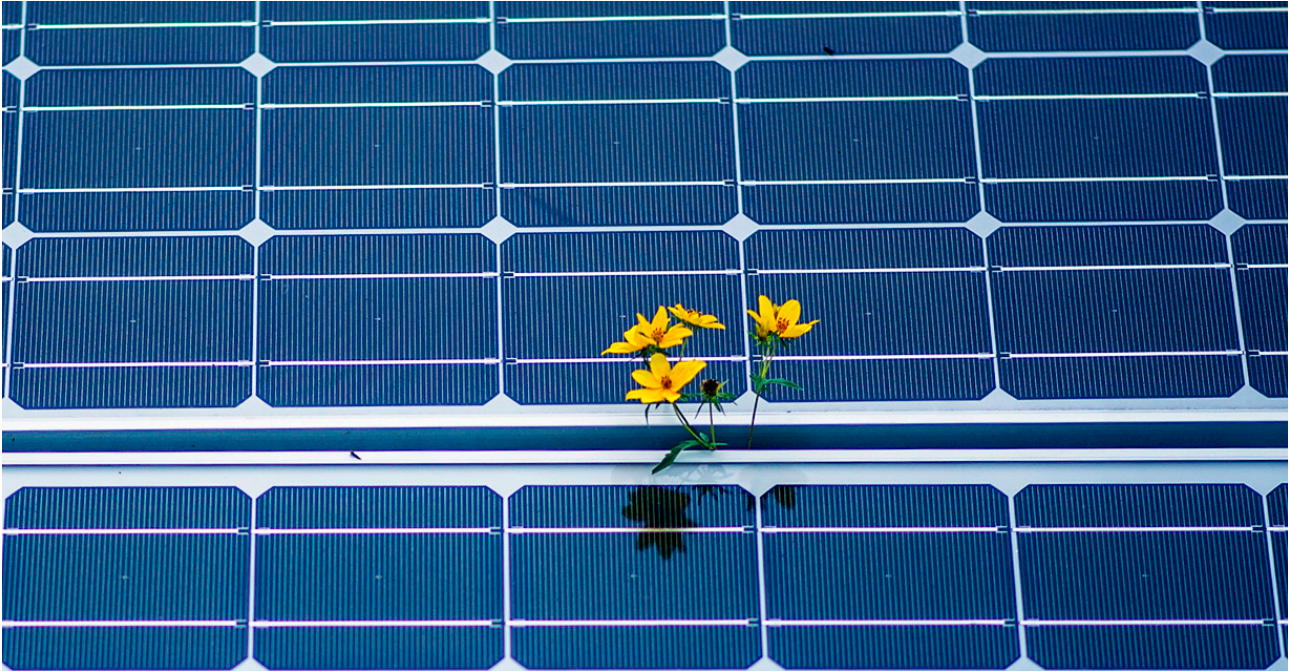


# ENVIRONMENTAL MAINSTREAMING

## A GUIDE FOR PROJECT MANAGERS



Digital images on the cover: Glenna Gordon, Flickr and ITC

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For further information on the guide, please contact Alexander Kasterine at [kasterine@intracen.org](mailto:kasterine@intracen.org).

## Foreword



The United Nations 2030 Agenda for Sustainable Development is a plan of action for people, planet and prosperity. The Agenda defines 17 Goals and 169 targets – including the objective to eradicate poverty by 2030. Trade is recognized as the “means for implementation” to achieve these Global Goals. The Paris Agreement reached in December 2015 further establishes a framework for urgent action on climate change. The International Trade Centre’s Aid for Trade programming supports developing countries to use trade as a lever for sustainable development and increased climate change resilience.

To ensure that ITC projects and programmes address these challenges effectively the ITC Trade and Environment Programme, as part of a corporate approach to sustainable development, has developed a strategy to mainstream environmental sustainability in ITC’s work. This Environmental Mainstreaming Guide for project managers and its accompanying training programme is the

culmination of that work.

A clear example of successful mainstreaming is ensuring that ITC’s SME clients develop climate-resilience and sustainability strategies and so remain viable businesses. ITC plays a critical role to help them mitigate environmental risks.

In addition, environmental mainstreaming has helped our clients to access new markets for certified products that meet high environmental standards and regulations. These products often fetch premium prices, helping producers create and capture higher value addition.

In short, mainstreaming will be critical to ensure that ITC continues to help shape profitable, resilient, inclusive and economically sustainable businesses.

Along with our gender and youth mainstreaming approaches, this guide is a critical step in aligning ITC work towards a more holistic approach in supporting sustainable and inclusive economic growth. I am pleased to introduce this guide as an important tool in ITC’s mission to deliver trade impact for good.

A handwritten signature in blue ink, appearing to read 'Arancha'.

Arancha Gonzalez

Executive Director, International Trade Centre



## Chapter 1 Introduction to environmental mainstreaming

The Environmental Mainstreaming Guide for project managers provides advice on planning and managing the environmental elements of ITC projects. The guide also aims to raise awareness of environmental issues and impacts in some of ITC's most frequently supported sectors.

The guide provides a summary of the activities involved in environmental mainstreaming, and wider appraisal processes. It does not contain all the answers, but helps project managers to assess project plans. It contains:

- Guidance on completing the environmental section of the cross-cutting issues and development markers section of a project plan;
- A list of indicative questions to help project managers consider specific environmental aspects of project plans;
- A matrix to identifying key environmental opportunities and risks – covering a range of sectors;
- Guidance on the environmental rating system and minimum environmental ratings;
- Guidance on finding appropriate outputs and indicators for environment in a project logframe;
- A detailed matrix of key environmental concerns by sector, with recommended sources of further information.

This guide will help project managers to mainstream issues of environmental sustainability into all of ITC's activities achieving sustainable trade impact for good.



This guide helps project managers to understand and implement environmental mainstreaming.



## 1. Who should use this guide?

This guide is a resource for ITC staff, consultants, and partners involved in managing ITC project activities such as planning, designing, appraising, implementing, monitoring and evaluating ITC projects.

Project managers are responsible to complete a screening note with respect to the environmental risks and opportunities faced by their respective project and to ensure that it is submitted with the other project documentation in the ITC project portal. It is also the responsibility of the project officer to ensure that any actions identified during screening are taken forward. Specific actions should be reflected in the project memorandum and logframe. A guide to integrating environmental considerations is included in Section 4.

The core objective of this policy document is to support project managers to incorporate environmental considerations into the planning, elaboration and implementation of ITC projects.



Mainstreaming requires the consideration of both opportunities, like organic certification, and risks, like higher emissions from project activities. © Tomás Munita

## 2. What is Environmental Mainstreaming?

*Environmental Mainstreaming means the integration of environmental considerations into ITC policies, planning and project activities to ensure the coherence and sustainability of our mission and practices.*

Definition agreed by the Environment Mainstreaming Taskforce, September 2013

There are two aspects of environmental mainstreaming relevant to ITC and its delivery of Aid for Trade:

### **Risks: Mitigate environmental impacts and strengthen environmental resilience**

- Exacerbate or cause environmental degradation or depletion
- Improve resource use efficiency, productivity and competitiveness
- Raise awareness of trade, environment and development linkages and their implications for sustainable development
- Reduce vulnerability to emerging risks and challenges, including resource depletion, environmental degradation and climate change.

### **Opportunities: Realize environmental potential**

- Expand trade in environmentally-sustainable product and services markets
- Enable beneficiaries to meet environmental standards, trading rules or funder requirements.

By working with its beneficiaries to recognize and address these aspects in their export development and promotion activities, ITC will achieve stronger and more enduring impacts on economic growth, poverty reduction and sustainable development.

The initiative to mainstream environment into ITC project and planning activities is also aligned with a set of global guiding principles towards sustainable development adopted by international bodies along the years. Furthermore, the case for mainstreaming environment takes into account the need to address funder requests and practical reasons that linkages trade and the Global Goals.

## 3. The role of the Trade and Environment Programme

The role of the Trade and Environment Programme (TEP) environmental mainstreaming officer is to advise ITC staff on the assessment of environmental risks and opportunities in their respective projects and to integrate environmental considerations in the respective project documents. The TEP officer can be consulted during the assessment or planning phases, particularly if there is uncertainty as to the possible environmental issues or the appropriate action to take.

## Chapter 2 Why is environmental mainstreaming important?

There are multiple reasons why mainstreaming environment is key for ITC project work. These include:

- Environment is consistent with the broader UN mandate to pursue sustainability, particularly in the context of the **Global Goals**
- There are numerous **competitive benefits** for beneficiaries that have sound environmental practices such as access to green markets (see section 2.2 for the full list).
- Environment is often identified by **funders as a key priority** or a necessary dimension of reporting
- Ensuring environmental sustainability of our projects is aligned to ITCs upcoming **Code of Conduct**.

### 1. UN Global Goals

*In order to achieve sustainable development, environmental protection shall constitute an integral part of the development process and cannot be considered in isolation from it.*

Principal 4, Rio Declaration on Environment, 1992

The UN has a long-term commitment to environmental sustainability and the challenge remains at the forefront of the UN agenda. In the 2012 UN Quadrennial comprehensive policy review (QCPR) survey, 80% of governments singled out environment and sustainable development as the most critical area of UN assistance in the next four years.

At Rio+20, the General Assembly called on UN entities to “*further enhance the mainstreaming of sustainable development into their respective mandates, programmes, strategies and decision-making process.*” They also endorsed the outcome document of Rio+20, entitled ‘*The future we want*’.

Environmental sustainability is a key dimension of the recommended vision for the Post-2015 Development Agenda. The United Nations Global Goals for Sustainable Development have identified environment. This new universal set of goals follows and expands on the Millennium Development Goals, and proposes a set of 17 goals that balances all dimensions of sustainable development: environmental, social and economic.

#### Box. Defining Aid for Trade

The exact definition of Aid for Trade remains contested. The World Trade Organization (WTO) Director General’s Task Force on Aid for Trade formulated the rationale for Aid for Trade as follows:

*“Aid for Trade is about assisting developing countries to increase exports of goods and services, to integrate into the multilateral trading system, and to benefit from liberalized trade and increased market access. Effective Aid for Trade will enhance growth prospects and reduce poverty in developing countries, as well as complement multilateral trade reforms and distribute the global benefits more equitably across and within developing countries.”*

To summarize, the goals of Aid for Trade as enunciated by the WTO are:

- Increased exports from developing and least developed countries;
- Enhanced economic growth;
- Reduced poverty and increased equity both across and within developing countries.

The Task Force also notes:

*“Aid for Trade should be rendered in a coherent manner taking full account, inter alia, of the gender perspective and of the overall goal of sustainable development.”*

## 2. Competitive benefits

Beyond our UN mandate and funder demands, there are a number of practical reasons why environment mainstreaming has become increasingly relevant to ITC. These may resonate differently with different staff and different programme areas. Five key motivations are discussed here.

**Table 1 Practical reasons for integrating environment into ITC activities**

Motivation	Description	Example approach?
Global demand for green products and services is growing	The expanding international market for green products and services offers new opportunities for developing country exporters to increase export incomes and improve sustainability across the value chain.	Assist exporters in realising opportunities in green products and services markets (including renewables, ecotourism and natural products).
Environmental performance is important to securing market share	Exporters are increasingly required to meet regulatory or private standards for environmental sustainability. Some of these attract a price premium, while others are mainstreamed requirements for market access.	Assist exporters attain market access through meeting regulatory and private, voluntary environmental standards.
'Green' technologies and resource use efficiency can improve export competitiveness	Environmentally scarce and detrimental inputs - including energy, water, chemicals, waste and fuel—are among the largest business costs. More efficient resource management can increase productivity, profitability and competitiveness and provide quality and safety benefits.	Assist exporters to improve sourcing, use and management of resource inputs to reduce operating costs and improve competitiveness.
Over-extraction, over consumption and depletion of natural resources threatens development outcomes in the long term.	Developing country economies and livelihoods are highly dependent on natural resources. Unsustainable resource use and deterioration of natural assets may lift exports in the short term, but undermine long-term income, employment and development.	Assist exporters to sustainably manage natural resources and mitigate negative environmental impacts, such as waste and emissions.
Developing countries are most vulnerable to climate change and other environmental challenges, which could undermine trade	The impacts of climate change—including severe weather events, higher temperatures and changes in rainfall patterns—are expected to vary between sectors and regions. Developing countries are particularly vulnerable given their limited capacity to cope with change.	Assist exporters to understand environmental risks, in particular, climate change.

## 3. Funder interests

Many funders have highlighted the need for ITC to focus on green economy. At the WTO Trade and Environment Committee meetings and at the 2013 JAG, many funders expressed a strong desire to see ITC work more on green economy and trade. These funders include China, Canada, Denmark, Finland and other European funders.

Most funders have 'environmental and climate sustainability' within their aid goals and priority areas. Furthermore, several funders, including Canada and Norway demand strategic environmental assessments for all funded trade-related technical assistance (TRTA) projects.

Additionally, funders are particularly impressed when a project is shown to be aligned with a country's National Action Plan (NAP) on environment. This alignment shows funders that ITC is taking into account national strategies and priorities. Many funder agencies support the creation of NAPs, so there may be a high level of interest in integrating strategies. Alignment indicates a project is more likely to have effectiveness and sustainability beyond the period of project activities.

#### 4. ITC Code of Conduct

With each project implementation, irrespective of the specific project objectives, we may cause unintended harm or have positive effects on Global Goals. For instance, a project may support the internationalisation and growth of enterprises/sectors that have a negative environmental impact, increase inequality or disrespect fair labour standards. Alternatively, a project could, for example as part of the support given to SMEs or trade and investment support institutions (TISIs), create solutions to pollution or inadequate working conditions.

It is suggested that ITC develop a 'code of conduct' that all projects have to follow. This code of conduct would guide projects on how to avoid unintentional harm. In the spirit of the Global Goals, it would also set minimum standards for the actors and beneficiaries we engage with, or define the minimum efforts ITC should undertake to help them reach these standards. The topics to be covered would include e.g. environmental sustainability and resilience in agri-food chains; how to cooperate with industries which contribute to pollution and contamination; minimum effort required to ensure equal access to all of ITC's capacity-building measures.

