequate earnings and productive work	Average hourly wage (local currency) Average hourly real wage (US\$, corrected for PPP) Minimum wage as % of median wage
Decent hours	Average hours worked per week % of workforce working more than 48 hours per week
Combining work, family and personal life	Provision and status of employee accommodation and other employer-provided facilities (especially for migrant labour) (where relevant) Provision and status of employee childcare facilities (where relevant) % of workforce eligible for paid leave and/or sick leave
Work to be abolished	Number of child workers (<15 years) Number of child workers (<15 years) engaged in hazardous activity
Stability and security of work	% of workforce employed on formal contracts % of workforce employed on daily labour basis
Equal opportunity and treatment in employment	% female share of employment Average gender wage gap
Safe work environment	Occupational injury rate, fatal (per 1,000 hours) Occupational injury rate, non-fatal (per 1,000 hours) % of workforce covered by occupational health insurance
Social security	% of workforce covered by (basic) health care provision (public/ private) % of workforce covered by pension provision (public/private)
Social dialogue, workers and employers' representation	% of employees belonging to labour union/other collective organization % of enterprises belonging to employer organization % of enterprises covered by collective bargaining
Economic and social context for decent work	Labour productivity (unit value added per employed person, local currency)

4. Green growth

Evidence suggests that there is large potential for well-designed green growth policies that result in net employment gains, especially in developing economies, where much of the labour force remains

underemployed. Assessing how green growth related strategies, policies and programmes impact the labour market, and identifying where these measures can create opportunities for green jobs creation and income is thus an important factor to consider during the sector selection process. Table 3 below outlines a number of questions to be considered for evaluating the implementation of green growth plans and strategies in the sector selection phase.

Table 3. Green growth selection criteria

Green growth element	Questions
Increasing resource efficiency	Has the organization benefitted from efforts to improve resource use and environmental practices, as evidenced by gains in productivity and competitiveness?
Green product and service eco-innovation	Is the organization involved in producing products and services which reduce environmental risk and/or minimize pollution and resource use? Has the sale of green goods and services led to improved market share in domestic and export markets?
Green certification accessing new markets	Compliance with green certification systems: are there environmental labels and standards applicable to the value chain (and wider sub-sector), and does the organization meet the relevant requirements?
Green business development services and finance	Is the organization able to access public or private business development services/financing institutions which provide assistance with improving environmental performance?
Green rules and regulations	Have green rules and regulations created a supportive environment for the implementation of sustainable enterprise initiatives on the part of the organization? Further evaluated through governance mapping exercise (indicated below).

5. Livelihood generation/economic growth

Assessing the ability of a given industry to generate employment and livelihood opportunities is a central aim of the value chain approach. Within the green jobs value chain development approach, this assessment covers two principal aspects:

1. current livelihood impact; and
2. potential livelihood impact.

Current livelihood impact

The first aspect, **current livelihood impact**, measures the existing impact of the sector in terms of livelihood generation and contribution to economic growth. Where specific target groups/forms of organization have been identified, and where information is available, livelihood impact can also be assessed on a differentiated basis. The table below provides a (non-exhaustive) list of potential indicators.

Table 4. Current livelihood impact selection criteria

Current livelihood impact	Potential indicators
General	Number of people employed Contribution of sector to total (national) employment Contribution of sector to total (regional) employment Average income generated from sector participation (see also DW) Contribution of sector to GDP (national) Contribution of sector to GDP (regional) Labour productivity within the sector (see also DW) Functional division of labour within the sector (see also DW) Terms of employment within the sector (see also DW)
Target group/organization specific	Number of target group employed Sector employment as % of total target group employment Average target group income generated from sector participation (see also DW) Target group segregation within the sector (see also DW) Target group terms of employment within the sector (see also DW) MSE participation in sector MSE employment as % of total employment Cooperative participation in sector Cooperative employment as % of total employment
Market specific	<i>For all primary market channels:</i> Size of market (by value) Scale of demand (domestic, regional or international) Market share (domestic, regional or international if applicable) Market as % of total sales Current market competition (if applicable) Current substitutes (if applicable) Current price/income elasticity of demand (if applicable)

Potential livelihood impact The second aspect of livelihood impact assessment, **potential livelihood impact**, aims to provide a basic appraisal of dynamic change within a given sector, both in terms of participation and overall market attributes. This involves a **quantitative examination of the recent trajectory of growth** (or decline) in overall employment, income generation and market scale within a given sector. Ideally this should be captured for a **significant time**

series (although, as with other elements of the sector selection process, this may be subject to data availability and resource constraints).

Alongside a quantitative appraisal of a sector's prior development trajectory, potential livelihood impact appraisal should also include a **qualitative assessment of predicted changes in both demand and supply dynamics** – these may include changes in scale and technological/capital intensity, new production norms, changes in demand through changing consumption patterns and increasing access to and development of new markets, and changing national and international regulatory environments (this data is often most usefully provided by initial engagement with industry analysts and end-of-chain actors). Besides overall sector growth, capturing a greater percentage of total value within a value chain is the other route for improved livelihoods among target groups. Where possible, consideration should therefore also be paid to the **distribution of benefits** within a given industry, and potential opportunities for redistribution of these benefits.

Below are provided an indicative list of livelihood potential indicators.

Table 5. Potential livelihood impact selection criteria

Potential livelihood impact	Potential indicators
General	% change over previous 5 years in: - Number of people employed - Contribution of sector to total (national) employment - Contribution of sector to total (regional) employment - Average income generated from sector participation (see also DW) - Contribution of sector to GDP (national) - Contribution of sector to GDP (regional) - Labour productivity within the sector (see also DW)
Target group/organization specific	% change over previous 5 years in: - Number of target group employed - Sector employment as % of total target group employment - Average target group income generated from sector participation (see also DW) - MSE participation in sector - MSE employment as % of total employment - Cooperative participation in sector - Cooperative employment as % of total employment
Market specific	For all primary market channels, % change over previous 5 years in: - Size of market (by value) - Average selling price (retail) - Market share (domestic, regional or international if applicable) - Market as % of total sales For all primary market channels, substantive change in: - Scale of demand (domestic, regional or international) - Current market competition (if applicable) - Current substitutes (if applicable)

Technical feasibility

An important element of green jobs value chain development is the **introduction of new technologies and techniques**, whether in upgrading existing value chains or developing new value chains. In some cases, this may involve incorporation or use of existing technologies and techniques; in others it may involve substantial adaptation and modification, or even development of entirely new technologies and processes. An assessment of technical feasibility can be divided into **internal and external**

characteristics.

Internal feasibility

Internal feasibility relates to those technical elements of a potential sector intervention within the immediate remit of the intervening organization(s). These are determined in part by the initial project parameters identified by the organization, and the proposed division of responsibility between the intervening organization, contracted individuals and organizations, and partners.

Project technical requirements may include measurement and assessment of a range of environmental and decent work impacts during assessment, intervention and monitoring and evaluation stages. Previous similar projects (see for example Section 4.3) have also required the technical ability to create and operate a pilot demonstration unit to develop, test and assist in the dissemination of new, cleaner technologies and processes.

External feasibility

External feasibility relates to those technical elements either entirely outside the scope of the intervention, or which relate to technical inputs provided by project partners or contractors. The latter category would cover all specific project technical requirements not available internally.

The table below outlines a number of questions to be considered in assessing technical feasibility issues within the sector selection process.

Table 6. Technical feasibility selection criteria

Technical feasibility	Questions
Internal	Does the organization have internal technical expertise on the wider industry or sub-sector in question, and the individual value chains being assessed? Does the organization have technical experience of implementing specific technical solutions or packages within a given industry (e.g. bio-gasifier technology for decentralised electricity generation, solar drying of agricultural produce, upgrading packages for two-stroke petrol engines, low impact plastics-processing technologies)? Does the organization have the capacity to provide (or otherwise contract) long-term technical support and training for technological upgrading, or does it intend to rely on existing or potential market participants to provide the necessary technical services (in the case of contracting or partnership see external feasibility)?
External	Maturity of relevant technologies– are there existing generic or sector-specific technologies offering clear benefits being deployed elsewhere? Capital and labour intensities of current and potential technologies– do these technologies match the factors of production in the country or region in question? Receptivity to technical change– has the value chain (and the wider sub-sector) demonstrated receptivity to technical change, including adoption of new technologies and processes? Do actual or potential partner organizations have the capacity to provide long-term technical support and training for technological upgrading? Local availability of relevant technologies and associated support– do supporting markets and service providers exist for potential technical interventions in the sector considered? Does the wider enabling environment required for technical upgrading (including for example sufficient physical infrastructure and an enabling policy and socio-economic environment) currently exist?

Organizational feasibility	Organizational feasibility relates to the capacity of the intervening organization and (where relevant) partner organizations to fund, manage and support the non-technical aspects of a value chain development project in a given sector. As with technical feasibility, organizational feasibility can be divided into internal and external categories.
Internal organizational feasibility	Internal organizational feasibility relates to those organizational elements of a potential sector intervention within the direct remit of the intervening organization(s). This includes both general compatibility with the organization's objectives, priorities and capacities, and the prospective financial and managerial requirements of a sector intervention.
External organizational feasibility	External organizational feasibility relates to those organizational elements of a potential sector intervention outside the direct remit of the intervening organization(s). This includes both financial and managerial aspects of a potential value chain initiative, and also the wider enabling conditions within a value chain or sub-sector. Note that within external organizational feasibility it is important to differentiate between strategic programme partners and implementation partners.

Table 7. Organizational feasibility selection criteria

Organizational feasibility	Questions
Internal	Does the sector match with your organizations' objectives and priorities? Does your organization have previous experience in the sector and/or sub-sector? What human resources will be required to start a value chain initiative in the sector? Does your organization have the necessary human resources capacity required to start a value chain initiative in the sector, or will this require assistance from partners/contractors? What financial resources will be required to start a value chain initiative in the sector? Does your organization have the necessary financial resources capacity required to start a value chain initiative in the sector, or will funding partners be required?
External	If external human resources are required (including contractors and partner organizations), are these available and sufficient? If funding is required from external partners, is this available and sufficient? Do effective organizations (including workers' and employers' organizations) exist through which value chain participants can be engaged? Receptivity to change – do stakeholders in the sector have the motivation/interest to change? Is there a strong partner organization in the sector with which you can cooperate and that could potentially drive forward change? Are there existing value chain initiatives/other national and international development organizations operating in the sub-sector, and do they adequately cover the sub-sector? Does a wider business-enabling environment (infrastructure, policy and socio-economic environment) currently exist in the country or region in question?

Outcome: list of criteria and sub-criteria for assessing green jobs potential

Sector selection is part of the appraisal of a value chain initiative

Step 3: Data collection and analysis

The outcome of the selection criteria phase of the sector selection process is the **identification of selection criteria and indicators for the four impact areas** (global environmental impact, local environmental impact, decent work and livelihoods), and an **assessment of the relative technical and organizational feasibility issues** for each sector under consideration.

The criteria used for sector selection needs to be seen in the overall context of a value chain initiative: they serve as an orientation for value chain research (see Section 4), focusing on key issues within a value chain system that the value chain research and analysis phase will subsequently investigate in greater detail. They also **set the foundation for monitoring and evaluation** during the implementation of interventions, providing potential indicators against which to monitor progress. For further details on the role of sector selection in the overall appraisal process, see **Section 5**.

Having identified the scope and scale of analysis and selected relevant selection criteria, the next step in the process is the **collection and analysis of data** on the sectors and individual value chains available. This may involve not only **appraisal of existing value chains**, but also **prospective value chains** which correspond to the relevant local production factors and market opportunities.

At the sector selection stage data is collected primarily from secondary sources (where available and considered reliable), supplemented and verified where necessary through primary research. **Secondary research** will involve an initial literature and statistical review to determine levels of data availability. This may involve data from a range of sources including regional and national government, national and international trade bodies, employee organizations and non-governmental organizations (NGOs), and bilateral and international agencies. Where possible, projects should seek to critically engage with, and build on, existing research and analysis undertaken by other organizations.

Primary research may include engagement with industry experts such as consultants and analysts, and value chain actors or supporting organizations with a strategic view of the sector in question (including lead firms, employers' and workers' organizations, regulatory agencies and civil society actors).

Care should be taken to collect and assess information along all axes of analysis (economic, social and environmental), ensuring that all selected criteria are populated to the extent necessary to allow informed ranking and selection. In the case of both existing and prospective value chains it may be necessary to **apply proxy data**, particularly on impact areas where data-gathering specific to the local chain may be weak or non-existent. For detailed guidance on data collection and analysis, please see *Value chain development for green jobs in Asia – Volume II: Operational guide*.

Step 4: Value chain ranking and selection

Two levels of aggregation are required within the value chain ranking and selection process: **aggregation of selected sub-criteria** to produce a single criteria score, and **aggregation of the criteria scores** to produce an overall value chain score for

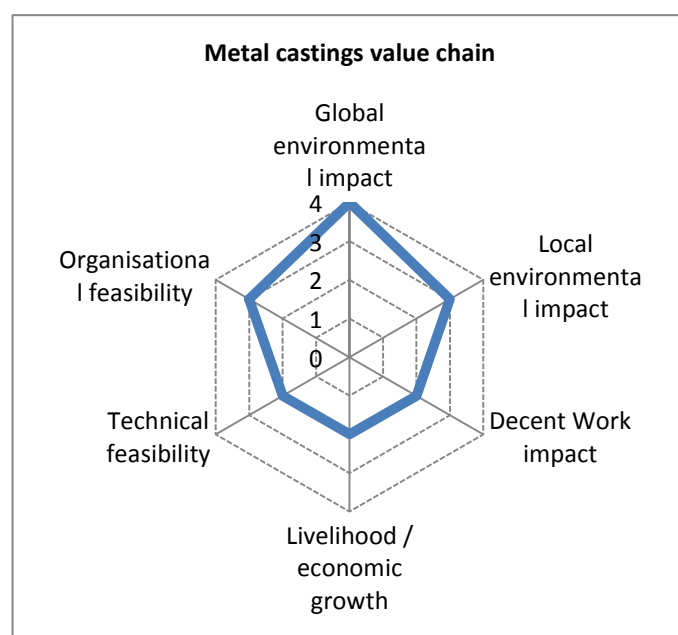
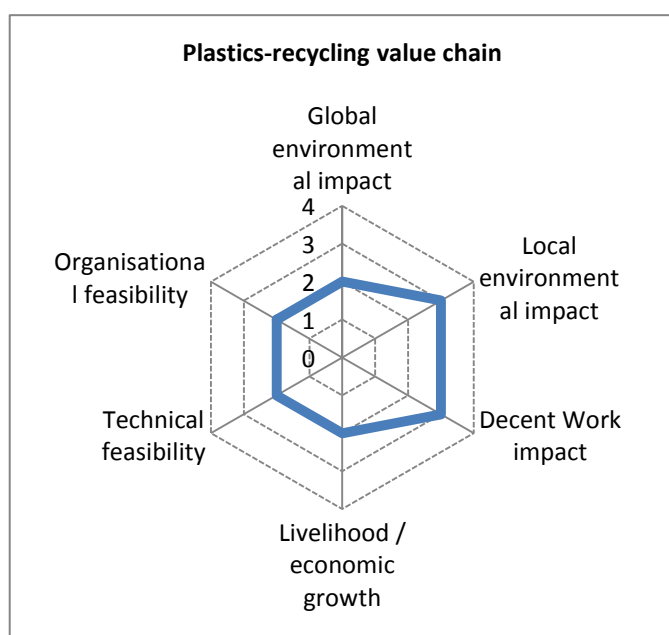
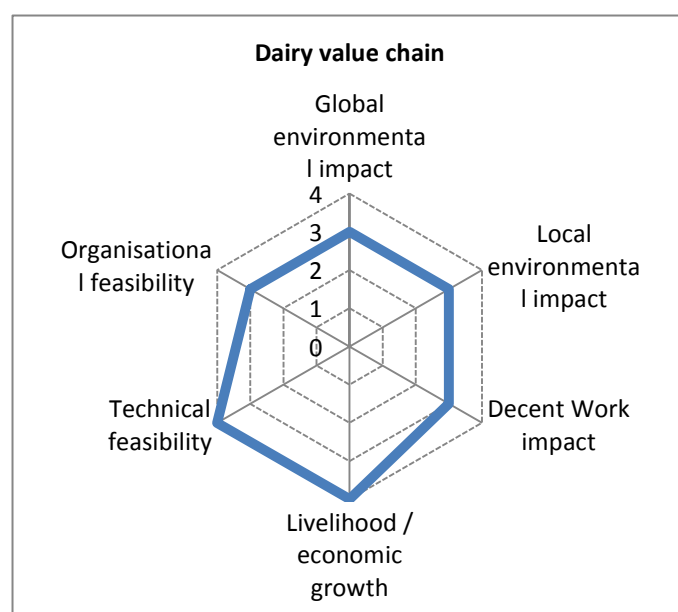
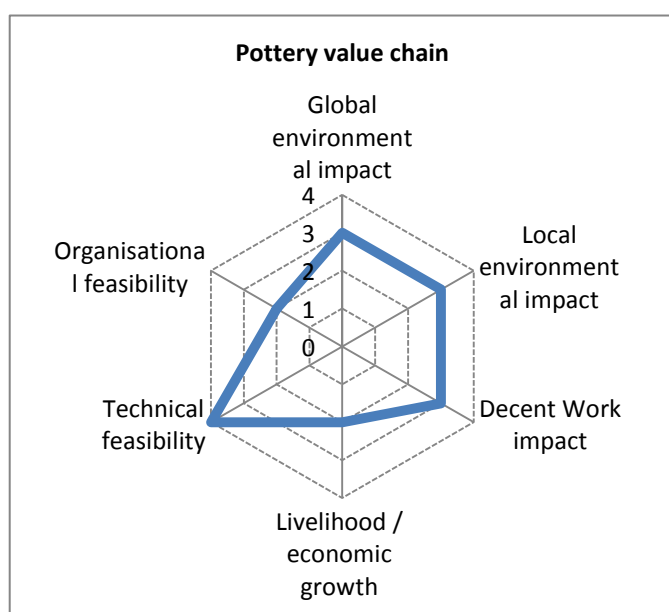
comparative purposes. Performance on each sub-criteria indicator selected should be tabulated and the results graded using a five point (0–4) scale. The intervening agency may wish to apply a specific sub-criteria grading methodology, or allow project staff to make a subjective judgement; the key requirement being that the grading scheme adopted is transparently and consistently applied.

