International Labour Organization

Handbook on measuring green jobs and skills for green jobs

Monitoring, evaluation and learning

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Content

Abbreviations and acronyms

CGE	Computable General Equilibrium
DFI	development finance institutions
EU	European Union
FGD	focus group discussion
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GJAM	Green Jobs Assessment Model
ICLS	International Conference of Labour Statisticians
IOT	input–output table
ISCO	International Standard Classification of Occupations
ISIC	International Standard Industry Classification
MEL	monitoring, evaluation and learning
MSD	Market Systems Development
MSME	micro-, small- and medium-sized enterprises
ODA	official development assistance
OECD	Organisation for Economic Co-operation and Development
SAM	Social Accounting Matrix
SEEA	System of Environmental-Economic Accounting
SMEs	small- and medium-sized enterprises
UN	United Nations
VCA	Vulnerability and Capacity Assessment

1

1. Introduction

1.1. Background

This handbook provides guidance for measuring and assessing green jobs and skills for green jobs in a context of monitoring, evaluation and learning. It was developed the ILO in cooperation with the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), on behalf of the Federal Ministry of Economic Cooperation and Development (BMZ).

In 2022, G7 leaders committed to increasing the share of their country's official development assistance (ODA) on employment and skills promotion programmes that are directed specifically towards supporting "green sectors" and "greening traditional sectors". This commitment was part of a broader effort to accelerate a just transition to an inclusive green global economy, ensure an equitable green recovery and strengthen global resilience against climate risks. In this context, G7 development ministers tasked the ILO with developing a lean harmonized approach to monitoring and evaluation (M&E) of employment and skills promotion programmes' impact on green jobs and skills for green jobs.

Subsequently, the ILO initiated a technical cooperation programme, "G7 support to improve the effectiveness of development assistance in green jobs and skills for green jobs". The programme has delivered three main components. First, it developed and applied a statistical method to monitor G7 countries' financial commitments to green employment and skills development. Secondly, it developed an approach that enables reporting on the impact of these green employment and skills development initiatives at the country level, and third, it facilitated knowledge-sharing for G7 partners to exchange best practices and strategies for advancing just transition policies across countries.

This handbook aims to provide a consistent approach to the measurement and assessment of green jobs and skills for green jobs in a monitoring, evaluation and learning (MEL) context. It was developed between 2022 and 2025, starting with an initial mapping and conceptual development phase, which sought to understand G7 members' approaches to measuring employment outcomes, with a focus on green jobs and skills for green jobs, as well as the challenges they face. This was followed by the development of a survey tool and data collection procedure. In 2023 and 2024, pilots were set up in three countries to test the application of the survey and refine it based on field experience and stakeholder feedback.

1.2. Objective of the handbook: Addressing a guidance gap

One of the main objectives is to address a gap in guidance in the MEL field on how to measure green jobs and skills for green jobs. This gap is due in part to the lack of consensus around measurable concepts of green jobs and skills for green jobs that can be applied in a MEL context. While measurable concepts exist, these are designed primarily for national data collection and not programme-level MEL purposes. At the same time, methodological challenges arise from the measurement of broader impacts, including indirect and enabled effects, and in determining how these impacts align with various environmental and decent work criteria. The intersectional and evolving nature of the topics and the fact that programmes focused on green jobs and skills outcomes tend to operate at the nexus of environmental sustainability, decent work, skills development and private sector development further complicates MEL processes. This handbook helps resolve a number of these conceptual and practical challenges.

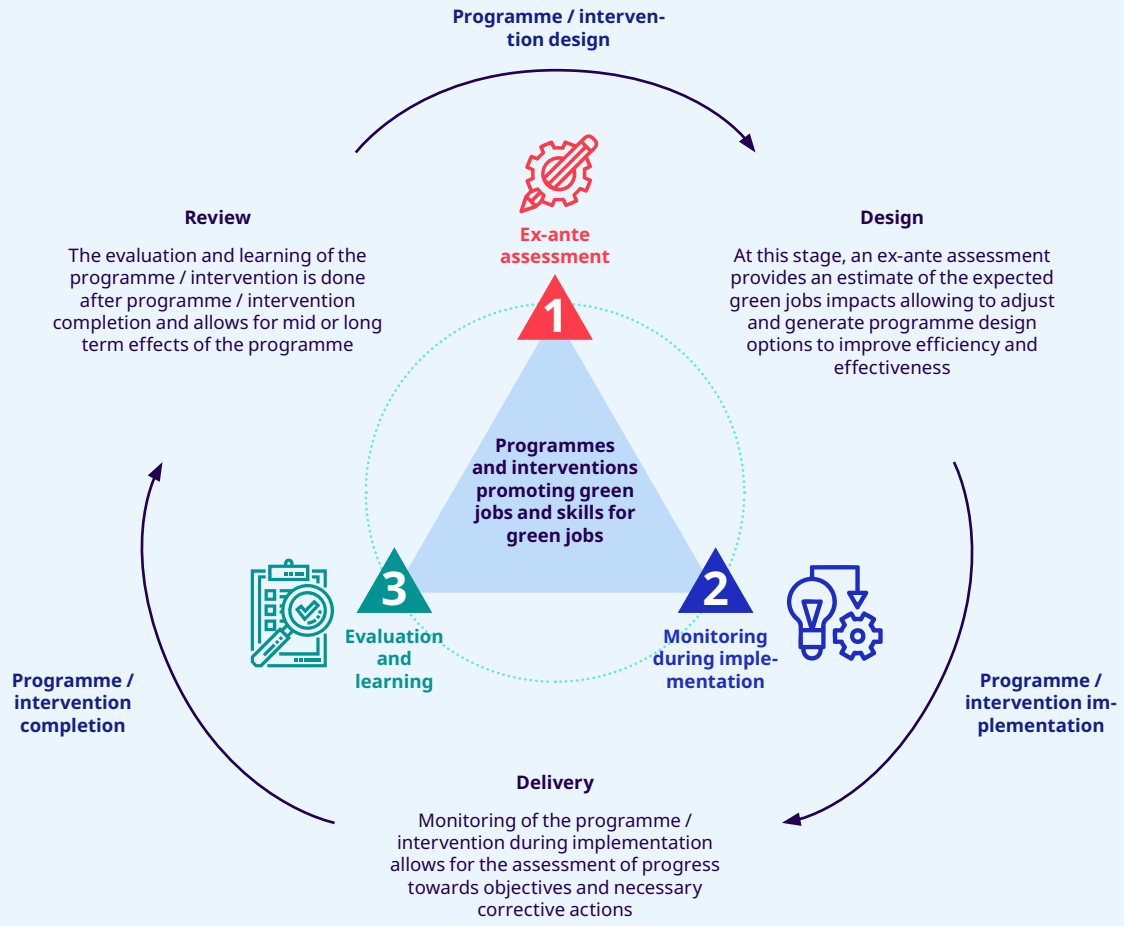
▶ Box 1.1. A brief overview of monitoring, evaluation and learning

Monitoring, evaluation and learning (MEL) is a systematic approach to understanding and improving the performance and outcomes of development programmes. It encapsulates three elements:

- **Monitoring** refers to concurrent practices used to understand progress of an intervention or programme for the purposes of improving implementation strategy as well as to track progress towards results (ILO 2020a).
- **Evaluation** assesses the relevance, efficiency, effectiveness and sustainability of programmes. It provides insights into both short-term results and long-term impacts. Determining a relevant evaluation methodology, such as impact evaluation (with a focus on attribution of impact) or process evaluation (with a focus on understanding the "how" and "why" of programme implementation), is a crucial step in the evaluation process (ILO 2020b).
- **Learning** refers to the range of information that can be used to inform adaptations of the programme or interventions objectives, organizational learning, decision-making and accountability (ILO 2022a; ILO 2018).

Figure 1.1 demonstrates the main steps of a green jobs and skills programme cycle along the main dimensions of monitoring, evaluation and learning. It begins with ex-ante assessment during the design phase, where expected green job impacts are estimated to design and refine programme strategies. The next stage involves monitoring during implementation, ensuring continuous assessment of progress toward objectives and enabling corrective actions where needed. Finally, the evaluation and learning phase (ex-post) occurs after programme completion, assessing mid- and long-term effects to inform future interventions.

▶ **Figure 1.1. The cycle of monitoring, evaluation and learning in programmes and interventions promoting green jobs and skills for green jobs**



Source: Adapted from ENRD, n.d.

1.3. Target users and focus of the handbook

The handbook is designed primarily for development and policy practitioners with strong backgrounds in MEL processes. It provides practical approaches for measuring and assessing green jobs and skills for green jobs in the context of employment and skills promotion programmes, enabling practitioners to integrate these methods into existing MEL frameworks. The handbook is also relevant for other users, including academics and professionals working on green jobs more widely.

The handbook covers two main areas:

1. **Direct measurement:** The identification of persons in green jobs or the acquisition and application of skills for green jobs that can be used for measuring direct impacts in MEL frameworks. This is achieved through questionnaires that are applied at the individual and enterprise level with

programme beneficiaries. This approach is particularly relevant for ex-post evaluations, as it focuses on assessing actual observed impacts of a programme, typically after the programme ends (but also during).

2. **Indirect measurement:** The estimation of indirect impacts, which captures broader systemic or economy-wide effects. Employment impacts are captured beyond the immediate scope of the programme. Indirect measurement plays a crucial role in both ex-ante and ex-post evaluations. In ex-ante assessments, it helps estimate the potential impacts of programmes before implementation to help in programme design and decision-making. In ex-post evaluations, indirect measurement helps assess long-term, economy-wide effects by analysing trends beyond programme participation.

There are two limitations within this guidance that are important to point out.

First, the handbook does not aim to provide comprehensive guidance across all dimensions of MEL. Instead, it focuses primarily on the monitoring aspect, emphasizing practical tools and methodologies to track programme progress. The survey tools are meant to serve as adaptable modules to be incorporated into existing data collection processes.

Second, while methodological guidance is available for assessing indirect impacts, it is less developed than direct measurement approaches. The guidance aims to introduce practitioners to the complexities of indirect measurement rather than providing detailed instructions. Since indirect approaches are not typically part of MEL systems, their inclusion in this framework serves two purposes: first, to provide a forward-looking perspective that informs intervention design and targeting; and second, to capture the complexity of green jobs programmes, where systemic and indirect impacts – such as supply chain effects or environmental benefits – are often challenging to measure.

1.4. Lessons from pilot initiatives

A series of pilot initiatives were conducted to test and refine the tools and to ground the handbook in practical experiences (see Appendix III for further details). These pilots tested what works, what doesn't and how to make MEL more relevant for field level programmes promoting green jobs and skills. The pilots took place across different regions and sectors, including the:

- Employment and Skills Development in Africa (E4D) programme in Uganda, implemented by GIZ;
- SWITCH-Asia programme in Cambodia, implemented by Care and Plan International with financial support from European Union (EU); and
- Organic Waste-to-Value Initiative in Ghana, implemented by the Management for Development Foundation (MDF) West Africa programme and funded by Germany through GIZ.

Each pilot provided insights into how green jobs emerge in different contexts and how best to capture the resulting employment and skill outcomes. The pilots revealed the importance of tailoring survey tools to local contexts, ensuring clarity in definitions and the importance of recognizing both direct and indirect employment impacts.

1.5. Navigating the handbook

The handbook is organized into six main sections:

- **Section 2. Concepts, definitions and conceptual framework:** This section provides an overview of concepts and definitions around green jobs and skills for green jobs, and explains the rationale behind those. It concludes with the conceptual framework, highlighting what can feasibly be measured and estimated through two main pathways: (i) a direct pathway to employment outcomes; and (ii) an indirect pathway.

- **Section 3. Measuring and estimating green jobs and skills for green jobs:** This section provides a framework for measuring and estimating green jobs and skills for green jobs, outlining key methodologies – including surveys, value chain assessments and macroeconomic modelling – to assess direct and indirect employment impacts,
- **Section 4. Implementation:** This section provides guidance on the step-by-step process for implementing the framework. It uses a single approach that forks at the outcome level to direct and indirect pathways.
- **Section 5. Applying the findings:** This section presents examples for applying direct and indirect approaches of the MEL framework in programming. Potential uses include indicator tracking, donor reporting, knowledge generation and programme design.
- **Section 6. Final remarks:** Concludes with reflections on the use of the framework.

2

2. Key concepts and framework

2.1. Defining green jobs, skills for green jobs and associated concepts

2.1.1. Defining green jobs

Precise definitions are integral to an efficient and reliable MEL framework. Different definitions for green jobs exist.[1] The definition of green jobs used in this handbook is based on the ILO's statistical definition of green jobs, which is especially relevant for direct outcome measurement. A "statistical definition" provides a fixed set of criteria, which lends itself to a more consistent and comparable measurable approach.

The statistical definition was established in the 2013 Guidelines Concerning a Statistical Definition of Employment in the Environmental Sector,[2] adopted by the 19th International Conference of Labour Statisticians (ICLS) (ILO 2013b). Adoption by the ICLS means that the definition has undergone a validation process with ILO Member States and different stakeholders. It is therefore considered to be a validated definition.

There are three main criteria for a job to be considered a green job:

1. **Employment in the environmental sector:** This encompasses activities and jobs contributing to environmental sustainability, which can be further disaggregated to:

   a. employment in the production of environmental goods and services – also known as employment in environmental production; AND/OR

   b. employment in roles that involve making production processes more environmentally friendly or making more efficient use of natural resources in all other

1 Please see the following report for a comparison of different terms and concepts: ILO, *Green jobs, Green Economy, Just Transition and Related Concepts: A Review of Definitions Developed through Intergovernmental Processes and International Organizations*, 2023.

2 See ILO, *Guidelines Concerning a Statistical Definition of Employment in the Environmental Sector*, 2013. See also figure 2.1 below.

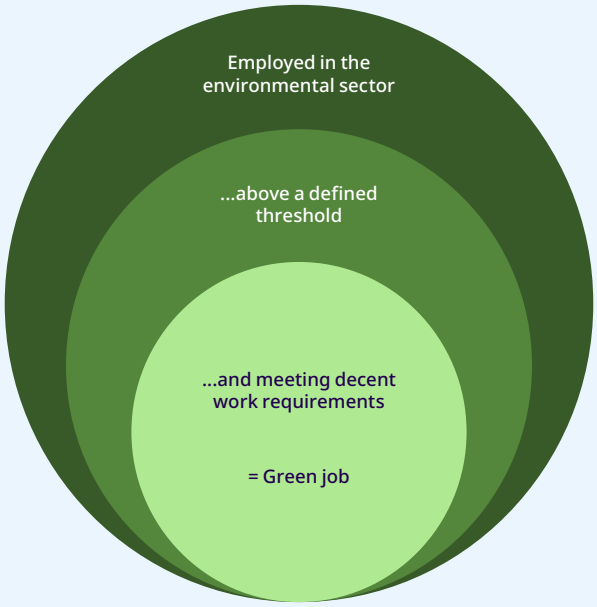
"traditional" industries/sectors – also known as employment in environmental processes.

The classification of the environmental sector draws from the System of Environmental-Economic Accounting (SEEA), a globally recognized statistical framework developed to integrate environmental and economic data. The SEEA provides a standardized approach to measure the environmental contribution of economic activities, ensuring consistency across programmes and comparability of results at the national and international levels. By aligning with the SEEA, activities contributing to environmental outputs can be categorized and measured.[3]

2. **Above a defined threshold:** For the two categories of employment in the environmental sector, the second – employment in environmental processes – is expected to meet a defined threshold in order to be counted. The ICLS definition states "where possible, a distinction should be made between those workers that spend less than 50 per cent and those that spend more than 50 per cent of their working time on environmental processes" (para. 12(B)). However, in the context of MEL, it is not always feasible to apply this distinction. Therefore, the handbook explores alternative methods for identifying workers whose roles are primarily focused on environmental processes.

3. **Meet decent work requirements:** According to the ICLS definition, green jobs refer to a subset of employment in the environmental sector above a defined threshold that meets the requirements of decent work. This decent work dimension may be selected according to the context and the type of intervention, and may draw from the ILO Guidelines on Decent Work Indicators.[4]

▶ **Figure 2.1. Visual representation of the definition of "green job" used in this handbook**



Note: Based on ILO 2013b.

3 For more information on SEEA, see: https://seea.un.org.

4 See ILO, *Decent Work Indicators: Guidelines for Producers and Users of Statistical and Legal Framework Indicators*, Second Version, 2013.

2.1.2. Skills for green jobs

"Skills for green jobs" refer to skills that are necessary to successfully perform tasks for green jobs and to make any job greener. The term includes both core and technical skills and covers all types of occupations that contribute to the process of greening products, services and processes, not only in environmental activities but also in other sectors (Gregg, Strietska-Ilina and Büdke 2015). However, there is no universal or widely accepted definition of skills for green jobs (ILO 2019; Strietska-Ilina et al. 2011). Skills for a green transition, skills for a just transition, skills for climate change mitigation and skills for climate change adaptation are all relevant to understanding skills and their role in the transition to a green economy.

In the context of this handbook, "skills for green jobs" are defined as the skills necessary or associated with different categories of the environmental sector. This definition offers a measurable approach that does not distinguish between the technical or core nature of the skills, but does align exactly with the same categories used for assessment of employment in the environmental sector.

At the same time, taxonomies exist that identify green tasks and activities in different occupations, and these can be applied to measure skills for green jobs. Green tasks and activities can also be used to assess the "greenness" of a job (Vona et al. 2015), this is particularly relevant for assessing environmental processes (Vona, Marin and Consoli 2019).

▶ Box 2.1. The importance of the term "skills for green jobs"

In the context of MEL, the term "skills for green jobs" is preferred over "green skills" or "green jobs and skills", as it emphasizes the connection to green jobs. This phrasing aligns the concept of skills directly with the employment opportunities they enable, making it more actionable and measurable within MEL frameworks. "Skills for green jobs" also acknowledges that skills are needed not just for inherently green jobs, but also for "greening" traditional jobs in non-green sectors.