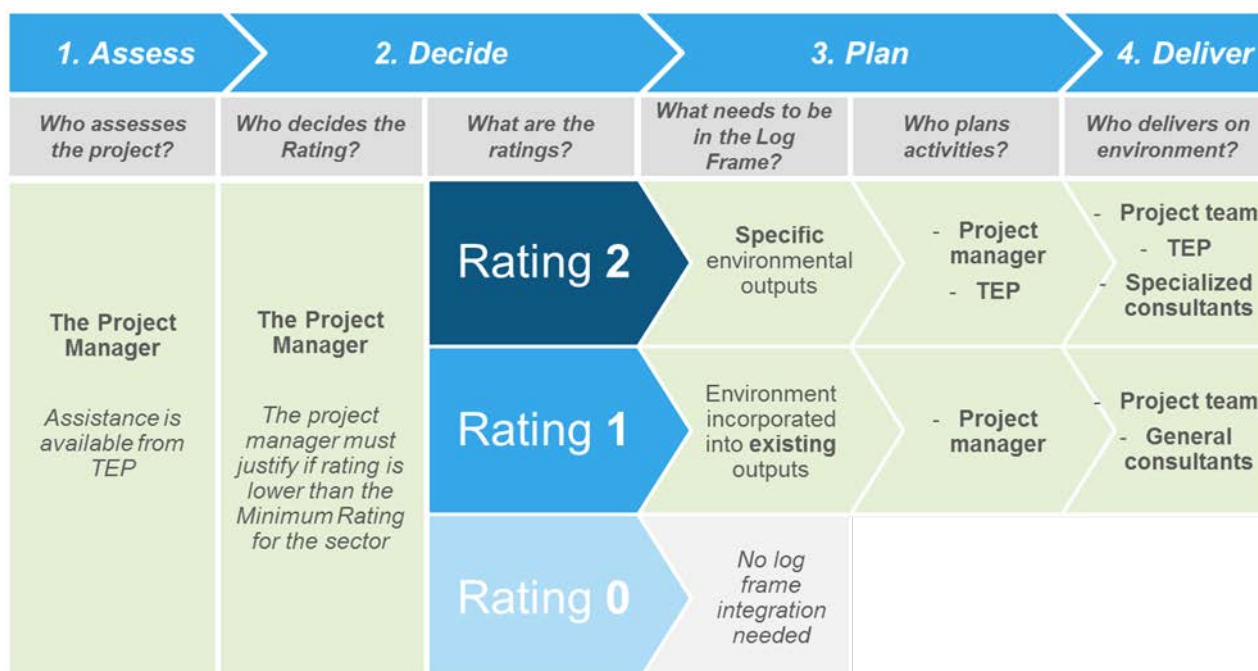


Environmental Mainstreaming for projects is split up into four steps: assess, decide, plan and deliver. The methodology allows flexibility for application to all ITC projects. © Tomás Munita

## Chapter 3 Process overview

Environmental mainstreaming follows a four step process: assess, decide, plan and deliver.

**Figure 1 Summary of the environmental mainstreaming process for ITC projects**



- Assess.** The first step is to assess the project’s potential environmental impacts. In this step, a project manager gathers environmental information about potential risks and opportunities surrounding a project, the sector it will assist, and the geographic area where it will take place. Managers should talk to the in-country project counterparts about potential environmental issues as they do about all other aspects of the plan. To help assist this process, this guide presents a number of tools that will help project managers find environmental dimensions to consider. Managers should complete this process by filling out the *Environmental Assessment Template* in the New Project Portal.
- Decide.** The second step is to decide the project’s appropriate environmental rating. Projects will be rated by the project manager based on their environmental risks and opportunities. Ratings are 0, 1, or 2. Rating 2 corresponds to the highest level of risks and opportunities. TEP has assessed a wide range of sectors that ITC supports and assigned a *Minimum Rating* to each. If, after investigating the projects potential environmental impacts, a project manager disagrees with the assigned *Minimum Rating* based upon the projects subsector they may rate the project lower than the minimum rating. In such a case the project manager must briefly explain why the project should have a lower rating. These explanations will be reviewed by TEP and PAC.
- Plan.** The third step is to plan the project activities required to address the environmental risks and opportunities. Project rated as 0 (indicating that no risks or opportunities exist) need not follow this step. For projects rated 1 and 2, appropriate actions should be planned in the logical framework at the output level. For project rated 1 (moderate environmental risks and opportunities), environmental aspects should be integrated into existing outputs. For projects rated 2 (high levels of environmental risks and opportunities), environmental aspects should be their own stand-alone outputs. This guide presents a number of example outputs and indicators.
- Deliver.** The fourth and final step is to deliver on the environmental activities. For projects rated as 1, the project team should be able to deliver the activities with existing resources and consultants. For projects rated as 2, specialized consultants may be necessary. TEP may also be available to support projects with a high level of potential environmental impact.

## Chapter 4 Assessing environmental risks and opportunities

Assessing the projects' potential environmental impacts is essential to mitigating risks and taking advantage of opportunities available to the project. The assessment must take a holistic look at the project gathering information on the sector, the geographic area as well as taking into consideration beneficiary's capacity and needs. Although a thorough environmental assessment needs technical expertise there are certain factors which can be directly assessed by the project manager. Where further technical assistance or information is needed the Trade and Environment Programme is available to help.

*Environmental Assessment Template* in ITC internal project portal is a good tool for starting your assessment. Also ITC's project plan template contains space for noting "crosscutting-issues" of gender, youth and environment and has a space to assess development markers. However, there has not been specific guidance issued to project managers on the important elements that are should be included in that section nor to project evaluators, like members of the Project Approval Committee (PAC), on when such a section should be considered as complete.

Environmental screening is the responsibility of the project manager – who should consult colleagues in TEP as required. The TEP mainstreaming officer can provide advice on the completion of the screening note.



Assessing the risk and opportunities of projects requires speaking with beneficiaries and considering some core questions about the project, sector and geographic area. Following templates provided in the guide allows project managers to fully understand the environmental implications of their projects.

## 1. The Environmental Assessment Template

The cross-cutting section on environment should be complete using the below *Environmental Assessment Template*. It should include:

- **Risks:** Mitigating impacts of the project and strengthen environmental resilience of beneficiaries
- **Opportunities:** Realising environmental opportunities that could strengthen the project's impact

To help consider these questions, please refer to the indicative questions in Section 4.3. A project manager should be able to answer all of the "core" questions about the project.

After careful research and reflection by the project manager, the outcome of this section in the Project Plan should clearly lead to whether and how environment should be included in the Project Plan's logframe.

**Table 2 Cross-cutting issues addressed in the Environmental Assessment Template**

<p><b>Environmental Impacts:</b> <i>(refer to checklists in the Environment Guide)</i></p> <p><i>Please list the key environmental issues raised by this project. This might include:</i></p> <ul style="list-style-type: none"> <li>• <i>Risks: Mitigating environmental impacts of the project</i></li> <li>• <i>Opportunities: Strengthen environmental resilience of project beneficiaries and realising environmental opportunities that could strengthen the project's impact</i></li> </ul> <p><i>Be sure to include any assumptions you may be making about the environment.</i></p> <p><i>Please refer to the environmental guide tools in below, which are organised according to topics/sectors. These will offer further guidance, although the lists are not intended to be exhaustive.</i></p>
<p><b>Additional comments:</b></p> <p><i>This is a space for other relevant information such as:</i></p> <ul style="list-style-type: none"> <li>• <i>comments on capacity for environmental management in country;</i></li> <li>• <i>comments on communicating environmental benefits and risks to project beneficiaries</i></li> <li>• <i>capacity of implementing institutions;</i></li> <li>• <i>comments on environmental trends in the country or region</i></li> <li>• <i>information on related environmental projects implemented by government or other funders.</i></li> </ul>

## 2. Tips on completing the Environmental Assessment Template

- **Reference the tools made available in the guide.** The tools contained in this guide will help project managers consider possible environmental aspects of their project.
- **Start as early as possible.** Screening should go hand in hand with project concept development. This way environmental opportunities and risks can be appropriately and easily integrated into subsequent design stages, rather than being brought in at the last minute leading to both cost and time inefficiencies.
- **Consider indirect effects.** Some important environmental effects may be secondary or indirect – for example changes in government policy on taxation may have far-reaching but not immediately obvious environmental implications. Indirect effects can often result from business responses to a project, for example forest encroachment due to expanded agricultural land use as a result of profitable exports.
- **Consider existing causes of environmental change.** Underlying causes of change may include: increased environmental hazards; market failure; perverse policies; weak institutions; unclear



property rights; and inadequate knowledge. How will the intervention contribute to or reduce these causes?

- **Consider gender aspects of environmental concerns.** Women living in rural areas are often more vulnerable to environmental degradation due to existing inequality in access to land, natural and productive resources, training, credit, and development programmes. Women in urban and in low-income areas can be particularly vulnerable to environmental risks at home and at work.
- **Consider impacts on different social groups.** Different groups in society feel positive and negative impacts of environmental issues differently. Varying socio-economic circumstances mean that there are winners and losers.

**Assessment is the start of the process, not the end.** Key results from all stages of environmental appraisal must be integrated into project or programme cycle management. Actions need to be included in logframes, project documents etc., and be monitored and reviewed during PAC reviews. If there is any environmental output, purpose or PIMS marker, there should be appropriate indicators and means of verification (MOVs) in the logframe. The Template cutting section may need revising if issues are addressed by design changes, or if new problems arise.

### 3. Indicative questions for project managers

The environmental dimensions of ITC work will vary greatly by circumstances in each individual sector, firm and county. As a result, it is not possible to create a generic approach to mainstreaming environmental concerns into ITC projects. Nevertheless, what's most important is that project managers consider the environment from an early stage of project design.

These questions are designed to help project managers consider various aspects of environmental risks and opportunities. While not exhaustive, they may serve as a good starting point during the design and assessing of projects. Project managers should answer the relevant questions in the Environmental Assessment Template in the New Project Portal.

#### Risks: Mitigating impacts and strengthening resilience

The core questions for assessing the environmental risks of a project include the following:

- **In what ways might the project impact the environment?**  
*See the Sector Matrix (Table 2)*
- **Does the firm or sector use any inputs or practices that are causing damage to natural resources?**  
If yes, what strategies could the project use to mitigate them?
- **Will project activities indirectly affect the environment?**  
If yes, what strategies could be used to lessen the environmental impact?
- **Are there opportunities for improved environmental management on the firm or sector level?**  
If yes, what tangible benefits will need to be communicated to beneficiaries to change environmental behaviours?
- **What kind of natural resources is the firm or sector reliant upon (supplies of water, arable land, mined materials)?**  
Is there a reasonable risk of those resources becoming scarcer? What strategies could beneficiaries adopt to mitigate their exposure?
- **Does the firm or sector face regulatory risks surrounding the environment?**  
If yes, what can the beneficiaries do to prepare for environmental-related regulatory changes?

### Additional questions

- Is there a risk of asset “lock-in” dictating negative environmental business practices moving into the future?
- What are the existing causes of environmental change in the region(s) where project beneficiary operate? For example increased environmental hazards; market failure; perverse policies; weak institutions; unclear property rights; and inadequate knowledge. Could the project contribute to or reduce these causes?
- Could there be differentiated impacts on different socio-economic groups?
- Are there any environmental risks that could have particular harm over longer terms?
- Does the host country have a Climate Change National Action Plan? Are environmental issues part of its other national development plans and policies?
- Does the project geographical placement (island state, water scarce regions) pose any climate or other environmental risks to beneficiaries?
- How do environmental challenges affect the client’s employees and beneficiaries?

### Opportunities: Leveraging environmental benefits

#### Core questions

- **What market opportunities arise from environmental needs?**  
Is the beneficiary in position to address new market demands?
- **Are there opportunities to improve resource or process efficiency?**  
How can these benefits be communicated to beneficiaries?
- **What environmental strategies have been shown by similar firms or sectors?**  
Can these strategies be spread through TSIs or adopted by project beneficiaries?
- **What environmental certifications are available in this sector?**  
Check the [ITC Standards Map](#). Is there a possibility of adoption by project beneficiaries?
- **How will the benefits and opportunities of action be communicated to beneficiaries and other stakeholders?**  
For help with communicating benefits to beneficiaries, please contact the Trade and Environment Officer.

#### Additional questions

- Are there investments in environmentally sound technologies that could also bring a long-term return?

## 4. Tools to rate and assess your project

Every project, sector and national context is unique and should be evaluated on its own merits. However, there are some general areas of concern that should be flagged for closer investigation and discussion with beneficiaries. These are outlined in Table 2 on the next page. The table is a loose guide, a conducted version of the matrix found in Annex II, rather than a definitive tool. The full sector matrix of environmental concerns in the Annex II of this document, presents key environmental impacts by sectors that project managers should examine.

**Table 3 Sector matrix of environmental concerns**

 Note: Areas of environmental relevance are marked with an **R** while areas of high concern are marked with **HC**.

Sector	Subsector	Minimum Rating	Air and Climate	Biodiversity	Energy and Minerals	Forests	Fresh water resources	Land and Agriculture	Marine and Coastal Areas	Chemicals and Waste
<b>Agricultural products</b>	Aquaculture	1	R	R			HC	R	HC	HC
	Cocoa	1		R		R	R	HC		
	Coffee	1	R	R		HC	R	HC		R
	Cotton	1		R		R	HC	HC		HC
	Essential oils	1		R		R	R	R		
	Fibres (natural)	1		R		R	R	R		
	Fisheries	1	R	HC					HC	R
	Floriculture	1	R	R		R	HC	R		HC
	Fruits & vegetables	1	R	R		R	R	HC		R
	Livestock	1	HC	R		HC	R	HC		HC
	Medicinal plants	1		R		R	R	R		
	Tea	1	R	R	R	R	R	HC		R
	Spices	1		R		R	R	R		HC
	<i>All other agricultural products</i>	1	R?	R?	R?	R?	R?	R?	R?	R?
<b>Manufactured products</b>	Creative industries	1			R					
	Fibres (synthetic)	1	R		R		R			R
	Leather	1				R	HC	R		HC
	Machinery	1	R		HC					R
	Paper/ Packaging	1	HC	R	R	HC	R	R		R
	Pharmaceuticals	1		R						HC
	Textiles and clothing	1					R	R		HC
	Wood and Wood Products	1	R	R		HC	R	HC		R
	<i>All other manufactured goods</i>	1	R?	R?	R?	R?	R?	R?	R?	R?
<b>Fair trade and environmental exports</b>	Biodiversity-based products	2		HC		R	R	HC		
	Fair trade and environmental exports	2	HC		HC	R	R		R	R
	Organic products	2		R		R	R	R		
	<i>All other Fair trade and environmental exports</i>	2	R?	R?	R?	R?	R?	R?	R?	R?
<b>Services</b>	Construction Services	1	R		HC	R		R		HC
	Investment / Financial Services	0	R	R	R	R	R	R	R	R
	IT & IT-enabled Business Services	0			R					
	Tourism	1	HC	R	R				R	R
	Transport, logistics, distribution	1	HC		HC				R	R
	Waste and environmental services	1	R	R	R	R	HC	R	HC	HC
	<i>All other services</i>	1	R?	R?	R?	R?	R?	R?	R?	R?