This information can then be used to produce an average score per criteria, or individual sub-criteria scores can be differentially weighted to reflect the project's specific aims and objectives. Having generated the criteria scores, these may be aggregated to produce a single overall score. This score can then be used as the sole basis for final value chain selection, with the value chain presenting the highest score being selected. Alternatively, the intervening organization may wish to weight individual criteria scores in order to better reflect their specific aims, objectives and capabilities. The comparison of different value chains with similar overall scores but differing attributes can also be facilitated through the use of assessment tools such as radar graphs (these tools are particularly useful in communicating value chain assessments where the project intends to apply a participatory approach to the final ranking and selection process).

For reference, below is provided a hypothetical example of an unweighted ranking and selection examples using the five point scale (0–4), applied to four different value chains (pottery, dairy, plastics recycling and metal casting). Individual criteria scores have been rounded to the nearest whole number. For more detailed guidance on methodologies for value chain ranking, please see *Value chain development for green jobs in Asia – Volume II: Operational guide*.

Figure 3. Sector selection examples

Assessment category	Pottery	Dairy	Recycled plastics	Metal castings
Global environmental impact	3	3	2	4
Local environmental impact	3	3	3	3
Decent work impact	3	3	3	2
Livelihood/economic growth potential	2	4	2	2
Technical feasibility	4	4	2	2
Organizational feasibility	2	3	2	3
Total	17	20	14	16



Outcome: identification of target value chain for further research and analysis

The outcome of the value chain ranking and selection phase is the selection of one or more target value chains for more detailed research, analysis and intervention.

Section 3. Value chain research mapping

Summary

The purpose of this section is to set out a framework for the value chain analysis and mapping process. It will outline the various steps in the process, including the initial mapping of processes and actors, and assessment of the qualitative and quantitative economic aspects of the value chain (volume, employment, value addition and costs/margins). It will also outline the methodology for identifying and assessing environmental and decent work deficits within the value chain.

Outcomes

Initial analysis and value chain map identifying:

- actors and processes.
- quantitative information, including volume, employment, value addition and costs/margins;
- qualitative information, including relationships and governance structures;
- environmental impacts; and
- decent work impacts.

3.1 Value chain overview map (processes and actors)

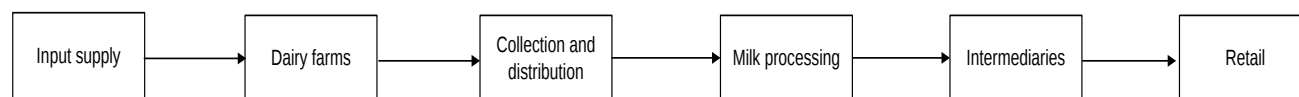
3.1.1 Mapping processes

Mapping value chains processes

The first step in the value chain mapping process is the creation of a **basic flow chart identifying core transactions within the target value chain**.

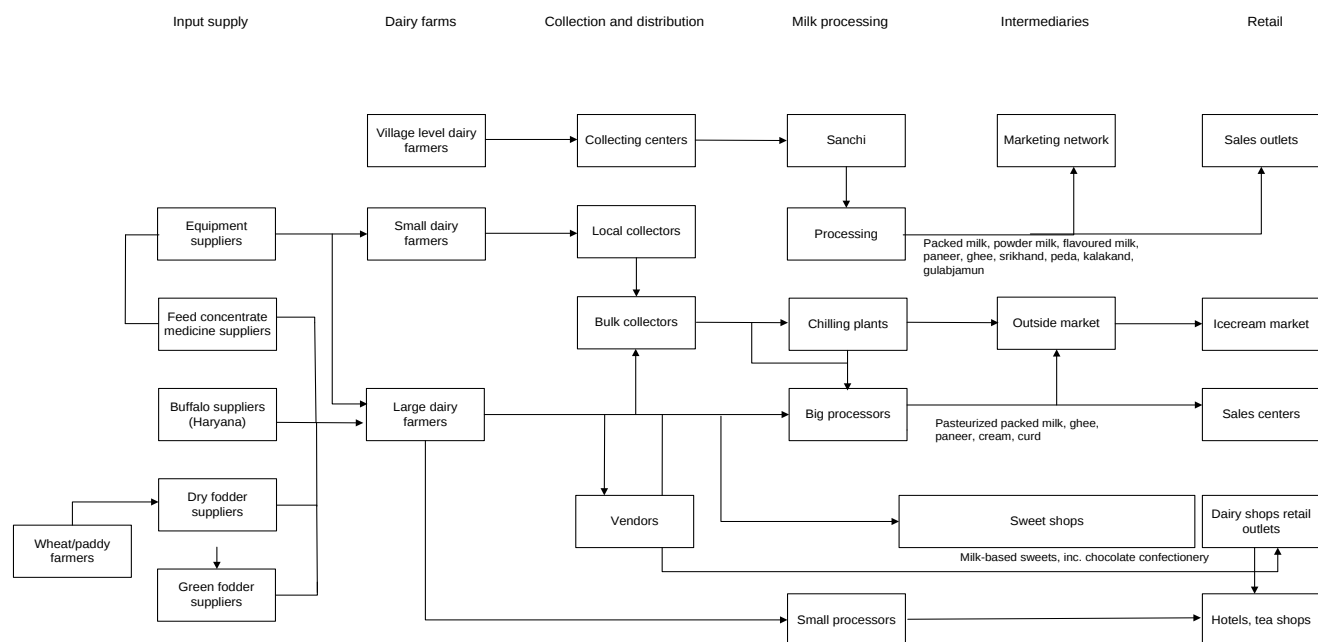
This initial process mapping will involve the **selection of value chain boundaries** – for example grouping related activities and functions under one value chain level (for example collection, cooling, aggregation and transport to processors under collection and distribution), and by drawing a line which limits the value chain to a certain number of levels and location (suppliers for example have their separate value chains, and could therefore simply be grouped under the label input supply – see Section 2 for further discussion of this).

Figure 4. Initial process-based flow chart



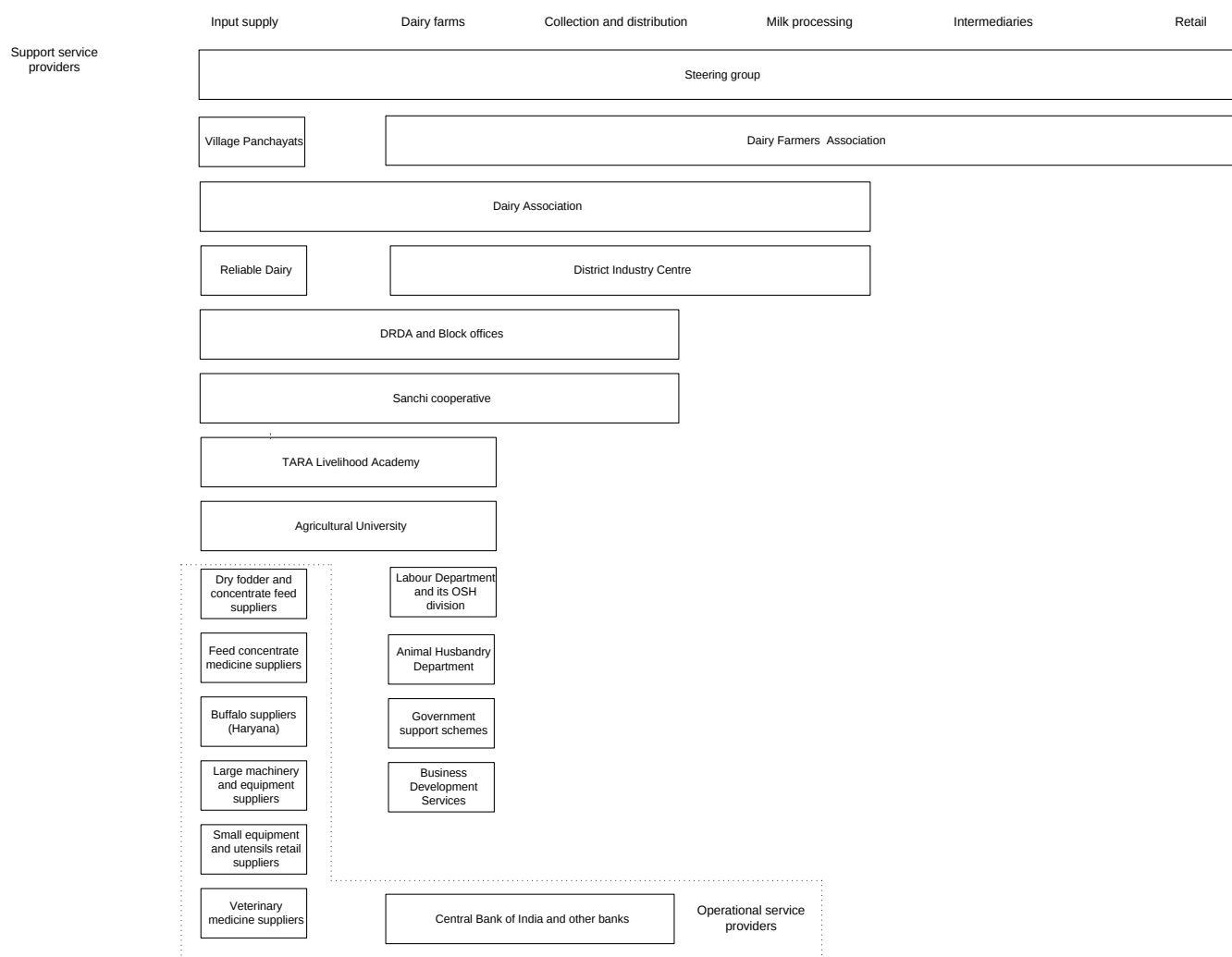
3.1.2 Mapping actors (direct, operational and supporting service providers)

Figure 5. Initial actor-based grid chart



Source: ODI, 2010.

Figure 6. Support service provider chart



Creating an inventory of market players

Having identified the core transactions of a value chain in a sector – i.e. the steps that lead from design/raw material to the final products – you can now use this flow chart to identify and map key market players. There are three stages to this process:

1. identifying actors directly engaged in value chain transactions;
2. identifying actors engaged in the value chain through the provision of operational services (e.g. provision of direct services such as supply of equipment, finance or other input provision); and
3. identifying actors engaged in the value chain through the provision of support services (e.g. regulation, provision of indirect/industry-wide services such as standard setting, sub-sector R&D).

Further practical guidance on identifying actors engaged in the value chain is provided in *Volume II*.

Step 1: Identifying actors directly engaged in value chain transactions

The first step in the value chain mapping process is the identification of core transactions within the target value chain – i.e. the process steps from design/raw material to the end customer – using a grid chart. A grid chart not only illustrates different value chain levels – i.e. the horizontal process

from conception to final consumer – but also the vertical allocation of different actors and market channels within a sector.

Step 2: Identifying operational service providers

Operational services are those provided directly to value chain actors in order to directly facilitate transactions and processes within the value chain. These would include value chain specific services not captured within the value chain boundaries selected – in the case of the dairy value chain, for example, the provision of veterinary services, or the sale and servicing of equipment for dairy processing. These would also include generic business services such as utilities (for example water, electricity and gas where applicable) and financial services. Operational service providers may be specific to a value chain stage or actor, or may provide services to several (or all) stages within a value chain.

Step 3: Identifying support service providers

In order to facilitate systemic change in the market system, we also need to identify other market players who are not directly involved in core business transactions within the value chain. Support services providers are those actors which do not directly support (or perform) transactions and processes in a value chain, but which still influence the overall functioning of the value chain or sections of it. These would include government regulatory authorities and public institutions, business and worker membership organizations, and other organizations responsible for value chain regulation and governance, worker representation, the setting of professional standards, provision of sector-specific information, and the generation of generally applicable technical solutions. In the context of promoting social dialogue, particular emphasis should be placed on identifying and engaging with relevant government, business and workers' organizations wherever these exist.

Note that different supporting actors may be relevant for different value chain actors or market channels. Where relevant, the appraisal of support service providers should also look beyond the immediate value chain to include those actors responsible for wider institutional and economic frameworks such as infrastructure development and national-level regulation and policy-making.