2.1.3. Associated measurement objectives

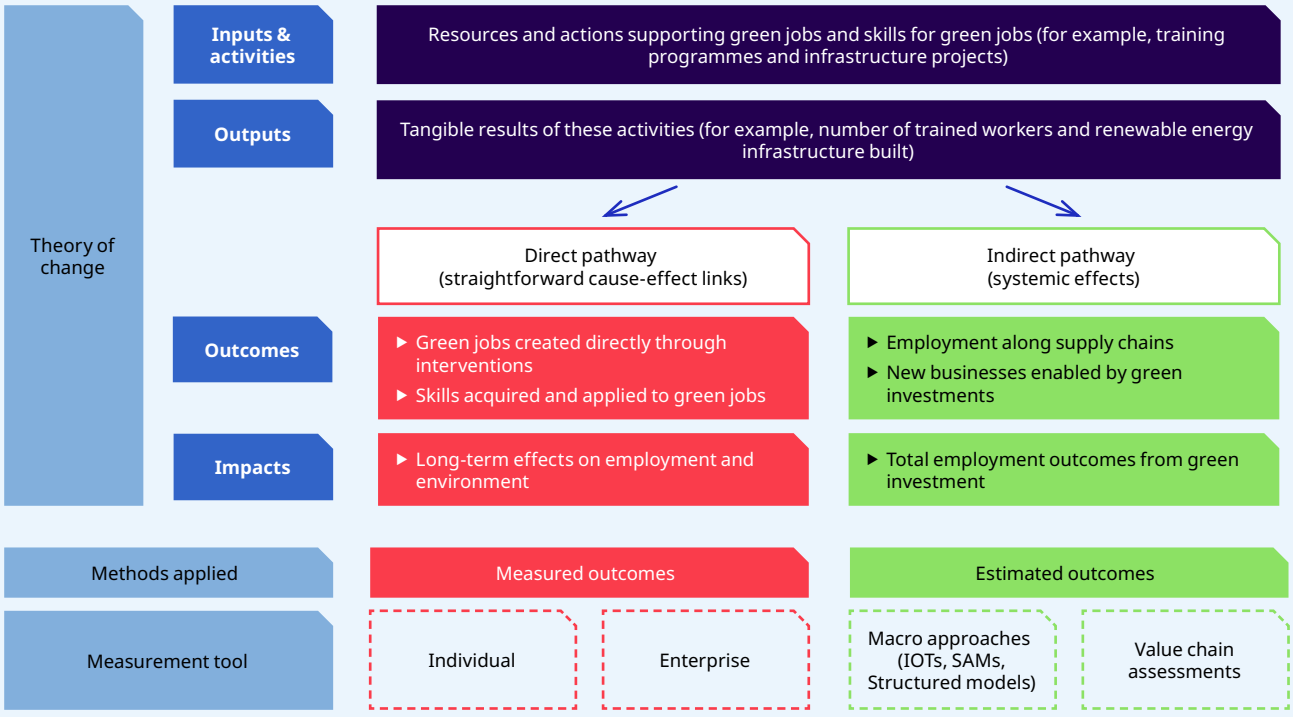
Many jobs in the environmental sector do not squarely meet the three criteria defined in section 2.1.1 above, particularly in regard to the decent work element. Accordingly, different measurement objectives are used (by development and financial institutions) as proxies to estimate green jobs such as:

- **Employment outcomes from green investments**: A common approach used by development finance institutions (DFIs) is to model all employment outcomes based on whether an *investment* is considered to be green or not. This requires categorization of an investment as green from the input standpoint – that is, it cannot assure that the outcomes of the investment are in green jobs (which would be an output standpoint). These estimates tend to be higher than estimates of employment outcomes in green jobs, green sectors or green occupations (see section 3.2).
- **Employment outcomes in green sectors**: This approach assumes that all employment can be considered green within a sector that is itself generally categorized as "green" – for example, renewable energy. However, this only partially complies with the ICLS definition of green jobs, as it does not account for the *extent* to which a job in a given industry is green, nor does it take into account employment that supports environmental processes in traditional sectors (i.e. not considered as green sectors as per the ICLS definition).
- **Employment outcomes in green occupations**: Some models estimate green employment by assessing the "greenness" of an occupation. Various task-based taxonomies have been developed to evaluate the environmental content of different occupations, assigning a greenness score based on the tasks performed. However, these approaches do not align with the statistical definition of green jobs or employment in the environmental sector.

2.2. Conceptual framework for measuring green jobs and skills for green jobs

The main objective of this handbook is to provide advice to programme managers, MEL practitioners and policymakers on measuring green jobs and skills for green jobs to be able to provide accurate information on programme outcomes. The basis for choosing a relevant measurement approach is an understanding of the programme's objectives, its theory of change (or logical framework) and the type of impacts being measured. With the MEL definitions clarified (section 1.6) and the definitions around green jobs and associated concepts outlined (section 2.1), the conceptual framework is presented in figure 2.2.

▶ **Figure 2.2. Conceptual framework for measuring green jobs and skills for green jobs**



Note: IOT = input–output table; SAM = Social Accounting Matrix.

The conceptual framework begins with inputs and activities, such as training programmes, policy interventions and green infrastructure investments. These inputs generate measurable outputs, like the number of individuals trained, enterprises supported or infrastructure developed.

At this point in the framework there is a decision point, represented by two pathways: direct or indirect. The pathway one chooses will depend on the design and main objective of the programme. This involves determining whether an intervention directly creates jobs and skills for individual or enterprise beneficiaries – such as those enrolled in training financed by the programme – or whether an intervention (or investment) indirectly generates jobs and skills outcomes in the wider value chain or economy.

The direct pathway leads to immediate and measurable outcomes, such as green jobs created

through interventions and/or skills acquired and applied to green employment, with long-term impacts on employment and environmental sustainability. The indirect pathway captures broader, systemic effects, where employment is generated along supply chains and new businesses emerge as a result of green investments, ultimately contributing to total employment growth in the green economy.

Development practitioners typically focus on measuring direct impacts as part of a MEL approach, which looks at the jobs supported or created directly by an intervention or an activity. Direct impacts tend to be more straightforward to measure and provide a basis for understanding broader impacts.

However, measuring the number of indirect green jobs supported through an investment or intervention is important, as it provides a broader perspective on the systemic impacts of green initiatives. Indirect jobs are particularly relevant and often more significant for environmental projects because they occur within complex interconnected systems. Environmental projects, such as renewable energy installations, sustainable agriculture or waste management systems, rely on extensive supply chains and economic linkages to achieve their goals. Thus, measuring indirect jobs provides a more comprehensive view by capturing impacts beyond the immediate scope of the project. For the purposes of this handbook, indirect, induced and enabling impacts are all classified as "indirect".

A methodological approach and associated tools can be selected for each pathway – direct or indirect. The direct pathway seeks to measure outcomes, that is, it applies tools to directly observe outcomes – or effects – on programme beneficiaries. The indirect pathway seeks to estimate outcomes using economic modelling, rather than direct observation, to infer the broader employment effects of green investments.

The main tool for measuring direct outcomes are surveys, either at the individual level or the enterprise level. Programmes that work primarily with firms, either small or large, would choose to make use of enterprise level surveys to understand business-level employment outcomes, such as the number of employees and the type of environmental sector. Individual level surveys focus on workers or employees, capturing their job roles, skill acquisition and skill application in green sectors.

The tools for estimating broader, indirect employment outcomes are more complex and may require a higher level of technical support. The choice of the tool depends on the desired level of detail, resource availability and the associated policy context. The tools include:

- **Macroeconomic modelling approaches:** Empirical models, such as input–output tables (IOTs), Social Accounting Matrices (SAMs) and structured models, are used to analyse and predict the behaviour of an economy by examining relationships.
- **Value-chain assessments:** An analysis of linkages involved in the production of a product or service. Using mixed-method approaches, these analyses assess broader systemic impacts, such as labour conditions, environmental sustainability and market dynamics across a supply chain.

The focus of the next chapters of this handbook will be to describe in detail how to apply each of these tools.

3

3. Measuring and estimating green jobs and skills for green jobs

This section focuses on indicators and methodological tools. It goes through the objectives and key components of the tools, and provides examples of application, as drawn from the pilot initiatives referred to in section 1.4 above.

3.1. Indicators of green jobs and skills for green jobs

Indicators are a key aspect of MEL systems, as they provide metrics to assess the results of programmes. A menu of indicators to assess green jobs and skills outcomes is presented in table 3.1 below to help guide programmes in selecting relevant indicators based on their specific objectives. These indicators then serve as a basis to design surveys, collect data and evaluate programme effectiveness.

The indicators are limited to the presented definitions of green jobs and skills for green jobs, and therefore do not attempt to present a comprehensive list of other associated indicators. In line with the conceptual framework, table 3.1 distinguishes between direct and indirect indicators at the outcome level.

Direct indicators use specific, measurable terms (such as, “persons employed in the environmental sector”), capturing the immediate observed effects of interventions, typically through surveys.

Indirect indicators use broader, inferential language (such as, “jobs created as a result of [intervention]”), to estimate wider systemic employment effects.

▶ Table 3.1. Indicators relevant to assessing green jobs and skills outcomes in direct and indirect pathways*

Indicator level	Direct indicator	Indirect indicator
Inputs and activities (examples)	Budget allocated for green job training programmes	
	Investment in green infrastructure	
Outputs (examples)	Trained workers with skills for green jobs	
	Infrastructure projects completed	
	Policies enabling green investments and entrepreneurship	
Outcomes	Persons employed in the environmental sector	Jobs created as a result of green [intervention]
	Persons employed in green jobs	Green jobs created as a result of [intervention]
	Persons acquiring skills relating to the environmental sector	Jobs created in green sectors as a result of [intervention]
	Persons applying skills relating to the environmental sector	Jobs created in green occupations as a result of [intervention]
	Enterprises with employees in the environmental sector	
	Enterprises with employees employed in green jobs	Jobs created in supply chains supporting green sectors
	Employees within enterprises in the environmental sector	
	Employees with green jobs within enterprises	
Impacts	Long-term employment that meets decent work and environmental criteria	Total employment outcomes from green investments
	Enhanced workforce resilience in response to climate and environmental transitions.	Employment outcomes in “green sectors” or green occupations

* The outcome indicators marked by the red box are the main focus of this guidance

3.2. Direct pathways to employment outcomes

3.2.1. Overview

We first focus on the direct pathway with the goal of establishing direct cause and effect linkages between a programme and its intended outcomes and impacts. MEL tools such as survey questionnaires are typically used by development agencies and their partner organizations to gather primary data from their targeted beneficiaries in order to monitor the direct effects of their programmes.

The subsequent sections provide examples of data and analysis from the piloting of survey questionnaires. The objectives of these "data demos" are to:

- Demonstrate application of the concepts in this handbook to a live project;
- Show how data findings can be used; and
- Discuss how the tools can be improved.

The examples in the data demos come from two projects of the SWITCH-Asia programme, implemented in the Lao PDR and funded by the EU, namely: SuPER WE Coffee and SUSTOUR.

▶ **Data demo: SWITCH-Asia Programme**

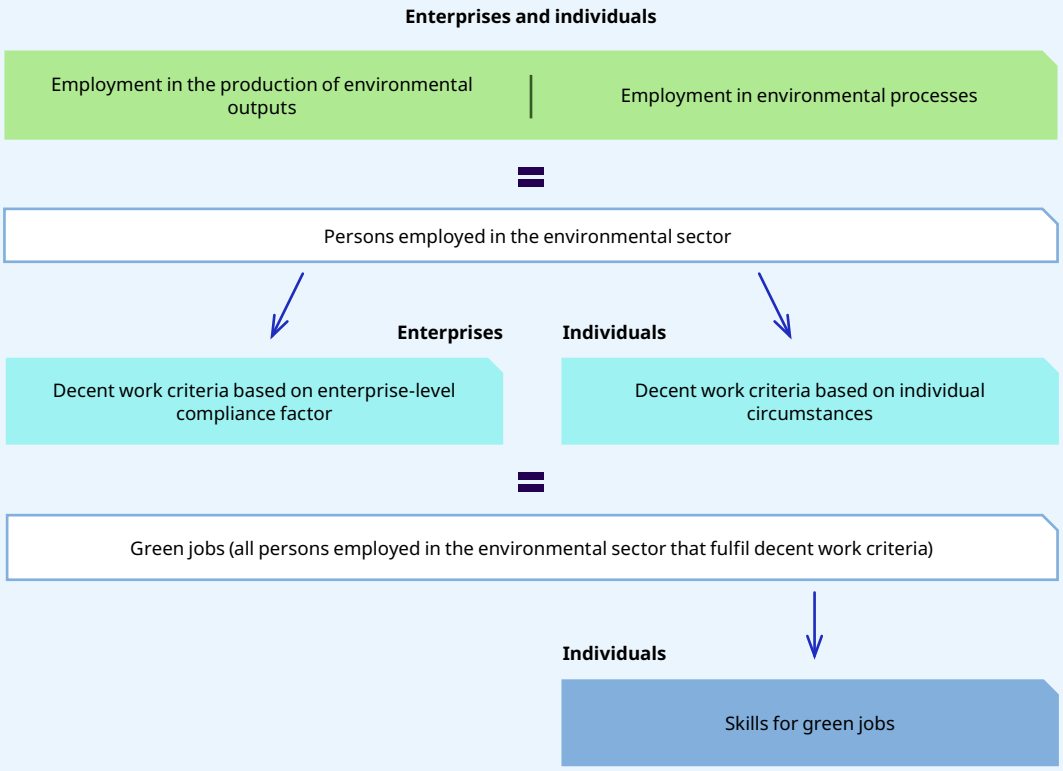
1. **The SuPER WE Coffee project** aims to promote sustainable coffee production by integrating climate-smart agricultural practices, circular economy principles and inclusive business models. The project supports smallholder farmers, cooperatives and rural enterprises in adopting agroforestry, organic farming and soil conservation techniques through training, access to finance and building relationships with international buyers. The project contributes to green job creation by increasing farmers' income stability and enhancing the role of women in jobs like cooperative and small- and medium-sized enterprise (MSMEs) management.
2. **The SUSTOUR project** promotes sustainable tourism practices by integrating micro-, small- and medium-sized enterprises (MSMEs) into eco-friendly supply chains and certification programmes. It supports enterprises in areas such as energy and resource efficiency, waste management, and biodiversity conservation, providing training, financial access and policy engagement. The project contributes to green job creation by driving demand for workers skilled in energy-efficient operations, waste management and sustainable tourism services.

As pilots for measuring green jobs, the projects were interested in improving their understanding of green jobs definitions and integrating the learnings into the projects' MEL systems.

The data shown in the examples below comes from a specific sample collected in the context of a MEL pilot and is demonstrative in nature. It is displayed for learning purposes only, and is not meant to be representative.

The core methodological tools used to measure direct employment outcomes are two survey questionnaires (or modules) to be applied alongside existing MEL systems. One of the survey questionnaires collects data from individuals and the other collects data from enterprises in order to establish whether the jobs and skills that have been impacted by the interventions are considered to be "green" or not. This approach complies with the definition of green jobs used in this handbook, namely jobs that are in the environmental sector and meet decent work requirements. A visual representation of the two questionnaires and their main differences are summarized in figure 3.1

▶ Figure 3.1. Visual representation of the questionnaire approach to measuring direct outcomes



Both questionnaires are structured in a similar manner. However, there are some differences in terms of content and structure:

- The first difference applies to measuring decent work, which varies based on the beneficiary type, such that an individual beneficiary approach includes worker perspectives concerning decent work (such as wages and working conditions); whereas an enterprise beneficiary approach includes enterprise-level measures for decent work (such as occupation and wage structure; labour cost; job vacancies).
- Secondly, the individual beneficiary approach includes elements related to an individual's skills for green jobs (with a focus on skills profiles, tasks and occupations), which is not feasible in the enterprise questionnaire. This is because individual-level skill acquisition and application is difficult to assess or gauge when an enterprise representative is the respondent providing information; instead, an enterprise survey can be a valuable resource for estimating gaps in skill needs, although this is not covered in the current version of the questionnaire.[5] The structure of the two questionnaires is presented in table 3.2.

5 For more information on estimating gaps in skills needs, consult ETF, CEDEFOP and ILO, Developing and Running an Establishment Skills Survey: Guide to Anticipating and Matching Skills and Jobs, Volume 5, 2017

▶ **Table 3.2. Structure of individual and enterprise questionnaires**

Individual questionnaire structure	Enterprise questionnaire structure
Background of the individual	Background of the company
A. Employment in environmental sector	A. Employment in environmental sector
B. Skills for green jobs	B. Decent work criteria
C. Decent work criteria	

3.2.2. Employment in the environmental sector

As mentioned in chapter 2, the environmental sector can be broadly split into two groups: (i) environmental outputs/products; and (ii) environmental processes.

- **Environmental outputs or products** refer to environmental goods and services produced by an enterprise or individual – for example, *manufacturing* solar panels, recycled materials or products.
- **Environmental processes** refer to the adoption of environmentally sustainable practices in the production of goods and services – for example, *use of* solar panels in a factory, *implementing* organic agricultural practices.

The environmental sector categories presented immediately below use top-level classifications based on the SEEA framework,[6] making them relevant for monitoring both environmental and employment outcomes. The categories are:

1. **Energy from non-fossil fuel renewable resources:** For example, production/use of electric power from solar, wind, hydroelectricity or biogas.
2. **Energy-efficient goods and services:** For example, energy-efficient manufacturing equipment, electrical appliances (such as milk coolers), buildings and E-vehicles; energy-efficient bulbs or motion sensors; manually operated machines instead of motored.
3. **Prevention, reduction or elimination of pollution and greenhouse gas emissions:** For example, waste-to-energy machinery, a sock pit, water and sewage treatment plants, equipment for treatment of industrial wastewater and sewage, waste gas absorbers, catalytic converters, pollutant recovery condensers, filters, absorbers, more-efficient wood-burning stoves, rechargeable batteries.
4. **Recycling, reuse, reduction and disposal of waste:** For example, fixing electrical goods; recycling plastic waste to make tiles, bricks or plates; making charcoal briquettes; biogas; bio digesters; fertilizer from waste.
5. **Protection or conservation of natural resources and the environment:** For example, drainage systems, eco-cleaning products, building water trenches, use of good agricultural practices (such as organic and sustainable farming techniques, soil protection from planting trees), sustainable forestry practices, water harvesting, re-use of towels in hotels.
6. **Environmental administration, compliance and public awareness:** For example, producing materials or providing the service of education, training and certification, such as offering training on specific environmental regulations and compliance.
7. **Other:** To allow for alternative, new and emerging environmental sector activities to be included, or those that are not clearly assigned to any of the categories above.