## Chapter 5 Deciding on environmental ratings

In addition to the Environmental Assessment Template, every project is assigned a rating on the level of impact that the project may have on environment. This rating reflects the level of environmental risk and will inform how deeply environmental activities should be integrated into the project logframe and results chain.

### 1. How to rate your project

ITC’s current rating guidance is as follows:

**Rating 0: Project has no addressable environmental risks and no opportunities:** Cross-cutting dimensions are not relevant and/or no further action is needed. “(1) Avoids negative impacts to the environment, (2) does not take place in a sector or geographical area where beneficiaries may have risks from environmental change and (3) does not present to any market access opportunities by adopting good environmental standards or practices.

**Rating 1: Project has moderate environmental risks and/or some opportunities:** Cross-cutting dimensions are not the project focus, but there are one or more relevant opportunities or risks to the environment, women or youth. These will be addressed by integrating environmental concerns into existing project outputs.

**Rating 2: Project has high environmental risks and/or extensive opportunities:** There is a high level of environmental risk and/or opportunity in the project. These will be addressed by creating specific environmental outputs.

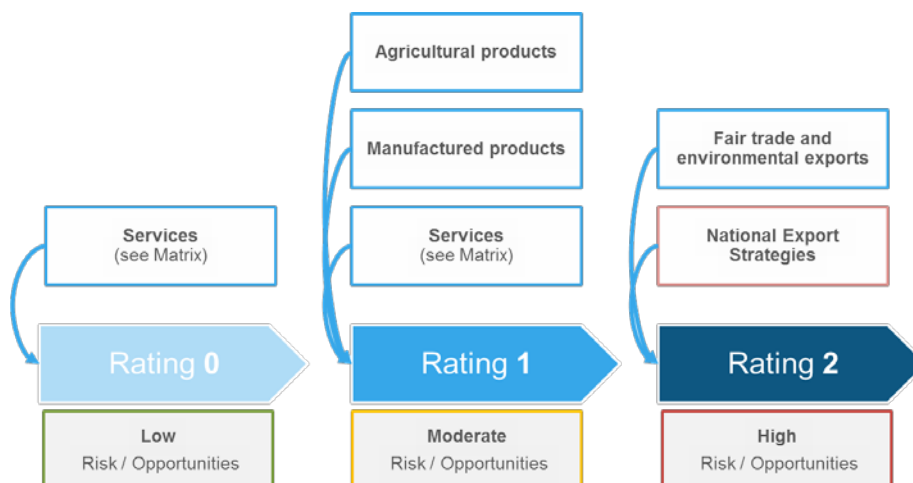
Ideally, the tools in this guide will expand the awareness environmental issues for ITC project manager. As a result, Environment should seldom be rated as a “0”.

### 2. Minimum ratings

After researching each of ITC sectors of work, TEP has assigned each sector a Minimum Rating for environment. These minimum ratings can be found above in Table 2, or through the project portal. Most ITC projects are in sectors with a minimum rating of “1”, meaning that they pose some environmental risks or opportunities. Fair trade and environmental exports and National Export Strategies have a minimum rating of 2.

The project manager feels that environment should be rated lower than the Minimum Rating justification must be given in the new project portal. These exceptions will be reviewed by PAC and TEP.

Figure 2 Minimum ratings



## Chapter 6 Planning: How environment fits into your logframe?

After the project manager has considered environmental issues in the cross-cutting section and determined the importance to the project, it is time to incorporate environment into the logical framework (logframe).



To ensure that the project's response is aligned with needs the project manager must integrate environmental in project logframes. Projects with higher ratings will have environment more deeply embedded into their outputs, activities and indicators.

### For projects with Rating 0:

**Meaning:** There are neither environmental risks nor opportunities associated with the project

- **Environmental considerations are not required to be incorporated in the project documents.**

### For projects with Rating 1:

**Meaning:** There are environmental risks and/ or opportunities associated with the project

- **Environmental considerations must be incorporated into existing outputs.**
- Incorporate environmental risk and opportunities. The logframe must contain into at least:
  - 1 existing output
  - 1 existing activity and corresponding indicator

### For projects with Rating 2:

**Meaning:** There are large environmental risks and/ or opportunities associated with the project

- **Environmental considerations must be reflected in specific outputs.**

- Create specific environment outputs and activities in logframe. The logframe must contain at least:
  - 1 dedicated environmental output
  - 1 dedicated environmental activity, and corresponding indicator
- Project manager may consider having environment as part of the outcome statement.

The integration of environmental outputs, activities, and indicators into project logframes will be reviewed by PAC and the environment experts of the Trade and Environment Programme.

**Table 4 Example of a logframe template**

Objectives	Indicators including baseline and targets	Means of verification	Risks/assumptions
Impact			
<b>Outcome</b> Projects that have a Rating 2 <i>may</i> incorporate environment into the project outcome.			
Output 1 Projects that have Rating 1 must incorporate environment into existing outputs	Determine appropriate indicators that reflect the Project's environmental output	Find the appropriate means of verification, reflecting the environmental indicator	
Output 2. Projects that have Rating 2 must reflect environment in specific outputs	Determine appropriate indicators that reflect the Project's environmental output	Find the appropriate means of verification, reflecting the environmental indicator	

For examples of integrated logframes across a number of sectors, please refer to Annex I.

## Chapter 7 Delivery

The environmental aspects of projects should be delivered in the same fashion as any other component of the framework. For most projects with Rating 1, the project team should be able to develop and deliver most activities with their normal resources: the core project team and non-specialized consultants.

For delivery of environmental aspects where projects have a high level of environmental risks and opportunities, generally rated at Rating 2, TEP may be consulted as a resource, or help deliver project activities. For such projects, it may also be necessary to hire consultants that specialize in environmental issues. TEP may also serve as a resource for identifying and hiring such consultants.

TEP stands ready to assist project teams that need additional help. Delivering this work will be part of TEP's on-going Environment Mainstreaming offering.

If project managers have questions about how TEP can support their upcoming project designs, please consult with the environmental mainstreaming officer in the Trade and Environment Unit.



Environmental mainstreaming ensures that actions are taken to promote sustainable practices, for example, in the agricultural sectors.

## Annex I Examples of mainstreaming logframes by sector

### Agricultural products

**Example:** General Agriculture

**Minimum Rating 1 / Manager's Rating: 2**

Output	Indicator
Market studies for demand for organic agricultural goods	Number of market studies for export

**Example:** Tea Farming

**Minimum Rating: 1 / Manager's Rating: 2**

Output	Indicator
Training the trainer for climate resilience	Number of extension officers trained in ITC climate resilience
Tea factory energy efficiency	Number of tea factories that receive trainings on improving energy efficiency; number of tea factories reporting improvements made in energy efficiency as a result of trainings
Capacity of tea exporters and producers is strengthened to adapt to and mitigate climate change	Number of gap analyses and cost benefit analysis to see current energy usage
	Number of key managers and extension staff are trained in methodologies to mitigate emissions
	Number of factory managements, lead farmers, community members, and other stakeholders trained on climate change mitigation measures.

**Example:** Avocado Exports

**Minimum Rating: 1 / Manager's Rating: 1**

Output	Indicator
Export competitiveness of the avocado sector enhanced	Number of farmer groups obtaining Global GAP certification
Sustainable export capacity of exporting SMEs and farmer groups enhanced	Number of farmer groups trained in production, disease management, post-harvest handling and sustainable pesticide use.
Capacity of TSIs improved in providing sector development support services to SMEs, including environmental support	Number of environmental support services to SMEs updated and/or newly developed



**Example: Mango Exports**

**Minimum Rating: 1 / Manager's Rating: 1**

Output	Indicator
Post-harvest processing for organic mangos	Number of SMEs trained in the requirements for post-harvest processing of needed for organic certification
Training for key managers and extension officers on the use of ITC's Standards Map and Blue Numbers Initiative	Number of managers and extension officers who have been trained on ITC's environmental products

**Example: Honey Exports**

**Minimum Rating: 1 / Manager's Rating: 2**

Output	Indicator
Monitoring of environmental health	Number of environmental surveys given to producers to reflect the health of their colonies, report compiled from those surveys
Market surveys for demand	Number of market surveys on organic demand held in target markets
Organic certification	Number of organic certifications begun by farmers and processors

**Example: Cotton Farming**

**Minimum Rating: 1 / Manager's Rating: 2**

Output	Indicator
Learning less water intensive farming processes	Number of farmers attending trainings on less intensive water practices

**Example: Livestock and Animal Feed**

**Minimum Rating: 1 / Manager's Rating: 1**

Output	Indicator
Sustainable livestock and animal feed sector analysis published and development	Baseline situation, stakeholder maps, <b>potential environmental impacts</b> , livestock and feed value chains analysed. Resource requirements, market options and project operating zones agreed

## Manufactured products

**Example:** Leather Goods Manufacturing

**Minimum Rating: 1 / Manager's Rating: 1**

Output	Indicator
Better manufacturing processes	Number of trainings held on best effluent management practices

**Example:** Ethical Fashion

**Minimum Rating: 1 / Manager's Rating: 2**

Output	Indicator
Environmental practices and impacts monitored at the firm level	Survey and analysis of producer solid and liquid waste through indicator survey's to beneficiaries

**Example:** Wood and Wood Products

**Minimum Rating: 1 / Manager's Rating: 2**

Output	Indicator
Key managers and extension staff are trained in methodologies to mitigate emissions	Number of trainings held on emissions mitigation
Conduct gap analysis and cost benefit analysis to see current energy usage	Number of gap analysis held on reducing energy use
	Number of factory managers who report reduced energy use

## Services

**Example:** ITC Survey of Non-Tariff Measures

**Rating: 2**

Output	Indicator
Analysis of non-tariff measures involving environmental considerations	Number of respondents surveyed on the importance of environmental related non-tariff measures

## **Annex II Detailed matrix of environmental concerns**

### **1. Food and agri-business**

- 1.1 Food and agri-business - Aquaculture
- 1.2 Food and agri-business- Cocoa
- 1.3 Food and agri-business -Coffee
- 1.4 Food and agri-business - Cotton
- 1.5 Food and agri-business - Essential oils
- 1.6 Food and agri-business - Fibres (natural and semi-synthetic)
- 1.7 Food and agri-business - Fisheries
- 1.8 Food and agri-business- Floriculture
- 1.9 Food and agri-business - Fruits & vegetables
- 1.10 Food and agri-business- Livestock
- 1.11 Food and agri-business - Medicinal plants
- 1.12 Food and agri-business - Spices
- 1.13 Food and agri-business - Tea

### **2. Fair trade and environmental exports**

- 2.1 Fair trade and environmental exports - Biodiversity-based products
- 2.2 Fair trade and environmental exports - Fair trade and environmental exports
- 2.3 Fair trade and environmental exports- Organic products

### **3. Manufactured goods**

- 3.1 Manufactured goods - Creative industries
- 3.2 Manufactured goods - Fibres (Synthetic)
- 3.3 Manufactured goods - Leather
- 3.4 Manufactured goods - Machinery
- 3.5 Manufactured goods - Paper/ Packaging
- 3.6 Manufactured goods - Pharmaceuticals
- 3.7 Manufactured goods - Textiles and clothing
- 3.8 Manufactured goods - Wood and Wood Products

### **4. Trade in services**

- 4.1 Trade in services - Construction Services
- 4.2 Trade in services - Investment / Financial Services
- 4.3 Trade in services - IT & IT-enabled Business Services
- 4.4 Trade in services - Tourism
- 4.5 Trade in services - Transport, logistics, distribution
- 4.6 Trade in services - Waste and environmental services

**To suggest changes or additions to this matrix, please email [environment@intracen.org](mailto:environment@intracen.org)**

Subsector	Risk Area	Risks	Opportunities
<p><b>1.1 Food and agri-business - Aquaculture</b></p>	<p>(HC) Fresh water resources</p>	<ul style="list-style-type: none"> <li>- Discharge of suspended solids and nutrient and organic enrichment of recipient waters can result in build-up of anoxic sediments and the eutrophication of lakes.</li> <li>- Intensive use of freshwater for inland facilities can cause the salinization of drinking water supplies</li> </ul>	<ul style="list-style-type: none"> <li>- Special consideration must be given to better management of aquaculture developments affecting sensitive inland habitats, such as wetlands, mangroves, specific breeding and nursery grounds and riparian fauna and vegetation,</li> </ul>
	<p>(HC) Marine and Coastal Areas</p>	<ul style="list-style-type: none"> <li>- Discharge of suspended solids, and nutrient and organic enrichment of recipient waters resulting in build-up of anoxic sediments which can disturb nearby habitats and other users of the marine environment</li> <li>- Sediment accumulation can lead to alteration of seabed fauna and flora communities</li> <li>- Large-scale shrimp culture has resulted in physical degradation of coastal habitats, for example, through conversion of mangrove forests and destruction of wetlands</li> </ul>	<ul style="list-style-type: none"> <li>- Special consideration must be given to better management of aquaculture developments affecting sensitive habitats, for example, estuaries, mangroves, specific breeding and nursery grounds, as well as other users to prevent conflict and therefore sustainable production.</li> </ul>
	<p>(HC) Chemicals and Waste</p>	<ul style="list-style-type: none"> <li>- Discharge of suspended solids, and nutrient and organic enrichment of recipient waters resulting in build-up of anoxic sediments</li> <li>- Misapplication of husbandry and disease management chemicals can impact other wildlife and may be present in higher quantities in the food</li> </ul>	<ul style="list-style-type: none"> <li>- The use of multi-trophic systems can reduce organic waste as filter-feeders such as mussels filter the waste, and produce a valuable by-product</li> <li>- Effective guidelines on the appropriate and best-practise use of chemicals can mitigate impacts of chemicals on the surrounding organisms</li> <li>- Other fish species that feed on fish parasites can be introduced to produce a valuable by-product and reduce disease prevalence (such as wrasse for salmon sea lice)</li> <li>- Disease information networks can reduce the spread of parasites or viruses</li> </ul>
	<p>Air and Climate</p>	<ul style="list-style-type: none"> <li>- Energy used in production, transport and storage can release significant emissions</li> </ul>	<ul style="list-style-type: none"> <li>- Energy efficient storage, packaging and transport can reduce the impact on the environment</li> </ul>

