eco aral
Ecologically Oriented Development in the Aral Sea Region

ADAPTATION TO CLIMATE CHANGE
CLIMATE EXPERT APPROACH

german cooperation
DEUTSCHE ZUSAMMENARBEIT

Implemented by:
giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

CLIMATE EXPERT

adelphi

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Ecologically Oriented Development in the Aral Sea Region

A consulting package developed by the regional project Ecologically oriented regional development in the Aral Sea region, implemented in Uzbekistan and Kazakhstan by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ).

The consulting package presents the Climate Expert which was developed by the GIZ Sector project Sustainable Economic Policy in cooperation with adelphi consult GmbH.

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List of Abbreviations

BMZ	GERMAN FEDERAL MINISTRY FOR ECONOMIC COOPERATION AND DEVELOPMENT
CBA	COST-BENEFIT ANALYSIS
CE	CLIMATE EXPERT
CET	CLIMATE EXPERT TOOL
ECO ARAL	ECOLOGICALLY ORIENTED REGIONAL DEVELOPMENT IN THE ARAL SEA REGION
GDP	GROSS DOMESTIC PRODUCT
GIZ	DEUTSCHE GESELLSCHAFT FÜR INTERNATIONALE ZUSAMMENARBEIT (GIZ) GMBH
KAZ	KAZAKHSTAN
SMES	SMALL AND MEDIUM-SIZED ENTERPRISES
TOC	TRAINING OF CONSULTANTS
UZB	UZBEKISTAN

ADAPTATION TO CLIMATE CHANGE – THE CLIMATE EXPERT APPROACH

Facing the impacts of climate change is a key challenge of this century, not only for governments and communities, but also for businesses. Based on an Excel tool *(English / Russian)*, the Climate Expert (CE) approach helps small and medium-sized enterprises (SMEs) deal with climate change.

What is the Climate Expert about?

The CE entails a practical 5-step approach and working materials that help companies analyse climate change risks and opportunities and generate strong adaptation strategies.

Who is the Climate Expert for?

The CE approach was developed for SMEs that are or will be affected by climate change. It also addresses consultants, experts and multipliers who want to support the private sector in adapting to climate change.

What are the 5 steps of the Climate Expert approach?