6 Taking inspiration from the green jobs module for establishment surveys and the green jobs modules for labour force surveys from the Green Jobs Assessment Institutions Network (GAIN) Training Guidebook (ILO 2017).

Respondents to the survey questionnaire are asked if they either: (i) produce a good or service in these categories; and/or (ii) use these categories in the production of a good or service. This allows for alignment with the "environmental outputs" and "environmental processes" categories of the SEEA and the ICLS statistical definition of green jobs.

It is possible for respondents to meet the criteria for more than one category, and for respondents to both use and produce such goods and services. It is also possible for activities to potentially cut across different categories. In the latter case, it is best to select the category that the respondent considers to be the most suitable.

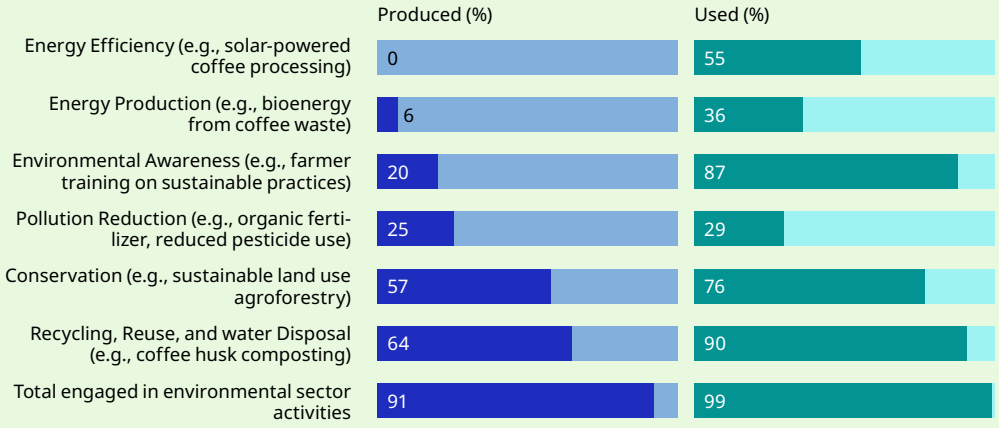
▶ Data demo

Part I. Employment in the environmental sector

The SuPER WE Coffee pilot ran from 9 to 15 May 2024. A total of 100 phone interviews were conducted among smallholder farmers and cooperative members involved in the coffee industry.

Figure 3.2 shows the distribution of individual respondents according to the production of and use of different environmental sector activities. The findings show that while most of the individuals – over 90 per cent in both categories – are employed in the environmental sector, there was greater engagement in using environmental goods and services (99 per cent), than producing them (91 per cent). The highest share of employment both in the production and use of environmental goods was in the recycling category, while there was low engagement in energy efficiency and energy production.

▶ Figure 3.2. SuPER WE Coffee: Distribution of individuals by environmental sector activity



The key lesson for improving the measurement process is the need for a threshold – that is, a set level or standard that must be met – to differentiate individuals who are primarily engaged in environmental activities from those who participate casually or on a limited basis. Without a threshold, it becomes difficult to assess the true extent of involvement in green activities. Establishing such a criterion would help determine the level of intensity of an individual's engagement in environmental work, ensuring more accurate classification and measurement of green jobs.

Source: Adapted from pilot findings.

3.2.3. Applying a threshold for environmental sector activities

If an individual or an enterprise is engaged with one or more of the categories of the environmental sector, the next step is to gauge how fundamental this engagement is to someone's job. This helps determine whether they should be classified as employed in the environmental sector or if their engagement is only incidental. This determination is made by applying a threshold measure that a worker will need to meet or surpass.

To be in alignment with the ICLS statistical definition of green jobs, the threshold for someone to be considered employed in the environmental sector is **if they spend more than half their time engaged in "environmental processes"** – that is, in the use of environmental goods and services. The use of the threshold is important, as otherwise there is no way of distinguishing between those who are closely engaged in the environmental sector and those who are only engaged at the margins.

3.2.3.1. Production of environmental goods and services

Typically, any employment related to the production of environmental sector goods and services is categorized as employment in the environmental sector. This is consistent with the "sectoral approach" used by some development agencies, which categorizes employment automatically by the sector or category of economic activity.

The downside of this approach is that it generally does not apply particularly well when the production of an environmental good or service is a secondary or minor part of a business' or individual's overall activities. For example, consider a hotel whose primary function is hospitality but also sells a small number of recycled cups in its gift shop. In this case, the hotel's core business is not environmental production, making it difficult to classify it as a green enterprise based on this minor activity alone. Accordingly, the survey questionnaire attempts to gauge the relative importance of the environmental sector goods and services on offer to the overall activities of the individual or enterprise. This is done through the following questions:

[Individuals] Could you do the same activity without producing these environmental goods and services?							
1. Yes, all of it.	☐	2. Not everything but more than half.	☐	3. Only some (less than half).	☐	4. None.	☐
[Enterprises] Could the business do the same activity without producing these environmental goods and services?							
1. Yes, all of it.	☐	2. Not everything but more than half.	☐	3. Only some (less than half).	☐	4. None.	☐

At the individual level, if the person gives response 3 or 4, it confirms that environmental goods and services are a core part of the business or job, rather than a minor or secondary activity. This means the threshold criteria for employment in the environmental sector are met, as the production of environmental goods and services plays a significant role in the economic output. For example, someone who produces solar panels could not run their solar panel production business without this activity. Similarly, a recycling plant could not function without these environmental activities. However, a hotel that produces recycled cups could still do their primary activities. The situation is not always this clear cut, which is why the respondent should be given enough time and be specifically asked to elaborate on their answers. For instance, an organic coffee farmer could probably still produce coffee without the organic methods; however, the organic methods allow

the farmer to receive a premium price and sell the produce in a different market. Therefore, for the farmer it may be deemed to be fundamental to their primary economic output.

If an enterprise answers 3 or 4 – that is, that production of the environmental goods and services are fundamental to the enterprise activity – then all employees within the enterprise can be considered as being "employed in the environmental sector".

If, however, the enterprise answers that "not everything, but more than half" of activities would be feasible without producing environmental goods and services (answer 2), then the following question can be used to identify how many of the enterprise's employees are engaged in environmental goods and services.

How many employees require the production of environmental goods and services activities in order to do their current work?	COUNT:

This allows for the survey to consider **employees who are engaged** in the production of environmental goods and services in **enterprises that are not producing** environmental goods and services as their main activity.

3.2.3.2. Use of environmental goods and services

For users of environmental goods and services – for example, someone who uses a solar panel in the production of goods and services, or someone who uses recycled products or pollution-reducing components – the qualifying question to see whether they meet the threshold is the same. The difference is that it is more likely that users of environmental goods and services will not consider such usage to be fundamental to their primary activity – that is, they could still do their work without it. Those for whom the use of environmental goods and services is not fundamental to their primary activity are not counted as being employed in the environmental sector. This is determined through a question that asks:

[Individuals] Could you do the same activity without using these environmental goods and services?							
1. Yes, all of it.	☐	2. Not everything but more than half.	☐	3. Only some (less than half).	☐	4. None.	☐
[Enterprises] Could the business do the same activity without using these environmental goods and services?							
1. Yes, all of it.	☐	2. Not everything but more than half.	☐	3. Only some (less than half).	☐	4. None.	☐

If an enterprise answers 4 – that is, saying that none of the activity could be done without the use of environmental goods and services – then all employment within the enterprise can be considered as being "employed in the environmental sector". If, however, the enterprise answers 3 "only some (less than half)" of activities would be feasible without the environmental activities, then the following question can be used to identify how many of the employees are engaged in environmental goods and services.

How many employees require the production of environmental goods and services activities in order to do their current work?	COUNT:

This allows for the survey to consider **employees that are engaged** in the use of environmental goods and services in enterprises that **do not require the use** of environmental goods and services to carry out their main activity.

The survey pilots revealed challenges in obtaining reliable estimates of working hours split between environmental and non-environmental activities. As a result, the question above was introduced to elicit information on the relative importance of environmental activities rather than requiring respondents to estimate exact working hours.

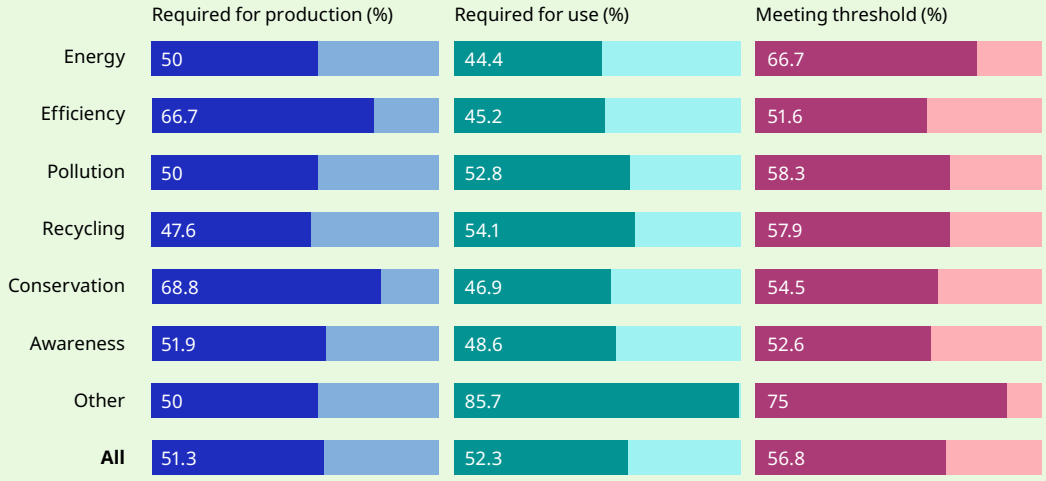
▶ Data demo

Part II: Employment in the environmental sector above a threshold

The SUSTOUR pilot involved both phone and in-person interviews with 44 tourism workers and businesses, including hotels, restaurants and tour operators. Here we demonstrate the results of the threshold question: "Could the business or employee do the same activity without these environmental activities?" This question is used to understand how important environmental activities are in one's job or business.

Figure 3.3 shows that on average, about half (51.3 per cent) of enterprises require environmental activities for production, and 52.3 per cent require them for use. Conservation (68.8 per cent) and Efficiency (66.7 per cent) activities are the most frequently required for production, suggesting that businesses relying on sustainable land use or energy-efficient systems see these activities as integral to their operations. Overall, just over half (56.8 per cent) of the businesses meet the threshold for being classified as an environmental-sector enterprise, indicating that the majority of businesses engaged in environmental activities rely on them fundamentally for daily operations.

▶ **Figure 3.3. Distribution of enterprises by whether or not the economic activity is required for everyday business as usual**



Source: Adapted from pilot findings.

3.2.4. Decent work

The specific criteria for measuring "quality" aspects of green jobs are not explicitly specified in the green jobs definition, although they are an integral part. Decent work indicators need to be tailored to specific contexts, and can be selected or defined based on the particular needs of the intervention. The approach for data collection on decent work varies depending on whether the respondent is an enterprise or an individual.

In the questionnaire for enterprises, decent work components are based on compliance with established labour and human rights standards, such as those outlined in the Guiding Principles of Business and Human Rights (UN Human Rights Office 2011) and the ILO's Fundamental Principles and Rights at Work, which include the elimination of child labour, the prohibition of forced or compulsory labour, the promotion of non-discrimination in employment and the protection of workers' rights to freedom of association and collective bargaining. To define what is meant by compliance with labour and human rights standards, questions may draw from a wide range of decent work indicators, such as, the self-assessment tool for enterprises regarding the Multi-National Enterprises Declaration (ILO 2022d) or the UN Compact Self-Assessment Tool (UN Global Compact 2010), among others.

In the survey tool for individuals, questions on decent work are based on an experience perspective, and can include wages and earnings, working conditions and job security. Indicators can be drawn from the ILO manual on decent work indicators (ILO 2013a), as well as other resources including the IRIS+ Quality Jobs Framework, the Global Impact Investing Network (GIIN) Job Quality Framework[7] or the ILO SME Performance Measurement Toolkit.[8]

Job quality for individuals can be both objective (such as income levels and hourly work, levels of occupational safety and health, access to social protection) and subjective (such as sufficiency of earnings, perceptions around work–life balance, opportunities for career progression and training).

It is important to note that, in the context of the present handbook, job quality is a qualifier for whether employment in the environmental sector is considered a green job or not. The framework is not intended to support a comprehensive assessment of decent work. Instead, if "decent work" or "job quality" are central to the intended outcomes of an intervention, they should be assessed in greater depth as part of the wider MEL framework. In this regard, any decent work measures that are already included in the wider MEL framework can be used for the purposes of measuring green jobs.

To ensure practical implementation while addressing key concerns, the following approach is recommended:

1. **Prioritization of decent work criteria:**

Identify one or two decent work indicators that align with the overall objectives of the programme and that are most relevant to the programme context. These can be determined either:

   a. By leveraging existing decent work measures already included in the MEL framework; or

   b. Through a risk-based screening exercise using appropriate tools at the enterprise or intervention level.

2. **Integration into the green jobs module:**

The selected criteria should be integrated into the green jobs module in a way that aligns with the intervention's focus and objectives. This ensures that job quality is appropriately addressed without overwhelming the assessment process.

7 See: https://navigatingimpact.thegiin.org/quality-jobs/.

8 See: https://www.sme-measurement.org/gimi/KPIInventory.action.

▶ Box 3.1. Examples of decent work criteria used in the pilot phase

Enterprise questionnaire:

- Do you provide employees with a written contract?
- Do your employees have access to social security?
- Do you register your employees for statutory health insurance?

Individual questionnaire:

- Are your earnings sufficient to cover the basic needs of you and your family?
- Did your earnings increase, decrease or stay the same as a result of the programme?

Why focus on a limited number of decent work criteria?

The advice to monitor a limited number of decent work criteria is based on practical considerations, such as:

- **The complexity of the decent work concept**, which involves interconnected dimensions such as wages, job security, working conditions, social protection, equality and others. Capturing this comprehensively is often infeasible.
- **Relevance to the intervention**: If job quality is a key focus, it is assumed to be addressed elsewhere in the programme's broader MEL framework.
- **Feasibility for data collection**: Too many criteria can overwhelm enumerators and detract from capturing the environmental aspects effectively.
- **Aggregation challenges**: Defining what counts as decent work or a quality job becomes increasingly difficult as more and more criteria are included.

▶ Data demo

Part III. Meeting decent work requirements

The pilot survey questionnaire tested different questions concerning fulfilling decent work criteria. These included a question about the impact on beneficiaries' income levels as well as the presence of a written contract. Table 3.3 shows responses to a question posed to SuPER WE Coffee beneficiaries about whether their earnings had changed as a result of the intervention. It shows that the incomes of 88 per cent of beneficiaries had increased as a result of the intervention, with the remaining 12 per cent stating that their incomes had stayed the same. However, when beneficiaries were limited to those who met the stricter criteria (threshold) of being in the environmental sector, the share of beneficiaries who saw increased incomes as a result of the intervention rose to 92.5 per cent. This may demonstrate that the project significantly contributes to income improvements for participants.

▶ **Table 3.3. SuPER We Coffee pilot: Distribution of individuals by whether or not their incomes increased as a result of the intervention**

Change to earnings as a result of programme	Surveyed beneficiaries in the environmental sector		Surveyed beneficiaries in the environmental sector with threshold applied	
	No. of beneficiaries	Share of beneficiaries (%)	No. of beneficiaries	Share of beneficiaries (%)
Increased	88	88	87	92.5
Stayed the same	12	12	7	7.5
Decreased	0	0	0	0

Note: Respondents were asked "How have your earnings changed as a result of the intervention?" as a proxy for the decent work component of the questionnaire.
This example is used for the purpose of demonstrating a potential decent work question and the implications for measuring green jobs according to the ICLS statistical definition. An increase in earnings as a result of the intervention was used as the criterion for this particular case, but it should be noted that this may not be an appropriate measure for all programmes. The particular context in which this was applied was for own-account workers who were not earning a salary. In this particular case, the intervention had no other impacts on job quality or labour market outcomes, although certain measures were in place to ensure certain minimum standards were met.

3.2.5. Green jobs

Green jobs are those that meet all of the criteria established in section 2.1, namely individuals or enterprises that:

1. are employed in the environmental sector; and
2. are above a defined threshold; and
3. meet decent work criteria.

3.2.6. Skills for green jobs

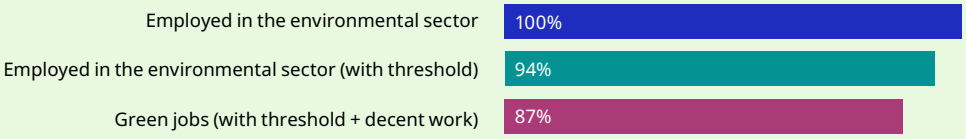
Skills for green jobs are defined as skills that are necessary to successfully perform tasks for green jobs or to make any job greener. In the context of this handbook, skills for green jobs are defined as the skills necessary or associated with different categories of the environmental sector (see section 2.1.2)

▶ Data demo

Part IV. Calculating green jobs

Applying the definition of green jobs means that only a subset of the total beneficiaries are considered to be in green jobs. Figure 3.4 presents findings from the level survey of SuPER WE Coffee. While 100 per cent of respondents were employed in the environmental sector, the value drops to 94 per cent when the threshold is applied, and then drops again to 87 per cent when decent work criteria are applied. This means that, in total, more than three-quarters of the survey respondents are in green jobs.

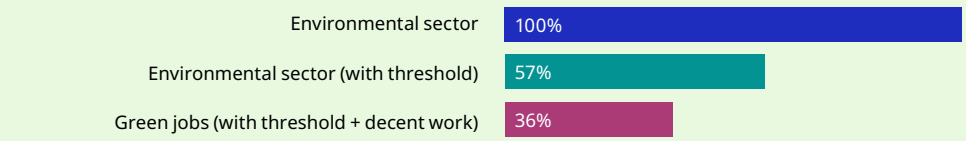
▶ **Figure 3.4. Green jobs, individual questionnaire (SuPER WE Coffee)**



N = 100

For the enterprise questionnaire of SUSTOUR respondents, 100 per cent of businesses were in the environmental sector, but just 36 per cent count as providing green jobs. However, it should be noted that this refers only to the number of enterprises providing green jobs, and one would need to know the number of employees in these enterprises to capture the overall number of green jobs.