Subsector	Risk Area	Risks	Opportunities
	Biodiversity	<ul style="list-style-type: none"> <li>- Collection of seed from the wild (by-catch of non-target species occurring in the collection of wild seed)</li> <li>- The use of fishery resources as feed is also causing concern.</li> </ul>	<ul style="list-style-type: none"> <li>- Precautionary approaches are advocated for many aquaculture practices, particularly as regards the introduction and use of alien species.</li> </ul>
	Land and Agriculture	<ul style="list-style-type: none"> <li>- Salinization of agricultural water supplies and land subsidence due to groundwater abstraction</li> </ul>	<ul style="list-style-type: none"> <li>- Improved coordination and management of development initiatives at sectoral, eco-regional and local levels can contribute to more environmentally sustainable development of aquaculture.</li> </ul>
	Further Information:	<p>FAO 2005-2015. World inventory of fisheries. Impact of aquaculture on environment. Issues Fact Sheets. Text by Uwe Barg. In: FAO Fisheries and Aquaculture Department [online]. Rome. Updated 27 May 2005. <a href="http://www.fao.org/fishery/topic/14894/en">http://www.fao.org/fishery/topic/14894/en</a></p>	
<b>1.2 Food and agri-business- Cocoa</b>	(HC) Land and Agriculture	<ul style="list-style-type: none"> <li>- The clearing of forests can reduce the quality of soil structure and result in increased soil erosion.</li> <li>- Drought can stress the Cacao trees as a result of reduced water retention from poor soil quality and result in lower yields</li> <li>- Full sun- grown cocoa generates more weeds and can become more susceptible to certain diseases. This can result in an increased use of herbicide and pesticide which can later lead to resistance which will require a higher frequency of future applications.</li> </ul>	<ul style="list-style-type: none"> <li>- Suitable soil management, proper irrigation, composting and intercropping can lessen environmental impacts</li> <li>- Better access to pest control products such as biocides and the use of better pest management practises as an alternative to the harmful pesticide use</li> </ul>
	Air and Climate	<ul style="list-style-type: none"> <li>- Collection and transport of raw material and final product contribute significant emissions</li> <li>- The use of diesel at the industrial processing stage contributes emits more emissions than necessary</li> </ul>	<ul style="list-style-type: none"> <li>- Energy efficient storage, packaging and transport can reduce the impact on the environment</li> <li>- Use natural gas instead of diesel oil for roasters and boilers due to its lower emissions</li> </ul>
	Forests	<ul style="list-style-type: none"> <li>- In some countries, cocoa farming contributes to rainforest and old growth forest deforestation.</li> <li>- Cocoa farming becomes a destructive circle as farmers wear out the soils and cut further into the forest to obtain fresh land.</li> </ul>	<ul style="list-style-type: none"> <li>- Cocoa farmers can go back to the original method of farming, by planting within the natural tree-cover and without cutting down existing trees.</li> </ul>
	Biodiversity	<ul style="list-style-type: none"> <li>- By clearing land in these forests, farmers decrease the biodiversity and interactions between the organisms that naturally live in this area. Many wildlife habitats are destroyed and the plant species diversity is drastically reduced.</li> </ul>	<ul style="list-style-type: none"> <li>- If the shade trees are fruit-bearing, this can also provide additional income to farmers.</li> </ul>

Subsector	Risk Area	Risks	Opportunities
	Fresh water resources	<ul style="list-style-type: none"> <li>- Nutrients begin to leach out of the soil due to poor irrigation and inadequate soil protection</li> <li>- Excessive pesticide and herbicide applications have contributed to pest resistance and</li> </ul>	<ul style="list-style-type: none"> <li>- The production of natural fertilizer from old, fermented pods can lessen the need for fossil-fuel based fertilizers</li> <li>- The use of integrated pest management and adequate soil fertility management could reduce long-term production input costs and reduce the negative impact on water resources and future resistance in pests</li> </ul>
<b>1.3 Food and agri-business - Coffee</b>	Further Information:	<p>Ntiamoah and Afrane 2008, Environmental impacts of cocoa production <a href="http://www.sciencedirect.com/science/article/pii/S0959652607002429">http://www.sciencedirect.com/science/article/pii/S0959652607002429</a></p>	<p>production and processing in Ghana: life cycle assessment approach</p>
	Forests	<ul style="list-style-type: none"> <li>- Coffee is typically cultivated in tropical and subtropical areas at high elevations, often in rugged mountainous areas.</li> <li>- It provides functions such as soil erosion control and nutrient retention</li> <li>- A growing market demand for coffee has led to changes in growing methods such as forest clearance for “sun cultivation”, which reduces the ability of forests to perform soil erosion control and nutrient retention services</li> </ul>	<ul style="list-style-type: none"> <li>- Maintaining diverse vegetation on the farm reduces soil erosion and slope failure as well as helps to improve soil quality. Nitrogen-fixing trees, fallen leaves and pruned branches enrich the soil and provide vital nutrients,</li> </ul>
	Land and Agriculture	<ul style="list-style-type: none"> <li>- Coffee is typically cultivated in tropical and subtropical areas at high elevations, often in rugged mountainous areas.</li> <li>- The traditional ‘Shade-growing’ technique has been widely replaced by “sun cultivation”. Sun cultivated coffee is produced as a monoculture, where shade-grown coffee groves are replaced by hybrid, sun-resistant trees that bring high yields.</li> <li>- Lack of vegetation amongst coffee trees reduces the amount of natural mulch, increases soil exposure and weed occurrence, resulting in enhanced application of herbicides, chemical fertilizers and pesticides.</li> </ul>	<ul style="list-style-type: none"> <li>- An environmentally favoured alternative to sun cultivated coffee is shade-grown coffee. In this method, coffee plants are interspersed beneath local forest trees, mimicking the way coffee grows naturally in these regions.</li> <li>- Shade-grown coffee discourages weed growth and reduces pathogen infection.</li> <li>- Coffee grown in shade has a longer maturation period which may enhance flavour richness of the crop.</li> </ul>

Subsector	Risk Area	Risks	Opportunities
	Air and Climate	<ul style="list-style-type: none"> <li>- Collection and transport of raw material and final product contribute significant emissions.</li> <li>- Roasting, packaging, distribution, grinding and purchasing of coffee-related products and materials contribute significant emissions.</li> </ul>	<ul style="list-style-type: none"> <li>- Vegetation rich farms play a crucial role in stabilising microclimates and buffering against temperature and humidity fluctuations associated with climate change.</li> <li>- Efficient roasting stoves, organic and decomposable packaging, as well as energy and fuel efficient transport and grinding systems can lessen the environmental impact of the project.</li> </ul>
	Biodiversity	<ul style="list-style-type: none"> <li>- Traditional shad-grown coffee provides a habitat for a wide range of animal and plant species.</li> <li>- Sun-cultivation and associated forest clearance can reduce biodiversity.</li> </ul>	<ul style="list-style-type: none"> <li>- Shade coffee supports biodiversity, with farms serving as wildlife corridors between plots and natural habitats. Increased numbers of pollinators increases the fruit set and yield of coffee and other plants on the farm. Diversity of predators has a positive impact on pest control, reducing the need for pesticide use.</li> <li>- Shade farming can provide other economic benefits. Some trees yield non-coffee products such as fruits and fuelwood, providing an additional source of income for farmers.</li> </ul>
	Fresh water resources	<ul style="list-style-type: none"> <li>- Sun grown coffee with reduced nutrient retention leads to water contamination (due to leaching of organic pollutants).</li> <li>- Contamination of waterways also poses serious environmental threats from the processing of coffee beans. Discharges from coffee processing plants represent a major source of river pollution.</li> <li>- Ecological impacts result from the discharge of organic pollutants from the processing plants to rivers and waterways, triggering eutrophication of water systems and robbing aquatic plants and wildlife of essential oxygen.</li> <li>- There is also a large amount of waste produced during the manufacturing of coffee. This excess waste can be detrimental to soil and water sources as coffee pulp is often dumped into streams, degrading fragile systems.</li> </ul>	<ul style="list-style-type: none"> <li>- Shade-grown coffee discourages weed growth, reduces pathogen infection,</li> <li>- Shade coffee farms tend to have fewer weeds. Natural mulch, supplied by fallen leaves, combined with limited sunlight, prevents weed from spreading and reduces the need for herbicide application.</li> </ul>

Subsector	Risk Area	Risks	Opportunities
	Chemicals and Waste	<ul style="list-style-type: none"> <li>- "Sun cultivated coffee production" involves an intensive use of chemicals with serious negative impacts on human health and ecosystems. Higher weed and pest occurrence leads to further herbicide and pesticide application.</li> <li>- Ecological impacts result from the discharge of organic pollutants from the processing plants to rivers and waterways, triggering eutrophication of water systems and robbing aquatic plants and wildlife of essential oxygen.</li> <li>- There is also a large amount of waste produced during the manufacturing of coffee. This excess waste can be detrimental to soil and water sources as coffee pulp is often dumped into streams, degrading fragile systems.</li> </ul>	<ul style="list-style-type: none"> <li>- Shade-grown coffee discourages weed growth, reduces pathogen infection,</li> <li>- Shade coffee farms tend to have fewer weeds. Natural mulch, supplied by fallen leaves, combined with limited sunlight, prevents weed from spreading and reduces the need for herbicide application.</li> </ul>
	Further Information:	<p>Victoria Moore, last access 10/11/2015, <a href="http://www.sustainablebusiness toolkit.com/environmental-impact-coffee-trade/">http://www.sustainablebusiness toolkit.com/environmental-impact-coffee-trade/</a></p>	
<b>1.4 - Cotton</b>	(HC) Fresh water resources	<ul style="list-style-type: none"> <li>- Excessive use of agricultural chemicals has negative impacts on ecosystems that receive run-off from farms.</li> <li>- Massive inputs of freshwater are required.</li> <li>- Downstream, large quantities of chemicals, water, and energy are required to prepare and then dye cotton fabric as well.</li> </ul>	<ul style="list-style-type: none"> <li>- Water irrigation practises need to be appropriate to ensure a sustainable supply of water and associated soil quality.</li> </ul>
	(HC) Land and Agriculture	<ul style="list-style-type: none"> <li>- Depletion of water resources can cause salinization rendering agricultural land unsuitable for future use.</li> <li>- Excessive use of agricultural chemicals has negative impacts on ecosystems that receive run-off from farms.</li> <li>- Massive inputs of freshwater are required.</li> <li>- Downstream, large quantities of chemicals, water, and energy are required to prepare and then dye cotton fabric as well.</li> </ul>	<ul style="list-style-type: none"> <li>- Educating farmers on sustainable growing methods and pesticide use important to make the cotton harvest more sustainable.</li> <li>- Sustainable certifications like the Better Cotton Initiative (BCI) may be an important tool.</li> </ul>



Subsector	Risk Area	Risks	Opportunities
<b>1.5 - Food and agri-business Essential oils</b>	(HC) Chemicals and Waste	<ul style="list-style-type: none"> <li>- Unsafe use of agricultural chemicals has severe health impacts on workers in the field and on ecosystems that receive excess doses that run-off from farms.</li> <li>- Downstream, large quantities of chemicals, water, and energy are required to prepare and then dye cotton fabric as well.</li> </ul>	<ul style="list-style-type: none"> <li>- Appropriate health and safety protocols should minimise the risk to workers.</li> <li>- Disposal of waste by-products used in processing should not be detrimental to the environment and users of the environment.</li> </ul>
	Biodiversity	<ul style="list-style-type: none"> <li>- Depletion of aquifers can reduce existing habitable ecosystems and has already been responsible for the destruction of large-scale ecosystems.</li> </ul>	<ul style="list-style-type: none"> <li>- Ecosystems are a source of water and provide services such as water filtration and water retention which is required for reduced water risk for nearby plantations.</li> </ul>
	Forests	<ul style="list-style-type: none"> <li>- Large-scale production can cause deforestation and the resulting reductions in soil erosion control, carbon storage, and nutrient cycling.</li> </ul>	
	Further Information:	<p>WWF 1999, The Impact of Cotton on Fresh Water <a href="http://d2ouvy59p0dg6k.cloudfront.net/downloads/impact_long.pdf">http://d2ouvy59p0dg6k.cloudfront.net/downloads/impact_long.pdf</a></p> <p>WWF Cotton Farming, <a href="http://www.panda.org/about_our_earth/about_freshwater/freshwater_problems/thirsty_crops/cotton/">http://www.panda.org/about_our_earth/about_freshwater/freshwater_problems/thirsty_crops/cotton/</a> Last access 10/11/2015,</p>	<p>Resources and Ecosystems A Preliminary Synthesis, 10/11/2015,</p>
	Biodiversity	<ul style="list-style-type: none"> <li>- The essential oils sector covers a diverse number of crops and wild-collected plants. As a result it is difficult to generalize about environmental concerns. For wild collected plants, habitat and biodiversity loss and overharvesting are threats.</li> <li>- Threats to wild plant species and their populations include intensive and commercial collection (often concentrated in few areas rather than within the whole area of their distribution).</li> <li>- Over-exploitation of wild resources can result in a severe decline in genetic diversity, with many species already threatened.</li> </ul>	<ul style="list-style-type: none"> <li>- Sustainably harvested certification can ensure reduced impacts on the environment and biodiversity, and retain the services they provide for the growth of crops used to extract essential oils.</li> <li>- Implementation of CITES regulations can help reduce pressure on wild populations and increase access to international markets for sustainably produced raw materials.</li> </ul>
Forests	<ul style="list-style-type: none"> <li>- Large-scale harvest and production can cause deforestation</li> <li>- Destructive harvesting techniques and largely unmonitored trade can reduce the ability of the forest to sustain itself</li> </ul>	<ul style="list-style-type: none"> <li>- Implementation of CITES regulations can help reduce pressure on wild populations and increase access to international markets for sustainably produced raw materials</li> </ul>	