3.2 Quantitative analysis

3.2.1 Volume

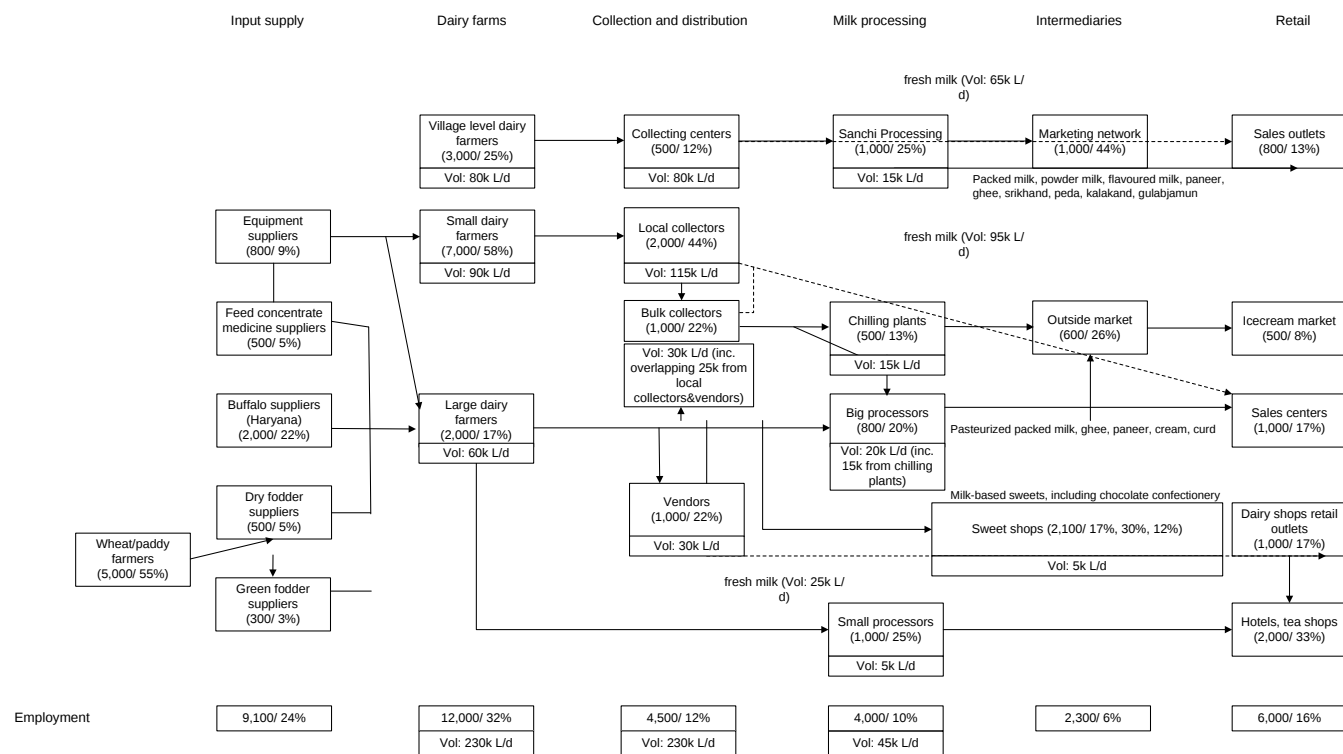
Volume analysis

The volume analysis phase of the initial research and mapping process assesses the contribution of each stage of the value chain to total employment in the value chain, and within these stages each market actor or group of market actors (as appropriate).

Volume is frequently subject to seasonality, and it is therefore essential to assess and record volume throughout the year (including average and high/low figures). Volume analysis should also seek to capture dynamic change in the sector in recent years (see also sector assessment previously undertaken in sector selection phase in Section 2). Note that volume categories and units may change at various stages of the value chain – where this is the case conversion factors should be provided to the greatest extent possible.

Further practical guidance on assessing volume is provided in *Volume II*.

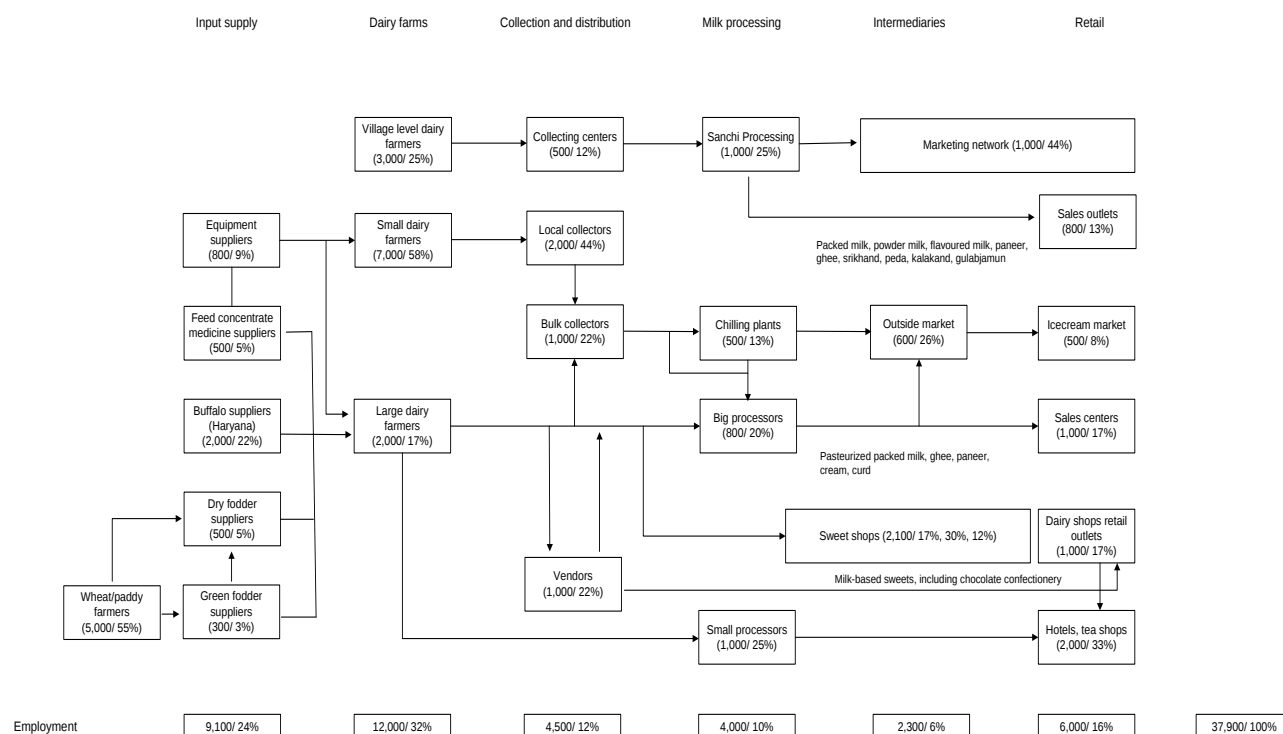
Figure 7. Initial volume chart



Source: ODI, 2010.

3.2.2 Employment

Figure 8. Employment grid chart



Employment analysis

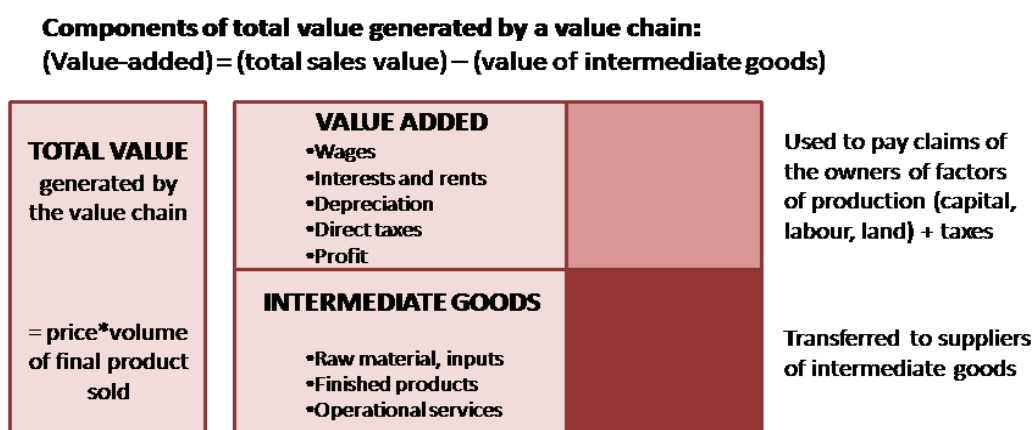
The employment analysis phase of the initial research and mapping process assesses the contribution of each stage of the value chain to total employment in the value chain, and within these stages each market actors or group of market actors. The employment analysis should capture not only employee characteristics, employment characteristics and total employment figure during the immediate research period, but where relevant should attempt to assess and record seasonal fluctuations or other cyclical changes in employment. It should also, where possible, record dynamic change in recent years. Depending on the aims and objectives of the project, it may wish to assess the representation of different groups within overall employment, either throughout the value chain or in relation to specific actors or unit processes. It may also wish to qualitatively categorize the type of employment provided. Examples are provided below.

Focus area	Category
Gender	Male/female
Ethnicity/caste or other group identifier	As applicable
Origin	Local/temporary migrant/ permanent migrant/local
Skills	Unskilled/semi-skilled/highly-skilled
Employment type	Formal/informal
Employment period	Day labour/temporary labour/ permanent labour

Further practical guidance on assessing volume is provided in *Volume II*.

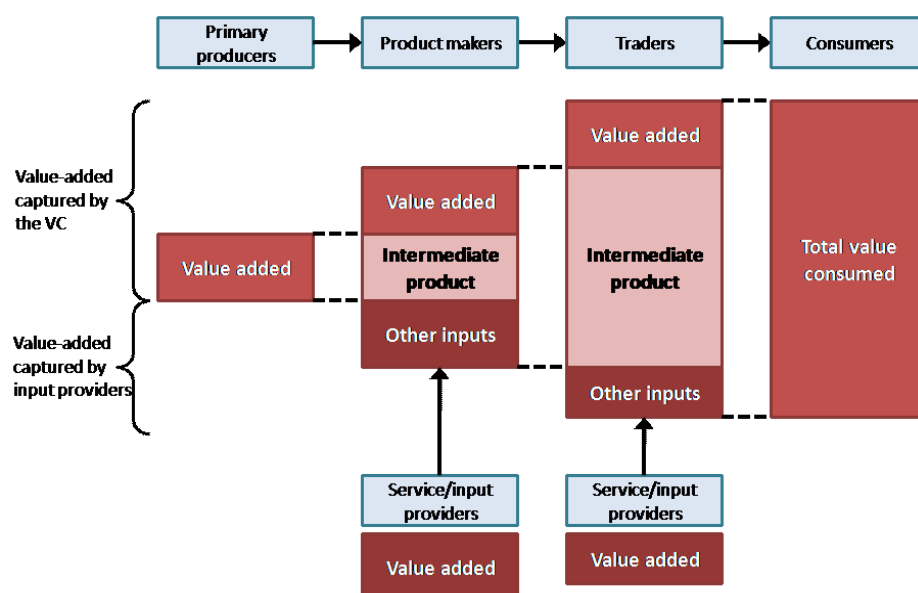
3.1.3 Value addition/distribution

Figure 9. Concept of calculation of value addition



Source: GTZ, 2007.

Figure 10. Value addition along the supply chain



Source: GTZ, 2007.

Quantitative analysis of the value chain

The next step within the analysis of the value chain is the calculation of value added, and its distribution between the various actors in a value chain. Value added for the total value chain is calculated as the sales value minus the cost of external inputs (i.e. intermediate goods).

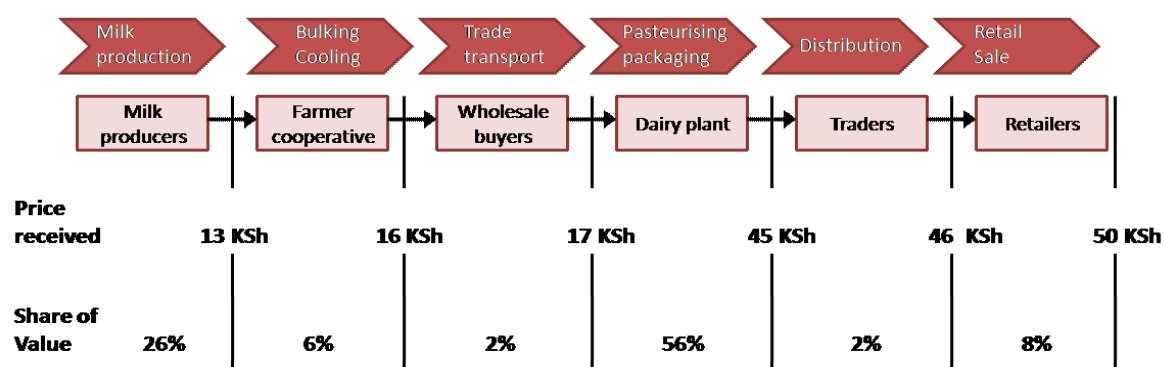
Figures 9 and 10 above outline the method for calculating the total value added within the value chain (note that total value generated by the value chain here includes the value of intermediate goods).

Calculating value addition

Applying the principles outlined previously, value addition should be calculated for each stage of the value chain. The collection and analysis of this information is central to the value chain approach, allowing the intervening organization to map the distribution of value added between stages and actors. Figure 10 provides an elaboration of the calculation of value added by stage. Note that where several actors exist within each stage, value added may be calculated and presented on an actor-by-actor or representative (average) basis. Where formal transactions do not take place (for example in the case of value chain actors whose activities extend across several stages) estimated or proxy data should be employed.

The calculation of value addition across different stages of the value chain provides a breakdown of the distribution of value added between various actors within the chain, as shown in figure 11 below.

Figure 11. Distribution of value/revenue along the value chain

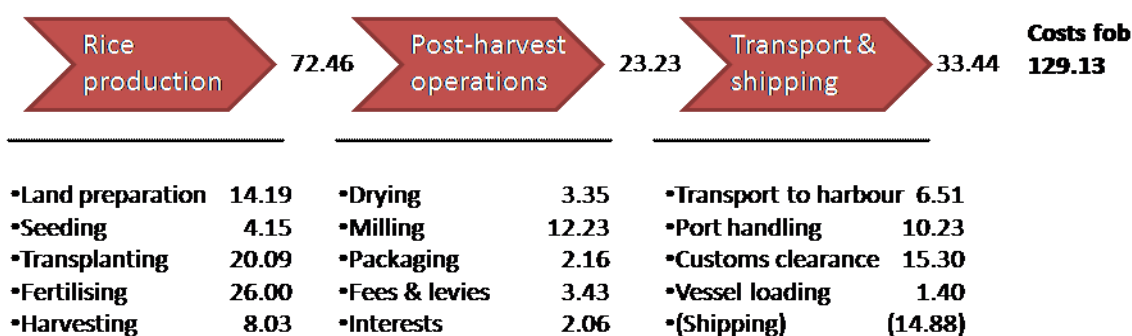


Source: Hoeffler and Ogana, 2006.

3.1.4 Cost/margin analysis

Figure 12. Example – cost calculation related to rice value chain in Cambodia

Costs of performing functions in production of Neang Mali Rice for export, Cambodia (in US Dollar/ton)



Source: GTZ, 2007.

Assessing the distribution of value – costs and margins

Measuring value chain distribution, although it may provide an initial indication of asymmetry within and/or between value chain stages – for example very low levels of value added at the producer level relative to aggregate chain value – does not directly address the distribution of benefits within the value chain, and therefore the potential for a rebalancing of this distribution to support improved decent work or environmental outcomes. In order to determine this, it is necessary to assess costs for each actor within the value chain, allowing the intervening organization to then calculate the margin received at each stage. Figure 12 above provides an example of a cost calculation for a section of the export rice value chain in Cambodia.

3.2 Qualitative mapping: value chain governance

Introduction to qualitative analysis and mapping (governance and linkages)

Within the value chain approach **governance** relates to the linkages and relationships – in effect the power relations – between different actors within the value chain, and the wider social and economic context (or business enabling environment) within which they operate. It can encompass both formal and informal mechanisms of coordination, regulation and specification, and (following the terminology outlined in Section 3.1.2) includes both actors directly engaged in the value chain, and operational and support service providers.

Green growth policy-making involves cross ministerial coordination and enhanced public and private sector collaboration. Accordingly, a key feature of the value chain approach is the identification of relevant actors and instruments understood as playing a facilitating role in supporting green jobs and the shift to a greener economy. This includes stakeholders within different public institutions (ministries and units at the central government level) and at the sub-national level, such as academic and research institutions, civil society partners, and the private sector. Various instruments include policies, regulations, economic incentives and related public/private sector investments and financial mechanisms seen as contributing to creating an enabling environment for green jobs and sustainable enterprises.

There are many approaches to assessing and mapping value chain governance, the selection of which will depend on the requirements of an individual project (for further information see *Volume II*). Next is provided an example of a map highlighting forms of linkages between value chain actors.