▶ **Figure 3.5. Green jobs, enterprise questionnaire (SUSTOUR)**



N = 44

Source: Adapted from pilot findings.

The questions concerning skills for green jobs are only asked to individual beneficiaries. Their focus is both on the **acquisition of skills** and the **application of skills** relevant to the environment. This allows users to assess either one of these notions, or both. This information can help shed light on whether an individual has learned a new skill but also whether they were able to actually apply these learned skills in their work. The skills information can be checked against information derived from the employment questions to assess whether an individual is employed in the same environmental area in which they received training.

The individual questionnaire's question on skills draws on the same environmental categories that are applied to employment in the environmental sector section (see box 3.2). Individuals are also asked to provide further information in an open-ended question.

▶ Box 3.2. Individual questionnaire question related to skills for green jobs

Question 10: From the [...] intervention, did you acquire or apply skills / information / advice related to:

- ▶ Energy from non-fossil fuel renewable resources.
- ▶ Energy-efficient goods and services.
- ▶ Prevention, reduction or elimination of pollution and greenhouse gas emissions.
- ▶ Recycling, reuse and disposal of waste.
- ▶ Protection or conservation of natural resources and the environment.
- ▶ Environmental administration, compliance and public awareness.
- ▶ Other.

Note: These categories are indicative of the environmental sector categories, and more information on the components of each is available in the questionnaire.

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▶ Data demo

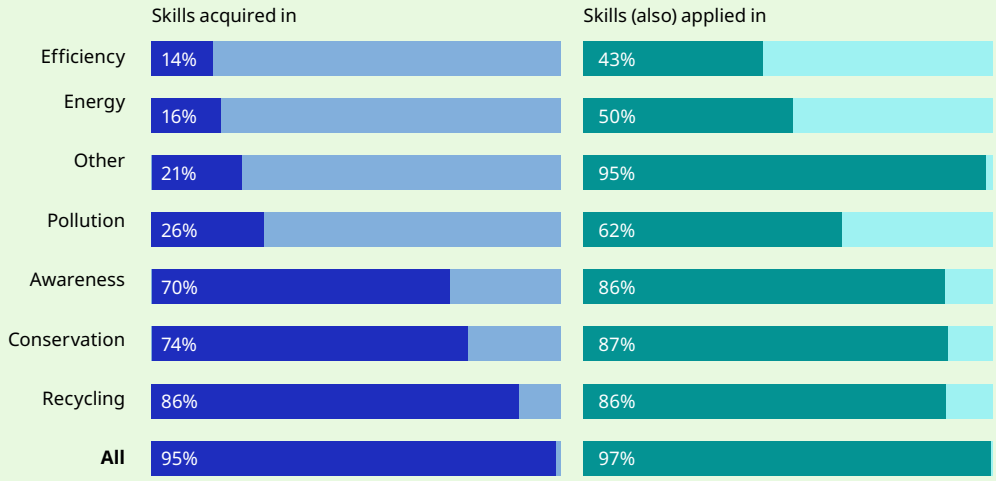
Part V. Assessing skills acquisition and application

Figure 3.6 shows results on environment-related skills among SuPER WE Coffee project beneficiaries. The first column represents the share of individuals who have acquired skills in various environmental categories. The second column indicates, among those who had acquired these skills, the share who had also applied them. The most commonly acquired skills are Recycling, Conservation and Awareness. Efficiency, Energy and Pollution have relatively low acquisition rates, but moderate to reasonably high application rates among those who acquired these skills, indicating broader practical relevance than might be thought on the basis of skill acquisition alone. Conservation and Recycling both show a strong correlation between learning and real-world application.

In order to provide more insights into these findings, there are options to include open-ended questions. These might ask respondents to provide examples of how they have applied these skills at work, or to explain what difficulties they face in learning and using these skills.

Further analysis of large datasets is also feasible by using the individual ISCO codes and applying a taxonomy of green occupations to these codes – for example, a task-based approach (see, for example, Vona, Marin and Consoli 2019; Scholl, Turban and Gal 2023).

▶ Figure 3.6. Distribution of individuals, by skills acquired and applied (SuPER WE Coffee)



Note: Energy = Energy production from non-fossil fuels;
Efficiency = Energy-efficient goods or services;
Pollution = Prevention, reduction or elimination of pollution and greenhouse gases;
Recycling = Recycling, reuse and disposal of waste;
Conservation = Protection or conservation of natural resources and the environment, with a focus on water, soil and other natural resources;
Awareness = Goods/services or systems related to environmental administration, compliance and public awareness.

Source: Adapted from pilot findings.

3.2.7. Background information and inclusion factors

This section of the questionnaire focuses on gathering background information about the interviewee to ensure that inclusion factors can be assessed and analysed effectively. Inclusion is a critical consideration in the design, implementation and monitoring of green jobs programmes, particularly when targeting specific populations, such as women, youth, persons with disabilities or marginalized groups. Collecting this data ensures that the programme outcomes are equitable and representative, supporting the broader goals of a just transition and sustainable development.

The inclusion of questions on interviewee information – such as gender, age and disability status – serves a dual purpose:

1. **Basic disaggregation:** It enables results to be analysed by demographic groups, providing insights into how different populations benefit from green jobs initiatives – for example, understanding whether training programmes equally benefit men and women, or how youth or persons with disabilities are represented in green jobs (see, for example, the Washington Group questions).
2. **Quotas and targets:** Programmes with specific inclusion targets can use this data to monitor progress, assess participation rates and determine whether quotas are being met (for example, 40 per cent women's participation in a training programme).

Given that inclusion – particularly related to gender, age and disability – is sometimes overlooked in MEL processes, the background section of the questionnaire ensures that at least some baseline information is collected.

▶ Box 3.3. Gender information in the context of climate change and environmental action

While the gendered dimension of climate and environmental change is documented in several reports, the dearth of quality data on gender in this space has also been highlighted (CARE 2022). A UN Women brief on the "Effects of Climate Change on Gender and Development" also underlines that policy frameworks generally omit or inadequately address women's specific needs, and that women remain largely under-represented in climate action bodies and forums (UN Women 2023).

The recent ILO policy guide *Gender, Equality and Inclusion for a Just Transition in Climate Action* also makes a case for generating more systematic and robust sex-disaggregated data on the intersection between climate/environmental change, climate action and their impact, to inform gender-responsive national strategies and investments in climate action (ILO 2024).

Data gaps related to gender and other personal characteristics – such as disability and ethnicity – should be addressed, and data analysis considering the gender impacts of green jobs outcomes should be carried out to ensure that climate action offers inclusive opportunities and support to women and men workers and enterprises in the green and blue economies (ILO 2022b). More specifically, data analysis should take into consideration the disaggregation of production sectors, workers' characteristics and working conditions. This information can provide a useful baseline from which to understand the direct and indirect employment effects of climate change and of policies for carbon neutrality on women and men in all their diversity (ILO, forthcoming).

3.3. Indirect pathway to employment outcomes

This section explores the "indirect pathway" part of the conceptual framework for measuring green jobs and skills for green jobs outcomes. The indirect pathway is particularly relevant for programmes that aim for broader systemic or economy-wide effects – that is, indirect employment outcomes. The "estimated" outcome measurement methods rely on modelling and secondary data, rather than direct observation, to infer broader employment effects resulting from investments or policy changes that aim to promote a green economy.

The employment outcomes measured through estimation tools in the "indirect pathway" are less likely to meet the requirements of the definition of green jobs. Instead, the models often provide approximate estimates for employment outcomes, and these can vary significantly depending on the methodology used.

Programmes or investment projects aiming for indirect impacts, such as those typically supported by development finance institutions (DFIs) and policy-oriented development programmes are generally more distanced from end beneficiaries compared to direct technical assistance programmes. The effects of such programmes/projects – occurring through systemic or value-chain linkages – are typically more diffuse and varied, applying to a broad range of beneficiaries and factors for which impact-level data is not readily available.

3.3.1. Tools

Estimating indirect employment outcomes requires a range of analytical tools that vary in complexity, resource requirements and accuracy. While some methods rely on simple ratios and multipliers, others use detailed economic models that account for sectoral interactions, income flows and behavioural responses. The tools broadly fall into two main categories: (i) macroeconomic modelling tools and (ii) value-chain assessments.

The choice of method depends on data availability, technical expertise and the level of detail required for decision-making (see table 3.4). The choice of method is also determined by the objectives, that is, what type of outcomes are to be measured. This section provides an overview of the different estimation tools available, with regard to different measurement objectives.

3.3.1.1. Macroeconomic models

As part of the development of this handbook, consultations with various G7 development partners pointed towards the use of a macroeconomic (or structural) modelling approach as being the most cost-efficient, comparable and consistent approach for measuring indirect employment outcomes related to the investments of DFIs. Other available approaches include value-chain assessments that provide a deeper, more qualitative assessment of indirect employment impacts.

The main macroeconomic modelling approaches, detailed below, include Social Accounting Matrices (SAMs) and Computable General Equilibrium (CGE) models, which are widely used to simulate the economic effects of an investment, policy change or external shock to a sector. These models rely on input–output tables to demonstrate how a change in one part of the economy – such as an investment in renewable energy or energy efficiency – impacts other sectors, triggers multiplier effects and indirectly influences employment, among other economic outcomes. These modelling approaches can support ex-ante assessments (to estimate the potential impact of an intervention or investment before implementation) or serve as ex-post simulations (to evaluate what the estimated impact may be after implementation).

- **Input–output tables (IOTs):** These are matrices that contain all the economic linkages within an economy, thereby showing the interactions between all sectors and institutions. When the matrices are in equilibrium, it allows for the simulation of shocks to that equilibrium, which can be used to estimate the effects of changes such as a policy shift or capital injection. IOTs are compiled from national accounts data that contain value-added across sectors as well as the flow of commodities (also known as supply use tables). IOTs can have information on labour input or be linked with employment data to allow for the modelling of employment effects.

- **Social Accounting Matrices**: SAMs are based on the same underlying data as IOTs aligned with labour input and employment data, but they are also aligned with additional datasets on institutional and household transfers that allow for the estimation of consumption and production linkages. This means that SAMs can distinguish between how much goes towards different factors of production, namely labour or capital costs, allowing for more accurate estimates of the effects of a shock to the equilibrium. SAMs are compiled from national accounts data, household accounts (such as household income and expenditure surveys and labour force surveys) and current accounts.
- **Structural simulation models:** Structural models build on input–output and SAM frameworks, incorporating labour market dynamics, sectoral linkages and policy interventions. The key difference is that they are dynamic models, while IOT analyses use a static process. Being dynamic means that the approach can capture the effects of policy measures, such as carbon taxes, green investments and structural shifts in demand – that is, it allows for scenario-based policy analysis. An example of this is the Green Jobs Assessment Model (GJAM) developed by the ILO to evaluate the employment effects of green policies at the national and sectoral levels.

▶ Box 3.4. GJAM: Examples at the country level

In **Jordan**, a green jobs assessment was conducted to estimate current levels of green employment across six economic sectors: agriculture, waste and water, manufacturing, energy, tourism and transport. The study found that between 75,000 and 95,000 jobs could be considered green within these sectors, representing 4.3 per cent of total employment. Scenario analyses suggested that implementing specific green economy initiatives could create up to 8,650 additional jobs by 2030 (Germany, GIZ 2023).

GJAM was applied in **Mauritius** to estimate direct and indirect job multipliers in various sectors. The study revealed that green investments in the agriculture, manufacturing (textiles), services (hotels) and energy sectors could lead to higher employment multipliers compared to conventional investments. For instance, green manufacturing in textiles showed a total employment multiplier of 2.5, significantly higher than the 1.5 multiplier for conventional methods (ILO 2014).

The example of GJAM shows the relevance of including macroeconomic modelling approaches to M&E systems in projects aiming for broad employment impacts. These models allow both practitioners and policymakers to anticipate employment impacts, assess potential trade-offs and design evidence-based programmes and policies that maximize labour market outcomes.

A macroeconomic modelling approach is perceived to be the most appropriate approach in most circumstances due to its balance of rigour and practicality. Of the three modelling options covered above, SAMs are typically the most feasible option, as they tend to be more practical to implement than structural simulation models (which are much more complex) while also tending to be more rigorous than IOTs. SAMs are built using publicly available data, but require a level of technical expertise to compile, use and interpret.

Many DFIs in the G7 use the Joint Impact Model, which is a publicly available resource that simplifies the process of using SAMs and allows for a transparent and consistent approach to modelling employment outcomes from investments for different countries globally (see box 3.5). There are also many cases of country-specific models, including those developed by the STRENGTHEN2 programme and ILO Green Jobs Assessments.

▶ Box 3.5. The Joint Impact Model and G7 development partners

The Joint Impact Model is a macro-model, or more specifically, a portfolio-level tool that relies on modelling, using statistics reflecting sector and country averages to allow users to estimate the gross direct and indirect economic, employment and environmental impacts of a portfolio of investments in developing markets. It can be used for both ex-post estimates and ex-ante estimates. The Joint Impact Model was developed in a collaborative manner between a consulting firm and multiple DFIs. Many of the DFIs involved in the establishment of the Joint Impact Model are G7 development partners, including Germany's KfW (Kreditanstalt für Wiederaufbau) and the Dutch Development Bank FMO (Nederlandse Financierings-Maatschappij voor Ontwikkelingslanden N.V.), among others. While developed principally for DFIs, the Joint Impact Model can be used for modelling the impacts of technical cooperation programmes. It is open access, based on a subscription fee to cover maintenance costs and updates.

The advantages of the Joint Impact Model include its transparent methodology and simplicity, requiring users to fill intervention data into a fixed input template, specifying information on sales, direct employment (if known) and power production in MWh for power-enabling impacts, along with information about the year, sector, firm size, location and more. The input data file is then uploaded onto an online platform that provides an output file displaying the direct, supply chain, induced, finance-enabling and power-enabling impacts by sector. Detailed modelled outputs include:

1. employment, with breakdowns (based on average data) for female, formal, informal and youth employment;
2. value-added, broken down by wages (salaries), taxes and savings; and
3. greenhouse gas emissions.

While these estimation tools provide a comparable and consistent way to measure indirect employment outcomes, they come with limitations. They do not, for instance, comply with measurement outcomes such as "number of green jobs created" as per the ICLS 2013 definition of green jobs, which requires identifying whether a person is employed in the environmental sector and whether the job meets decent work criteria. Rather, macroeconomic models typically rely on sectoral or industry-level classifications that do not distinguish whether the jobs created are in or outside of the environmental sector. They also typically use average job quality characteristics (for example, sectoral informal employment rates), making it difficult to infer whether the modelled indirect, induced or enabled jobs meet decent work standards at the beneficiary level.

3.3.1.2. Value chain assessments

Value chain assessments (VCAs) provide a qualitative and sector-specific approach to assessing indirect employment and skills outcomes related to green jobs. As a complement to macroeconomic modelling approaches, VCAs offer a more detailed, bottom–up perspective on how green investments influence employment dynamics across supply chains. While macroeconomic models provide economy-wide employment estimates, VCAs help uncover firm-level labour impacts, skills gaps and employment transitions that may not be visible in large-scale modelling. They provide a more nuanced understanding of indirect employment effects, including upstream effects (such as job creation among suppliers of green technology or sustainable raw materials) and downstream effects (such as new employment opportunities created by increased demand for green products and services).

VCAs align with the Market Systems Development (MSD) approach outlined in the ILO's guidance on MSD and Just Transition (Bird 2024), which emphasizes systemic interventions that create enabling conditions for green jobs and sustainable employment outcomes. This perspective shifts focus from isolated interventions to market-wide transformations, highlighting the importance of understanding value chains as dynamic systems where policies, investments and external factors shape employment conditions and opportunities.

In Bolivia, a VCA in the sustainable agriculture sector explored how the adoption of organic farming practices –particularly in quinoa and

Andean grain production– could generate green employment along the value chain, from cultivation and aggregation to processing and export. The assessment identified opportunities for reducing post-harvest losses and improving access to organic certification, while also emphasizing the need for targeted training in climate-smart agriculture and value chain management. These findings informed recommendations for upskilling rural producers and strengthening the inclusion of informal workers in sustainable agro-industrial employment (ILO 2019).

VCAs rely on a mix of qualitative and quantitative data sources to assess employment outcomes. The following are common data collection methods for VCAs:

- **Enterprise and supplier surveys** collect information on employment levels, workforce skills and training needs within green value chains.
- **Key informant interviews** engage industry experts, business owners and labour representatives to understand employment dynamics and skills gaps.
- **Administrative and sectoral data** use industry reports, trade data and labour statistics to supplement primary data.
- **Case studies and focus groups** provide insights into worker experiences, employment barriers and labour conditions.

The VCA and MSD approaches recommend incorporating power and incentive analyses into data collection processes, helping to understand how firms, workers and institutions interact within the value chain and what barriers may limit employment growth in green sectors.

The VCA approach highlights the importance of market-wide interventions, reinforcing the need to analyse power structures, incentives and sustainability factors within value chains. Incorporating VCA findings alongside macroeconomic estimates ensures a more comprehensive understanding of how green investments shape employment across economies.