Subsector	Risk Area	Risks	Opportunities
	Fresh water resources	<ul style="list-style-type: none"> <li>- Large-scale production can cause water resources overexploitation as well as soil and water contamination due to the use of chemical fertilizers (in the case of non-organic farms).</li> </ul>	<ul style="list-style-type: none"> <li>- Certification of organic produce can enable access to higher value international markets and reduce the use of chemicals. Guidelines to producers and processors can promote a consistent product which can compete with synthetic oils.</li> </ul>
	Land and Agriculture	<ul style="list-style-type: none"> <li>- Cultivation is an alternative to wild collection. Yet, growing a substantial amount of plant material to produce essential oil often involves a monoculture style of farming, managed by intense mechanisation and irrigation for optimal production.</li> <li>- Conventional methods of essential oil extraction can be inefficient in terms of energy and resources, and can result in an inconsistent product quality.</li> </ul>	<ul style="list-style-type: none"> <li>- Organic certification and Sustainably grown certification can enable producers to sell to international markets and benefit the longevity of crop cultivation</li> <li>- Traceability of organic origin (certification, conservation status, and green production and extraction technologies) can ensure products are produced sustainably and have a minimal impact on the land used.</li> </ul>
	Further Information:	<p>Snelder, Denyse J.; Lasco, Rodel D. (29 September 2008). Smallholder Tree Growing for Rural Development and Environmental Services: Lessons from Asia <a href="https://books.google.ch/books?id=LmA_5zxDSRkC&amp;pg=PA248&amp;redir_esc=y#v=onepage&amp;q&amp;f=false">https://books.google.ch/books?id=LmA_5zxDSRkC&amp;pg=PA248&amp;redir_esc=y#v=onepage&amp;q&amp;f=false</a></p>	
	<p><b>1.6 Food and agri-business = Fibres (Natural and semi-synthetic)</b></p>	Biodiversity	<ul style="list-style-type: none"> <li>- Cultivation of natural fibres can result in loss of habitat; however some natural fibres are by-products from the cultivation of other crops.</li> </ul>
	Forests	<ul style="list-style-type: none"> <li>- Large-scale production can cause deforestation and reduce the ability of the forest to sink and store atmospheric carbon.</li> </ul>	<ul style="list-style-type: none"> <li>- Sustainable harvest certification for fibre crops and their final products can provide access to higher value international markets and reduce pressure on forests.</li> </ul>
	Fresh water resources	<ul style="list-style-type: none"> <li>- Large-scale production can cause water resources overexploitation as well as soil and water contamination due to the use of chemical fertilizers (in the case of non-organic farms).</li> <li>- Conventional rayon, made of cellulose from trees, is easier on the land, but chemical-heavy in the fibre-spinning phase.</li> </ul>	<ul style="list-style-type: none"> <li>- Promotion of the use of fibre-crop by-products as organic fertiliser can reduce the amount of chemical fertiliser needed.</li> <li>-The use of chemicals in processing stages should be treated to international standards to reduce the negative impact on the water resources.</li> </ul>
	Land and Agriculture	<ul style="list-style-type: none"> <li>- Large-scale production can reduce the quality of the soil for future years, as water retention, erosion control and nutrient retention services are reduced.</li> </ul>	<ul style="list-style-type: none"> <li>- The use of low impact variants, such as organic, fibre by-products from other crops, or recycled fibres can be promoted through certification.</li> </ul>

Subsector	Risk Area	Risks	Opportunities
	Further Information:	Fernando et al 2014, Environmental aspects of fiber crops cultivation and use. <a href="http://www.sciencedirect.com/science/article/pii/S0926669014006086">http://www.sciencedirect.com/science/article/pii/S0926669014006086</a>	
<b>1.7 Food and agri-business - Fisheries</b>	(HC) Biodiversity	<ul style="list-style-type: none"> <li>- Overfishing—catching fish faster than they can reproduce—is an urgent and devastating issue, and is one of the biggest threats to ocean ecosystems. Today, 90 percent of the world's fisheries are either fully exploited, overexploited or have collapsed due to over fishing (catching fish faster than they can reproduce). The global fishing fleet is operating at 2.5 times the sustainable level—there are simply too many boats chasing a dwindling number of fish.</li> <li>- Harmful practises (such as dredges) are detrimental to seabed habitats, reducing the habitat's capacity for primary growth and therefore the use of the area as a spawning ground to replenish wild stocks of fish.</li> </ul>	<ul style="list-style-type: none"> <li>- Unsustainable fishing requires that new practices are widely adopted. There are two main ways to drive this. The first is through government intervention and enforcement of fishing practices. The second is through voluntary private standards and labels, such as the Marine Sustainability Council, MSC.</li> </ul>
	(HC) Marine and Coastal Areas	<ul style="list-style-type: none"> <li>- The global fishing fleet emit large amounts of greenhouse gases.</li> <li>-Storage and transport of produce requires a large amount of energy.</li> </ul>	<ul style="list-style-type: none"> <li>- Promote good fishing practises that do not damage the seabed through the use of voluntary standards which reward the industry with higher prices.</li> </ul>
	Air and Climate	<ul style="list-style-type: none"> <li>- During processing, fish offal is often wasted.</li> <li>- Discarded by-catch can negatively impact the ability of wild populations to survive.</li> <li>- Fish may be found to have high levels of chemicals and micro-plastics which can be harmful to human health when consumed.</li> <li>- Abandoned nets in the ocean can continue to catch and kill fish until the gear erodes.</li> <li>- Fishing with dynamite and poisons has negative impacts on surrounding organisms and their habitat.</li> </ul>	<ul style="list-style-type: none"> <li>- Provision of guidelines for energy-efficient storage can help to reduce energy consumption.</li> <li>- Sourcing fish from closer markets can reduce transport miles and associated emissions.</li> </ul>
	Chemicals and Waste	<ul style="list-style-type: none"> <li>- Waste products can be utilised for animal and fish feed and are high in omega-3 fatty acids.</li> <li>- Voluntary standards and certain markets require low levels of chemicals in fish. However reducing waste and chemicals in the ocean is a global issue.</li> </ul>	
	Further information:	FAO 2005-2015. World inventory of fisheries. Impacts of fishery activities. Issues Fact Sheets. Text by Pere Oliver and Rebecca Metzner. In: FAO Fisheries and Aquaculture Department [online]. Rome. Updated 27 May 2005. [Cited 11 November 2015]. <a href="http://www.fao.org/fishery/topic/12273/en">http://www.fao.org/fishery/topic/12273/en</a>	

ENVIRONMENTAL MAINSTREAMING: A GUIDE FOR PROJECT MANAGERS

Subsector	Risk Area	Risks	Opportunities	
<b>1.8 Food and agri-business-Floriculture</b>	(HC) Fresh water resources	<ul style="list-style-type: none"> <li>- Floriculture needs larger volumes of water than conventional crop cultivation.</li> </ul>	<ul style="list-style-type: none"> <li>- Water re-use systems can reduce water consumption and relieve pressure on water resources as well as increase resilience to varying resource availability to reduce risk.</li> </ul>	
	(HC) Chemicals and Waste	<ul style="list-style-type: none"> <li>- Floriculture requires intensive use of chemical fertilizers and pesticides.</li> <li>- Inadequate waste management systems do not recover fertiliser or pesticides.</li> </ul>	<ul style="list-style-type: none"> <li>- A wider variety of pest management practises and a higher use of natural fertilizers can lessen the impact of floriculture on the environment. This will also reduce the likelihood that resistance will occur in pests.</li> <li>- Waste management systems can recover and reuse water and fertiliser. When integrated with biological pest control this can reduce significantly the concentrations of chemicals needed and released into the environment.</li> </ul>	
	Air and Climate	<ul style="list-style-type: none"> <li>- Floriculture sales from developing countries nearly always use air freight transport for shipping to developed market, causing significant carbon footprints.</li> </ul>	<ul style="list-style-type: none"> <li>- Offsetting the emissions of airfreight is also beneficial and may provide flower producers a differentiating marketing opportunity.</li> </ul>	
	Biodiversity	<ul style="list-style-type: none"> <li>- The clearing of forest for cultivation can reduce the level of biodiversity.</li> </ul>	<ul style="list-style-type: none"> <li>- Intercropping can retain a high level of biodiversity and also the soil quality to sustain harvest levels in the future.</li> </ul>	
	Forests	<ul style="list-style-type: none"> <li>- The clearing of forest for cultivation can reduce the ability to sink and store atmospheric carbon</li> </ul>	<ul style="list-style-type: none"> <li>- Sustainably harvested certification can educate the consumers of product origin and its impact on local forests.</li> </ul>	
	Land and Agriculture	<ul style="list-style-type: none"> <li>- Floriculture requires intensive use of chemical fertilizers and pesticides and needs larger amounts of water than conventional farming.</li> </ul>	<ul style="list-style-type: none"> <li>- A wider variety of pest management practises and a higher use of natural fertilizers can lessen the impact of floriculture on the environment.</li> </ul>	
	Further information:	Tehrani-kronner 2012, Socio-Economic and Environmental <a href="http://lib.ugent.be/fulltxt/RUG01/001/894/550/RUG01-001894550_2012_0001_AC.pdf">http://lib.ugent.be/fulltxt/RUG01/001/894/550/RUG01-001894550_2012_0001_AC.pdf</a>	Impact of Floriculture Industry in Ethiopia	
	<b>1.9 Food and agri-business - Fruits &amp;</b>	(HC) Land and Agriculture	<ul style="list-style-type: none"> <li>- Environmental concerns of fruit and vegetable farming vary by crop and surrounding ecosystem.</li> </ul>	<ul style="list-style-type: none"> <li>- Switching to organic farming methods may also open up new markets in developed countries</li> </ul>

Subsector	Risk Area	Risks	Opportunities
<b>vegetables</b>	Air and Climate	<ul style="list-style-type: none"> <li>- Production, storage and transport result in high levels of emissions.</li> </ul>	<ul style="list-style-type: none"> <li>- Best practise guidelines can be issued to producers, suppliers and consumers on how they can best contribute to reduce emissions in the supply chain. For example, consumers could choose to consume seasonal produce, and buyers could reduce air miles, however this could negatively impact poorer suppliers over others.</li> </ul>
	Biodiversity	<ul style="list-style-type: none"> <li>- The clearing of forest for farms can reduce biodiversity levels, which are needed for the natural pollination of crops.</li> <li>- Clearing forests can also result in the reduction of wild fruit populations that have genetic traits that could be selected to improve cultivars.</li> </ul>	<ul style="list-style-type: none"> <li>- Intercropping can retain habitats and associated biodiversity, also acting to benefit pollination.</li> <li>- Sustainably grown products can be certified increasing access to higher value international markets.</li> </ul>
	Forests	<ul style="list-style-type: none"> <li>- The clearing of forest for farms can reduce the ability of the forest to sink and store atmospheric carbon.</li> </ul>	<ul style="list-style-type: none"> <li>- Switching to organic farming methods may open up new markets in developed countries and reduce pressures on forest habitats and the carbon footprint of the final product.</li> </ul>
	Fresh water resources	<ul style="list-style-type: none"> <li>- Fruits and vegetables often over-use fertilizers and pesticides which can be detrimental to nearby water sources.</li> </ul>	<ul style="list-style-type: none"> <li>- Better practices for water irrigation and effective use of fertiliser can relieve pressures on water sources. Biological pest control and intercropping can reduce the need for high levels of pesticide applications.</li> </ul>
	Chemicals and Waste	<ul style="list-style-type: none"> <li>- Poor post-harvest storage and inadequate transport of produce can increase post-harvest losses.</li> </ul>	<ul style="list-style-type: none"> <li>- Better practices for pest control and waste management can help farmers minimize environmental impacts and cut long-term costs.</li> </ul>
	Further information	<p>Stoessel et al 2012, Life Cycle Inventory and Carbon and Water <a href="http://pubs.acs.org/doi/abs/10.1021/es2030577">http://pubs.acs.org/doi/abs/10.1021/es2030577</a></p>	<p>FoodPrint of Fruits and Vegetables: Application to a Swiss Retailer.</p>
<b>1.10 - Food and agri-business-Livestock</b>	(HC) Air and Climate	<ul style="list-style-type: none"> <li>- Cattle and other ruminant livestock produce a large amount of methane, a greenhouse gas. The carbon footprint of animal feed in addition to the processing and transport of the final produce is significant.</li> </ul>	<ul style="list-style-type: none"> <li>- Sourcing local animal feed inputs can reduce associated transport emissions.</li> <li>- Markets may prefer to pay a similar or higher price for local produce.</li> </ul>
	(HC) Forests	<ul style="list-style-type: none"> <li>-The clearing of forests for pastureland is an issue more prominent in developing countries and can reduce the ability of forests to sink atmospheric carbon and store it.</li> </ul>	<ul style="list-style-type: none"> <li>- Sustainable grazing practises can be used whereby the land for grazing is divided and rotated allowing for effective recovery and sustainable use of a given area of land</li> </ul>

Subsector	Risk Area	Risks	Opportunities
<p><b>1.11 Food and agri-business - Medicinal plants</b></p>	<p>(HC) Land and Agriculture</p>	<p>- Live stock is an intensive use of the land, particularly with grazing animals.</p>	<p>There are vast differences between production systems and animal products. In general:</p> <ul style="list-style-type: none"> <li>- Feed efficiency is a key driver of productivity and can reduce the amount of raw plant material required for the production of a given amount of meat.</li> <li>- Rotational land management practises can reduce the need for new forest areas for grazing animals.</li> </ul>
	<p>(HC) Chemicals and Waste</p>	<ul style="list-style-type: none"> <li>- The improper treatment of livestock waste can lead to related illnesses downstream and on the farm.</li> <li>- Over-use of antibiotics can result in resistant bacteria which can be a risk to human health.</li> </ul>	<ul style="list-style-type: none"> <li>- Guidelines for the treatment of waste and use of antibiotics should be considered due to the level of risk associated with these practises.</li> <li>- Regulations for antibiotic use should be adhered to.</li> </ul>
	<p>Biodiversity</p>	<ul style="list-style-type: none"> <li>- The clearing of forest for pastureland can reduce the level of biodiversity.</li> </ul>	<ul style="list-style-type: none"> <li>- Rotational land management practises can reduce the need for new forest areas for grazing animals.</li> </ul>
	<p>Fresh water resources</p>	<ul style="list-style-type: none"> <li>- Furthermore, livestock waste can pose a threat to inland waterways as high levels of phosphorus and nitrogen run-off can cause eutrophication.</li> </ul>	<ul style="list-style-type: none"> <li>- Feed efficiency can reduce the availability of nutrients in waste runoff. This can also reduce raw material inputs and the carbon footprint of the meat.</li> </ul>
	<p>Further Information:</p>	<p>Herrero et al 2013, Biomass use, production, feed efficiencies and greenhouse gas emissions from global livestock systems. <a href="http://www.pnas.org/content/110/52/20888.abstract">http://www.pnas.org/content/110/52/20888.abstract</a></p>	<p>and greenhouse gas emissions from global livestock systems.</p>
	<p>Biodiversity</p>	<p>(General) Environmental concerns of medicinal plant farming and wild-collection varies by crop and surrounding ecosystem.</p> <ul style="list-style-type: none"> <li>- There are risks that such products will be unsustainably harvested or collected from the wild, reducing the ability for the population to survive.</li> <li>- Habitat loss through the clearance of forest for cultivation can reduce biodiversity levels.</li> </ul>	<ul style="list-style-type: none"> <li>- Research into crop-specific artificial propagation can allow communities to grow their own, reducing the pressure on wild populations and securing a more constant supply and through certification and adherence to CITES regulations, access to higher value international markets.</li> <li>- Intercropping can retain a high level of biodiversity and natural pollinators, and can allow diversification of income and sustainable harvest certification.</li> </ul>
<p>Forests</p>	<ul style="list-style-type: none"> <li>- Forest may be cleared for the cultivation of medicinal plants.</li> </ul>	<ul style="list-style-type: none"> <li>- Certification of sustainable production methods can communicate to consumers the impact of the product on forest areas.</li> </ul>	
<p>Fresh water resources</p>	<ul style="list-style-type: none"> <li>- Artificial propagation of plants requires large amounts of water.</li> </ul>	<ul style="list-style-type: none"> <li>- Water re-use systems can reduce the extraction of freshwater resources.</li> </ul>	