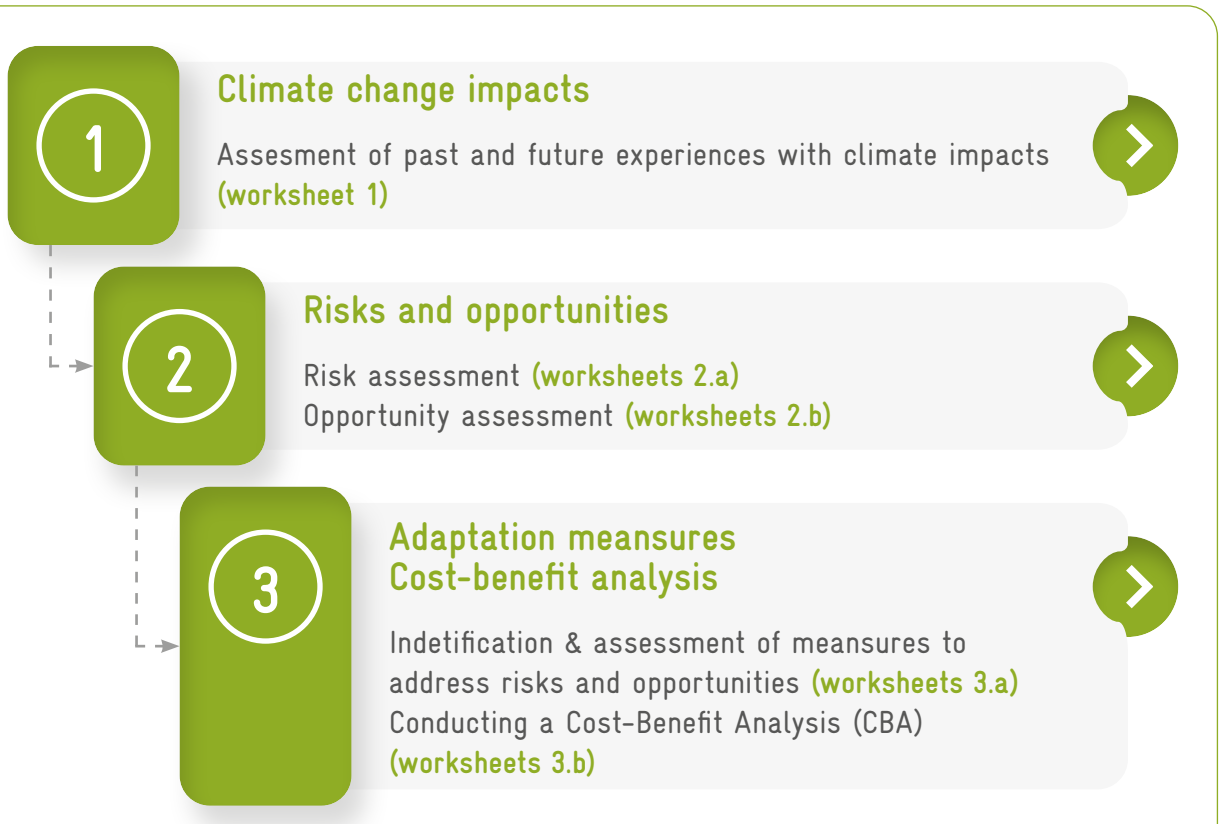
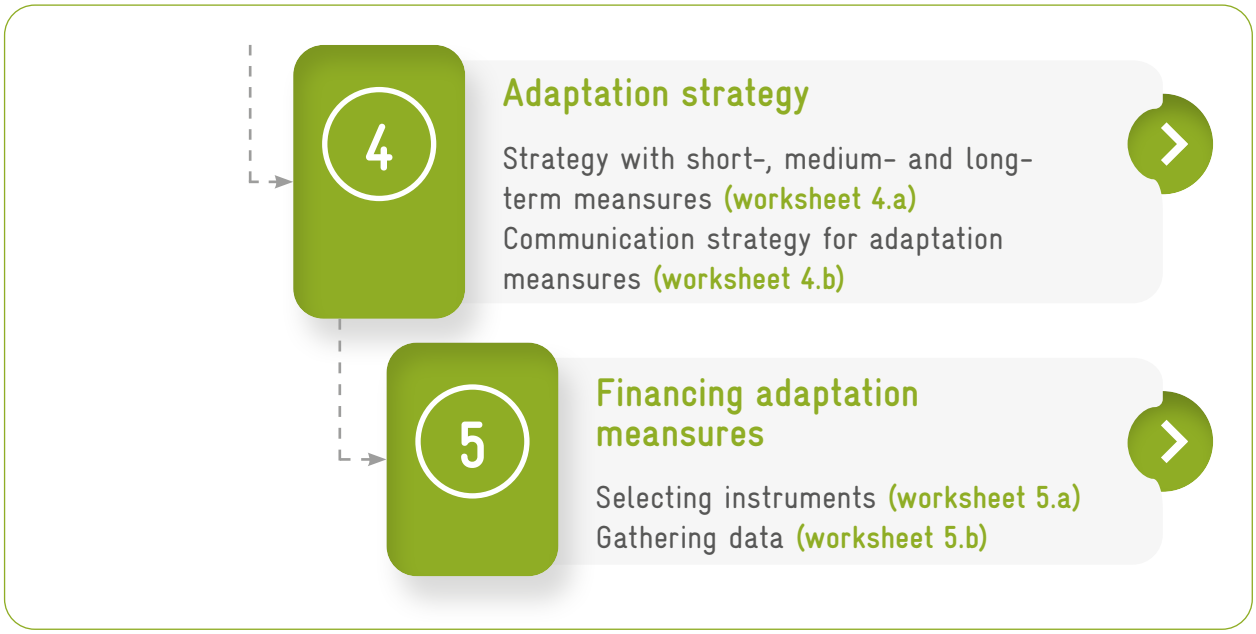


Figure 1: 5-step approach of the Climate Expert (GIZ, 2024, www.climate-expert.org)



Climate Expert - tailored to SMEs and their needs and characteristics:

Challenges of SMEs

- Lack of capacities and time
- No strategic and structured planning processes
- Complex and indirect linkages with business operations
- Short-term decision-making process
- Lack of technical information

CLIMATE EXPERT

- Easy and flexible step-by-step process
- Requires little expenditure from the company
- Can be used as stand-alone assessment tool or as part of other risk / quality management processes
- Complemented by a variety of working materials

On the CE website, the entire approach and working materials are described in detail. Find out more: ***www.climate-expert.org.***[1]

Adapting to climate change means taking action to adjust to its present and future impacts.[2]

EXECUTIVE SUMMARY

Adapting to climate change has become a critical imperative for businesses in the 21st century. As the global climate continues to evolve, organizations face escalating risks and opportunities that necessitate proactive strategies to **ensure long-term resilience** and **sustainability**.

This consulting package, developed by **GIZ ECO ARAL** in cooperation with project partners, presents and promotes the application of the ***Climate Expert (CE)*** in Central Asia, an approach and working materials to **support businesses in analysing climate change risks and opportunities** and **generating strong adaptation strategies**. The CE approach was developed by GIZ.