Figure 13. Mapping linkages

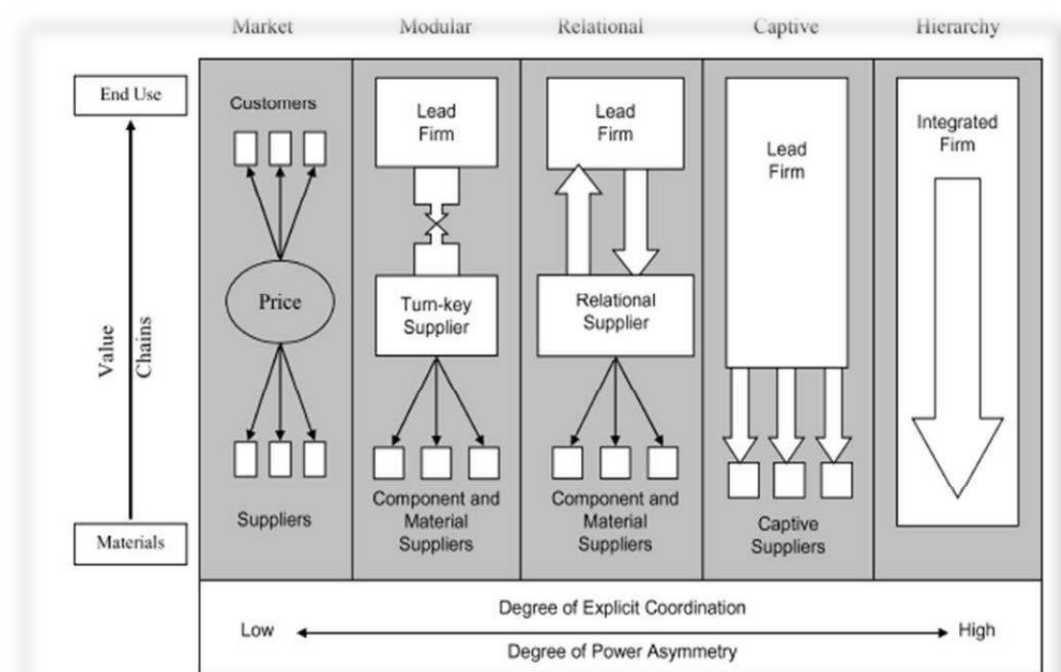


Figure 1 Five global value chain governance types.

Source: Gereffi et al., 2005.

3.3 Environmental impact assessment

Environmental assessment in value chains	The Green jobs value chain development methodology uses as its primary reference point one of the most widely applied environmental assessment tools – the Life Cycle Assessment (LCA) approach – to quantify and assess the environmental impact of a given value chain. Having undertaken an initial mapping of value chain processes, actors, values and relationships, the green jobs methodology specifies the creation of an inventory of environmental loads generated at each stage (unit process) of the value chain. This is then combined with an impact assessment integrating global and local environmental considerations in order to identify and prioritize stages within the value chain for intervention.
Green jobs environmental assessment and LCA: similarities and differences	Although adapted from the LCA approach, the green jobs value chain development methodology does not involve the commissioning of a full LCA – instead it adopts elements of the LCA approach and attempts to adapt them to an action research context. The green jobs value chain development methodology is therefore neither fully compliant with the principles of LCA (as defined by relevant ISO standards), nor a substitute for a more rigorous orthodox LCA approach. The green jobs methodology is not designed to quantify the precise overall environmental impact of a given product or service – instead it is designed to identify the primary environmental loadings associated with the unit processes required to produce a given product or service, and to design an intervention strategy to substantially and sustainably reduce those loadings.
Methodology outline	Following the model common within many LCA methodologies, the environmental assessment process will consist of four principal stages: Stage 1: Initiation – including the specification of the functional unit, the adaptation of the existing system flow diagram and the definition of system boundaries Stage 2: Inventory analysis – the collection of data for all inputs (raw materials and energy) and outputs (products and solid, liquid and gaseous emissions) at each stage of the process Stage 3: Impact assessment – a technical and qualitative process to examine the potential and actual environmental effects of the environmental loadings identified in the inventory component Stage 4: Improvement analysis – identification and evaluation of improvement options. The first three of these stages – initiation, inventory analysis and impact assessment – will be outlined in Section 3.3.3 next. The fourth stage (improvement analysis) will be undertaken as part of the wider analysis and intervention design process outlined in Section 4.
Step 1: Initiation	The initiation step within the environmental assessment framework involves the definition of the scope and goals of subsequent analysis.

At this stage of the value chain analysis, several necessary elements will already exist, including a definite set of **aims and objectives** for the individual value chain development project and a value chain chart identifying discrete unit processes.

There are, however, several further issues which must be addressed before undertaking an inventory analysis. These include the following:

1. Identification of functional unit and reference flow – this refers to the overall functional unit of analysis, defined as the quantified performance of a product system (i.e. by the primary function fulfilled by a product system). The reference flow relates to the measure of the outputs from processes in a given product system required to fulfil the function expressed by the functional unit (for example, using a litre of milk as the functional unit in assessing a dairy value chain). This is particularly relevant if the project wishes to focus primarily on unit efficiency – note that it does not in itself capture aggregate environmental loads and must be combined with accurate overall production data.

2. Definition of system boundaries – including the boundary separating the product system studied from other product systems, and the boundary between processes taken into account and those not taken into account in the product system. The initial value chain mapping and analysis exercise provides a chart identifying the main unit processes within the value chain. Check that this relates to processes with environmental outcomes, and that boundaries between unit processes are appropriate. Where assessing multiple units (rather than individual units) make decisions on scope and scale of assessment, i.e. single representative unit, or multiple units.

3. Criteria for inclusion of inputs and outputs – in standard LCA practice this refers to orders of magnitude (for example inputs/outputs as a percentage of total mass, volume or value). In the green jobs methodology it may also refer to the prioritization of certain environmental loads (e.g. emissions of carbon dioxide equivalent (CO₂e), use of biotic resources such as water, etc.) over others. While this prioritization process will also subsequently occur at the impact assessment stage, issues such as resource and data availability constraints (and the initial aims and objectives of the organization) may circumscribe the specific environmental categories on which data is initially collected (for example, the primary remit of the project could be greenhouse gas emissions, or the prevention of deforestation and land degradation).

4. Allocation – having identified the system boundaries and inputs/outputs to be included, allocation involves the partitioning of the input or output flows of a process or other product system to the product system under study (for example, the allocation of impacts from co-production of refined sugar and molasses when assessing the sugar value chain).

5. Data quality requirements – this will include definition of coverage (for example time, geography, source, precision, completeness and representativeness). For further detailed guidance on implementation of the environmental impact assessment methodology, please see *Volume II*.

Step 2: Inventory of environmental loads

The second step of the environmental assessment is **inventory analysis** – the identification and quantification of the environmental loads involved in each unit process within the value chain. This involves the collection of data for all physical inputs (raw materials and energy) and outputs (products and solid, liquid and gaseous emissions) at each stage of the value chain, and is generally the most time-consuming stage of the environmental assessment process.

Each unit process inventory contains only emissions and resource inputs from one process step (as defined in the initiation phase), plus references to input from other unit processes. So for example the unit process “dairy processing” contains only “transport of chilled milk to processing unit, processing and packaging”. The unit process starts at the point where the milk arrives as part of another process – the environmental load connected to all activities prior to this is therefore captured in a series of other unit processes.

Within a conventional LCA framework, a large percentage of the Life Cycle Inventory (LCI) is typically derived from or validated against existing (benchmark) data on a given impact – examples of existing LCI databases are outlined below.

Established LCI databases widely used in LCA practice	GaBi, SimaPro, KCL-Eco, LCAit, SPINE, TEAM, Umberto
National LCI database projects	Australia, Canada, Germany, Italy, Japan, Switzerland, United States.
Multinational LCI database projects	Action 530, eLCA

Outcome: production of input/output tables for each unit process within the value chain

Working in a developing country context, and examining unit processes that may not have clear or direct comparators within existing environmental impact databases, may require both a greater degree of initial primary data collection, and a higher degree of qualitative assessment (see *Volume II* for detailed guidance on environmental data gathering). Note that once the inventory analysis process has begun, it may also become necessary for reasons such as data availability to revisit the parameters determined in Step 1, including the identification of system boundaries, the division of process steps, criteria for inclusion of inputs and outputs and overall data quality requirements.

The initial outcome of the inventory analysis will be the production of input/output tables for each unit process within the value chain. table 8 provides an example of the resulting input/output inventory using the basic flow chart template – note that in most cases an inventory of the entire value chain will require a number of individual flow charts or sub-charts (for example where several market channels exist, or where a range of actors exist at any one node of the value chain). It is recommended that these input/output tables capture aggregate (rather than solely functional unit) inputs and outputs in order to present an accurate picture of overall environmental load.

These individual unit process input/output tables will be then aggregated to create an inventory of total environmental loads.

Identifying impact categories

Table 8. Potential impact assessment categories

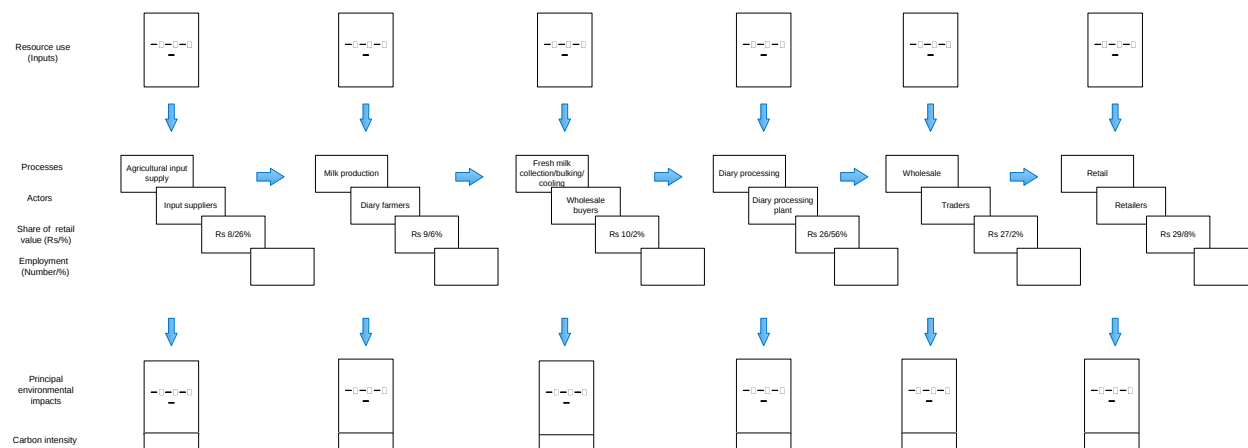
Impact category	Unit
Resource use	kg resource
Global warming	kg CO ₂ equivalents
Water use	m ³ water
Land use	Equivalent hectares
Waste	kg waste
Acidification	kg SO ₂ equivalents
Eutrophication	kg PO ₄ ³ equivalents
Smog formation	kg Ethene equivalents
Ozone depletion	CFC 11 equivalents
Human toxicity	HTx equivalents
Eco toxicity	ETx equivalents

Source: LCA Centre, 2010.

Outcome: identification of environmental deficits

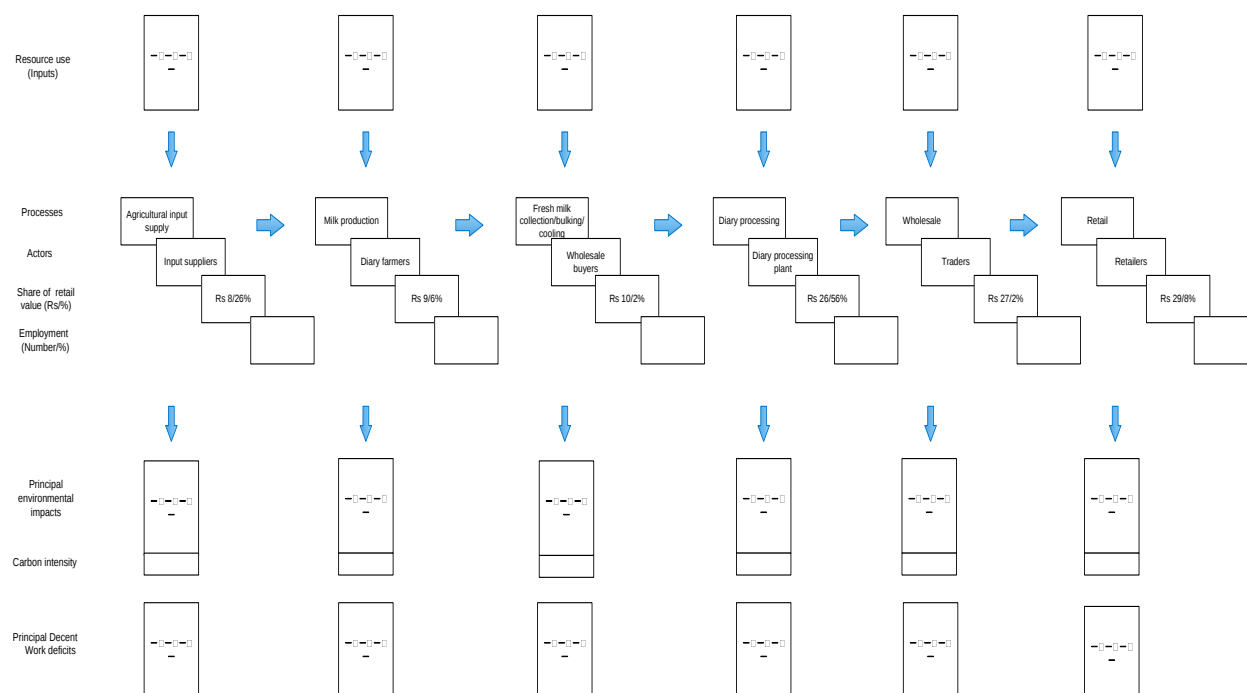
The outcome of the environmental analysis and mapping process will be a diagram outlining the principal environmental loads generated by the value chain, see figure 14.

Figure 14. Value chain diagram incorporating environmental impacts



3.4 Decent work mapping

Figure 15. Value chain diagram incorporating decent work impacts



Methodology outline

The green jobs methodology identifies two groups of **indicators for assessing decent work impacts: recommended indicators**, and **discretionary indicators**.

Several of the decent work indicators can potentially be derived directly from the employment assessment undertaken in Section 3.2.2 – these may include data on stability and security of work (employment type and period) and equal opportunity and treatment in employment (gender and ethnicity). Other indicators will indirectly incorporate data derived from Sections 3.2.2, 3.2.3 and 3.2.4 (on employment, costs and value addition respectively).

The recommended decent work indicators are those already **outlined in the sector selection phase** (see Section 2.2). Alongside the recommended indicators outlined in Section 2.2, the intervening organization(s) may also wish to **select further generic or sector-specific indicators as applicable**.

Table 9 below provides a number of indicative examples of further potential indicators – please note that these are non-exhaustive, and projects may wish to develop their own indicators as necessary.

Table 9. Decent work indicators (discretionary)

Decent Work Agenda element	Potential indicator
Adequate earnings and productive work	% of workforce provided with paid overtime (where relevant).
	% of workforce living at or under national poverty line.
	% of workforce able to meet stated minimum living standards.

Decent hours	% of workforce working in excess of 48 hours per week.
Combining work, family and personal life	Provision of accommodation for families of migrant workers.
Work to be abolished	Number of bonded/indentured workers.
Stability and security of work	% of workforce self-employed.
Equal opportunity and treatment in employment	Occupational segregation by sex. Measures for discrimination by race/ethnicity/of indigenous people /of (recent) migrant workers/of rural workers where relevant and available at the national level.
Safe work environment	Level of provision of amenities/worksites facilities (e.g. water, toilet facilities). % of workforce exhibiting persistent health conditions. Level of sickness absence (days per year).
Social dialogue, workers and employers' representation	Number of days lost to lockouts/industrial action (12 month period).

Outcome: identification of decent work deficits

The outcome of the decent work analysis and mapping process will be a series of diagrams outlining the current decent work status of the value chain.

Section 4. Value chain analysis and intervention design

Summary

The purpose of this section is to translate the initial value chain research undertaken into the development of a vision for change, and related options for intervention. This involves the prioritization of specific environmental and decent work deficits for further analysis and intervention, research on specific opportunities and constraints related to these deficits, and the development of a framework for identifying and selecting intervention options.

Outcomes:

- Identification of priority environmental and decent work deficits for further analysis.
- Vision statement on improved environmental and decent work outcomes.
- Analysis of opportunities and constraints in relation to identified deficits.
- Appraisal of options for intervention, and selection of intervention options.