Subsector	Risk Area	Risks	Opportunities
1.12 Food and agri-business - Spices	Land and Agriculture	<ul style="list-style-type: none"> <li>- Wild harvest methods can reduce the ability of the species to recover and therefore future harvests.</li> </ul>	<ul style="list-style-type: none"> <li>- Better practices for water use, pest control and waste management can help farmers minimize environmental impacts and often save money.</li> <li>- Switching to organic farming methods may also open up new markets in developed countries.</li> </ul>
	Further Information:	<p>Schippmann, Leamann and Cunningham 2002, FAO. Impact of Cultivation and Issues. <a href="ftp://193.43.36.93/docrep/FAO/005/aa010e/AA010E00.pdf">ftp://193.43.36.93/docrep/FAO/005/aa010e/AA010E00.pdf</a></p>	<p>Schippmann, Leamann and Cunningham 2002, FAO. Impact of Cultivation and Gathering of Medicinal Plants on Biodiversity: Global Trends and Issues.</p>
	(HC) Chemicals and Waste	<ul style="list-style-type: none"> <li>- The spice sector deals with sustainability issues such as uncontrolled use of agro-chemicals.</li> </ul>	<ul style="list-style-type: none"> <li>- Better practices for waste irrigation, pest control and waste management can help farmers minimize environmental impacts and often save money.</li> <li>- Organic certification can reduce chemical use and possibly provide access to higher value end-consumer markets. The use of intercropping and biological pest control can reduce the application levels of pesticides.</li> </ul>
	Biodiversity	<ul style="list-style-type: none"> <li>- The clearing of forest for cultivation can reduce the level of biodiversity.</li> </ul>	<ul style="list-style-type: none"> <li>- Intercropping can retain a high level of biodiversity, pollinators and a diversified income stream.</li> </ul>
	Forests	<ul style="list-style-type: none"> <li>- Forest may be cleared for cultivation and reduce the ability of forests to sink and store atmospheric carbon.</li> </ul>	<ul style="list-style-type: none"> <li>- Certification of sustainable production methods can communicate to consumers the impact of the product on forest areas.</li> </ul>
	Fresh water resources	<ul style="list-style-type: none"> <li>- Issues such as uncontrolled pesticide use and poor wastewater management can have a negative impact on water systems.</li> </ul>	<ul style="list-style-type: none"> <li>- Guidelines for irrigation practises can improve the efficiency of water use.</li> <li>- Integrated pest management or improved pest management controls can be promoted to reduce pesticide use.</li> </ul>
	Land and Agriculture	<ul style="list-style-type: none"> <li>- Environmental concerns of spice farming and wild-collection vary by crop and surrounding ecosystem. Poor agricultural practices and the lack of adequate processing facilities has been a concern for some spice markets.</li> <li>- Intensive farming can reduce soil fertility and increase the need for fertilizers.</li> </ul>	<ul style="list-style-type: none"> <li>- Better practices for waste irrigation, pest control and waste management can help farmers minimize environmental impacts and often save money.</li> <li>- Switching to organic farming methods may also open up new markets in developed countries. This could be supplemented with consumer awareness in these markets, as the majority of spice crops are purchased by retailers and processors and are not visible to final consumers.</li> </ul>

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Subsector	Risk Area	Risks	Opportunities
1.13 Food and agri-business - Tea	Further Information: (HC) Land and Agriculture	<p>Guillou Pascale, and Marjon van Opijnen, 2010, Could you pass me the Sustainable pepper, please? Towards a sustainable spices supply chain, Keys findings and sector recommendations, CREM in collaboration with Both ENDS and Cordaid. <a href="http://www.bothends.org/uploaded_files/document/6Sustainable%20Spices-Boths%20ENDS%20-%20Cordaid%20-%20October.pdf">http://www.bothends.org/uploaded_files/document/6Sustainable Spices-Boths ENDS - Cordaid - CREM - October .pdf</a></p> <ul style="list-style-type: none"> <li>- Environmental concerns of tea cultivation include the clearance of land, the resulting habitat loss, over-use of pesticides and soil quality degradation.</li> </ul>	<ul style="list-style-type: none"> <li>- Towards a sustainable spices supply chain, Keys findings and sector recommendations, CREM in collaboration with Both ENDS and Cordaid. <a href="http://www.bothends.org/uploaded_files/document/6Sustainable Spices-Boths ENDS - Cordaid - CREM - October .pdf">http://www.bothends.org/uploaded_files/document/6Sustainable Spices-Boths ENDS - Cordaid - CREM - October .pdf</a></li> </ul>
		<ul style="list-style-type: none"> <li>- Intercropping, the use of biological pest control, and good management practises can increase the quality and fertility of the soil and reduce long-term costs resulting from the need for increased fertiliser and pesticide use.</li> <li>- Switching to organic farming methods may also open up new markets in developed countries.</li> </ul>	
	Air and Climate	<ul style="list-style-type: none"> <li>- Production, storage and transport of production inputs and tea result in high levels of emissions.</li> </ul>	<ul style="list-style-type: none"> <li>- Best practise guidelines can be issued to producers, suppliers and consumers on how they can best contribute to reduced emissions.</li> </ul>
	Energy and resources	<ul style="list-style-type: none"> <li>- The drying processes uses fuel.</li> <li>-Synthetic packaging requires energy and takes a long time to degrade.</li> </ul>	<ul style="list-style-type: none"> <li>- The use of organic packaging and efficient drying techniques can reduce fuel consumption and the impact of waste on landfill sites.</li> </ul>
	Biodiversity	<ul style="list-style-type: none"> <li>- The clearing of forest for farms can reduce the level of biodiversity, especially when replaced with large areas of monoculture.</li> </ul>	<ul style="list-style-type: none"> <li>- Intercropping can retain habitats and associated biodiversity.</li> </ul>
	Forests	<ul style="list-style-type: none"> <li>- The clearing of forest for farms can reduce the ability to sink and store atmospheric carbon, and reduces its ability to control soil erosion and retain water.</li> </ul>	<ul style="list-style-type: none"> <li>- Certification of sustainable production methods can communicate to consumers the impact of the product on forest areas.</li> </ul>
	Fresh water resources	<ul style="list-style-type: none"> <li>- Practises that over-use fertilizers can be detrimental to nearby water sources. Monocultures require an increased use of pesticide per unit area and this can be detrimental to water sources and the farmers who apply it.</li> </ul>	<ul style="list-style-type: none"> <li>- Better practices for water irrigation and effective use of fertiliser can relieve pressures on water sources.</li> <li>- Intercropping and improved pest management practises can reduce the need for large amounts of pesticide applications.</li> </ul>
	Chemicals and Waste	<ul style="list-style-type: none"> <li>- Pesticide use can negatively impact nearby waterways.</li> </ul>	<ul style="list-style-type: none"> <li>- Better practices for pest control and waste management can help farmers minimize environmental impacts and often save money.</li> </ul>
	Further Information:	<p><i>Ethical Consumer, 2013. Report on the Tea Industry</i> – December 2013. Last Access 11/10/2015. <a href="http://www.ethicalconsumer.org/ethicalreports/tea-industry-report.aspx">http://www.ethicalconsumer.org/ethicalreports/tea-industry-report.aspx</a></p> <p>Groosman, 2011. Sector Overview: Tea. IDH, The sustainable trade initiative. <a href="http://www.idhsustainabletrade.com/site/getfile.php?id=184">www.idhsustainabletrade.com/site/getfile.php?id=184</a></p>	



Subsector	Risk Area	Risks	Opportunities
<b>2.1 Fair trade and environmental exports - Biodiversity-based products</b>	(HC) Biodiversity	<ul style="list-style-type: none"> <li>- Biodiversity can be a substantial source of value. There are risks however, that such products will be unsustainably harvested or collected from the wild, not allowing viable reproductive time for populations to replenish.</li> </ul>	<ul style="list-style-type: none"> <li>- Appropriate mechanisms can be put in place to ensure sustainable harvest levels and reduce pressure on wild populations, such as adhering to CITES regulations.</li> </ul>
	Forests	<ul style="list-style-type: none"> <li>- Certain techniques for harvesting biodiversity-related products from forests (trees, wild plants, animals) can be detrimental to the survival of the species and the capacity of services that forests provide.</li> </ul>	<ul style="list-style-type: none"> <li>- Switching to organic farming methods may open up new markets in developed countries.</li> </ul>
	Fresh water resources	<ul style="list-style-type: none"> <li>- For cultivated biodiversity-based products the application of fertiliser and pesticide can pollute fresh water resources.</li> <li>- Processing of oils and other biodiversity related products requires the use of chemicals and may release by-products into adjoining waterways.</li> </ul>	<ul style="list-style-type: none"> <li>- Better practices for water irrigation and effective use of fertiliser can relieve pressures on water sources</li> <li>- Better practices for pest control and waste management can help farmers minimize environmental impacts and often save money.</li> <li>- Better practices for waste irrigation, pest control and waste management can help farmers and processors minimize environmental impacts and often save money.</li> </ul>
	Further Information:		
<b>2.2 Fair trade and environmental exports - Fair trade and environmental exports</b>	(HC) Air and Climate	<ul style="list-style-type: none"> <li>- Fair trade and environmental exports vary greatly but, as with all manufactured goods, the energy use of production and waste is an issue.</li> <li>- Transport of raw materials and final products increase the carbon footprint of the goods.</li> <li>- Inefficient energy use for production will incur avoidable cost and avoidable emissions.</li> </ul>	<ul style="list-style-type: none"> <li>- There are a wide range of mitigation measures such as the optimization of manufacturing, materials transportation, installation, maintenance, dismantlement and disposal practices.</li> <li>- Reducing negative effects on wildlife, land-use change and water resources should also be of high priority.</li> </ul>
	(HC) Energy and Minerals	<ul style="list-style-type: none"> <li>- Energy-intensive infrastructure can reduce net emission reductions of renewable technologies.</li> <li>- Energy-efficient vehicles and battery-storage appliances place heavy demands on rare earth elements.</li> <li>- Inefficient energy use for production will incur avoidable cost.</li> </ul>	<ul style="list-style-type: none"> <li>- The life cycle of Fair trade and environmental exports should be assessed and compared to alternatives to find the least polluting and costly option.</li> <li>- A closed-loop production cycle could reuse rare earth materials and other inputs with depleting natural stocks.</li> </ul>

Subsector	Risk Area	Risks	Opportunities
	Forests	<ul style="list-style-type: none"> <li>- The impact of clearing forest for the cultivation of biofuel crops should be taken into account in life cycle assessments comparing the net carbon benefits of different technologies.</li> </ul>	<ul style="list-style-type: none"> <li>- Consideration of the carbon footprint of biofuel crops will allow a more accurate evaluation of the life technologies life cycle.</li> </ul>
	Fresh water resources	<ul style="list-style-type: none"> <li>- Production processes require large amounts of water.</li> <li>- Water usage for the cultivation of biofuel crops can be significant.</li> </ul>	<ul style="list-style-type: none"> <li>- Production processes require the appropriate handling and disposal of waste by-products and the reuse of water in production systems can relieve pressure on limited freshwater stocks.</li> </ul>
	Marine and Coastal Areas	<ul style="list-style-type: none"> <li>- Technologies such as wind, wave and tidal have unknown consequences on seabed habitats.</li> </ul>	<ul style="list-style-type: none"> <li>- Pilot schemes should assess the feasibility of these projects and their impact on the environment.</li> </ul>
	Chemicals and Waste	<ul style="list-style-type: none"> <li>- Production processes can result in chemical and other waste products</li> </ul>	<ul style="list-style-type: none"> <li>- Production processes require the appropriate handling and disposal of by-product waste</li> </ul>
	Further Information:	<p>DG ENTERPRISE. 2014. REPORT ON CRITICAL RAW MATERIALS FOR THE EU. Report of the Ad hoc Working Group on defining critical raw materials. <a href="http://ec.europa.eu/growth/sectors/raw-materials/specific-interest/critical/index_en.htm">http://ec.europa.eu/growth/sectors/raw-materials/specific-interest/critical/index_en.htm</a></p> <p>Frid et al 2011. The environmental interactions of tidal and wave energy generation devices. <a href="http://www.vliz.be/imisdocs/publications/224420.pdf">www.vliz.be/imisdocs/publications/224420.pdf</a></p>	
<b>2.3 Fair trade and environmental exports- Organic products</b>	Land and Agriculture	<p>(General) Organic industry encompasses a wide range of products (including food, cosmetics and clothing).</p>	<ul style="list-style-type: none"> <li>- In general, organic practises promote soil fertility and structure by applying organic waste materials to the soil.</li> </ul>
	Fresh water resources	<ul style="list-style-type: none"> <li>- Pesticide use is often used for organic production which can run-off into inland water supplies.</li> </ul>	<ul style="list-style-type: none"> <li>- Pesticide use can be reduced through intercropping and Integrated Pest management.</li> </ul>
	Energy and minerals	<ul style="list-style-type: none"> <li>- Negative environmental impact is limited and mainly associated with cultivation of source crops and transportation of produced goods.</li> </ul>	<ul style="list-style-type: none"> <li>- Mitigation measures include optimisation of best practices and implementation of new technologies to reduce negative environmental effects at all stages of product life cycle. Consumers may be willing to pay a price premium for local produce.</li> </ul>
	Further Information:	<p>Tuomisto et al 2012. Does organic farming reduce environmental impacts? – A meta-analysis of European research. <a href="http://www.sciencedirect.com/science/article/pii/S0301479712004264">http://www.sciencedirect.com/science/article/pii/S0301479712004264</a></p>	
<b>3.1 Manufactured goods - Creative industries</b>	Energy and Minerals	<ul style="list-style-type: none"> <li>- Creative industries generally have a low economic impact. Energy use and the use of air traffic may be considered.</li> </ul>	<ul style="list-style-type: none"> <li>- Better practices include application of energy-efficient technologies and sustainable sourcing of eco-friendly materials.</li> </ul>
	Further Information:	<p>Forum for the Future, 2010. The creative industries. <a href="https://www.forumforthefuture.org/sites/default/files/project/downloads/creativeindustriessustainabilitybeaconproject.pdf">https://www.forumforthefuture.org/sites/default/files/project/downloads/creativeindustriessustainabilitybeaconproject.pdf</a></p>	<p>Beacon Project Final Report.</p>