▶ **Table 3.4. Summary of applicable approaches for estimating indirect employment outcomes**

Methodology	Outputs	Resource intensity	Practicality	Rigour
Value chain assessments	**Indirect:** Supply chain and sector-level effects	Time: **High** Resource: **Moderate** Cost: **High** Expertise: **Moderate**	**Low:** Can be done in-house or by hiring third-party firm to conduct assessment	**Moderate:** Quite rigorous, but highly context-specific and can be limited in terms of data availability
Input–output models (IOTs)	**Direct:** Can be used for all indicators **Indirect:** Supply chain effects and spending effects	Time: **Moderate** Resource: **Moderate** Cost: **Moderate** Expertise: **Moderate**	**High:** Straightforward macro-model approach	**Low:** Least rigorous of the macro-models; strict assumptions
Social Accounting Matrix (SAM)	**Direct:** Includes direct impacts **Indirect:** Models production linkages, spending effects, enabling effects	Time: **Moderate** Resource: **Moderate** Cost: **Moderate** Expertise: **Moderate**	**Moderate:** Can require hiring a third party to conduct the analysis.	**Moderate:** More rigorous macro-model approach than IOTs, allows for consumption effects and less costly than CGE modelling
Structural Simulation Models (e.g., GJAM)	**Direct and Indirect:** Captures macroeconomic, sectoral and employment impacts dynamically	Time: **High** Resource: **High** Cost: **High** Expertise: **High**	**Moderate:** Requires specialist knowledge, but is adaptable for long-term policy scenarios	**High:** Most robust for policy scenario analysis; integrates labour market dynamics, technological change and investment feedback loops

e.g. = for example. Source: Adapted from United Kingdom, FCDO 2021

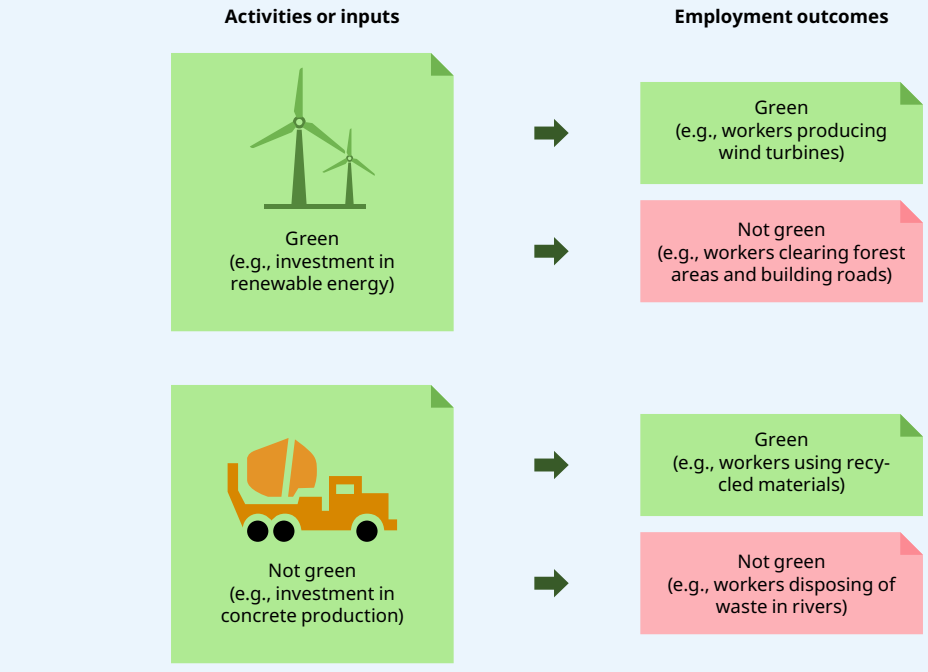
3.3.2. Alternative measurement objectives

As outlined in section 2.1 above, the ICLS statistical definition of green jobs requires information aligned with SEEA categories and information on decent work. This presents some challenges that will be addressed in this section, along with alternative measurement objectives and concepts that do not necessarily comply with all the criteria of the ICLS statistical definition of green jobs.

3.3.2.1. Estimating employment outcomes from green investments

The most common approach used by DFIs is to model the employment outcomes from green investments or investments focused on greening and other environmental outcomes. This requires categorization of an investment as green from an input standpoint – which is to say, it cannot assure that the outcomes of the investment are in green jobs (that is, the output standpoint). Figure 3.7 shows the implications of categorizing by inputs rather than by outcomes, and how estimating employment outcomes from green investments would ultimately include both green and non-green employment outcomes.

▶ Figure 3.7. Categorizing "greenness" by inputs versus outcomes



e.g. = for example.

Different organizations have different approaches to how an investment or programme can be categorized as green; however, the Organisation for Economic Co-operation and Development (OECD) Donor Assistance Committee (DAC) reporting framework does allow for some degree of standardization, at least by input category. A recent review of trends in ODA towards green jobs and skills by Bomprezzi and Reinsberg (2024) provides a helpful insight into the input approaches available for categorizing programmes according to dimensions reported in the Creditor Reporting System (CRS). These can be done via purpose codes, which uniquely classify an aid activity into one subsectoral category and five "green" policy markers (including the four Rio[9] markers – biodiversity, climate adaptation, climate mitigation, desertification – and environment), through which reporting donors orient their aid activities towards "green" objectives.

3.3.2.2. Estimating employment outcomes in green sectors

Sectoral averages can be incorporated into a model to estimate the impact of an investment or other exogenous shock by using coefficients that reflect the "greenness" of different sectors based on averages derived from available microdata. If a macro-model uses data from a sector that is considered green from the outset, then employment in that sector can be considered green employment. This would not necessarily be classified as employment in the environmental sector (as per the ILO statistical definition), but the resulting data can still serve as a helpful gauge.

Despite this, a challenge for many macro-models is that the standard breakdowns of industry/economic activity typically align with either the International Standard Industry Classification (ISIC), the Statistical Classification of Economic

▶ Box 3.6. Modelling employment outcomes from a green mini-grid facility in Kenya

The ILO STRENGTHEN2 project carries out employment impact assessments of EU-funded investments in sub-Saharan Africa, with the goal of promoting the creation of more and better jobs. One of these assessments was for the Green Mini-Grid Facility Programme in Kenya. The impact assessment was based on 33 mini-grid sites, and indirect and induced employment were estimated using the ILO STRENGTHEN2 estimation tool, based on ILO's Structural Model for Sustainable Development.

The indirect and induced estimates can be considered "employment outcomes as a result of greening or green investments", as the green component used for modelling is based on the inputs, or categorization of the investment, rather than on the greenness of outcomes. The estimates found that there were around 652 indirect and induced jobs (headcount) as a result of the investment. Men accounted for around 80 per cent of all jobs, unskilled workers accounted for around 90 per cent of all jobs, and youth accounted for around 12 per cent of all jobs.

▶ **Figure 3.8. Overview of jobs created as a result of green investments by sex, skill level and age (Green Mini-Grid Facility Programme, Kenya)**

Sector	Men	Women	Skilled	Unskilled	Youth	Total
Agriculture	79	41	10	110	15	119
Manufacturing	110	57	16	151	21	167
Services	329	37	53	313	44	366
Total	518	134	79	573	80	652

Source: Oyuma, Game and Lieuw-Kie-Song 2023.

9 That is, the Rio Declaration on Environment and Development, 1992.

Activities in the European Community (NACE) or other standard categories that do not easily separate environmental activities from non-environmental activities. An example can be found in the production of electricity, as the NACE category "Production of electricity (35.11)" does not distinguish whether the production was from renewable or non-renewable sources. Similarly, the ISIC category "Construction of buildings (4100)" does not allow for any way of distinguishing between environmentally friendly approaches and non-environmental approaches. Some classifications do allow for this distinction, however, such as the sector categories under the Global Trade Analysis Project (GTAP), which separates wind, hydro and solar power from non-renewable energy sources.

3.3.2.3. Estimating employment outcomes in green occupations

There are various taxonomies, particularly in academia, that assign a greenness score to the task component of different occupations. One example is the taxonomy developed by Vona et al. (2018) and Vona, Marin and Consoli (2019), which is based on the US Standard Occupation Classification (SOC). This taxonomy was later aligned with the International Standard Classification of Occupations (ISCO) by the OECD in 2023 (Scholl, Turban and Gal 2023). As ISCO categories are used by the majority of countries globally in labour force surveys, it means that a green occupation taxonomy based on ISCO can allow for some degree of standardization. This standardization means that when cross-tabulated with ISIC or other industry classifications, a "green occupations" average for that industry can be calculated, which can, in turn, allow for the share of "green occupations" to be calculated for a given country and each of its sectors.

There are a number of limitations to this approach, not least that it applies a task-based approach derived from the characteristics of the US labour market. Nonetheless, it is a transparent approach that allows for some degree of comparable and consistent estimates across countries. It also can be improved over time and by country through further developments in green task-based assessments. For instance, the Joint Impact Model is developing a green occupation average to incorporate into the model to allow users to estimate the number of green and non-green occupations from its employment estimates (see box 3.7).

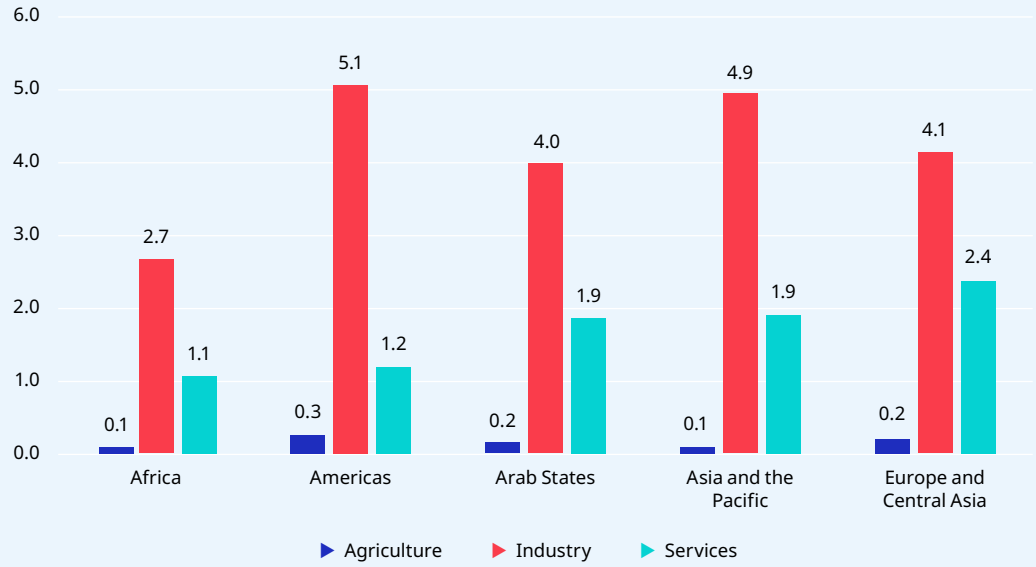
Furthermore, as highlighted in a recent World Bank (2023) *Measuring Green Jobs: A New Database for Latin America and Other Regions*, the integration of green occupational frameworks into employment estimation models can enhance labour market planning and skills development strategies. These frameworks help policymakers identify emerging skill demands, ensuring that workforce transition strategies are aligned with climate policies and industrial transformations.

▶ Box 3.7. Modelling green occupations through the Joint Impact Model

The Joint Impact Model is developing a method to estimate employment outcomes in green occupations. This applies a taxonomy of green occupations originally developed by Vona et al. (2018) and Vona, Marin, and Consoli (2019), which was aligned with the ISCO classification in 2023 (Scholl, Turban, and Gal 2023). It enables the calculation of the share of green occupations at both the national and sectoral levels. These coefficients by sector are then incorporated into the Joint Impact Model to simulate employment outcomes by sector.

Using this approach, figure 3.9 below shows the average share of total employment in green occupations by broad sector group (agriculture, industry and services) for different regions, based on the simulation of a homogenous investment package in each region. The investments are hypothetical and used here for comparative purposes, but represent a portfolio of investments across different industries, regardless of the greenness of the investments or the activities. The data shows that agriculture holds a lower share of employment in green occupations across regions, while industry consistently has the highest share. The share of employment in green occupations in the services sector shows more variation, ranging from 1.1 per cent of total employment impacts in Africa to 2.4 per cent in Europe and Central Asia.

▶ **Figure 3.9. Share of employment in green occupations, by region and broad sector group (percentage)**



Note: Unweighted averages based on countries with available datapoints per region.
Source: Joint Impact Model preliminary calculations.

▶ Data demo

Example: Variation in results from modelled impacts depending on the measurement objective

The hypothetical example below assumes that there is a US$10 million investment in solar energy systems in Zambia. The project has a budget of around US$20,000 for the monitoring and evaluation of jobs as an outcome indicator of the project and to produce estimates in the next month. Based on this, the monitoring and evaluation team make the following decisions:

Selecting a measurement approach:

- **Value chain assessment:** Considered unsuitable, as many of the materials will be imported and there will be an induced impact that would not be captured in the assessment.
- **Macro-models:** The Social Accounting Matrix (SAM) approach is considered most appropriate, as the team do not have the resources to hire an external party to do a CGE model and a SAM is considered more rigorous than input–output tables.

Selecting a measurement objective:

- **Modelling employment outcomes from green investments:** In this case, it is feasible to measure this, as the investments are categorized as being green, due to the focus on solar energy.

- **Modelling employment outcomes in green sectors:** This is feasible, but in the SAM available for Zambia, only a handful of sectors can be considered green, including different green energy categories. This concept can be considered, but may not be reliable.
- **Modelling employment outcomes in green occupations:** This is also feasible, but given the nature of the investment, it might require complementary data for the direct impacts, as many of these are likely to be in green occupations.

The different results based on the application of a SAM to different measurement objectives are illustrated in figure 3.10.

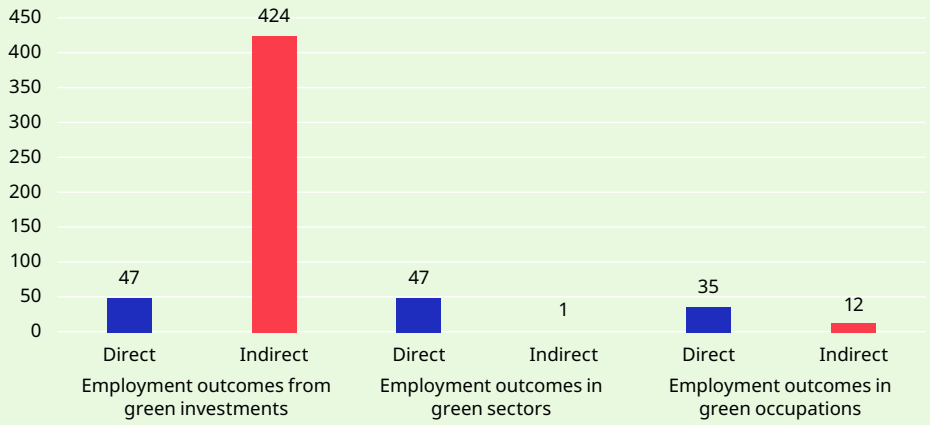
In terms of direct impacts, both the total employment outcomes and the employment outcomes in green sectors are estimated to be 47 jobs. This is slightly lower for the green occupations, which was adjusted based on primary data about the jobs in the project (that is, some activities were not considered to have green tasks, like administrative roles).

In terms of the indirect impacts, the estimated **total employment outcomes** were exceptionally high at 424 jobs. This results from capturing all induced jobs as a result of the US$10 million investment in the economy, as well as supply chain jobs from the investment in the solar energy project. It should be underscored that not all these jobs are green jobs – indeed, not all of them will even be in the environmental sector.

In terms of **employment outcomes in green sectors**, the model estimated only one indirect job; this reflects the lack of green sectors identified in the sectoral breakdowns. The result suggests that "employment outcomes in green sectors" would not be a suitable measure.

Finally, the indirect jobs estimate for **employment outcomes in green occupations** comes to a total of 12 jobs, based on a ratio of 2.8 per cent green occupations in "electricity, gas, steam and air conditioning supply" activities. While this value is low compared to the total employment impact of 424 jobs, it might be considered a more rigorous estimate.

▶ Figure 3.10. Applying a SAM to different measurement objectives: Estimated employment impacts, based on a hypothetical US$10 million investment in solar energy in Zambia



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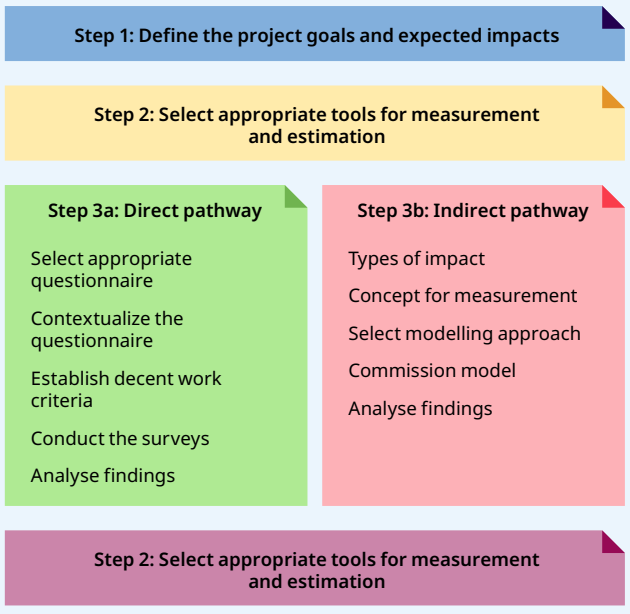
4. Implementation

This section provides a step-by-step guide for implementing the measurement of green jobs and skills for green jobs within MEL frameworks. It offers practical guidance on selecting the appropriate tools and adapting and applying these for different contexts. It highlights key considerations at each stage – from identifying the relevance of employment outcomes in green jobs within a theory of change to conducting surveys and analysing findings. Importantly, it underscores the role of contextualization, including through focus group discussions and selecting decent work criteria that reflect programme priorities. Examples of application are provided.

Figure 4.1. Overview of steps for direct and indirect pathways for the measurement or estimation of employment outcomes



Step 1: Define the project goals and expected impacts

The first step involves studying the project's theory of change, including the main goals, indicators and expected impacts. The objective at this stage is to determine whether the focus is on direct green job creation for individual or enterprise beneficiaries – such as those enrolled in training programmes financed by the agency – or on capturing green jobs and skills outcomes in the wider value chain or economy as an indirect impact (or a combination of both).

Some of the key questions to answer in this process would be:

- **What specific employment, social or environmental outcomes does the project aim to achieve?**

  Consider if the project focuses on:

  1. direct job creation, such as the number of new green jobs in solar energy, or on job retention and transformation, which might involve reskilling workers in traditional industries for green jobs; or
  2. green investments to create additional jobs in supply chains, or structural shifts in labour markets due to green policies (such as coal phase-out, electrification of transport).

- **What indicators are already established for monitoring?**

These might include common employment indicators such as the share of workers employed in green occupations, the number of workers trained, or gender-disaggregated employment data. It might also include more policy or investment indicators, such as the amount of investment in green sectors, shares of public versus private funding distribution for green projects, or adoption of national green job strategies or just transition policies.