4.1 Focussing on specific deficits and markets within the value chain system

4.1.1 Prioritizing environmental and social deficits within the value chain system

Prioritization of environmental and decent work deficits

During the initial analysis and mapping phase, we have developed a broad picture of the **principal environmental and decent work deficits** within the value chain, and recorded a range of quantitative and qualitative data. Having mapped the value chain, the next phase of the process is the **prioritization of specific deficits** for further research and analysis. This means selecting some of the environmental and decent work deficits which you have identified in your initial research for further analysis and potential intervention.

Methodology for prioritizing environmental and decent work deficits

The green jobs value chain development methodology adopts a **three stage approach to prioritizing environmental and decent work deficits** for intervention. This focuses on **hot spots** – environmental and social aspects in a specific value chain stage that assume high relevance in the context of the whole chain. Hot spots are hence assigned priority for action towards the reduction of the chain's environmental and social footprints. Hot spot identification includes three main steps:

1. **Environmental and social aspects significance assessment:** Firstly, the significance of a given set of environmental and social aspects for each value chain stage is assessed individually.
2. **Value chain stage significance assessment:** Secondly, the relative significance which different value chain stages have on the environmental and social performance of the entire value chain is assessed.
3. **Hot spot identification:** Thirdly, the grading of the environmental and social aspects significance is combined with the value chain stage significance in order to identify the most important environmental and decent work deficits, or hot spots.

The purpose of this identification is to select the focus areas within the product chain by assessing the relevance of different environmental and social aspects

along the product or service life-cycle. Below are provided step-by-step details of the methodology for prioritizing impacts.²

**Step 1: Aspects
significance
assessment (individual
stage)**

Firstly, the significance of a given set of environmental and social aspects for each life-cycle phase is assessed individually. This assessment will cover all the environmental and decent work issues assessed in the initial value chain analysis and mapping phase. Following the participatory approach advocated by the ILO, the methodology outlined will integrate the views of enterprises, employees and other stakeholders into the assessment process. It will involve undertaking brief representative surveys with enterprises and workers at each value chain stage assessing impacts relevant to their specific stages, and surveys assessing all value chain stages with key stakeholders such as business membership organizations, regulatory agencies and worker's organizations.

The three stages of the initial aspect significance assessment are as follows:

1. The intervening organizations categorize the environmental and decent work issues identified into categories using a three-point High/Medium/Low (HML) scale (i.e. High significance = 3; Medium significance = 2; Low significance = 1).
2. Enterprises and workers within the individual value chain stage are asked to categorize the environmental and decent work issues identified into HML categories using the three-point scale, with the average incorporated into the assessment table.
1. 3. Stakeholders within the wider value chain are asked to categorize the environmental and decent work issues identified into HML categories using the three-point scale, with the average incorporated into the assessment table.

² See *Volume II* for detailed practical guidance on undertaking the significance assessment.

Table 10. Example aspect significant assessment (individual stage)

Product chain	Cotton garment (dyed, printed woven)				
Life cycle phase	Agriculture/raw fiber production				
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Environmental aspects	Fact based scoring (1–3)	Source of fact based information	Company internal relevance based scoring (1–3)	Stakeholder expectations based scoring (1–3)	Aspect significance
Raw material (fertilizer and pesticide use)	3	Banuri T. 1998. <i>Pakistan: Environmental Impact of cotton production and trade</i> (Paris, UNEP).	1	2	3
Water consumption	3	WWF	3	3	3
Energy consumption	1	n/a	1	1	1
Land use	2	WWF	1	2	2
Waste generation	1	n/a	1	1	1
Air emissions	1	n/a	1	1	1
Wastewater generation	3	WWF	2	2	2
Health effects on cotton pickers	3	WWF	2	3	3
Social aspects					
Working conditions	3	n/a	2	2	2
Social security	3	n/a	2	2	2
Training and education	3	n/a	2	2	2
Human rights	3	n/a	2	2	2
Living wages	3	n/a	2	2	2
Total					26

Source: ODI, 2010.

Step 3: Hot spot identification

In Step 3, the grading of the environmental and decent work aspects significance for the individual stages is combined with the value chain stage significance assessment in order to identify the most important hot spots. This is achieved by integrating the individual value chain stage assessment with the assessment of stage significance within the overall value chain. Hot spots for each stage are identified by multiplying the aspect score for individual value chain stages with the stage significance score. The resultant score for each aspect will be in the range of 1 to 9, see table 11. The aspects scoring within the range 6 to 9 are considered hot spots.

Table 11. Identification of impact hot spots

Product chain	Cotton garment (dyed, printed woven)							
	Agricul	Ginn	Spinn	Weav	Process	Stitch	Distrib	Use
Environmental aspects								
Raw material	9				6			
Water consumption	9				9			
Energy consumption		9	6	6	9			
Land use	6				6			
Wastewater generation	6				9			
Health effects on cotton pickers	9							
Occupational Health and safety issues								
Noise		9			6			
Cotton dust		9						
Fire		9			6			
Injuries		6						
Social aspects								
General working conditions	6	6			6			
Social security	6	6						
Training and education	6	6			6			
Human rights	6	6			6			
Living wages	6	6						

Outcome: identification of deficits for analysis and intervention The outcome of the environmental and decent work deficit prioritization process will be a chart outlining the hot spots identified for project intervention.

4.1.2 Assessing current and potential value chain performance

Benchmarking performance

The process of benchmarking is often central to determining the scope for improvement in environmental and decent work outcomes, and potential technologies and processes with which to achieve these improvements. Benchmarking compares the value of key indicators of environmental, decent work and economic performance with the value of indicators in other comparable unit processes or value chains. There are two stages to the quantitative benchmarking process:

Step 1: Identify benchmarks

Step 2: Measure quantitative performance gaps

For further practical guidance on the benchmarking process please see

Step 1: Identify benchmarks

The first stage of the quantitative benchmarking process is the identification of suitable performance benchmarks for each of the value chain stages or unit processes prioritized for intervention, and for the individual performance indicators identified within these. Benchmarking can relate to any of the performance indicators assessed in the initial value chain analysis phase. Benchmarks will normally be set against the functional units and other parameters set during the initial analysis and mapping stage (where these do not match available benchmark data, clear and consistent conversion factors should be applied).

Two forms of benchmarking are envisaged within the green jobs approach – benchmarking against peer performance, and benchmarking against existing and future potential regulatory standards and norms. Although responsibility for identifying and selecting peer benchmarks lies with individual projects, this process should be clear and transparent, considering a range of potential options for benchmarking including:

- industry/cross-industry benchmarks;
- regional/national /international benchmarks; and
- benchmarking against average/best practice performance.

One purpose of the benchmarking process is comparability – where relevant, benchmarks selected should therefore take account of existing technologies, processes, local factors of production and other constraining factors (although this should not preclude reference to international best practices, including performance in developed economies). Where directly comparable sectors or industries exist but performance benchmarks do not exist, the project may wish to develop these through primary or secondary research. Where these are not available, the project may adopt realistic proxies against which to benchmark.³

Alongside peer benchmarking, it is also useful to define performance parameters against national and international regulatory standards and norms. This allows the intervening organization and its partners to situate value chain performance within a wider context, identify those elements of peer performance which are inappropriate for use as a benchmark in the development of performance targets and assess the potential scope for regulatory action to reduce environmental and social externalities. Benchmarking against standards is also particularly important where peer benchmark data may be non-existent or of poor quality.

Step 2: Measure performance gaps

For each of the processes chosen for investigation, the relevant performance variables are related to the identified performance benchmarks. The performance gap represents the difference between benchmark and actual performance. Depending on the benchmarking principles and benchmark/s chosen, the performance gap for each indicator may be expressed in absolute terms or within a range. Box 1 provides an example of environmental performance (energy

³ Where neither of these options are available, normative performance goals may be set in consultation with stakeholders – see Section 4.3.2.

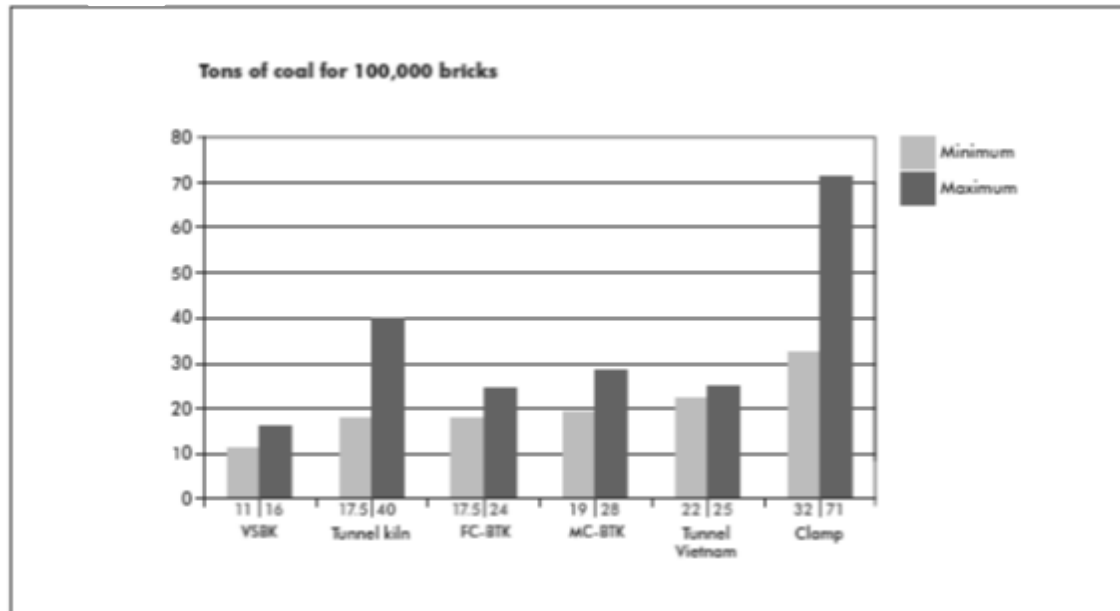
Box 1

Environmental benchmarking – brick kiln performance in Asia

Using the example of the brick industry, the table and graph provide comparative data on energy and resource consumption (and by proxy carbon and other emissions) for various types of brick kiln. This benchmarking was undertaken as part of the Swiss Agency for Development and Cooperation's (SDC) Asian brick industry programme, and demonstrates the substantial efficiency gains possible in moving from the kiln technologies currently employed across most of developing Asia (clamp and other batch kilns, Bulls Trench Kilns (BTKs) and tunnel kilns) to the Vertical Shaft Brick Kiln (VSBK) technology.

The Asian brick industry currently produces around 1,000 billion bricks, consuming one hundred and ten million tonnes of coal and emitting roughly 180 million tonnes of carbon dioxide (CO₂). The benchmark data outlined above suggests that up to 40 per cent of the 180 million tonnes of CO₂ emitted by the Asian brick industry (72 million tonnes of CO₂) could be saved just by switching to more efficient kilns such as the VSBK.

Type of kiln	Specific energy consumption (MJ/kg of fired brick)	Specific coal consumption (tons/100 000 bricks)
VSBK (India, Nepal, Viet Nam)	0.7–1.0	11–16
Fixed chimney BTK (India)	1.1–1.5	17.5–24
Moveable chimney BTK (India)	1.2–1.75	19–28
Tunnel kiln (Nam Dinh, Viet Nam)	1.4–1.6	22–25
Modern tunnel kiln (Germany)	1.1–2.5	17.5–40
Clamp and other batch kilns (Asia)	2.0–4.5	32–71



The basic relations between bricks and coal consumption for different kilns in tons of coal used to produce 100,000 bricks (of 3kg each)

In this project, SDC's benchmarking process then went on to assess other elements of the product and production process and life-cycle. For example, if hollow bricks could be introduced – instead of solid bricks – this would lead to another dramatic reduction in energy, as the energy consumption of baking a brick is proportional to its mass. A hollow brick, having up to 20 per cent less mass, thus requires less energy for baking compared to a solid brick. Adoption of this technology would also have further positive environmental impact during use. Solid brick walls offer poor thermal insulation and thus a building constructed with solid bricks consumes considerably higher lifetime energy for heating or cooling of the building. Furthermore, using hollow bricks alongside improved building techniques and practices (such as using rat-trap bond in place of traditional English bond masonry for constructing walls) would further reduce the amount of bricks and mortar required per m² of wall construction. This would both reduce the embodied energy in building construction, and improve the building's insulation properties, contributing to substantial reductions in CO₂ emissions over its lifetime.

Source: UNDP/SDC, 2008

4.2 Developing a framework for finding sustainable upgrading solutions in value chain systems

4.2.1 Analysis of key constraints and options for intervention

Market diagnosis

The **market diagnosis** phase of the assessment process is the stage at which the qualitative and quantitative data on value chain performance is combined with the assessment of environmental and decent work deficits to produce a multidimensional analysis of opportunities and constraints to value chain upgrading.

Moving from symptoms to underlying systemic constraints

The benchmarking and performance assessment process allows the project to identify and quantify the performance gap between existing and potential technology and practices, and potentially identify a range of potential options for upgrading. These performance gaps are potential symptoms of dysfunction within the value chain or unit process in question. The challenge is then to move from the identified performance gaps (symptoms) through proximate drivers to the **underlying systemic constraints** (causes) generating dysfunctional market outcomes.

Step 1: Identifying key performance drivers

The first step in the development of options for intervention is an assessment of the **drivers of differential performance** (i.e. the underlying causes of a performance gap). The benchmarking results should be analysed to better understand the similarities and differences between comparator performance, and the underlying technical feasibility of undertaking change in a given sector.

In the case of environmental benchmarks, an assessment will be made of eco-efficiency relative to best practice with existing technologies and processes within the value chain, and to best practice with potential technology. Where opportunities for upgrading are judged to exist, we then need to ask: why has not the industry upgraded to best practice? In the case of process upgrading for improved environmental incomes, is it because actors in the value chain are unaware of improved technology and operating procedures (lack of information)? Is it because they cannot afford the capital cost of newer technologies (lack of resources)? Or is it because there are no substantial market pressures to adopt new technologies and practices (lack of incentive)?

For example, the superficial answer to the question “why are pottery kiln emissions so high?” may be that kilns are using dirty fuels, inefficient kiln technologies and inappropriate working practices. In assessing the possibility and efficacy of upgrading strategies, we need to go beyond this recognition, and assess the underlying reasons for the value chain’s relative underperformance. The ultimate causes of value chain dysfunction may be single or multiple, direct and/or indirect, and may exist at several degrees of separation from the unit process in question. In attempting to identify underlying causes, it is therefore necessary to look beyond the boundaries of a specific process, since possible causes may be found in interdependencies with other processes.

Projects should therefore look back at the quantitative and qualitative analysis and mapping stages to determine how the market is organized, and how the benefits and costs generated by the chain are distributed

between the various actors. Why is the value chain generating dysfunctional outcomes? To what extent are environmental and social costs being internalised in the operation of the chain, and if they are not, why not? How are value chain supporting actors contributing to the performance deficit through action or inaction? What functions are being undertaken in better performing peer value chains that are inadequate or non-existent within the target value chain?

The result of this initial assessment of performance drivers should be the production of a causal chain for each deficit, identifying the principal contributory factors identified by the project for the gaps between value chain and benchmark performance.

Step 2: Assess capacity to effect change

Having identified the primary drivers, Step 2 assesses the intervening organization's technical and organizational ability to address these drivers using the resources at its disposal. In part, this is an elaboration of the process undertaken during the sector selection phase (with the benefit of the information gained during the initial research and mapping phase).

This process first involves being clear on the resources available to the intervening organization and on its potential role relative to value chain participants and supporting actors (in both the immediate, medium and long terms). Value chain interventions can typically be understood as existing on a continuum between a strict facilitation role and direct market intervention (although the actual activities undertaken often fall somewhere between these two poles in practice). **Facilitation** is generally understood to involve activities which catalyze performance improvements in the value chain, but which do not involve the intervening agency undertaking a direct market function. **Direct intervention** involves the intervening agency effectively inserting itself as an actor within the value chain or wider market system. In part the role of the intervening organization will be circumscribed by the time and resources available, with projects undertaken using the basic green jobs approach likely to adopt a narrower facilitation role (see Annex for further details).