Subsector	Risk Area	Risks	Opportunities
<b>3.2 Manufactured goods - Fibres (Synthetic)</b>	Fresh water resources	- Production and processing of synthetic fibre requires water as an input. This can put a strain on waterways and impact other users and waterway ecosystems.	- Efficient water recovery and reuse can reduce the strain on the environment, and provide resilience and reduced risk when water supplies are running low.
	Air and Climate	- Emissions associated with sourcing raw materials, processing and transport of final products are large.	- Assessment of transport and distribution options can allow a cost-effective and emission-friendly option to be selected.
	Chemicals and Waste	- Disposal of waste from production processes can be detrimental to the disposal site and the surrounding ecosystem.	- International standards for waste disposal should be adhered to.
	Energy and Minerals	- Production processes require large amounts of energy. Inefficient technologies can waste energy and result in avoidable consumption.	- Best practise and energy efficient production technologies can reduce long-term costs by reducing long-term energy requirements.
	Further Information:	Shen et al 2010. Environmental <a href="http://www.sciencedirect.com/science/article/pii/S092134491000217X">http://www.sciencedirect.com/science/article/pii/S092134491000217X</a>	impact assessment of man-made cellulose fibres.
<b>3.3 Manufactured goods - Leather</b>	(HC) Fresh water resources	- The primary environmental threat involves the dumping into waterways of solid and liquid waste that contains leftover chromium and other hazardous compounds.	- Best practice pollution control systems can be uneconomical for many developing country tanneries. However, there may be a number of relatively inexpensive practices to reduce worker exposure and environmental damage.
	(HC) Chemicals and Waste	- The tanning process may pose many dangers to the environment. The primary environmental threat involves the dumping into waterways of solid and liquid waste that contains leftover chromium and other hazardous compounds. This is commonplace in regions without strong environmental protection standards.	- Certification can require minimal inputs of certain chemicals and allow processors to reach international markets and reduce worker exposure to chemicals.
	Forests	- Cleared forest for pastureland reduces soil erosion control, habitat diversity, and carbon storage.	- Certification of leather requires the hide source, which can be used to assess the environmental impact of the livestock the tannery sources.
	Land and Agriculture	- Raising animals for food and leather requires huge amounts of feed, pastureland, water, and fossil fuels.	- Appropriate treatment and disposal of waste products can reduce the lasting impacts chemicals may have on the environment and land.
	Further information	FAO 1996. Management of Waste from Animal Product Processing. <a href="http://www.fao.org/wairdocs/lead/x6114e/x6114e00.htm#Contents">http://www.fao.org/wairdocs/lead/x6114e/x6114e00.htm#Contents</a> IFC 2007. Environmental, Health, and Safety Guidelines for Tanning and Leather Finishing. <a href="http://www.ifc.org/wps/wcm/connect/de6c3d00488556f2bb14fb6a6515bb18/Final+-Tanning+and+Leather+Finishing.pdf?MOD=AJPERES">http://www.ifc.org/wps/wcm/connect/de6c3d00488556f2bb14fb6a6515bb18/Final+-Tanning+and+Leather+Finishing.pdf?MOD=AJPERES</a>	

Subsector	Risk Area	Risks	Opportunities
<b>3.4 Manufactured goods - Machinery</b>	(HC) Energy and Minerals	<ul style="list-style-type: none"> <li>- Inefficient energy use for production will incur avoidable cost.</li> <li>- Raw materials must be extracted from the ground. Stocks of some metals may face volatile supplies.</li> </ul>	<ul style="list-style-type: none"> <li>- Energy efficient machinery should be promoted where possible</li> <li>- The raw materials and machinery or product parts should be processed or produced using energy efficient processes.</li> <li>- Reuse and recycle schemes can reduce susceptibility to dwindling stocks of certain raw materials and reduce negative environmental impacts associated with extraction processes.</li> </ul>
	Air and Climate	<ul style="list-style-type: none"> <li>- Inefficient energy use for production will incur avoidable cost and avoidable emissions.</li> </ul>	<ul style="list-style-type: none"> <li>- Assessment of transport and distribution options can allow a cost-effective and emission-friendly option to be selected.</li> </ul>
	Chemicals and Waste	<ul style="list-style-type: none"> <li>- The improper handling and disposal of industrial waste can negatively impact the environment it is placed in.</li> </ul>	<ul style="list-style-type: none"> <li>- International waste management standards (such as ISO) can help to facilitate proper waste management and increase quality and consistency.</li> </ul>
	Further Information:	Environment Life Cycle, webpage, <a href="http://www3.niu.edu/~c90mdk1/ems/environmental.htm#eZ">http://www3.niu.edu/~c90mdk1/ems/environmental.htm#eZ</a> Northern	Illinois University. Last access 11/11/2015.
<b>3.5 Manufactured goods - Paper/ Packaging</b>	(HC) Air and Climate	<ul style="list-style-type: none"> <li>- Air pollution with nitrous, sulphur and carbon dioxides during paper production is a concern.</li> <li>- Harvest and transport of raw material and the final products can release significant emissions.</li> </ul>	<ul style="list-style-type: none"> <li>- Guidelines on the most cost-effective low emission production processes can mitigate emissions, reduce long-term costs and promote worker health and safety.</li> </ul>
(HC) Forests	<ul style="list-style-type: none"> <li>- The paper industry accounts for a large proportion of harvested trees. Paper comes from a mix of forested areas and plantations. As a result, deforestation is a key concern.</li> </ul>	<ul style="list-style-type: none"> <li>- Certifications can contribute to more sustainable forestry and plantation management practices.</li> <li>- The use of recycled material for production can also help reduce deforestation rates.</li> </ul>	
Biodiversity	<ul style="list-style-type: none"> <li>- The clearance of forest habitat can reduce the connectivity of ecosystems and the level of biodiversity.</li> </ul>	<ul style="list-style-type: none"> <li>- Suitable forest management practises can ensure a level of connectivity between adjoining ecosystems to reduce the impact on existing biodiversity levels.</li> </ul>	
Energy and Minerals	<ul style="list-style-type: none"> <li>- Paper production uses a large amount of energy.</li> <li>- During packaging production, the use of petroleum-based oils can also be environmentally damaging.</li> </ul>	<ul style="list-style-type: none"> <li>- Printing and packaging production using vegetable based oils may lower the environmental risk.</li> <li>- Energy efficient production processes can reduce long-term energy requirements and therefore costs.</li> </ul>	

Subsector	Risk Area	Risks	Opportunities
<b>3.6 Manufactured goods - Pharmaceuticals</b>	Fresh water resources	<ul style="list-style-type: none"> <li>- Nutrient discharge can cause eutrophication, and contamination of water from processing chemicals can have detrimental effects on water resources.</li> </ul>	<ul style="list-style-type: none"> <li>-Guidelines for the most appropriate handling and disposal of waste chemicals from treatment processes can be implemented.</li> </ul>
	Chemicals and Waste	<ul style="list-style-type: none"> <li>- Additionally, the paper production process often produces hazardous wastewater like during the bleaching of wood pulp.</li> </ul>	<ul style="list-style-type: none"> <li>- International standards for waste management should be adhered to.</li> </ul>
	Land and Agriculture	<ul style="list-style-type: none"> <li>-The unsustainable harvest of secondary forest can reduce the ability for regrowth.</li> <li>-Erosion control functions can be reduced which can have negative impacts on nearby settlements.</li> </ul>	<ul style="list-style-type: none"> <li>- Certifications can contribute to more sustainable forestry and plantation management practices.</li> </ul>
	Further Information:	Kenneth Marsh and Betty Bugusu, 2007. Scientific <a href="http://www.ift.org/~media/Knowledge%20Center/Science%20Reports/Scientific%20Status%20Summaries/Editorial/editorial_0407_foodpackaging.pdf">http://www.ift.org/~media/Knowledge%20Center/Science%20Reports/Scientific%20Status%20Summaries/Editorial/editorial_0407_foodpackaging.pdf</a>	Institute of Food Technologists.
<b>3.6 Manufactured goods - Pharmaceuticals</b>	Chemicals and Waste	(General) A substantial fraction of the global production of pharmaceuticals takes place in low-cost production countries. <ul style="list-style-type: none"> <li>- Because of the high solubility of most pharmaceutical products, aquatic organisms are especially vulnerable to their effects.</li> </ul>	<ul style="list-style-type: none"> <li>- Proper management of pharmaceutical manufacturing facilities is important to minimize the chances of environmental impacts.</li> </ul>
	Biodiversity	<ul style="list-style-type: none"> <li>- Pharmaceuticals that are derived from biodiversity-based products also raise concerns about the sustainability of propagation or wild collection.</li> </ul>	<ul style="list-style-type: none"> <li>-International guidelines on the treatment of water with chemicals should be implemented to reduce adverse impacts on biodiversity and human health.</li> </ul>
	Further information:	BIO Intelligence Service (2013), Study on the environmental risks of medicinal products, Final Report prepared for Executive Agency for Health and Consumers. <a href="http://ec.europa.eu/health/files/environment/study_environment.pdf">http://ec.europa.eu/health/files/environment/study_environment.pdf</a>	

Subsector	Risk Area	Risks	Opportunities
<p><b>3.7 Manufactured goods - Textiles and clothing</b></p>	<p>(HC) Chemicals and Waste</p>	<p>The exact environmental impact of textile and clothing production varies depending on the type of fibre the items are made from.</p> <ul style="list-style-type: none"> <li>- Manufacturing processes such as washing, (water heating and detergents); bleaching; and dyeing of textiles can release ecotoxic chemicals.</li> <li>- Toxicity, hazardous waste and effluent associated with all stages of production (including pre-treatment chemicals, dyes and finishes) are also significant concerns that should be taken into account.</li> <li>- Synthetic fibres are difficult to recycle and they are small enough to be ingested by wildlife, working their way into food chains.</li> <li>- The cultivation of fibre crops involves intensive water use and the resulting contamination of water from fertiliser, herbicide and pesticides.</li> </ul>	<ul style="list-style-type: none"> <li>- Implementing waste reducing design and clean production adjustments such as waterless dyeing and reuse, reduce and recycle policies could help to improve efficiency and reduce resource depletion as well as pollution.</li> <li>- Implementing best practices in technological innovation is important for improving environmental and carbon footprints of manufacturing processes.</li> <li>- Supporting information exchange about innovative solutions is crucial to address sustainability challenges and objectives.</li> <li>- Educating producers and manufacturers about international social and environmental standards and requirements can help to lessen the environmental impact of the industry.</li> </ul>
	<p>Energy and Minerals</p>	<ul style="list-style-type: none"> <li>- Production processes entail intensive energy use.</li> <li>- High energy use in the processing of fossil fuels into synthetic fibres (e.g. polyester, nylon)</li> </ul>	<ul style="list-style-type: none"> <li>- Implementing best practices in technological innovation is important for improving environmental and carbon footprints of manufacturing processes.</li> </ul>
	<p>Air and Climate</p>	<ul style="list-style-type: none"> <li>- Direct greenhouse gas emissions are produced from factory processes, and indirect emissions are released in the production and transport of raw materials, and transport of final product.</li> </ul>	<ul style="list-style-type: none"> <li>- Factories can utilise best practise energy efficient processes to reduce emissions.</li> </ul>
	<p>Fresh water resources</p>	<ul style="list-style-type: none"> <li>- The cultivation of fibre crops involves fertiliser, herbicide and pesticide use, which can cause eutrophication and be harmful to wildlife.</li> </ul>	<ul style="list-style-type: none"> <li>- Better practices for water irrigation and effective use of fertiliser can relieve pressures on water sources.</li> <li>- Better practices for pest control and waste management can help farmers minimize environmental impacts and often save money.</li> </ul>
	<p>Land and Agriculture</p>	<ul style="list-style-type: none"> <li>- The cultivation of fibre crops involves fertiliser, herbicide and pesticide use resulting in the loss of soil fertility among other impacts.</li> </ul>	<ul style="list-style-type: none"> <li>- A wide range of mitigating practices can be applied. One of them is sustainable sourcing (including sourcing local production).of eco-friendly raw materials, fibres and natural dyes</li> <li>- Social and environmental responsibility can be addressed by promoting fair production and transparent value chains.</li> </ul>