- **Does the project focus on short-term outcomes (for example, job placements) or long-term impacts (for example, structural economic changes)?**

Consider whether the project prioritizes immediate employment effects or assesses systemic changes over time. An example of the former might be immediate job creation from infrastructure investments (for example, renewable energy construction projects), while an example of the latter might be structural just transition impacts, including social protection and economic resilience.

This consideration should include:

- Who the main beneficiaries are;
- Whether there is a direct impact on individuals or enterprises from an activity (for example, through technical assistance directly provided to the beneficiary);
- Whether wider indirect impacts are likely, for instance, on a supply chain (upstream and downstream from an intervention);
- Whether wider induced impacts are likely (such as loans and capital injections that will result in higher incomes by direct beneficiaries elsewhere in the economy); and
- Whether enabling impacts are likely (for example, the construction of a road or energy plant that will benefit whole communities).

These pathways to employment outcomes should be outlined in the theory of change.

The answers to these questions will help ascertain the appropriate measurement tools to use in the steps that follow.

Step 2: Select appropriate tools for measurement or estimation

Once the goals, indicators and intended impacts of the project are defined, the next step is to identify the most suitable measurement tools. The selection of tools depends on the:

1. **Type of employment impact:** direct or indirect pathways;
2. **Level of analysis:** individual, enterprise, sector or economy-wide; and
3. **Data availability** and the **feasibility** of different methodologies.

As outlined in Section 3, direct pathways allow for the **measurement** of green jobs and skills for green jobs, while indirect pathways allow for the **estimation** of green jobs and related concepts. An activity may have employment outcomes in one or both of these pathways, which will be considered in turn, with Step 3a representing the direct pathways and Step 3b representing the indirect pathways.

Step 3a: Direct pathways to employment outcomes

The direct pathway uses a questionnaire approach. There are two questionnaires, one for individuals (see Appendix I) and one for enterprises (see Appendix II). Adjustments will likely need to be made to the questionnaires before implementation to meet the specific needs of the project (or donor), and these adjustments can benefit from conducting focus group discussions with target beneficiaries and/or consultations with technical experts. The sub-steps for the direct pathways are outlined below, as follows:

- **Select the appropriate questionnaire**
- **Contextualize the questionnaire**
- **Establish decent work criteria**
- **Conduct surveys**
- **Analyse findings**

Select the appropriate questionnaire

There are two questionnaires, for individuals and enterprises. However, it is not always immediately apparent which questionnaire applies to a given context. The following can help ascertain which questionnaire is appropriate.

- **Individuals:** For example, self-employed workers or entrepreneurs without or with only a few employees. This can include smallholder farmers, waste pickers, small-scale service providers and others. It can also include recipients of training programmes. All these types of beneficiaries can be interviewed using the individual questionnaire (see Appendix I).
- **Enterprises:** Does an intervention work directly with an enterprise? If so, does that enterprise have employees? If there are no employees, then consider the individual questionnaire. It can also be helpful to think in terms of data collection. For an intervention involving enterprises, consider whether interviews would be conducted directly with employees (less likely) or with a representative of the enterprise (more likely) – this sort of scenario would merit the use of the enterprise questionnaire (Appendix II), which asks for information about both the enterprise's and the employees' activities. Even if the end beneficiaries are the workers within an enterprise, if the intervention itself works directly with the enterprise, then the target beneficiary is the enterprise.

Contextualize the questionnaire

The questionnaires are designed to be adapted to specific contexts. In this regard, examples for each of the environmental sector categories are pivotal for understanding the different concepts. But these examples vary by location and context. Relevant examples that can resonate with beneficiaries in different contexts can be incorporated by conducting a few (say, two or three) **focus group discussions (FGDs)** with programme beneficiaries prior to rolling out of the questionnaire. This allows the group to go through the different questions and adjust the examples as needed so that the questions will be better understood by the target respondents, and by consequence the

questionnaire can be rolled out more efficiently and effectively.

Data collection is also more efficient when enumerators are familiar with the topic. As such, having enumerators facilitate or take part in the preparatory FGDs has also been found to be beneficial and to result in more efficient and more effective data collection.

Preparatory FGDs should preferably involve a selection of men and women (where possible), with representatives from different key groups (for example, a single beneficiary group might include managers, technicians and service personnel). Each question should be gone through one by one. While discussions will mainly focus on the environmental sector questions, they will also help validate the feasibility and appropriateness of the decent work questions. The FGDs typically take around two hours each to complete.

When adjusting the language, it is suggested to minimize deviation from the original questions in order to prevent meanings from being altered. However, context-specific examples should be edited and refined as much as possible. At the end of the FGDs, the objective is to have a context-specific version of the questionnaire that can be applied in the survey with minimal interpretation challenges by the interviewee.

▶ Box 4.1. Key points to be considered in focus group discussions

- Context-specific examples for environmental sector categories.
- Wording of questions (without changing original meanings), including translation differences.
- Opportunity to introduce questionnaires to survey enumerators.

The questionnaire covers a number of technical concepts around the environmental sector. These concepts are best understood by questionnaire recipients when accompanied by context-specific examples. The model questionnaire includes several generic examples, but it is recommended to adjust and contextualize these examples to fit the target respondents prior to implementing the questionnaire.

▶ Table 4.1: Context-specific examples for environmental categories

Question	Lao PDR coffee farming	Uganda Boda Boda driver
Q5.2. Do you produce or use energy-efficient goods or services – that is, items or systems that use less energy or power?	▶ Use manual harvesting machinery instead of motorized	▶ Use battery-powered e-mobility bikes
Q5.4. Do you produce or use goods/services or systems for recycling, reuse and disposal of waste?	▶ Produce handicrafts from damaged coffee sacks	▶ Use waterproof clothing made from recycled plastics
Q5.5. Do you produce or use goods/services or systems that help to protect or conserve natural resources and the environment? With a focus on water, soil and other natural resources.	▶ Conduct water harvesting (rainwater collection)	▶ Use an eco-friendly product for cleaning bikes

Lao PDR = Lao People's Democratic Republic.

Establish decent work criteria

The section on decent work criteria has to be adapted to each context and programme. The decent work criteria are a requirement for the statistical definition of green jobs. As such, context-specific and intervention-specific questions should be included to fulfil these criteria, while recognizing from the outset that this will not serve as a comprehensive assessment of decent work.

The questions should be relevant to the intervention, particularly in regard to the contextual risks to decent work, and ideally only one or two questions should be used. If decent work is already used in the programme's assessments or monitoring framework, it is recommended to use one of the pre-existing questions.

▶ **Table 4.2. Context specific decent-work examples**

Context	Question	Logic
Kenya fruit pickers (individuals)	Do you have a written contract?	▶ Fruit pickers in the sector may be working without or with only oral contracts ▶ A written contract is one step towards formalization
Uganda eco-tourism (enterprises)	Do you pay your employees a minimum wage / living wage?	▶ Gauge as to whether employees earn above either a legal or recommended threshold
Ghana waste management (individuals)	Do you have access to basic occupational safety and health resources?	▶ Waste management sector typically characterized by poor occupational safety and health. This question would be relevant assuming the intervention provided some kind of basic occupational safety and health information

Conduct the surveys

During the pilot, it was found that trained enumerators could implement the questionnaire in around 20 minutes, compared to 30-40 minutes for untrained enumerators. It is therefore recommended to conduct a short **training for enumerators**.

The questionnaire can be applied in-person (or through computer assisted in-person interviews (CAPI)) or via phone (or computer assisted telephone interviews (CATI)). It is recommended not to do solely digital/online surveys due to the inability to clarify questions and other points raised by the respondents. Survey implementation should follow and comply with the usual MEL protocols of the donor or implementing agency.

Analyse the findings

Analysis of the findings should start after a short "pilot" or sample phase of implementation to ensure that the surveys are being implemented correctly and to address any areas of the questionnaire that are not sufficiently understood by respondents. Once satisfied with implementation, the findings should be analysed incrementally, as outlined in the examples in section 5.1 of this handbook.

Step 3b: Indirect pathways to employment outcomes

There are two interrelated considerations when modelling indirect impacts: (i) the measurement objective; and (ii) the model to use. These considerations are outlined below, as follows:

- **Specify the appropriate concept**
- **Select the estimation approach**
- **Commission the approach**
- **Analyse the findings**

Understand the relevant concepts and define a measurement objective

As outlined in section 3.3.2, there are different concepts to consider when selecting the most suitable approach for assessing different green outcomes. The key challenge lies in distinguishing employment outcomes from green investments, green sectors and green occupations, each of which require distinct measurement techniques to ensure policy relevance and analytical rigor:

- **Employment outcomes from green investments:** a common approach used by development finance institutions (DFIs) is to estimate employment outcomes based on categorization of investments as green (input-based), rather than directly measuring job creation in green occupations. This input-based classification ensures that investments are tracked according to their intended environmental contributions, but does not guarantee that the resulting employment will be in green jobs. Consequently, employment outcomes from such investments will include both green and non-green employment.
- **Estimating employment outcomes in green sectors:** This approach assumes that if a sector is predominantly green, then all employment within that sector can be considered green employment. For these types of assessments, macro-modelling techniques can incorporate sectoral averages to estimate employment in green industries.
- **Estimating employment outcomes in green occupations:** For labour market-focused projects, estimating employment in green occupations requires a task-based approach, distinguishing the extent to which different jobs contribute to environmental sustainability. This can be achieved using occupational taxonomies that assign a greenness score to each occupation.

The selection of the measurement objective and of the appropriate approach should be done concurrently, given that both are determining for one another.

Select appropriate estimation approach

There are different estimation tools available for users, including macroeconomic models and value chain assessments. Each are summarized in section 3.2.2 in terms of their strengths, weaknesses and other considerations, including input requirements, outputs and resource intensity.

The main factor to consider is the trade-off between practicality and analytical rigour. One way of achieving high practicality while still achieving a medium degree of rigour, is to use an open access Social Accounting Matrix. This sidesteps the requirements of building a model from scratch.

Alternatively, organizations with technical expertise and resources – such as donor agencies with in-house modelling teams – can leverage macroeconomic simulation models. This approach offers a higher level of analytical rigour but requires access to country-specific models and sufficient data availability.

Ensuring that the selected estimation tool aligns with project objectives, data constraints and policy needs is key.

Commission the approach

The choice of model implies different implementation approaches. More technical models, such as structural simulation models, will likely need to be outsourced to a third party, whereas the use of a simpler model and/or an open access tool, such as the Joint Impact Model, will entail the preparation of input data and running this data through the platform to obtain an output file.

Each approach has different implications in terms of time frame and budget.

Analyse findings

One consideration in analysing findings for the indirect pathway to employment outcomes is that, if a third party is commissioned to develop a new tool/model, that third party will need to provide information that outlines the assumptions and other considerations that the tool/model used to reach its findings. Such information needs to be specified when analysing and presenting findings. A demonstrable example is provided in section 5.2.

Step 4: Synthesize results for monitoring and reporting

At all levels, direct and indirect employment outcomes should be synthesized or aggregated with caution, owing to the different methodologies and concepts involved. For instance, the results from a programme that applies a rigorous process of data collection for direct employment outcomes for green jobs are not comparable with estimates for employment outcomes in green jobs generated through macro-models. For the purposes of reporting, the numbers can be combined, but these should always be accompanied by methodological notes or explanatory footnotes that summarize the methodologies undertaken and highlight any considerations in interpretation.

A key issue is how to synthesize and aggregate the findings. This includes the intervention level (for example, direct and indirect employment outcomes), the programme level (for example, different interventions), and the portfolio level (for example, different programmes). At the same time, results should factor in data disaggregation where possible, including by age, sex and other requirements established by the reporting entity.

At the same time, caution should also be taken when it comes to synthesizing or aggregating findings based on different concepts. This is particularly the case for the indirect pathways to employment outcomes, which can produce vastly different figures depending on the concept applied (see, for example, figure 3.10 above). Combination of findings should be accompanied by methodological notes, or explanatory footnotes that summarize the methodologies undertaken and highlight any considerations in interpretation.

In all cases, the inclusion first of the total employment outcomes; then disaggregating by “green” or “not green” (or by other concepts); and then further disaggregating by age, sex and other variables would provide increased transparency as to the scale of the employment outcomes being examined.

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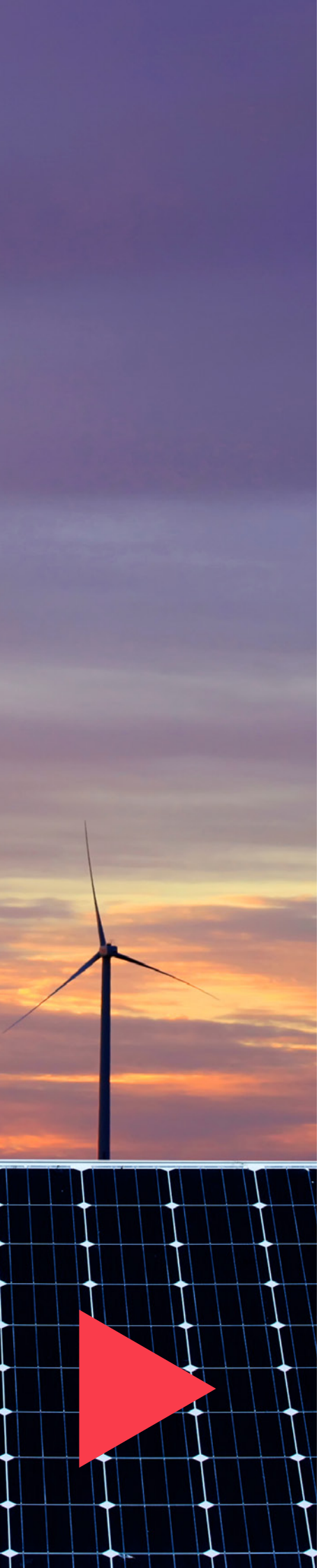


5. Applying the findings

Both the direct and the indirect approaches have different applications and uses, which are summarized in this section. The methodologies upon which to apply the MEL framework will also depend on the monitoring and evaluation objectives and priorities, as well as learning objectives and priorities. Four examples of potential applications of the MEL framework are presented in table 5.1 along with the relevance of the direct and indirect approaches covered in this handbook:

Table 5.1. Relevance of direct and indirect approaches for different applications and uses

Applications and uses	Direct	Indirect
Indicator tracking	Through application of the questionnaire as part of baseline, midline and endline monitoring	Estimates will not change over time unless the input values change, but they can be used to show the corresponding impacts per input value, such as per year or per sector
Donor reporting on green jobs	Through application of the questionnaire across a donor portfolio's monitoring and evaluation system	Allows for consistent and comparable estimates of indirect effects, although noting that the definitions will not be compliant with the ICLS statistical definition of green jobs
Knowledge generation	On demand for skills for green jobs through application of the questionnaire as part of a tracer survey from a training intervention	Allows for analysis of sectoral linkages and potential wider impacts of an intervention or financial cooperation
Programme design	The questionnaires are shaped for measuring and assessing programme impacts and are limited in their use for programme design	Using modelling approaches as an ex-ante tool to inform programme design and implementation

5.1. Monitoring indicators

Direct impacts: One of the main objectives of the questionnaire is to provide a standardized and consistent means of monitoring indicators (and tracking progress towards targets) for green jobs and skills for green jobs that are gender-disaggregated from the outset. This concerns programmes that have developed or that are in process of developing logical frameworks with indicators and metrics to measure green jobs or skills for green jobs.

The questionnaires presented in this handbook can be used to monitor indicators such as those outlined in section 3.1. These indicators can also be disaggregated beyond gender, particularly by age, disability status and location (among others). The desired disaggregation should be considered up front, and if needed, incorporated into the questionnaire. Additional breakdowns, for instance, by types of decent work criteria (for example, improved incomes) or by full-time equivalent (FTE) jobs rather than persons, can also be used and incorporated from the outset.

Indirect impacts: It should be noted that modelled estimates do not change over time unless the input values do. Nonetheless, the method allows for a consistent and comparable approach, that can change over time and per sector depending on the actual allocation of financial cooperation or the shape of the intervention.

5.2. Reporting on results

One of the main factors behind the G7 development ministers' request for a lean and harmonized approach to monitoring and evaluation of green jobs and skills for green jobs was to facilitate reporting on programmes that have these outcomes. Accordingly, the methodology was designed to satisfy this requirement, among others.

While different development agencies have their own definitions and approaches towards green jobs and skills for green jobs, this handbook provides a definition that is flexible enough to match with existing – and typically stricter – definitions of green jobs, and therefore facilitates a common and consistent measure across different reporting bodies. It can also be that one same development agency uses different approaches. This can arise when green jobs are a primary focus in some programmes, while only being a secondary focus in others; or when there are different or multiple donors to a programme that each have their own requirements for measuring green jobs and skills for green jobs.

The examples that follow in table 5.2 are designed to show how a development agency and/or an implementation partner can use the tool to report consistently on green jobs and skills for green jobs, in a scenario where there are different measures and definitions used by programmes funded by the same development agency. The same principle applies for when multiple countries are reporting on green jobs and skills for green jobs, for instance in the situation of the G7 development partners.

Direct impacts: Through the use of the questionnaire, different programmes can report to a single donor on the number of green jobs that have been created, improved or supported as a result of various interventions. This can be aggregated by the donor to obtain a total number. Assuming the questionnaires are used, the figures would be consistent and comparable. Additionally, breakdowns by gender and age should always be incorporated, along with disability and other statuses wherever feasible.

Indirect impacts: The indirect component of the handbook also allows for consistent and comparable reporting over time. This consistency and comparability is extended further when multiple agencies or donors use the same tools, as is done with different DFIs using the Joint Impact Model.

5.3. Knowledge generation

Direct impacts: The questionnaire allows for multiple applications, both in terms of methodology and disaggregation. Further, while the tool is designed to help identify whether a beneficiary is in a green job or not (that is, a binary measure), it also allows for the measurement of different degrees of greenness. This can be insightful for various reasons, not least because the process of greening, and particularly donor-funded interventions around greening and a just transition, often require incremental changes over time. Such changes are not as binary as "green" or "not green". Consider the example that follows in box 5.1.