It then involves an assessment of the **capacity and incentives** of value chain actors to contribute to addressing the identified deficits, and the ability of the intervening organization to shape these. Previous projects (including those outlined in the case studies attached) demonstrate the benefits of a push/pull approach to improving social and environmental outcomes within value chains – in other words, shaping incentive structures (for example through regulation, or taking advantage of exogenously-generated changes in incentives, such as fuel price rises) whilst simultaneously improving the capacity of value chain actors to respond in ways that promote green jobs outcomes (for example through technology development and support). Alongside feasibility, projects should also assess the **likely dynamic impact** of engaging with the identified drivers, and the potential for negative effects, based on the knowledge gained from the research and analysis phase. The result of this process will be the clear identification of which constraints the project has to work around, and which the project should attempt to tackle (directly or indirectly).

Step 3: Visioning for value

Having identified the key areas of focus and assessed current and potential performance, the next step within the value chain promotion

chain development

process is the development of a **vision statement** outlining the strategic aims and objectives of the project over a given timeframe.

In line with the broader green jobs ethos, this vision statement should be ambitious, recognizing the scale of the shift necessary to reorient economic activity towards genuine environmental and social sustainability. It should cover both the overall value chain, and those stages and unit processes within the value chain targeted for further analysis and intervention.

Developing a vision statement

This vision statement will form the framework within which will be incorporated specific goals and performance targets (following upgrading assessment and intervention design), and against which the project's success will be monitored and assessed (see also Sections 5 and 6). The vision statement uses impact categories (rather than individual indicators) to define key areas of improvement. This is in effect an elaboration of the aims and objectives outlined at inception, incorporating the information gained from the initial research and analysis and hot spot identification. At this stage project objectives do not have to be directly quantitative, but should instead define areas of focus and direction of travel, addressing the basic question:

“What would a (more) socially, environmentally and economically sustainable value chain look like in five years?”

Note that the vision statement does not necessarily focus on how impact will be achieved– for example, high particulate emissions or stagnant productivity within a given unit process could be addressed through the introduction of new technology, better use of existing technology or phasing out of the process altogether. Instead the vision statement provides a frame of reference through which to approach the subsequent intervention design and implementation stage.

Step 4: Propose options for upgrading

Step 4 involves the final identification of improvement options, and the development of an intervention plan. Many of the principles of intervention design within the green jobs approach mirror those which apply to most value chain development methodologies – these include the maintenance of a **long-term vision and systemic perspective**, a **focus on complementarity** rather than duplication, and the **integration of flexibility** into project design and implementation. The key principle of intervention selection within green jobs is, however sustainability. The term sustainability applies both to the ability of the value chain to continue to support certain performance-enhancing functions after the withdrawal of the intervening agency, and also to the adaptive capacity of the value chain to future change. For example, a project aimed at promoting upgrading of production processes may develop improvements in technology or operating practice which, once introduced, are adopted throughout the value chain and persist after the organization's exit – a legitimate and significant project goal. Ideally, however, a project intervention will generate not only improved performance through value chain upgrading, but also a sustained increase in the capacity of the chain and supporting actors to continue to generate further upgrading activity in response to future changes in the market environment.

Step 5: Identify partners

Given the diversity and dynamism of market systems, there is no fool-proof approach to partner selection. Personal factors (such as the

character and motivation of individuals running organizations) will play an important role, but are difficult to capture in a list of criteria.

However there are a number of considerations that facilitators should bear in mind:

- appropriate capacity to perform and continue performing specific market functions;
- clear incentives (e.g. to reform, to improve practice or perform a new market function);
- demonstrated ownership or initiative over a reform process or market function;
- existing momentum upon which engagement can be built (assuming that it is in a direction consistent with intervening organizations' objectives and strategy);
- potential for viability to continue to perform and adapt market functions; and
- responsiveness to facilitators' overtures, vision and way of working.

Facilitators work with partners as a means to an end: to stimulate wider and sustained market system change. Therefore the relationships facilitators have with partners should foster appropriate behaviour in partners to accomplish objectives of market system change. In practice an effective relationship typically has to balance two considerations:

1. providing the right incentives to a market player partner to ensure their engagement and commitment and sustainability; and
2. achieving wider market system change and avoiding unfair competition or disproportionate capture of benefit – in other words “keeping the door open” for others.

To do this facilitators need to ensure: (a) that their support to partners is transactional; and (b) that their offer to partners is clear and credible.

If programme support is to crowd-in market functions and players, it is important that it should be structured in such a way as to stimulate commitment and ownership (i.e. it gets market players to invest in the market system). This typically means making support transactional, i.e. it should involve a *quid pro quo* – something in return for something. This might mean matching financial contributions, some form of in-kind contribution like personnel or premises or a significant level of effort (sweat equity).

Support that is transactional has a number of benefits:

- it requires reciprocity and therefore has the potential to leverage partner resources and commitment;
- it fosters more realistic incentives and behaviour;
- it links support to performance and attaches a value to support, encouraging prudent and effective utilisation and ensures appropriate intensity of support (see below); and
- it mimics and reinforces relationships in a manner that is consistent with market norms.

Conversely, unconditional or soft support can send the wrong messages to partners and the wider market system; it undermines market signals or incentives and is more likely to distort rather than develop markets.

A clear and credible offer to partners is key. “What is our offer?” is a

critical question for facilitators in market development. Because value chain development programmes rely less on providing direct financial support, their offer – what they provide, what they expect in return and how that deal is presented – to partners needs to be clear, well-understood, credible and valued, if it is to result in productive engagement.

4.2.2 The role of participation in intervention design and implementation

Participation in design and implementation

Participation is central to the green jobs value chain approach, and various participatory approaches can be used to present your findings and proposals and get feedback in order to further refine them (see *Volume II* for more information). In employing participatory tools to develop and assess proposed interventions, it is important to distinguish between means and ends. The role of the intervening organizations is to undertake an objective appraisal of the deficits, constraints and opportunities existing within a given value chain, and to develop and implement an intervention strategy that addresses these in the most effective way possible.

Within this process, participation is primarily useful in two ways:

1. providing information on existing conditions and potential upgrading options and challenges; and
2. improving the potential for success by increasing ownership and contribution from value chain actors.

In recognizing the value of participatory approaches to intervention design, it is important to emphasise that these should be undertaken instrumentally, with a view to improving intervention design and implementation. It is frequently the case that few (if any) actors within a value chain will possess the strategic view across stages which the intervening organization possesses. Pressure to deliver immediate results or support sectional interests can potentially lead to the selection of inappropriate or short-term intervention strategies, and an undue focus on participation as a process can dissipate time and resources without delivering tangible change within the sector. Projects should therefore attempt to ensure that, where adopted, participation processes inform, legitimise and support project interventions, without unduly compromising their effectiveness.

Section 5. Implementation, monitoring and evaluation

Summary

This section will outline the proposed framework for the monitoring, evaluation and impact assessment of project activities. It will outline a methodology for identifying and measuring key performance indicators, and applying these indicators to assess the effectiveness of project interventions. This section also contains case studies of a number of recent green jobs-related projects, providing guidance on opportunities and challenges in designing and implementing an intervention strategy and outlining key learning outcomes.

Outcomes:

- Identification of impact logic and selection of indicators for intervention monitoring and evaluation.
- Pre-inception assessment of proposed interventions against impact.
- A framework for assessing project outputs and outcomes during implementation.
- A framework for evaluating and reporting on environmental and decent work impact.

5.1 Developing a framework for intervention monitoring and evaluation

Developing a system for monitoring and evaluation

The monitoring and evaluation approach proposed within the green jobs value chain approach can be divided into three component stages:

1. **Appraisal:** The assessment of a project when it is in the planning stage, before implementation (i.e. it is prospective).
2. **Monitoring:** The routine collection and analysis of information to enable the assessment of a project's progress during the course of implementation (i.e. it is current).
3. **Evaluation:** The assessment of a project's performance conducted after a period of implementation (i.e. it is retrospective).

This monitoring and evaluation system will identify key performance indicators within four areas:⁴

Inputs

1. **Inputs:** The financial, human and material resources used for development intervention (i.e. resources needed to achieve the outputs).

Outputs

2. **Outputs:** The products, goods and services which result from a development intervention. Outputs are services or products the project is responsible for delivering. Examples include guides, publications, training programmes, and the development and dissemination of new technologies and processes, etc.

Outcomes

3. **Outcomes:** The likely or achieved short and medium-term effects of an intervention's outputs. Examples are increased awareness and/or adoption of a particular technology, increased enforcement of labour regulations, banks increasingly providing loans to small producers for technical upgrading, etc. Outcomes serve the achievement of long-

⁴ ILO, 2005.

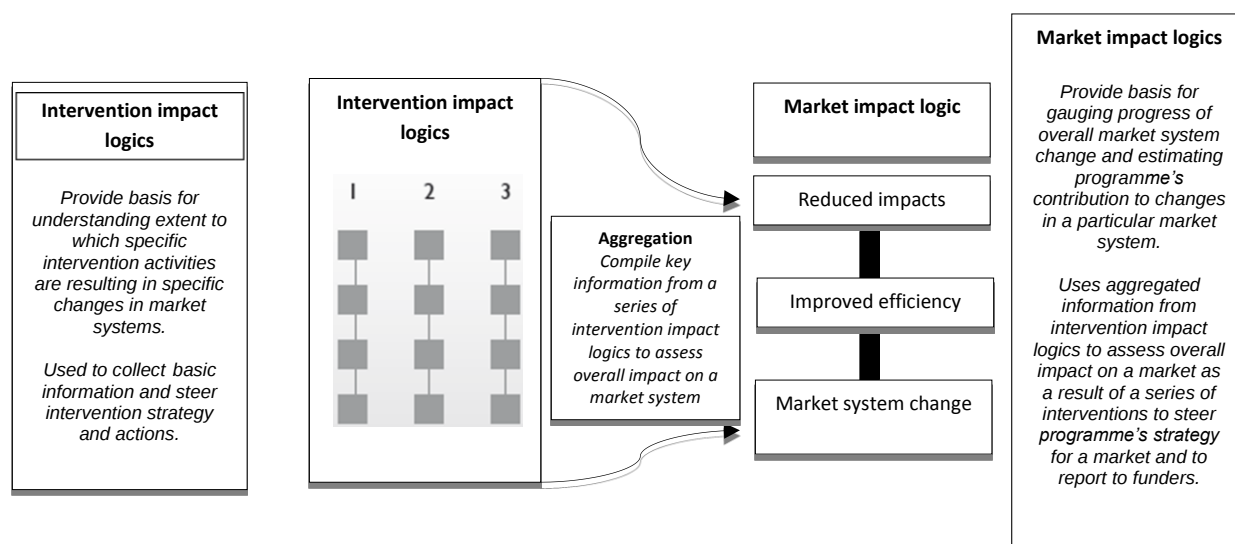
Impact

term development objectives (impact).

4. **Impact:** Impact assessment looks at the achievement of overall long-term and strategic development objectives, such as lower carbon emissions, reduced resource use, reductions in water pollution, improved gender equity at work, better working conditions, or eradication of child and forced labour.

5.1.1 Intervention assessment and indicator development

Figure 16. Impact logic



Source: Springfield Centre, 2008.

Indicator development and intervention appraisal

The process for developing the monitoring and evaluation indicators, baselines and targets during the intervention design phase is as follows:⁵

Step 1: Develop impact logics for each market system and related interventions in that market system, based on the overall programme strategic framework

Step 2: Use the impact logics to identify appropriate indicators to monitor the outcomes of specific interventions and their impact on the market system

Step 3: Establish a baseline for key indicators

Step 4: Predict at the beginning of intervention the amount of change in each indicator that may be expected to result from each intervention

Step 5: Design and implement a plan for collecting data to monitor and measure performance

Step 1: Develop impact logics

Step 1 involves the development of the impact logic or hypothesis for each individual stage or unit process. Impact logics show the chain of causality through which a programme's activities lead to improved

⁵ The following section is taken from M4P.

environmental, decent work and livelihoods performance. The logic describes key changes that are expected as a result of these activities.

Programmes need to have impact logics for individual interventions in a market (intervention impact logic). Typically, programmes will make multiple interventions in a market, so they will also have an impact logic to capture the changes expected from all interventions in a market (market impact logic). Impact logics ask explicitly: “What are the series of expected changes leading from intervention to impact on environment, decent work and livelihoods?”

Developing impact logics for project interventions requires the intervening organization(s) to:

- **Develop the logical cause and effect flow for specific interventions** – breaking down the overall market logic into more detailed, operational steps requires that the different constraints in the system are addressed through different actions. Each intervention requires its own logic, linking activities to expected outcomes related to systemic change and growth and access.
- **Ensure that each impact logic contains realistic causality links** – the connections between specific activities and their immediate effects on the market system and then to wider green jobs goals must be plausible.
- **Link to capacities and incentives, and pathways to crowding-in** – when constructing impact logics, facilitators need to reflect on how specific interventions link to systemic change and to the other frameworks related to systemic change. For example, impact logics help facilitators to think through the roles and incentives of market players (who does what – and why) and the pathway to crowding-in (ensuring that other market players and functions are brought in to the market development process).

Following the definitions set out above, for each proposed intervention an impact logic should be produced. This should outline the causal links between outputs, outcomes and impacts, and the estimated level of inputs required to achieve these.

Step 2: Use the impact logics to identify appropriate indicators

Producing **impact logics** for each individual intervention helps to make explicit the assumed linkages between cause and effect that form the analytical basis upon which the interventions are designed. Using the impact logics developed, the project should then identify the indicators which will be used to monitor performance.

Input indicators

Input indicators will measure the financial, human and material resources used within a given intervention. These will be project specific, although they will normally be subject to the definitions and reporting requirements adopted by the intervening agency, and to the greatest extent possible should be standardised across interventions and projects.

Output indicators

Output indicators will measure outputs (products, goods and services) produced by the intervention. As with input indicators these will be project specific, although subject to the definitions and reporting requirements adopted by the intervening agency, and where possible should be standardised across interventions and projects.

Outcome indicators

The **outcome indicators** selected will reflect the impact logics identified in the previous section. As intermediate indicators, these may measure

several steps within the causal chain between project outputs and desired impacts; for example, following the project output new technology developed and tested to defined performance parameters, outcome indicators may be developed to capture performance within several subsequent stages of the intervention impact logic e.g. new technology disseminated > approved/supported by local government > adopted by identified early adopters amongst producers > operating to satisfaction of early adopters > adopted by target threshold of total producers.

Impact indicators

Impact indicators will relate to the specific environmental, decent work and livelihood issues which the intervention seeks to address, and will be derived from the assessment undertaken in Section 3. Where necessary, and where the research and analysis phase has shown these to be credible, proxy or aggregate indicators may also be employed.

Supplementing key performance indicators

Alongside key performance indicators, the project should also seek to develop further methods of data collection to verify and contextualise the results of the KPI monitoring. These may include **qualitative assessment tools** such as case studies, stakeholder interviews and forums, and feedback from project staff.

Step 3: Establish a baseline for key indicators

Having identified potential outcome and impact indicators, it is then necessary to **identify baselines** in order to facilitate subsequent assessment. Inputs and outputs, as factors directly related to the actions of the intervening agency, possess a fixed (i.e. zero) baseline. Outcomes and impacts both require baseline data in order to facilitate monitoring and evaluation, and in both cases baseline data should be available (at least in part) as a result of the initial value chain analysis and mapping undertaken in Section 3 and the further analysis in Section 4. Where the intervention design necessitates the use of indicators that do not match the information gathered in the research and analysis phase, further baseline data should be collected (or estimated) prior to intervention inception.

Step 4: Predict change

Using the impact logic, indicators and baseline data produced in steps 1–3, the next stage in the development of the monitoring and evaluation system is to **predict change** and produce related targets. For each impact logic thread, values should be added corresponding to the inputs available and predicted corresponding outputs, outcomes and impacts. A measureable objective for each individual is then generated, consisting of the performance baseline, a performance target, and time frame. Although precise estimation is often difficult, these targets are intended to provide an initial benchmark against which to measure performance. These predicted outputs, outcomes, and impacts should then be assessed against the project's vision statement as part of the prospective assessment process, and where necessary the intervention reassessed or redesigned.