Presenting the Climate Expert approach, readers are provided with information and training materials, tools and guidance **for small and medium enterprises** (SMEs) and multiplier organisations aimed at raising awareness and building practical skills of SMEs to prepare for the impacts of climate change.

By applying the CE approach, SMEs – either through own application or via consulting services – will be able to answer questions related to climate change and its effects on businesses (e.g. How does climate change affect my business' survival and growth?) as well as questions related to climate change adaptation strategies (e.g. How can I identify vulnerabilities resulting from climate change for my business?) resulting in recommendations for adaptation.

Climate Change Adaptation

Climate Action

Business

Resilience

Sustainability

INTRODUCTION

HOW IS THE ARAL SEA REGION AFFECTED BY CLIMATE CHANGE?

The Aral Sea region experiences increased aridity, leading to the **degradation of ecosystems** and exacerbating the already critical water scarcity. Additionally, the changing climate poses risks of more frequent and severe dust storms, impacting air quality and human health.

According to the World Bank, **droughts, extreme heat, rainfall volatility and dust storms** are increasing causes for destruction in Uzbekistan, putting people and the economy at risk. Resulting from **rising temperatures, reduced precipitation and retreating glaciers**, Uzbekistan is projected to be among the most water-stressed countries in the world[3].

Kazakhstan faces similar problems, and the people and economy are vulnerable to physical climate changes such as changes in rainfall patterns, droughts, and **flooding** in particular. The World Bank states that in Kazakhstan "flooding alone is expected to reduce gross domestic product (GDP) by 1.3 percent by 2060 in the absence of adaptation"[4].

Climate change impacts in the region are exacerbated by the desiccated state of the Aral Sea. Once a crucial regulator of climate and geochemical runoff, the now-dried Aral Sea has transformed into a conduit for aeolian salt transport across the surrounding area. This shift has given rise to ecological, social, and economic challenges, demanding innovative approaches to resource management in the region[5].

WHY DO SMEs NEED TO ADAPT TO CLIMATE CHANGE?

Climate change poses significant challenges for small and medium-sized enterprises (SMEs) in the Aral Sea region, significantly impacting their operations and sustainability. With rising temperatures, altered precipitation patterns and an increased frequency of extreme weather events, **SMEs face disruptions in their supply chains, increased production costs, and challenges in maintaining consistent business operations**. In Uzbekistan, climatic stresses lead to reduced agricultural production, including livestock, as well as decreasing groundwater, threatening water supplies, food security and energy grids[3]. Especially for sectors using large amounts of water, such as agriculture, hydropower, industry, and public utilities, practical adaptation measures are urgently needed[5].

Since without action, **climate change will** continue to have severe impacts and **lead to greater economic volatility and lower average growth**, SMEs must adopt resilient strategies to navigate the evolving climate landscape.

To do so, SMEs need to be provided with the necessary support, resources, and information to adapt and thrive in the face of climate change, **ensuring the long-term resilience of their business**. Effective adaptation to climate change requires profound analysis informing decisions on the implementation of, hence investment in adaptation measures.

Within this consulting package, the Climate Expert (CE) approach is presented as one effective tool to meet these requirements.

WHAT IS THIS CONSULTING PACKAGE ABOUT?

GIZ ECO ARAL intends to facilitate the application of the CE approach by consultants and experts providing consulting services to SMEs, as well as to enable SMEs themselves to apply the approach.

Therefore, the information presented within the consulting package at hand aims to **enhance practical skills of SMEs to prepare for the impacts of climate change** by developing strong climate change adaptation strategies, ultimately supporting sustainable economic development in the region.

This consulting package presents the **elements of the CE approach**, the individual steps and the general functioning of the excel-based Climate Expert Tool (CET) as well as describes its application in detail. To illustrate the application of the CET, a case from Tajikistan is presented.

ADAPTATION TO CLIMATE CHANGE – APPLYING THE CLIMATE EXPERT APPROACH

General information on the CE approach and the CET

The CE entails a practical 5-step approach and working materials that help SMEs analyse climate change risks and opportunities and generate strong adaptation strategies. It also addresses consultants, experts and multipliers who want to support the private sector in adapting to climate change.

The approach is based on an Excel tool (the CET) with which a Full Company Assessment can be conducted. The Full Company Assessment can be carried out by consultants supporting SMEs' adaptation efforts as well as managers and staff of SMEs. The conduction requires approximately 2-3 days within the company and access to key figures of the company (sales, input requirements, logistic details, etc.).

The first step of the CE approach deals with the **identification of climate change impacts (1)**. The second step **assesses risks and opportunities (2)**, the third step **identifies adaptation measures (3)** including a Cost-Benefit Analysis (CBA). In the fourth step, an **adaptation strategy is developed (4)**, as well as a respective communication strategy, and the fifth step of the CE approach deals with the **financing of detected adaptation measures (5)**.