Indirect impacts: The indirect component also allows for knowledge generation, including for mapping forward and backward supply chain linkages and better understanding the potential value chain impact of an intervention.

▶ Table 5.2. Alignment of programme-specific indicators with a common measure for green jobs

Intervention	Pre-existing programme-specific approach	Alignment with common measure
Morocco: Skills training on renewable energy production	▶ Skills obtained are automatically assumed to be needed for green jobs, without asking questions to ascertain this.	▶ Asking the "skills for green jobs" questions would arrive at the same conclusion that the skills obtained were relevant to the environmental sector.
Uruguay: Sustainable agro-processing	▶ Sectoral approach used (that is, green sectors are from a pre-defined list). ▶ Decent work criteria based on a detailed list of indicators.	▶ The green sectors would be identified via the environmental questions rather than being assigned automatically. ▶ Decent work criteria would be used from the programme, in lieu of asking these questions again.
Croatia: Organic farming	▶ All farmers that have partaken in a skills development training on organic farming are assumed to: (i) be in green jobs; and (ii) have skills for green jobs.	▶ Employment in the environmental sector questions would ascertain if these workers actually do apply the skills to qualify as organic farmers. ▶ Additional decent work questions would ascertain whether they have a "green job" or not. Without this, the definition would only allow for "employment in the environmental sector". ▶ Additionally, questions on the skills acquired would confirm those who had undertaken the training, but also then ask if they had applied these skills in practice.

5.4. Programme design

Direct impacts: The direct approach, namely the questionnaires, cannot be used in programme design unless they are incorporated into preliminary assessments that inform the programme. At the programme inception phase, the questionnaires can be used to collect data to set the baseline for indicators on green jobs and skills for green jobs.

Indirect impacts: The indirect approach, namely the modelling approaches, can be used to assess the potential job creation impact or the impact on different green outcomes, via its purpose as an ex-ante tool. Accordingly, the tools can be reverse engineered to identify which sectors would contribute most to a desired investment objective.

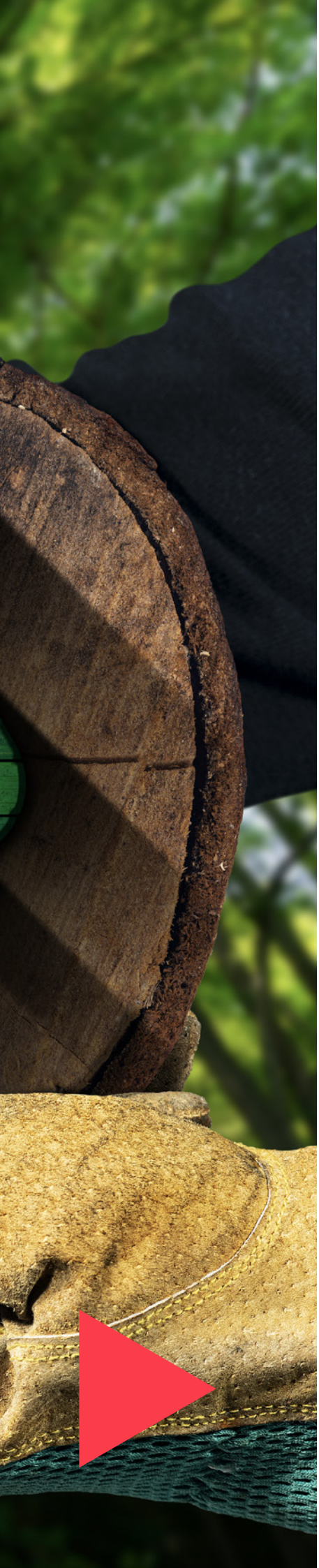
▶ Box 5.1. Learnings from renewable energy production training in Algeria

A training course on skills related to renewable energy production is provided to beneficiaries in Algeria. It is a six-week fully funded course, with an exam and certification at the end. The focus is set on women beneficiaries, and the idea is that beneficiaries will have greater access to jobs in renewable energy projects in Algeria, although the training is not provided in partnership with any companies.

An individual questionnaire is used to ask beneficiaries about the skills they acquired as well as employment in the environmental sector. The questionnaire is incorporated into a tracer survey, that contacts the beneficiaries every six months for five years. The survey is able to capture how many of the programme beneficiaries are employed in the environmental sector, including the renewable energy sector. It can also track how many of these beneficiaries applied the skills acquired from the training in their employment. It also allows for the identification of those who have jobs in other sectors, are without work or have not applied the skills acquired.

All of this information is broken down by gender, age and other criteria such as disability, providing insights into labour demand and supply in Algeria's renewable energy sector, as well as the effectiveness of the course and the factors behind some beneficiaries obtaining work in and outside of the target renewable energy sector.

6



6. Final remarks

This handbook provides guidance for programme managers, MEL practitioners and other relevant stakeholders for the measurement and estimation of green jobs, skills for green jobs and related concepts in a MEL context. The handbook addresses a guidance gap in measuring and assessing these topics in a MEL setting, while contributing to improve broader understanding of processes for achieving just transitions in the green economy.

The handbook provides an outline of the conceptual framework, alongside clarification of the underlying concepts and definitions (Section 2). Notably, the handbook uses the ICLS statistical definition of green jobs as a validated approach that is suitable for MEL context.

The overall approach is split according to two main pathways: (i) direct pathways to employment outcomes; and (ii) indirect pathways to employment outcomes. The methodological tools are different for each pathway; as is the feasibility of measuring and estimating green jobs. Accordingly, details of the different methodological tools are provided in the handbook (Section 3), alongside a step-by-step process for implementation (Section 4) and examples of analysis for both pathways (Section 5).

The process was developed through a consultative process with G7 development partners and technical experts, as well as a piloting process to test the different methodological tools, particularly the questionnaires for the direct pathway. The piloting process showed that challenges persist in the implementation of the tools, but these were mostly general MEL challenges and not specific to the tools being tested. Instead, the pilot findings generally were effective and provided the piloting programmes with a unique set of data to better understand the impacts of their programme activities.

One issue that has arisen is the adoption of definitions for green jobs, skills for green jobs and related concepts that are used by different development agencies or entities, and which MEL practitioners are still bound to comply with. The approach used in this handbook has been developed in a manner to minimize conflicting information, and instead, to ensure that the concepts and definitions used are broad enough to still be consistent with more detailed or more rigid context-specific definitions. For instance, a sectoral approach to identifying green jobs would still fit within the “production of environmental goods and services” component of the questionnaire.

It is encouraged to pay careful attention to the concepts being applied in measurements or estimations – particularly when it comes to related/similar concepts – as the differences in the numbers produced can be significant. Using different concepts and terms interchangeably when they are not actually the same, waters down the learnings that can be gleaned from the analysis. Consistent use of measurement concepts will help increase confidence in the findings.

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Appendix I. Individual questionnaire

Instructions to enumerators:

Please go through the respective questionnaire in sequence.

It is likely that not all subsections will be relevant, and so skip through bits that are clearly not applicable. However, please also ask if something is understood, and provide clarity if it is not.

Questions in black should be read out aloud.

Notes in blue are there for further clarification. Suggest to offer this information to the interviewee up-front, or alternatively, wait to see if something is not understood or if there is a request for more clarification.

Notes in red are notes for interviewers/enumerators.

Data disclaimer

To be read to interviewee.

Do you consent to freely participating in this study? YES/NO

Background information

1. What is your main occupation/job? The one that gives you the most earnings/income, or where you spend most of your time. For example, crop and vegetable grower, coffee farmer Please summarize main task and duties (if ISCO code or similar is known, please cite)	(For example, operators, technicians/ managers, and so on)
2. Are you employed by someone else (an individual or firm) or self-employed in your main occupation/job?	Employee: Self-employed:
3. Are you involved in any other businesses or activities outside of your main occupation/job? For example, paddy rice farmer, livestock producer, cassava grower, rice grower	Yes/No Specify activity:
4. What is your gender?	- Male: - Female: - Other: - Prefer not to say:

Enumerator should elaborately explain this section to the respondent before going on with the rest of the questions.

Introduction to environmental sector components:

There are two main categories of the environmental sector that we'd like to explore: (i) environmental goods and services; and (ii) environmental processes. We will begin by trying to identify which parts are most relevant to you.

Take the following two examples.

1. A person makes eco-friendly cleaning products, waste bins, solar panels, recycling systems and so on. For this person, we are interested in WHAT this person produces – that is, we are interested in the category of "environmental goods and services".
2. A worker uses eco-friendly cleaning products, waste bins, solar panels, recycling systems and so on in their work. For this worker, we are interested in HOW they do their work or what they use to do their work (it can be practices or products) – that is, we are interested in "environmental processes".

Part A. Employment in the environmental sector

In this next section, we will ask about different environmental categories and would like to know if you PRODUCE any goods/services for sale in each category, or if you USE any goods/services, methods, procedures, practices or technologies in each category.

5.1 Do you produce or use energy from non-fossil renewable resources? Example: - Production/use of electric power from solar, wind, hydroelectricity etc.	**PRODUCE:** Yes/ No	If yes, please explain:
	USE: Yes/No	If yes, please explain:
5.2 Do you produce or use energy-efficient goods or services – that is, items or systems that use less energy or power? Examples: - E-vehicles / E-bikes - Energy-efficient products such as light bulbs or motion sensors, manually operated machines instead of motored (for example, hand fire blower) - Rechargeable torches	**PRODUCE:** Yes/ No	If yes, please explain:
	USE: Yes/No	If yes, please explain:
5.3 Do you produce or use goods/services or systems that prevent, reduce or eliminate pollution and greenhouse gas emissions? Examples: - Filtration systems for sewage - Less-polluting stoves or burners - Water waste absorption pit - Sewage canal	**PRODUCE:** Yes/ No	If yes, please explain:
	USE: Yes/No	If yes, please explain:

5.4 Do you produce or use goods/services or systems for recycling, reuse, reduction and disposal of waste? Examples: - Fertilizer from compost, animal manure and coffee waste - Second-hand clothes - Recycling plastic and can waste to make bowls or cups	**PRODUCE:** Yes/ No	If yes, please explain:
	USE: Yes/No	If yes, please explain:
5.5 Do you produce or use goods/services or systems that help to protect or conserve natural resources and the environment? With a focus on water, soil and other natural resources. Examples: - Good agricultural practices such as planting grass and trees to protect soil erosion and to improve soil quality, organic and sustainable farming techniques. - Water harvesting (rainwater collection) - System or services that enhance water quality, timber resources, biodiversity and wildlife; replenish wild fauna and flora and restoration of habitats or ecosystems; soil treatment and research and training on environmental protection.	**PRODUCE:** Yes/ No	If yes, please explain:
	USE: Yes/No	If yes, please explain:
5.6 Do you produce or use goods/services or systems related to environmental administration, compliance and public awareness? Example: - Developing and disseminating environmental and natural resource protection regulations and compliance.	**PRODUCE:** Yes/ No	If yes, please explain:
	USE: Yes/No	If yes, please explain:
1.1 Other environmental goods or services (that are beneficial for the environment or conserve natural resources) not mentioned previously	**PRODUCE:** Yes/ No	If yes, please explain:
	USE: Yes/No	If yes, please explain:
Question 6 is for those who specified that they PRODUCED one or more of the environmental categories above		
6.1 Could you do the same activity without producing these environmental goods and services? That is, if these environmental goods and services were not being produced, can they still do business?	1. Yes, all of it 2. Not all, but most (more than half) 3. Less than half 4. None	

6.2 Please elaborate a little on why? For example: "My market is for organic coffee. Without certification I would not be able to receive a premium price, and it would not be economically viable to produce coffee."	
Question 7 is for those who specified that they USED one or more of the environmental categories above	
7.1 Could you do the same activity without using these environmental goods and services? That is, if these environmental goods and services were not being used, can they still do business?	1. Yes, all of it 2. Not all, but most (more than half) 3. Less than half 4. None
7.2. Please elaborate a little on why? For example: "No, it would not be possible, because the handicrafts are made from recycled goods, without which there would be no materials."	

Part B. Skills for green jobs

"Skills for green jobs" refer to skills that are necessary to successfully perform tasks for green jobs and to make any job greener. The term includes both core and technical skills and covers all types of occupations that contribute to the process of greening products, services and processes, not only in environmental activities but also in other sectors.

For respondents that went through Part A, it is not necessary to go over examples. But if examples are needed, refer to Part A. For those that did not go through Part A, also refer to Part A for examples.

8. Are you aware of environmental issues? For example: - Drought - Flooding - Water pollution - Air pollution - Landslides and natural disasters - Climate change - Poor soil quality	Yes/No
	Briefly explain

If the respondent is **not aware** of environmental issues, skip to Question 10. If the respondent **is aware**, ask the following: **9. How important is it for your job to protect the environment, through reduced emissions, reduced pollution, more efficient resource use and conservation?**	1 – Not important to protect 2 – Indifferent about protection 3 – Recognize need for limited protection 4 – Recognize the importance of protection 5 – Very important
Why is it important/not important for your job to protect the environment? **Use a scale of 1–5 where 1 is "not important" and 5 is "very important" to categorize the response.** Do not read out the categories in the scale to the respondent. The enumerator should categorize the response based on answer provided. Examples of reasons: health problems from pesticides, air pollution, water pollution, soil erosion	Reasons:
10. I am going to ask you questions related to various skills that you could have acquired as part of the [Project]. Also, please tell me whether you have applied these skills and how you applied them.	
10.1 From the [Project] did you acquire and/or apply skills/information/advice related to the production of energy or use of energy from renewable resources? Examples: Skills for using or installing components to obtain electric power from solar, wind or hydroelectricity.	Acquired? Yes/No Please specify skill:
	Applied? Yes/No If Yes, how? If No, why?
10.2 From the [Project] did you acquire and/or apply skills/information/advice related to production or use of energy-efficient goods/services or systems? Examples: - Acquired the skills needed to assemble an e-bike - Skills for installing energy-efficient products such as light bulbs or motion sensors, manually operated machines instead of motored (hand fire blower)	Acquired? Yes/No
	Applied? Yes/No If Yes, how? If No, why?
10.3 From the [Project] did you acquire and/or apply skills/information/advice related to the production or use of goods/services or systems that reduce or remove pollution and greenhouse gas emission? Example: Skills for producing less-polluting stoves or burners.	Acquired? Yes/No
	Applied? Yes/No If Yes, how? If No, why?

10.4 From the [Project] did you acquire and/or apply skills/information/advice related to the recovery, reuse, reduction and recycling of resources or substitution of natural resources? Examples: - Skills to produce fertilizer from compost, animal manure and coffee waste - Skills to market second-hand clothes - Skills to recycle plastic and can waste to make bowls or cups	Acquired? Yes/No Applied? Yes/No If Yes, how? If No, why?
10.5 From the [Project] did you acquire and/or apply skills/information/advice related to environmental protection and natural resource conservation, with a focus on water, soil and other natural resources? Examples: - Skills and knowledge around good agricultural practices, such as planting grass and trees to protect soil erosion and to improve soil quality; organic and sustainable farming techniques. - Skills and knowledge around water harvesting (rainwater collection) - Skills or knowledge around systems or services that enhance water quality, timber resources, biodiversity and wildlife; replenish wild fauna and flora and restoration of habitats or ecosystems; soil treatment and research and training on environmental protection.	Acquired? Yes/No Applied? Yes/No If Yes, how? If No, why?
10.6 From the [Project] did you acquire and/or apply skills/information/advice related to training, research, planning, maintenance and control of technologies related to environmental activities? Examples: - Information and guidance for developing and disseminating environmental and natural resource protection regulations and compliance.	Acquired? Yes/No Applied? Yes/No If Yes, how? If No, why?
10.7 Other environmental skills/information/ advice (please specify)	Acquired? Yes/No Applied? Yes/No If Yes, how? If No, why?

Part C. Decent work

For this survey, the term "decent work" refers to [adequate wages, safe conditions, workers' rights, social dialogue and social protection] in the environmental sector. Specific questions are asked in this context. [Please change these questions based on decent work criteria relevant to the context and the programme]

11. Are you employed on the basis of a written contract?	- Don't know - Yes, permanent contract - Yes, temporary contract - No contract
12. Are your wages equal to or above the minimum national wage (for the sector)? *Optional question if minimum wage is applicable in a given country and sector*	- Don't know - Below - At minimum wage for the sector - At least equal or above
Question to ask only if one of the objectives of the intervention was to affect wages **13. Have your earnings increased, stayed the same or decreased as a result of the project?**	- Increased - Stayed the same - Decreased
Why? Examples: - New agricultural techniques and support from project - High inflation and sale prices - New skills and ways of working - Improved infrastructure and roads	
14. Do you have access to social benefits like health insurance, paid leave or maternity leave?	- Don't know - Some benefits, in addition to wages - No benefits, only wages
Please elaborate.	
15. Do you use protective clothing provided by the [Project] when conducting your work?	- At all times - Sometimes - Never
Please elaborate. For example: "Yes, always", or "No, the protective clothes are cumbersome and slow me down."	

Appendix II. Enterprise questionnaire

Instructions to enumerators:

Please go through the respective questionnaire in sequence.

It is likely that not all subsections will be relevant, and so skip through bits that are clearly not applicable. However, as this is a pilot, please also ask if something is understood, and take notes on where it is not, as well as any other feedback.

Questions in black should be read out aloud.

Notes in blue are there for further clarification. Suggest to offer this information to the interviewee up-front, or alternatively, wait to see if something is not understood or if there is a request for more clarification.

Notes in red are notes for interviewers / enumerators

Data disclaimer

To be read to interviewee.

The responses to this pilot questionnaire are collected and processed for getting information and feedback on the questionnaire itself. The information collected is confidential and only used for the purposes of improving the questionnaire. Data will be stored digitally by the ILO team for a maximum period of one year after the closure of the survey.

Do you consent to freely participating in this study? YES/NO

Background information

1.1 Company name	
1.2 What are the main goods/services provided by your company? For example, for hotels, it would be hospitality; for a shop, it would be the main type of item sold. Please note a brief description	
1.3 Do you have a secondary activity (that is, are you selling/providing anything else)? If so, please describe For example, a hotel (main activity) that provides guided tours (secondary activity) Please note a brief description	

1.4 I am going to ask you about the number of your employees. **Please specify (if possible):** - **How many full-time workers do you have? (FT)** - **How many part-time workers do you have? (PT)** - **Other (for example, subcontractors/casual workers)** Specify if referring to total number of people, or full-time equivalent jobs. If it is possible to separate by gender, please include this information.	Total: FT: PT: Other, specify:

Enumerator should elaborately explain this section to the respondent before going on with the rest of the questions.