Step 5: Design and implement a plan for collecting data to monitor and measure performance

The final step in the development of the monitoring and evaluation framework is the design of a plan to collect and evaluate performance data. The scale and frequency of data collection will be determined by the nature of the intervention in question; for small-scale and pilot project, data collection may occur solely at project inception and completion, whereas more developed multi-year interventions may require an ongoing programme of data collection and analysis. For further information on planning and implementing data collection activities see *Volume II*.

5.2 Intervention monitoring and evaluation

5.2.1 Monitoring and adaptation during implementation

Role of monitoring during implementation Monitoring of identified data points during implementation is intended to serve two principal purposes:

1. a project management tool to ensure the project is delivering the expected outputs and outcomes (and potentially impacts where visible); and
2. to assist in the redesign of existing and planned interventions (changes in scope, scale, duration or other elements of project design), and development of subsequent interventions.

The strategic, long-term sector engagement process promoted within the green jobs value chain approach will usually involve a staged intervention strategy, with interventions subsequent to the initial intervention subject to redefinition and redesign on the basis of information generated by initial/pilot projects. Below is outlined the suggested process for intervention assessment and (re)design subsequent to intervention inception.

Intervention assessment and design during intervention Step 1: Assess and identify the key achievements from initial interventions, what is there to build on?

Step 2: Define the size and nature of the market system in the future, given initial intervention experience

Step 3: Design and implement supplementary interventions to stimulate wider market development

Step 1: Assessment Assess and identify the key achievements from initial interventions: what is there to build on?

There are two main criteria for assessing an initial intervention's results:

1. Are initial outcomes substantial and new?
2. Are initial outcomes consistent with incentives and the capacity of market players to change behaviour, practices, investment or relationships?

The extent to which these criteria are fulfilled determines the validity of initial interventions and therefore the potential for crowding-in and the nature of further interventions required. If the quality or relevance of initial interventions is weak, crowding-in measures will not be successful.

Step 2: (Re)definition Define the size and nature of the market system in the future, given initial intervention experience. The next step is to update the picture of how the market should operate in the future. This is driven by the ambition of a facilitator with respect to different features of market change:

- Breadth: will more transactions take place in the core of the market?
- Depth: will supporting functions around an initial change develop?
- Reach: will an initial change in one area, sector or target group spread to others?

Step 3: (Re)design Design and implement supplementary interventions to stimulate wider market development and progress - the market system needs to be encouraged to move towards the future picture developed in Step 2. In

doing so, facilitators need to consider:

- The processes through which natural crowding-in could happen and, in particular, the incentives, capacities and relationships required for this to happen; and
- The constraints that might prevent this process from taking place, e.g. information about potential benefits from change, how to knowledge and perception of risk.

Supplementary interventions to support crowding-in might typically include:

- **Demand-side stimulation:** Targeted measures to overcome consumers' resistance to trying new products or engaging with new suppliers.
- **Social marketing:** Used to promote widespread awareness of an issue and stimulate behaviour change.
- **Supply-side engagement:** Direct technical (and financial) support for one or more market players to take advantage of new opportunities revealed by a programme (i.e. to deepen the market system).
- **One-to-one replication:** Repeating a successful experience with other partners, say from one lead firm to other competitors.

Facilitators should recognize that a do nothing option based on the belief that an initial spark will result in a large-scale demonstration effect is usually over-optimistic. Other than in the most innovative and resource-rich environments, change does not happen in this manner.

5.2.2 Post-implementation evaluation

Definition of evaluation: retrospective assessment of interventions

Evaluation is the assessment of a project's performance conducted after a period of implementation (i.e. it is **retrospective**). Evaluation can be carried out after a relatively short time (e.g. after six months) through short **intervention reports**. These focus more on short- to medium-term outcomes, rather than long term impacts which often are not measurable within the project's limited timeframe and are usually dealt with in more detailed impact assessments (see *Volume II* for more details).

Structure of intervention reports

The suggested structure of the intervention reports is as follows:

Background

1. **Background:** Provides some basic information and data about the value chain (e.g. size, scale, growth trajectory); provides a summary of the main environmental and decent work issues, and describes briefly why the sector has been selected.

Action and plan

2. **Research and intervention strategy:** This section describes the projects' intervention strategy and how it arrived at this strategy, and provides a summary of proposals and selected interventions.

Activities for implementation

3. **Project interventions:** This section is about the activities that have taken place to implement certain interventions. It should not only focus on the projects' own activities, but also on actions local stakeholders and partners have taken as a direct or indirect result of the projects' intervention.

Outcomes

4. **Outcomes/impacts:** The initial intervention report is written after a relatively short time. It is therefore possible that interventions will not have demonstrated sustained improvement in impact indicators. It

Learning experiences

should however be possible to observe some outcomes that result from an intervention. These outcomes are described in this section.

5. **Learning, conclusion and next steps:** What has the project learnt from this intervention? What will it do different next time? What can it recommend to other development partners? What will happen next? The intervention report should not only describe success stories, but also assess problems, challenges and failures within the project, thereby helping to improve future interventions.

5.3 Case studies: learning from experience within green jobs interventions

5.3.1 Case study 1: Brick industry (Viet Nam)

Organization(s): SDC/Nam Dinh Provincial Government

Location: Viet Nam

Background

The Viet Nam Sustainable Brick-making Project (VSBP) is a partnership between the SDC and the provincial government of Nam Dinh Province, located some 90 km south of Hanoi. The region is a centre of brick production due to its location in the Red River delta and attendant clay resources, with more than 600 brick kilns currently operating.

The brick industry in Viet Nam is traditionally highly labour-intensive and employs hundreds of thousands of unskilled and semi-skilled workers. It is estimated that Viet Nam consumes over 20 billion bricks per year, almost 250 bricks per capita, and brick production in Viet Nam consumes some 2.2 million tonnes of coal per year. Within the sector, 10,000 traditional brick kilns are still in operation and are heavily polluting the environment. They have very high energy consumption (coal and firewood) and often exhibit poor working conditions. Traditional brick kilns are seasonally and batch operated. They work in the dry season, use the topsoil of agricultural land and are fired in batches (as opposed to continuous kilns).

Batch operated kilns are by definition less energy efficient than continuous kilns, as the heat generated can neither be used for pre-heating new bricks nor for cooling the fired bricks, leading to extremely high emissions of carbon dioxide and other gases relative to output. Fluorine and sulphur gases emitted by the brick kilns create severe local air pollution problems, damaging surrounding rice fields and other crops and leading to high compensation payments. To address these environmental problems, the Government of Viet Nam had decided to modernise the brick industry. In 2001, it decreed that traditional brick-making would be eliminated from urban areas by 2005 and phased out entirely by 2010. Replacing these traditional kilns with capital-intensive tunnel kiln technologies would not only substantially reduce employment opportunities (some 24 out of 25 jobs would become obsolete), but would also be in contradiction with the economic production factors where capital is scarce and labour abundant. The partnership therefore aimed to develop and promote intermediate solutions in order to both improve environmental performance and promote inclusive social development.

Research and intervention strategy

At the outset of the project, policy application was hindered by the lack of reliable information on a number of areas including brick-making processes, clay resource availability and use, energy efficiency,

kiln emissions, general local environmental impact and enterprise economics. Authorities had limited contact with brick-makers and – besides the unpromising prospect of attempting to close traditional units – they could propose no technical alternatives for improving the environmental performance of brick-making. Finally, the authorities lacked practical instruments for enforcing regulations and guiding development processes.

The partnership therefore began with an extensive series of diagnostic studies to establish an adequate basis for further work. Then, through a programme of workshops, seminars, forums, training courses and study tours, it built up contacts and mutual trust to establish a platform for exchange and cooperation that encompassed all stakeholders – large- and small-scale brick-makers, as well as provincial and district authorities. The subsequent intervention strategy contained several components, including development of a pilot VSBK enterprise and generation of performance data through comprehensive monitoring for an objective assessment of VSBK technology; the provision of technical support for tunnel kiln and VSBK improvements directly to entrepreneurs; and continuous policy dialogue and capacity building activities with provincial and national government.

Project interventions

Project interventions involved the identification and testing of options concerned the entire cycle of brick production, including clay extraction, green brick production and firing processes, as well as production organization and business management. Additionally, options were identified that provided authorities with more effective methods, equipment, and capacities for state management functions such as: emissions measurement; environmental monitoring; clay resource management; planning; and the promotion of development in the brick-making industry. In all of these areas, a demand-driven approach was applied involving authorities and private brick-makers in a process of assessing existing problems, identifying options, and developing appropriate technical and organizational solutions.

In practical terms, the project developed a pilot VSBK kiln following an improved design (incorporating modifications in the flue gas system and chimneys, and use of a hydraulically operated unloading system). The unit also included a de-airing extruder to mould hollow bricks, and an adequately-sized drying shed to ensure uninterrupted supply of dried green bricks to the kiln even in the rainy season. Alongside development of the pilot kiln, the project has also undertaken a series of technical and organizational measures to improve the economic efficiency and environmental performance of tunnel kilns. Experts were contracted to analyse the process and recommend improved operating methods, resulting in the development and dissemination of best practice guidance.

As part of the project, the following training courses were also provided:

- Brick-makers and technical staff training course – this eight-day course was held twice with a total attendance of about 100 participants. The curriculum covered a range of subjects including: labour protection and safety; equipment and technology; brick-making techniques; management skills.
- Production supervisors training course – the five-day course was held once with around 70 participants. Training modules dealt with: production techniques; quality control; trouble-shooting; energy efficiency; management functions.
- Directors forum – three two-day forums were attended by 45 directors and owners of brick enterprises. Based on participant priorities, the subjects covered included: investment decisions and enterprise expansion; technology and product design; planning and management of the enterprise; clay exploitation; environmental impact; production economics and cost efficiency; sales management; and human resource management.

As part of the training and technical support programme, printed guidelines and tools were prepared for brick-makers including: enterprise economics and financial planning guidelines; credit application template; VSBK guide; and guidelines for mitigating the environmental impact of brick-making.

Documentation was also produced on a model VSBK enterprise, including: plant layout; construction plans; financial planning format; registration and legalisation procedures. This material has been distributed to all participants in the training courses, and to a range of external stakeholders. Finally, technical assistance in the field was provided to brick-makers to assist them in solving practical problems associated with technical innovations.

Outcomes

The partnership has identified and tested technical and organizational options for brick-making that are environmentally sound, economically viable and, at the same time, accessible to small-scale producers. It has been successful in introducing viable intermediate technologies to overcome the dichotomy between choosing either traditional, polluting kilns with investments in the order of US\$10,000 to 35,000, and modern tunnel kilns with an investment of several million dollars. The project has contributed to the development of improved tunnel kilns with substantially reduced investment costs (from several million to less than US\$500,000), which can be operated by the private sector and offer improved energy efficiency and better working conditions. The number of tunnel kilns in Nam Dinh Province has more than doubled in three years, from 11 to 25, an outcome facilitated in part by the project's activities. The project has also assisted in the development of a model VSBK project to prove the technology, facilitating the widespread take-up of the VSBK technology (over 300 kilns now operational). While the brick industry was formerly a seasonal and intermittent production, industrial brick production with continuous brick-firing kilns and all-year round production has now been introduced.

The partnership has also played a crucial role in the development of an informed, pro-active and participatory approach to state-management of the brick-making sub-sector. Provincial authorities have recognized that more effective management requires the decentralisation of certain regulatory and support functions to the district and commune levels. Furthermore, it has become apparent that an extensive shift out of traditional brick-making cannot be left to the individual decisions of small-scale producers alone. It needs to be promoted within the framework of local, community-managed development.

Specific decent work and environmental outcomes identified include the following:

1. Decent work:

- i. **Improved incomes** – the income of the workers has increased as much as fourfold as brick kiln employment is now available all year round.
- ii. **Improved working processes** – green brick-making has been improved by selective mechanization such as a winch loading system, small extruders and hydraulic unloading systems, substantially reducing drudgery.
- iii. **Improved occupational health** – through the introduction of air flow control devices on VSBK, workers are no longer exposed to toxic flue gases such as carbon monoxide and sulphur oxide while loading the kiln.
- iv. **Supporting small-scale/labour-intensive production** – the partnership has provided viable intermediate technical solutions with substantially higher labour intensity than fully automated (and thus capital intensive) technological solutions.

2. Environment:

- i. **Reduction in flue gas emissions** – toxic flue gas emissions which were damaging crops and the health of the local population have been substantially reduced through improved design and operating practice.
- ii. **Reduction in CO₂ emissions** – a single VSBK reduces greenhouse gas emissions by between 40 to 60 per cent relative to a traditional kiln. The >300 VSBKs currently operating are therefore

reducing CO₂ emissions by 150,000 tonnes per annum.

- iii. **Reduced resource use** – traditional kilns use the topsoil of agricultural lands. A systematic mapping of clay resources now allows for the sustainable use of clay. This has led to improved brick quality and less competition with agriculture. The VSBK design also requires significantly less coal than traditional kilns (as little as 110 grams, compared to up to 500 grams for traditional kilns), thus substantially reducing resource use.
- iv. **Hollow bricks** – while traditional kilns can produce only solid bricks, modern kilns can produce hollow bricks that consume much less energy for firing, use 40 per cent less clay, and have much better insulation standards. Better insulation can lead to considerable energy saving over the lifespan of a brick if the energy spent on heating and cooling can be reduced, leading to substantial indirect reductions in CO₂ emissions and resource use.

Lessons learnt

The project has generated several lessons for similar future intervention projects. Firstly, the importance from a project perspective of engaging closely with (or, in this case, working in direct partnership with) regional and national government and regulatory bodies, both to understand their current approaches to a given industry, and to improve their ability to engage with and shape its development. Second, that the development of technological solutions to environmental and decent work challenges requires sustained involvement with an industry, and recognition of the project organizations as trusted and credible partners in sector development. Third, that this may require the development of a pilot initiative or enterprise in order to assess and demonstrate improved technologies and operating practices to business owners, workers and government bodies alike.

Fourth, that appropriate technical solutions are crucial, but not sufficient to achieve policy objectives – these require the creation of a wider enabling environment for sustainable sector development involving the institutional anchoring, scaling-up, and dissemination of solutions, techniques and programmes that have been developed and piloted by the project. Finally, that an extensive shift to more sustainable technologies and practices within a traditional industry such as brick-making cannot be left to the individual decisions of small-scale producers alone, but instead needs to be promoted within the framework of local, community-managed development, underpinned by strong, sustained and participatory engagement by local and national authorities.

Adapted from UNDP/SDC, 2008, http://www.swiss-cooperation.admin.ch/laos/en/Home/Programmes/Rural_Livelihood_and_Natural_Resource_Management/Vietnamese_Sustainable_Brick_making [accessed 29 Nov. 2013].

5.3.2 Case study 2: Glass industry (India)

Organization(s): SDC and The Energy and Resources Institute (TERI)

Location: India

Background

In 1991, the SDC established a Global Environment Programme to support developing countries in implementing measures aimed at protecting the global environment. In pursuance of this goal, SDC

India, in collaboration with Indian institutions including TERI, conducted a study of the small-scale industrial sector in India to identify areas in which to introduce technologies that would improve energy efficiency and reduce greenhouse gas emissions, while also contributing to social development goals. Four energy-intensive small-scale industrial sectors were selected for intervention, one of which was the small-scale glass industry cluster located in Firozabad, near Agra.

The Firozabad glass industry provides a source of livelihood to over 150,000 people and produces an estimated 2,000 tonnes of glass products daily, including around 50 million bangles (the majority of the country's production). These glass products are mainly low-value items. The bangle-making industry comprises tier upon tier of units whose activities are closely interlinked. At the apex are open pot furnace units that produce molten glass and raw bangles; below them are thousands of household-level units in which these raw bangles are processed; finally there are hundreds of muffle furnace (*pakai bhatti*) units in which the processed bangles are annealed to yield the finished products.