Subsector	Risk Area	Risks	Opportunities
	Further Information:	Muthu 2014. Assessing the Environmental Impact of Textiles and the Clothing Supply Chain. Link to table of contents: <a href="http://www.sciencedirect.com/science/book/9781782421047">http://www.sciencedirect.com/science/book/9781782421047</a>	
<b>3.8 Manufactured goods - Wood and Wood Products</b>	(HC) Forests	<ul style="list-style-type: none"> <li>- Unlike paper, wood usually come from larger, older trees, leading to possible old-growth forest destruction.</li> </ul>	<ul style="list-style-type: none"> <li>- Working with wood product manufacturers to source from sustainably certified sources (like FSC) can improve the sustainability and raise the value of products, especially in export markets.</li> <li>- Forest management best-practises can be implemented to ensure the capacity for sinking and storing carbon is not reduced.</li> <li>- Traceability systems can reduce the trade of illegal harvest.</li> </ul>
	(HC) Land and Agriculture	<ul style="list-style-type: none"> <li>- The unsustainable harvest of secondary forest can reduce the ability for regrowth.</li> <li>- Erosion control functions can be impact soil and slope structure which can result in negative impacts on downhill settlements.</li> </ul>	<ul style="list-style-type: none"> <li>- Working with wood product manufacturers to source from sustainably certified sources (like FSC) can improve the sustainability and raise the value of products, especially in export markets.</li> <li>- Forest management practises can be implemented to retain soil structure and erosion capacity of the land.</li> </ul>
	Air and Climate	<ul style="list-style-type: none"> <li>- Clearing of forests reduces the carbon stored by trees, while the combustion of wood releases greenhouse gases into the atmosphere. This contributes to the reduction of the earth's ability to sink and store atmospheric carbon as well as increasing atmospheric carbon levels.</li> <li>- Pollution from the harvest and transport of raw material and final product results in carbon emissions.</li> </ul>	<ul style="list-style-type: none"> <li>- Forest management best-practises can be implemented to ensure the capacity for sinking and storing carbon is not reduced.</li> </ul>
	Biodiversity	<ul style="list-style-type: none"> <li>- Habitat loss from deforestation reduces biodiversity levels.</li> <li>- The structure of established water-ways in forests can be altered, affecting water-dwelling species.</li> </ul>	<ul style="list-style-type: none"> <li>- Forest management best-practises can be implemented to ensure the capacity for sinking and storing carbon is not reduced.</li> </ul>
	Fresh water resources	<ul style="list-style-type: none"> <li>- The quality of water downstream of cleared forest can be negatively impacted as larger volumes of water run-off the surface rather than filtering through the soil.</li> </ul>	<ul style="list-style-type: none"> <li>- Forest management best-practises can be implemented to ensure the water retention and filtration functions of the forest are retained.</li> </ul>
	Chemicals and Waste	<ul style="list-style-type: none"> <li>- Chemicals are used in the processing of final wood products which can have a negative impact on the environment of disposal sites.</li> </ul>	<ul style="list-style-type: none"> <li>- Guidelines on the minimal usage of chemicals in processing products can help to promote reductions in their use.</li> </ul>

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Subsector	Risk Area	Risks	Opportunities
	Further Information: FAO, 2002. Environment and energy balances of wood products and substitutes. <a href="http://www.fao.org/docrep/004/y3609e/y3609e07.htm">http://www.fao.org/docrep/004/y3609e/y3609e07.htm</a>		
<b>4.1 Trade in services - Construction Services</b>	(HC) Energy and Minerals	<ul style="list-style-type: none"> <li>- Directly, construction uses large amounts of energy and materials.</li> <li>- Indirectly, the way that buildings are constructed has a critical "lock-in" effect on energy use.</li> </ul>	<ul style="list-style-type: none"> <li>- Promotion of energy efficient buildings is important and leads to high environmental benefits for the environment and the building's owners and occupants.</li> </ul>
	(HC) Chemicals and Waste	<ul style="list-style-type: none"> <li>- The disposal of construction waste may also be a concern.</li> </ul>	<ul style="list-style-type: none"> <li>- International guidelines on chemicals and waste disposal should be implemented to reduce negative impacts on the environment.</li> </ul>
	Air and Climate	<ul style="list-style-type: none"> <li>- Extraction and transport of raw materials as well as the production of cement can release significant emissions.</li> </ul>	<ul style="list-style-type: none"> <li>- Sourcing local raw materials or via less polluting transport can reduce relative associated transport emissions.</li> </ul>
	Forests	<ul style="list-style-type: none"> <li>- Construction can also encroach on environmentally sensitive areas and uses wood-based products.</li> </ul>	<ul style="list-style-type: none"> <li>- Materials used in extraction/production should be sourced from firms adhering to international standards.</li> </ul>
	Land and Agriculture	<ul style="list-style-type: none"> <li>- Development activity can reduce land available for agriculture.</li> <li>- Extraction of raw materials can require large amounts of water and also render adjacent land unsuitable for agriculture.</li> </ul>	<ul style="list-style-type: none"> <li>- Guidelines on water consumption and efficient practises can improve the sustainability of operations.</li> </ul>
	Further Information:	Horvath 2004. Construction Materials and the Environment. <a href="http://sites.harvard.edu/fs/docs/icb.topic661271.files/Horvath_Constr%20and%20the%20Environment.pdf">http://sites.harvard.edu/fs/docs/icb.topic661271.files/Horvath_Constr%20and%20the%20Environment.pdf</a>	
<b>4.2 Trade in services - Investment / Financial Services</b>	All areas	<ul style="list-style-type: none"> <li>- Directly, financial services have little impact on the environment. Indirectly, however, what projects are financed can have profound and long-lasting effects on the environment.</li> </ul>	<ul style="list-style-type: none"> <li>- Financial firms can be key partners for making environmentally sound investment decisions. Many developing country financial firms do not have environmental impact screening and due diligence in place. Finding ways to help firm's assess environmental impacts or their investments can lead to substantial economy-wide benefits.</li> </ul>
	Further Information:	Investing for social and environmental impact, a design for catalysing an emerging industry, 2009. Monitor Institute. <a href="http://monitorinstitute.com/downloads/what-we-think/impact-investing/Impact_Investing.pdf">http://monitorinstitute.com/downloads/what-we-think/impact-investing/Impact_Investing.pdf</a>	
<b>4.3 Trade in services - IT &amp; IT-</b>	Air and Climate	<ul style="list-style-type: none"> <li>- Extraction, production, usage and transport of raw materials, final products and waste can lead to significant emissions.</li> </ul>	<ul style="list-style-type: none"> <li>- Energy-efficient supply chains and products can reduce energy consumption and the lifecycle carbon footprint potential.</li> </ul>



Subsector	Risk Area	Risks	Opportunities
<b>enabled Business Services</b>	Energy and Minerals	<ul style="list-style-type: none"> <li>- Key environmental impacts of IT sector include: high energy consumption contributing to greenhouse gas emissions; air, water and soil pollution, ozone formation and bioaccumulation of toxins due to hazardous constituents in office equipment; E-waste (discarded electrical and electronic devices, intensive use of consumable materials (e.g. paper and ink) for imaging equipment; use of energy, finite resources and harmful emission from IT appliances production.</li> </ul>	<ul style="list-style-type: none"> <li>- Implementing IT equipment recycling, longer life and take back programmes could help to reduce E-waste generation.</li> <li>- Green procurement for electronics (favouring energy-saving, high-efficiency products with restricted amount of hazardous constituents) and virtualisation of servers are good ways to lower greenhouse gas emissions and contamination risks.</li> <li>- Implementing recycling policies for consumable materials and improving capacity planning to limit over-provisioning are some of the methods to reduce natural resources depletion and waste generation.</li> </ul>
	Chemicals and Waste	<ul style="list-style-type: none"> <li>- E-waste poses a serious threat to human and environmental health.</li> </ul>	<ul style="list-style-type: none"> <li>- International standards for waste treatment should be adhered to. Enforcement of regulations should minimise illegal disposal.</li> </ul>
	Further Information:	<p>Yi and Thomas, 2007. A review of research on <a href="http://www.sciencedirect.com/science/article/pii/S0160412007000736">http://www.sciencedirect.com/science/article/pii/S0160412007000736</a></p>	<ul style="list-style-type: none"> <li>- the environmental impact of e-business and ICT.</li> </ul>
<b>4.4 Trade in services - Tourism</b>	(HC) Air and Climate	<ul style="list-style-type: none"> <li>- The largest impact of tourism is on the greenhouse gas emissions from associated air travel.</li> </ul>	<ul style="list-style-type: none"> <li>- While air travel is critical to tourism, offsetting may provide one means of mitigating its impact.</li> </ul>
	Biodiversity	<ul style="list-style-type: none"> <li>-Demand for wildlife related souvenirs can reduce the ability of wild populations to sustain.</li> </ul>	<ul style="list-style-type: none"> <li>- Additionally, tourism has the potential to create beneficial effects on the environment by contributing to environmental protection and conservation. It is a way to raise awareness of environmental values and it can serve as a tool to finance protection of natural areas and increase their economic importance.</li> </ul>
	Energy and Minerals	<ul style="list-style-type: none"> <li>- Construction of general infrastructure such as roads and airports, and of tourism facilities, including resorts, hotels, restaurants, shops, golf courses and marinas.</li> </ul>	<ul style="list-style-type: none"> <li>- Wise decision making on the construction of tourism infrastructure is key.</li> </ul>
	Marine and Coastal Areas	<ul style="list-style-type: none"> <li>- Construction of tourism facilities, including resorts, hotels, restaurants, shops, golf courses and marinas.</li> </ul>	<ul style="list-style-type: none"> <li>- Wise decision making on the construction of tourism infrastructure is key.</li> </ul>
	Chemicals and Waste	<ul style="list-style-type: none"> <li>- Inadequate sanitary systems can be placed under increased pressure resulting from a rapid increase in tourism.</li> </ul>	<ul style="list-style-type: none"> <li>- Sanitary systems can be developed to cope with increasing demand.</li> </ul>

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Subsector	Risk Area	Risks	Opportunities
<p><b>4.5 Trade in services - Transport, logistics, distribution</b></p>	<p>Further Information:</p>	<p>Environmental Impacts of Tourism – Global Level, UNEP, webpage. <a href="http://www.unep.org/resourceefficiency/Business/SectoralActivities/Tourism/FactsandFiguresaboutTourism/ImpactsOfTourism/EnvironmentalImpacts/EnvironmentalImpactsOfTourism-GlobalLevel/tabid/78777/Default.aspx">http://www.unep.org/resourceefficiency/Business/SectoralActivities/Tourism/FactsandFiguresaboutTourism/ImpactsOfTourism/EnvironmentalImpacts/EnvironmentalImpactsOfTourism-GlobalLevel/tabid/78777/Default.aspx</a></p>	<p>Last Access 12/11/2015.</p>
	<p>(HC) Air and Climate</p>	<ul style="list-style-type: none"> <li>- This creates air pollution, including nitrous oxides and particulates, and is a significant contributor to global warming through emission of carbon dioxide, for which transport is the fastest-growing emission sector. The human health impact of transport emissions is also of concern.</li> </ul>	<ul style="list-style-type: none"> <li>- The key way to reduce the environmental impact is to shift the mode of transportation to a less harmful method (e.g. airfreight to sea shipping or truck shipping to rail).</li> </ul>
	<p>(HC) Energy and Minerals</p>	<ul style="list-style-type: none"> <li>- Transport is significant because it is a major user of energy, and burns most of the world's petroleum.</li> </ul>	<ul style="list-style-type: none"> <li>- The key way to reduce the environmental impact is to shift the mode of transportation to a less harmful method (e.g. airfreight to sea shipping or truck shipping to rail).</li> </ul>
	<p>Marine and Coastal Areas</p>	<ul style="list-style-type: none"> <li>- Ineffective management of navigation can result in spilled cargo and subsequent negative effects on the marine environment.</li> </ul>	<ul style="list-style-type: none"> <li>- International standards for the containment of chemicals should be adhered to, and appropriate precautions taken to reduce potential risks to the environment.</li> </ul>
	<p>Chemicals and Waste</p>	<ul style="list-style-type: none"> <li>- Spillage and ineffective disposal of residue from containers can result in chemical leaching into the surrounding environment.</li> </ul>	<ul style="list-style-type: none"> <li>- International standards for the containment of chemicals should be adhered to, and appropriate precautions taken to reduce potential risks to the environment.</li> </ul>
	<p>Further Information:</p>	<p>Transport Research Knowledge centre, 2009. <a href="http://www.transport-research.info/Upload/Documents/200908/20090818_124030_53136_TRKC_Transport_and_the_Environment.pdf">http://www.transport-research.info/Upload/Documents/200908/20090818_124030_53136_TRKC_Transport_and_the_Environment.pdf</a></p>	<p>Transport and the Environment. <a href="http://www.transport-research.info/Upload/Documents/200908/20090818_124030_53136_TRKC_Transport_and_the_Environment.pdf">http://www.transport-research.info/Upload/Documents/200908/20090818_124030_53136_TRKC_Transport_and_the_Environment.pdf</a></p>
<p><b>4.6 Trade in services - Waste and environmental services</b></p>	<p>(HC) Fresh water resources</p>	<ul style="list-style-type: none"> <li>- Sanitation and sewage services can have negative impacts on water sources and therefore be a human health hazard as well as having negative consequences for the marine ecosystem.</li> </ul>	<ul style="list-style-type: none"> <li>- Waste avoidance, recycling and sound environmental management can help mitigate some environmental impacts. ISO14001 accreditation may be one tool that can help waste management firms.</li> </ul>
	<p>(HC) Marine and Coastal Areas</p>	<ul style="list-style-type: none"> <li>- Sanitation and sewage services can have negative impacts on water sources and therefore be a human health hazard as well as having negative consequences for the marine ecosystem.</li> </ul>	<ul style="list-style-type: none"> <li>- Services can promote energy extraction from sewage services, appropriate disposal of waste and general good practise.</li> <li>- Waste standards should be adhered to and minimize the impact on the marine environment.</li> </ul>
	<p>(HC) Chemicals and Waste</p>	<ul style="list-style-type: none"> <li>- Inappropriate disposal of harmful waste can have serious impacts on human health and environment.</li> </ul>	<ul style="list-style-type: none"> <li>- The traceability of waste disposal should be enforced to ensure waste disposal services are not having a detrimental impact on human and ecosystem health</li> </ul>

Subsector	Risk Area	Risks	Opportunities
Air and Climate		<ul style="list-style-type: none"> <li>- Organic waste can result in large amounts of methane emissions.</li> <li>- Extraction of waste for fuel can increase emissions.</li> <li>- Incineration of waste emits large amounts of carbon into the atmosphere.</li> </ul>	<ul style="list-style-type: none"> <li>- Methane emissions at selected disposal sites can be captured and used as fuel.</li> <li>- Prevent, reuse, recycle and other good waste management policies, and international standards for waste disposal should be adhered to.</li> </ul>
Biodiversity		<ul style="list-style-type: none"> <li>- Inefficient conservation actions can reduce the cost-effectiveness and results of programmes.</li> </ul>	<ul style="list-style-type: none"> <li>- All interventions should be cost-benefit assessed to efficiently allocate resources.</li> </ul>
Land and Agriculture		<ul style="list-style-type: none"> <li>- The disposal of waste can have serious environmental damage, including land degradation.</li> <li>- Waste management is particularly harmful in developing countries that lack effective regulations.</li> </ul>	<ul style="list-style-type: none"> <li>- Landfills can pollute their surrounding environment and render adjoining land and water resources incapable of supporting agricultural and other activities.</li> </ul>
Further Information:		Environment Protection Agency, 2002. Solid Waste <a href="http://www3.epa.gov/epawaste/nonhaz/municipal/pubs/ghg/f020206.pdf">http://www3.epa.gov/epawaste/nonhaz/municipal/pubs/ghg/f020206.pdf</a>	Management: A local Challenge with Global Impacts.





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