Introduction to environmental sector components: There are two main categories of the environmental sector that we'd like to explore: i) environmental goods and services and ii) environmental processes. We will begin by trying to identify which parts are most relevant to you.

Take the following two examples.

1. A company makes eco-friendly cleaning products, waste bins, solar panels, recycling systems and so on. For this company, we are interested in WHAT the company produces – that is we are interested in the category of "environmental goods and services".
2. A company uses eco-friendly cleaning products, waste bins, solar panels, recycling systems and so on in their work. For this company, we are interested in HOW they do their work, or what they use to do their work (can be practices or products) – that is, we are interested in "environmental processes".

Part A. Employment in the environmental sector

In this next section, we will ask about different environmental categories and would like to know if you PRODUCE any goods/services for sale in each category, or if you USE any goods/services, methods, procedures, practices or technologies in each category.

2.1 Does your company produce or use energy from non-fossil renewable resources? For example, production/use of electric power from solar, wind, hydroelectricity, biogas and so on?	**PRODUCE:** Yes/No	If yes, please explain:
	USE: Yes/No	If yes, please explain:
2.2 Does your company produce or use energy-efficient goods or services – that is, items or systems that use less energy or power? For example, energy-efficient manufacturing equipment, electrical appliances (such as, milk coolers), buildings and E-vehicles; energy-efficient light bulbs or motion sensors, manually operated machines instead of motored?	**PRODUCE:** Yes/No	If yes, please explain:
	USE: Yes/No	If yes, please explain:

2.3 Does your company produce or use goods/services or systems that prevent, reduce or eliminate pollution and greenhouse gas emissions, For example, waste-to-energy machinery, a sock pit, water and sewage treatment plants, equipment for treatment of industrial wastewater and sewage, waste gas absorbers, waste gas flare/ incinerator, catalytic converters, pollutant recovery condensers, filters, absorbers, more-efficient wood-burning stoves, manufacturing of rechargeable batteries and so on?	**PRODUCE:** Yes/No	If yes, please explain:
	USE: Yes/No	If yes, please explain:
2.4 Does your company produce or use goods/services or systems for recycling, reuse, reduction and disposal of waste? For example, fixing electrical goods, recycling plastic waste to make tiles, bricks, plates, making charcoal briquettes, energy saving stoves, biogas, bio-digester, fertilizer from waste? Other examples include composting of solid waste (including treatment and disposal of hazardous waste); production of wastewater treatment products such as septic tanks, biological activators, sale of second-hand clothing, appliances, vehicles and so on.	**PRODUCE:** Yes/No	If yes, please explain:
	USE: Yes/No	If yes, please explain:
2.5 Does your company produce or use goods/services or systems that help to protect or conserve natural resources and the environment, with a focus on water, soil and other natural resources. For example, drainage systems, eco cleaning products, building of water trenches, use of good agricultural practices (such as organic and sustainable farming techniques, soil protection from planting trees), sustainable forestry practices, water harvesting, re-use of towels in hotels. Other examples include production or use of goods or services that enhance water quality, timber resources, biodiversity and wildlife; replenish wild fauna and flora and restoration of habitats or ecosystems; soil treatment and research.	**PRODUCE:** Yes/No	If yes, please explain:
	USE: Yes/No	If yes, please explain: -
2.6 Does your company produce or use goods/services or systems related to environmental administration, compliance and public awareness? For example, producing materials or providing the service of education, training, certification etc. For example: offering training on specific environmental regulations and compliance.	**PRODUCE:** Yes/No	If yes, please explain:
	USE: Yes/No	If yes, please explain:
2.7 Other environmental goods or services (that are beneficial for the environment or conserve natural resources) not mentioned previously	**PRODUCE:** Yes/No	If yes, please explain:
	USE: Yes/No	If yes, please explain:

Question 3 is for those companies who specified that they PRODUCED one or more of the environmental categories in Question 2.	
3.1 How important is the production of the environmental goods or services to the activities you carry out in your work?	1. Very important; 2. Quite important; 3. Not important
3.2 Please elaborate a little on why? For example, to save money, increase incomes, attract tourists, keep the town clean.	
3.3 Could the business do the same activity without producing these environmental goods and services? That is, if these environmental activities did not exist, can they still do business?	1. Yes, all of it 2. Not everything but more than half. 3. Only some (less than half). 4. None of it
3.4 Please elaborate a little on why? For example: "Yes, green certification increases the number of customers, but we would still have customers without it." For example: "No, it would not be possible, because the handicrafts are made from recycled goods, without which there would be no materials."	
This question is only for respondents that answered Question 3.3 with "2. Not everything but more than half. **3.5 How many employees (roughly) require these green activities in order to do their current work?** That is, if these green activities did not exist, would any employees not be able to do their current work? Ideally capture or calculate as a percentage. If it is possible to specify the gender of these employees (that is, how many are men and how many are women), please include this information.	
3.6 Please elaborate on why? Examples: "Without eco cleaning products the cleaners would use non-eco products and still do their work." "Our market is for organic coffee. Without certification we would not be able to receive a premium price, and it would not be economically viable to produce coffee."	
Question 4 is for those respondents who specified that they USED one or more of the environmental categories in Question 2	
4.1 How important is the use of the environmental goods/services to the activities you carry out in your work?	1. Very important; 2. Quite important; 3. Not important
4.2 Please elaborate a little on why? For example, to save money, increase incomes, attract tourists, keep the town clean	

4.3 Could the business do the same activity without using these environmental goods and services? That is, if these environmental activities did not exist, can they still do business?	1. Yes, all of it 2. Not all, but most (more than half) 3. Less than half 4. None
4.4 Please elaborate a little on why? For example: "Yes, green certification increases the number of customers, but we would still have customers without it." For example: "No, it would not be possible, because the handicrafts are made from recycled goods, without which there would be no materials."	
4.5 How many employees (roughly) require these green activities in order to do their current work? That is, if these green activities did not exist, would any employees not be able to do their current work? Ideally capture or calculate as a percentage. If it is possible to specify the gender of these employees (that is, how many are men and how many are women), please include this information.	
4.6 Please elaborate on why? For example: "Without eco cleaning products the cleaners would use non-eco products and still do their work." For example: "Our market is for organic coffee. Without certification we would not be able to receive a premium price, and it would not be economically viable to produce coffee."	

Part B. Decent work

For this survey, the term "decent work" refers to [adequate wages, safe conditions, workers' rights, social dialogue and social protection] in the environmental sector. Specific questions are asked in this context. [Please change these questions based on decent work criteria relevant to the programme]

1.1 Do you provide your employees with a written working contract?	Yes – All Yes, some (please clarify) – None –
1.2 For how many hours do your employees work in a day on average? Provide an estimate	___ hours per person, daily
1.3 After how many working hours is it considered overtime in your establishment? State whether there is a formal or informal threshold	___ hours per person, daily
1.4 Is there an occupational safety and health policy in place at the company?	Yes / No

Appendix III. Details of the pilots

The overall objective of the pilots was to test and refine the measurement framework used to assess green jobs and skills for green jobs. As such, the ILO proposed framework needed to fulfil certain criteria. These were identified during early consultations with G7 partners and technical experts in 2022, and included factors such as:

- the need for any new process to complement existing M&E systems (not to replace or change these systems);
- the need to allow for specific classifications to be applied that would be unlikely to be applied in existing systems, such as the System of Environmental Economic Accounting (SEEA); and
- the need for flexibility in measuring skills for green jobs.

The preliminary version of the framework was developed for technical cooperation programmes that addressed these factors and took the form of a questionnaire (or modular approach) to be applied alongside existing M&E systems. The end goal was to have a generic questionnaire that can be applied to different settings, is easily applied and understood, gives results that are consistent with broader notions of green jobs and skills for green jobs, and is considered accurate for the concepts and definitions used.

The pilot process was used to test the application of questionnaires in real programme contexts and was piloted on four programmes: (i) E-vehicles and eco-tourism in Uganda; (ii) sustainable coffee and tourism in the Lao People's Democratic Republic; (iii) waste management in Ghana; and (iv) renewable energy training in Morocco. Further details on the pilots are provided below:

E4D programme

The Employment and Skills Development in Africa (E4D) programme is a regional initiative operating in a number of countries, including Uganda. In Uganda, the programme seeks to mitigate some of the challenges around inadequate skills and access to markets, with the objective of improving the economic situation of jobseekers, employees and enterprises in Uganda, in cooperation with the public and private sectors. E4D is funded by the German Federal Ministry for Economic Cooperation and Development (BMZ), the Norwegian Agency for Development Cooperation (NORAD), the EU as well as various other co-financers. The programme uses GIZ's integrated approach to employment promotion, which consists of three pillars: (i) skills development (supply of labour); (ii) enterprise development (demand for labour); and (iii) matching labour demand and supply.

Three interventions under the E4D programme are particularly relevant and suitable for testing the abovementioned M&E approach for measuring green jobs and skills for green jobs in ODA. These include:

1. the Developing Relevant and Innovative Skills for e-Mobility (DRIVe) programme related to the e-mobility sector;
2. the Ukarimu Hospitality Training programme, focused on training in the tourism and hospitality sector (include eco-tourism); and
3. an ISO14001 programme looking to establish and improve environmental management systems training for Ugandan SMEs.

In all three projects, most of the beneficiaries are located in Kampala, though some are outside of the capital.

The objective of the pilot in Uganda was to obtain information to allow for the refinement of this measurement framework, namely the development of a questionnaire for measuring green jobs and skills for green jobs in different contexts. This was done by testing the questionnaire in real programme settings with beneficiaries from the three E4D programmes. The first stage of testing involved focus group discussions (FGDs) before moving on to a second stage of applying the questionnaire in a variety of interview settings – in-person, by phone and self-administered. The outcome from the pilot was to have a revised version of the questionnaire that had been tested from different perspectives, including implementation (from enumerator and interviewee perspectives) and outcomes. The two stages of the pilot are discussed in more detail below.

Stage 1 – Focus group discussions

The aim of the FGDs was to meet with groups of individuals involved in the pilot to discuss the questionnaire question-by-question, and use the shared thoughts and feedback to adjust unclear questions and terms in the questionnaire. The FGDs each lasted around two hours and contained both men and women. Specific sample characteristics are provided below.

▶ **Table A1. Focus group discussions in Uganda, sample characteristics**

Programme	Location	Participant characteristics	Number of focus group discussions (each two hours)
DRIVe	Kampala	8 programme beneficiaries each; at least 20 per cent female (where possible) Operators Technicians Managerial/administrative	3
Ukarimu	South-west, Rwenzori, Eastern	8 programme beneficiaries each; at least 20 per cent female Hospitality graduates employed in tourism (South-west or Rwenzori) Site guides (Eastern) Lodge managers (Rwenzori or Eastern)	3
ISO 14001	Kampala	8 programme beneficiaries; at least 20 per cent female Environmental managers of beneficiary SMEs	2
Total	**4 in Kampala, 2 outside**	**56 participants**	**8 focus groups**

Stage 2 – Questionnaire trial

The questionnaires had undergone an iterative process of refinement through the FGDs, with general changes to the structure of the questionnaire, as well as specific changes for each sub-programme, such as the inclusion of context-specific examples. This resulted in three different questionnaires. These were trialled with beneficiaries across the different programmes, with the questionnaire being delivered by phone (108), face-to-face (10) and through self-administration (5), as well as in Kampala and outside of Kampala, depending on the locations of the programmes. Beneficiaries included those who were employed as well as self-employed and also business owners and business representatives, some of whom had taken part in the FGDs. Sample characteristics can be found in annex table A2 below. The questionnaires were implemented over a period of around three weeks.

▶ **Table A2. Questionnaire trial in Uganda, sample characteristics**

Programme	Location	Modality	Sampling	Number of interviews
DRIVe,	Kampala	In-person / phone	Managers, technicians, operators	71 (14 managers, 17 technicians, 40 operators)
Ukarimu	South-west, Rwenzori, Eastern	In-person / phone	Individuals and enterprise representatives	30 (10 hospital graduates, 10 lodge managers, 10 site guides)
ISO 14001	Kampala	In-person / phone / self-administered	Enterprise representatives	22 enterprise representatives
Total				**123 interviews**

SWITCH-Asia programme

The SWITCH-Asia programme, funded by the EU, has been in operation since 2007 with a focus on promoting sustainable consumption and production (SCP) in the region. Aligning with the EU's 2019 Green Deal and Global Gateway initiatives, the programme is dedicated to aiding countries in transitioning to low-carbon, resource-efficient and circular economies. This commitment has not only bolstered the programme's foundation but has also reinforced its role in supporting Asian countries' SCP objectives, as outlined in Sustainable Development Goal 12 and the Paris Agreement.

Utilizing its grants scheme, SWITCH-Asia finances pilot projects aimed at enabling companies to embrace cleaner technologies and adopt sustainable industrial practices. Moreover, the programme endeavours to embed sustainability considerations into consumer decision-making processes. The primary objective of this initiative is to facilitate the dissemination of SCP practices among MSMEs across the region.

Since its inception, the programme has successfully funded 143 projects, with an average grant size of €1.7 million, spanning various sectors such as energy efficiency in industrial facilities and residential buildings, agri-food and fisheries, textiles and leather, tourism, as well as logistics and transportation. These projects have been executed in collaboration with over 500 Asian and European partners, in addition to more than 100 private sector affiliates, indirectly benefiting up to 80,000 MSMEs.[10]

Two interventions under the SWITCH-Asia programme were deemed particularly relevant and suitable for testing the abovementioned M&E approach for measuring green jobs and skills for green jobs in ODA. These were: (i) SUSTOUR Laos, which seeks to promote sustainable tourism through the integration of

10 For further information, see: https://www.switch-asia.eu/switch-asia/who-we-are/.

MSMEs into sustainable supply chains, while also raising consumer awareness; and (ii) SuPER WE Coffee which seeks to promote sustainable production and ethically responsible and women-empowered coffee value chains in the Lao People's Democratic Republic.

The objective of the pilot in the Lao People's Democratic Republic was to obtain information to allow for the refinement of this measurement framework, namely the development of a questionnaire for measuring green jobs and skills for green jobs in different contexts. This was done by testing the questionnaire in real programme settings with beneficiaries from the two selected SWITCH-Asia programmes. As in Uganda above, the testing included FGDs and trialling of the questionnaire through interviews – in-person, by phone and self-administered – in order to refine the questionnaire to facilitate implementation. Annex tables A3 and A4 provide an overview of the characteristics of the participants in the FGDs and the trial interviews, respectively.

▶ **Table A3. Focus group discussions in the Lao People's Democratic Republic, sample characteristics**

Programme	Location	Participant characteristics	Number of focus group discussions (each two hours)
SUSTOUR Laos	Vientiane, Luangprabang, Vang Vieng	23 discussants (15 women, 8 men)	5
SuPER WE	Dakcheung district, Sekong Province	39 discussants (23 women, 16 men)	5
Total		**62 discussants**	**10 focus groups**

▶ **A4. Questionnaire trial in the Lao People's Democratic Republic, sample characteristics**

Programme	Beneficiary location	Modality	Sampling	Number of interviews
SUSTOUR Laos	Vientiane, Luangprabang, Vang Vieng	In-person / phone	Individual and enterprise representatives	Phone: 39 In-person (Vientiane): 5
SuPER WE Coffee	Dakcheung district, Sekong Province	Phone	Individuals	Phone: 100
Total				**144 interviews**

Organic Waste-to-Value Initiative

The Organic Waste-to-Value Initiative in Accra, Ghana, is implemented by the MDF West Africa programme and funded by Germany through GIZ. The Initiative has the overall goal of promoting and developing the organic waste-to-value chain in the Eastern Region of Ghana in order to improve the employment situation of various actors within the value chain.

The programme is focused on constructing a dedicated training centre and providing entrepreneurship support, training opportunities and access to finance for young people within the organic waste-to-value chain, as well as conducting awareness and behaviour-change campaigns, with the aim of fostering the establishment of MSME start-ups and generating employment in the region and supporting the formalization of decent jobs in the sector. The target group for the programme consists of persons between 15 and 35 years of age, with a majority being women. The programme was considered particularly relevant

and suitable for testing the abovementioned M&E approach for measuring green jobs and skills for green jobs in ODA, especially as it focuses on a key environmental area of waste management.

The objective of the pilot in Ghana was to obtain information to allow for the refinement of the measurement framework, namely the development of a questionnaire, for measuring green jobs and skills for green jobs in different contexts. As above, this was done by testing the questionnaire in real programme settings. However, unlike in Uganda and the Lao People's Democratic Republic, the testing in the Ghana pilot only included FGDs that discussed the questionnaire question-by-question; no trial interviews were conducted. The FGDs lasted around 1 hour and 30 minutes each and contained both men and women. The specific sample characteristics of the FGDs are provided in annex table A5 below.

▶ Table A5. Focus group discussions in Ghana, sample characteristics

Focus group discussion	Location	Participant characteristics
FGD1 22 August 2024	Nsawam Wesley Methodist Church in the Eastern Region	8 discussants (2 women, 6 men); senior officers, directors, founders and co-founders of companies; companies at incubation stage
FGD2 23 August 2024	Nsawam Wesley Methodist Church in the Eastern Region	8 discussants (5 women, 3 men); directors, founders and co-founders of companies; companies at acceleration stage having operated for at least 4 years
FGD3 26 August 2024	Accra Digital Centre	8 discussants (4 women, 4 men); directors, founders and co-founders of companies; companies at acceleration stage having operated for at least 4 years
FGD4 28 August 2024	Accra Digital Centre	9 discussants (5 women, 4 men); directors, founders and co-founders of companies; companies at acceleration stage having operated for at least 4 years
Total		**33 discussants (16 women, 17 men)**

International Labour Organization

Federal Ministry
for Economic Cooperation
and Development

International Labour Organization

Route des Morillons 4
CH-1211 Geneva 22
Switzerland
T. +41 22 799 7777
E. emplab@ilo.org

ilo.org