Traditionally, the pot furnaces and muffle furnaces operated on coal, and were marked by low energy efficiency and high levels of emissions. An energy audit undertaken at the inception of the project found that the glass industry in Firozabad consumes in excess of 250,000 tonnes of coal per year, generating substantial greenhouse gas emissions and very high levels of local air pollution, including respirable suspended particulate matter (RSPM), SPM, sulphur dioxide and nitrogen oxides. The effects of this pollution are all the more serious because many of the operating units are located in the midst of densely populated residential areas of Firozabad. Working conditions in the sector were also extremely poor, with employees working in the furnace units exposed to very high levels of pollution, extreme heat, cramped working conditions and a range of other health and safety hazards. Workers in the industry are often badly paid, working long hours with few benefits. Until recently, there were few or no mechanisms of collective organization or representation. Within the cluster, child labour continues to exist in the household bangle-making sector, alongside extremely poor working conditions and levels of pay.

Research and intervention strategy

SDC and TERI, in partnership, intervened in the Firozabad cluster with a focus on introducing clean, energy efficient technologies for the pot and muffle furnaces, thereby reducing greenhouse gas emissions, curbing resource use and improving working conditions. This goal assumed particular significance in 1996, with the Supreme Court of India ordering industrial units in the area known as the Taj Trapezium zone – including the Firozabad pot furnace units – to stop burning coal and instead use natural gas as fuel. Having considered all of the above issues, SDC and TERI structured their research and intervention programme as a package of parallel and ongoing measures (listed below):

- perform audits on existing furnaces, including assessing current levels of energy efficiency and related issues (including furnace design, fuel quality and existing operating practices);
- search for suitable solutions to achieve the benchmarks set for energy efficiency and environmental performance;
- develop and demonstrate an improved technology, in terms of energy and environmental performance and other parameters. Fine-tune the developed technology for wider dissemination;
- help other units to upgrade and adapt their existing technologies as required;
- seed the market (i.e. help make the technologies available via local suppliers); promote measures to reduce their costs and increase their uptake;
- conduct studies on the existing socio-economic conditions in non-furnace operating units such as household processing;
- devise and implement strategies for the improvement of working conditions in household processing units;
- increase the number of partners and collaborators in the field, and strengthen their capabilities by ongoing human and institutional development in order to promote dissemination of improved

technology and working practices;

- make efforts to establish a regular policy dialogue between various players in each area (industries, institutions, government bodies, etc.); and
- identify new areas of R&D activity for future interventions.

Project interventions

As outlined above, SDC/TERI undertook a wide range of project interventions, with the primary initial focus on improving the energy efficiency and environmental performance of furnaces used within the cluster. The results of the energy audits undertaken clearly showed that all the furnaces – in particular, the coal-fired pot and muffle furnaces – were very low in energy efficiency, primarily due to two reasons: poor furnace design, and little or no heat recovery. Given the unique characteristics of the furnaces found within the cluster, the project decided to design, fabricate, and demonstrate an improved gas-fired pot furnace with a recuperator (heat recovery system) that would reuse heat from flue gases, and an improved gas-fired muffle furnace.

By 2001, SDC/TERI had succeeded in developing and demonstrating two cleaner, energy efficient technologies based on natural gas for the glass industry: the energy efficient recuperative gas-fired pot furnace, and the gas-fired muffle furnace. Following this, efforts were focused on incremental improvements to furnace design and installation (including research on reduced-cost materials and processes to facilitate replication), dissemination of improved technologies (including technical support and worker retraining), and also on undertaking a number of pilot social action initiatives to improve the lives of workers in the household-level units that process bangles and other decorative items.

These included an initiative to improve working conditions by promoting the relocation of household bangle-processing units to a common work shed, thereby reducing pollution and improving living conditions in their dwellings. With the project's support, self-help groups (SHGs) were formed among processing workers in a pilot locality and work was shifted to a rented workspace, with a crèche provided nearby to care for worker's children. To encourage adoption, workers were also offered slightly higher wages. Further social action projects included an initiative to promote the formation of cooperatives amongst workers engaged in glassware production, and a campaign to raise awareness of occupational health issues among household-level workers.

Outcomes

Despite numerous barriers, the project was successful in promoting the adoption of the recuperative pot furnace model in Firozabad. By 2008, more than 40 pot furnaces based on the TERI design were operating in the cluster, representing a penetration level of close to 50 per cent. Although the project also successfully developed a more efficient gas-fired muffle furnace, long-term take up of this design has been less successful, with replications going from a high of 78 operational furnaces by mid-2005 to a low of less than 15 by end-2007 (out of a total of 107 installed) as higher gas prices and inadequate supply infrastructure led to the re-adoption of coal by the majority of operators.

Specific decent work and environmental outcomes include the following:

1. Decent work:

- i. Improved working processes** – improvements in operating processes result in improved working conditions (including decreased exposure to extreme temperatures and improved ergonomics) for furnace employees.
- ii. Improved occupational health** – the development and adoption of the energy efficient furnace design has led to improvements in occupational health within furnace units by reducing air

pollution.

- iii. **Skills development** – the project has provided training and skills development support to workers in a range of activities including masons, furnace operators and employees of various service providers.
- iv. **Awareness-raising** – the project has contributed to raising awareness of occupational health issues among household-level workers.

2. Environment:

- i. **Reduction in CO₂ emissions** – as a result of the adoption of pot furnaces based on the project design, by 2008 a reduction in carbon dioxide emissions equivalent to 70,000 tonnes per annum was achieved.
- ii. **Reduction in particulate and other emissions** – adoption of energy efficient project-designed furnaces has also resulted in substantial reductions in emissions of other gases and PM.
- iii. **Resource use** – increases in energy efficiency have substantially reduced resource use per unit of output, with the project furnace requiring less than half the energy per kilogram of molten glass compared to the traditional coal-fired furnace design (2,455 kcal/kg melt, as opposed to 5,868 kcal/kg melt), and more than 30 per cent less than the retrofitted gas design adopted by some units (3,720 kcal/kg melt).

Alongside specific intervention outcomes, the project has spurred independent private-sector development and adoption of recuperative technologies in processes outside the immediate remit of the project (for example in auxiliary furnaces used to convert glass melt to finished products) – evidence of a substantial positive change in proprietor's and worker's attitudes to the adoption of new technologies and processes. The project has also succeeded in initiating dialogue among various stakeholders, at both cluster and policy levels, on a number of issues including energy efficiency, fuel supply, and the socio-economic conditions of the workforce.

Despite these successes, the pilot intervention to improve working conditions in the household bangle-processing units proved unsustainable – dwindling membership (due in part to social customs and cultural barriers which made it hard for women to move out of their homes), the hostility of the *thekedars* (labour intermediaries), the indifference of glass factory owners, and difficulties in day-to-day management meant that the common work shed could not achieve a sustainable level of profitable operation even with support from the project, and was eventually closed.

Lessons learnt

SDC and TERI's experience in Firozabad, as in other small-scale industrial clusters over the past decade, demonstrates that in order to achieve improved environmental outcomes in terms of increased energy efficiency and reduced carbon dioxide emissions in a highly dispersed sector, it is extremely important to develop cluster-specific intervention programmes with clearly defined objectives.

The Firozabad experience also highlights the fact that small-capacity users of energy, such as *pakai bhatti* (muffle furnace) operators and household-level processing units, find it very hard if not impossible to access cleaner fuels at affordable prices on a sustainable basis. At the policy level, these difficulties have been further compounded by shortages in availability of natural gas; an uneven pricing formula for gas; and the continued availability of coal in the cluster at relatively low prices. The widespread adoption of the larger pot furnaces has, however, demonstrated clearly that market-determined fuel pricing positively influences the adoption of energy efficient technologies, and that a sustained techno-social intervention programme can achieve substantial improvements in environmental outcomes (especially when coupled, as in this case, with the positive changes to the external regulatory and market environment).

The failure of one of the project's principal interventions within the bangle-processing stage of the value chain (the relocation of household units to a common work shed) served to demonstrate the complex social, cultural, and economic realities that governed the bangle-making community in Firozabad, posing a formidable barrier to any social action initiative that involved changes in the established pattern of work.

This ties into the wider lesson of the importance of working with tradition-engagement with the cluster led to the realization that, at times, tradition and custom wield far more influence than improved process or technology, and require patient and creative integration into project planning and implementation processes. The project also demonstrated the central importance of a sustained field presence in successful outcomes– the funding partner (SDC) has a principle of long-term engagement in its funding programmes, enabling the formulation of flexible, participatory schemes and programmes that were able to run for extended durations.

Adapted from Sethi and Ghosh, 2008.

5.3.3 Case study 3: Implementation of green policies in Malaysia

Malaysia has made strides towards greening its economy in recent years through concerted efforts to scale up renewable energy market penetration. In 2009, the Government incorporated a green technology portfolio into federal administration through the establishment of the Ministry of Energy, Green Technology and Water (KeTTHA). Under KeTTHA's authority, the country's 2009 National Green Technology Policy was developed with a view to strengthen institutional and policy coherence and promote market development of green technology in Malaysia.

In line with these objectives, Malaysia's Green Technology Financing Scheme was launched in 2010 to create a policy environment that would attract innovators and users of green technology. It includes a \$470 million soft loan to companies (both technology developers and technology users) with credit guarantees of up to 60 per cent of the loan amount; the government absorbs 2 per cent of the interest rate. This complements the country's 2011 Renewable Energy Act, which sets a target of 6 per cent (985 megawatts) of the national energy mix to be generated from renewable sources by 2015, and 11 per cent (2 gigawatts) to come from renewable sources by 2020.

An important feature of the Renewable Energy Act is the introduction of a feed-in-tariff aimed at catalyzing renewable energy market development. Tariffs have been set between 0.85 and 1.23 Malaysian Ringgit (MYR) per kWh (US\$0.28 to 0.40/kWh), depending on the system size, with an annual digression rate of about 9 per cent, based on expectations of reduced costs. The scheme is being financed through a national renewable energy fund accrued by setting a 1 per cent levy on all electricity users consuming over 300 kWh of electricity per month. This works to ensure that renewable energy projects remain financially viable and revenue returns are commensurate with current costs.

Since the implementation of the feed-in-tariff, there has been significant development in Malaysia's renewable energy landscape. To date, 43.9 megawatts of total installed capacity have been approved, with an additional 348.57 megawatts anticipated in 2014.

In addition to expanding renewable energy generation, Malaysia's green initiatives have also been successful in attracting higher value added foreign investment, contributing to the country's economic growth. Several leading multinational enterprises involved in the manufacture of solar panels and equipment, including First Solar (United States), Q Cells (Germany), Sunpower (United States) and Panasonic (Japan), have established operations in Malaysia, adding to the country's growing status as a

solar manufacturing hub. According to government estimates, Malaysia's green industries grew by 6 per cent between 2010 and 2011. Following this growth pattern, the government projects that renewable energy will generate \$23 billion in economic activity by 2020, support 50,000 jobs while at the same time reducing greenhouse gas emissions by roughly 40 per cent.

Given that micro, SMEs account for upwards of 99 per cent of business establishments in Malaysia, the Government also launched its MyHijau SME program in 2012. Designed to build the capacity of SMEs to manufacture green products, the programme provides technical consultation and training for up to two years with the aim of preparing the industry for eco-labeling certification.

As the above examples illustrate, Malaysia is advocating the right policy mix – including the effective use of market-based instruments, targets and standards – to expand green market opportunities, create jobs and promote energy security, thereby ensuring that the country's continued economic growth does not come at the expense of long-term environmental sustainability.

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Annex

The green jobs value chain development methodology has been designed to facilitate effective multi-year, sector-wide value chain interventions. This guide recognizes, however, that the financial resources, time and skill-sets necessary to implement such projects effectively may be unavailable to many organizations, and also that for other operational or policy reasons intervening organizations and their funders may wish to apply the methodology solely to specific regional and local sub-sector value chains. This annex therefore provides guidance on the application of the methodology to two differing levels of detail: a short version (Approach A), recommending certain minimum standards in relation to impacts assessed and performance indicators selected, and a full version (Approach B) outlining the recommended approach for strategic regional and national green jobs promotion programmes.

Approach A

Sector selection

Section 2.1 applicable.

Section 2.2 applicable on the following basis:

Selection criteria		Minimum level
Environmental impact (global)		At least two indicators from two different impact areas
Environmental impact (local)		
Decent work promotion potential		At least one indicator from two Decent Work Agenda elements
Livelihood generation/ economic growth potential	Current	At least two indicators from any impact area
	Potential	At least two indicators from any impact area
Technological feasibility		All indicators listed (if applicable)
Organizational feasibility		All indicators listed (if applicable)

Value chain research and mapping

Sections 3.1–3.3 applicable (although project may wish to limit the number of stages or range of actors assessed/mapped).

The purpose of value chain analysis and mapping is to provide an analytical tool to understand and ultimately improve value chain impact. Value chain mapping can, however, be a complex and time-consuming process. Particularly in circumstances where resources and time are constrained, it is important to identify and prioritize those issues and stages within a value chain that are most relevant to the intervening agencies' aims and objectives, while retaining a sufficient level of analytical rigour.

Section 3.4 applicable on the following basis:

Impact category	Minimum level
Resource use	At least one indicator from three impact categories.
Emissions to air	
Emissions to water	
Water use	
Waste generation	

Section 3.5 applicable on the following basis:

Decent Work Agenda element	Minimum level
Adequate earnings and productive work	At least one indicator from three Decent Work Agenda elements
Decent hours	
Combining work, family and personal life	
Work to be abolished	
Stability and security of work	
Equal opportunity and treatment in employment	
Safe work environment	
Social security	
Social dialogue, workers and employers' representation	
Economic and social context for decent work	

Value chain analysis and intervention design

Sections 4.1–4.3 applicable

Implementation, monitoring and evaluation

Sections 5.1–5.3 applicable

Approach B

Section 2.1 applicable

Section 2.2 applicable on the following basis:

Selection criteria		Minimum level
Environmental impact (global)		At least one indicator
Environmental impact (local)		At least two indicators
Decent work promotion potential		At least one indicator from five different Decent Work Agenda elements
Livelihood generation/ economic growth potential	Current	At least four indicators from any impact area
	Potential	At least four indicators from any impact area
Technological feasibility		All indicators listed
Organizational feasibility		All indicators listed

Value chain research and mapping

Sections 3.1–3.3 applicable (although project may wish to limit the number of stages or range of actors assessed/mapped).

Section 3.4 applicable except:

Impact category	Minimum level
Resource use	At least one indicator from each impact category
Emissions to air	
Emissions to water	
Water use	
Waste generation	

Section 3.5 applicable except:

Decent Work Agenda element	Minimum level
Adequate earnings and productive work	At least one indicator from six Decent Work Agenda elements
Decent hours	
Combining work, family and personal life	
Work to be abolished	
Stability and security of work	
Equal opportunity and treatment in employment	
Safe work environment	
Social security	
Social dialogue, workers and employers' representation	
Economic and social context for decent work	

Value chain analysis and intervention design

Sections 4.1–4.3 applicable.

Implementation, monitoring and evaluation

Sections 5.1–5.2 applicable.

Value chain development for green jobs in Asia – Volume I: Methodological guide

This guide outlines a framework for integrating the conventional market-focused approach to value chain development with an assessment of the environmental and social outcomes generated by a given sector. The aim is to promote employment that is environmentally, socially and economically sustainable, and is particularly focused on the challenges and opportunities for green jobs promotion in the Asia-Pacific region.

Central to the green jobs intervention design process is the identification and promotion of co-benefits; interventions that promote positive outcomes in more than one of the green jobs focus areas (e.g. global environmental impacts, local environmental impacts, decent work and sustainable livelihoods). The methodology emphasises the importance of engaging with the underlying structural factors and advocates the use of a systems-based approach which involves engagement not only with enterprises but also with government bodies and worker's organizations. Reducing the environmental and social externalities generated by the value chain therefore requires not just a firm-level cost or competitiveness analysis, but also an engagement with the wider business enabling environment.

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