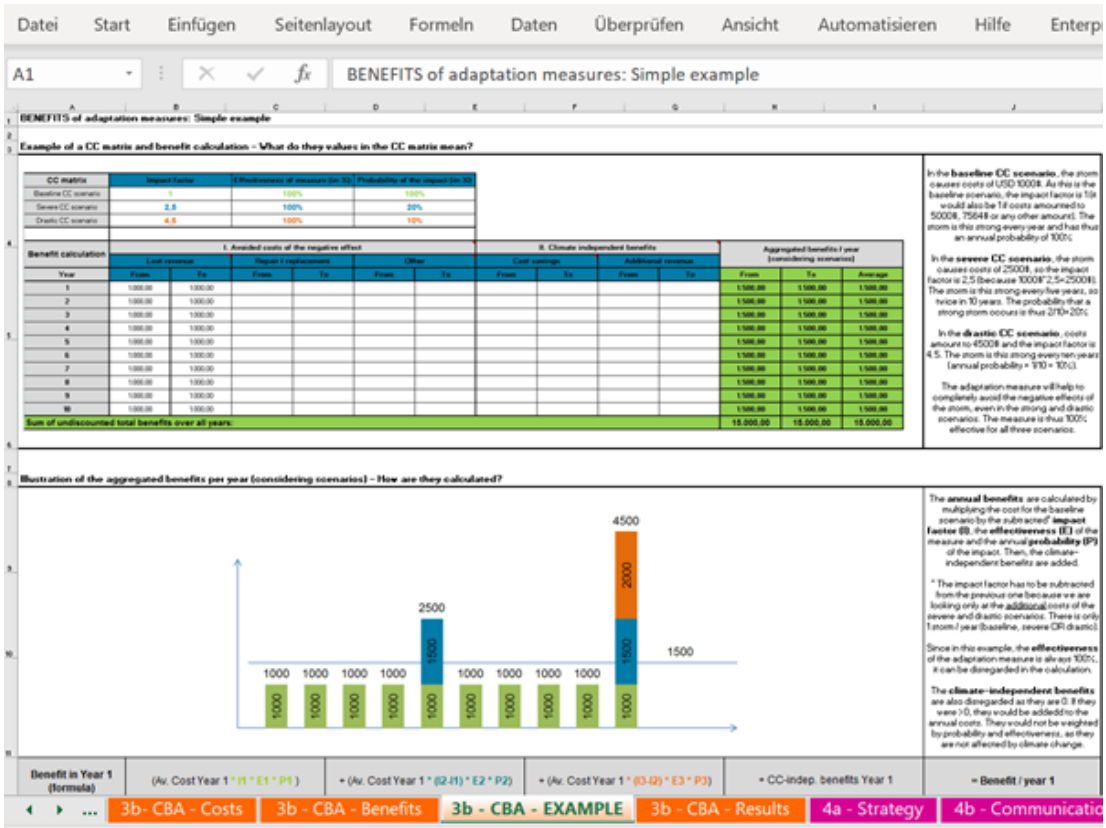


Figure 2: Extract from the CET Excel, sheet "3b-CBA-EXAMPLE"

Each of the five steps is reflected in the Excel tool: **Step 1** is reflected in worksheet **1** *"Past and future impacts"*, **step 2** in worksheets **2a** *"Risk assessment"* and *"Risk matrix"* as well as worksheet **2b** *"New business opportunity"*, **step 3** in worksheets **3a** *"Measures-Risks"* and *"Measures-New opportunity"* as well as worksheet **3b** *"CBA-Costs"*, *"CBA-Benefits"* and *"CBA-Results"* and so on.

Detailed instructions on the usage of the excel-based CET with a step-by-step guide for each worksheet can be found in the Excel Tool Manual ***(see Annex 2)***.

Information for consultants, experts and multipliers

For consultants, experts and multipliers who want to support the private sector in adapting to climate change, the participation in a CET Training of Consultants (ToC) is highly recommended to be able to conduct a Full Company Assessment by applying the CET independently. Material for the conduction of a CET ToC, which could be organized by service providers to qualify staff in consulting on adaptation to climate change, can be found in ***Annex 3***. But training materials are generally self-explaining and can also be used by self-learners.

Photo: Consultants exercising the collection of information from a farm in Karakalpakstan for a full company assessment as part of a CET ToC in Nukus, April 2022 ©GIZ 2022

General objectives of the CET ToC:

- Local professionals gained new knowledge and strengthened their teaching, advisory and technical support skills for the use of the CET. The beneficiaries are relevant SMEs, start-ups, rural professionals and agronomists.
- Trainees can transfer knowledge by strengthening the capacity of local professionals in the field of adaptation to climate change by consistently introducing CET into their practice.

Specific objectives of the CET ToC:

- The content, methodology and process of using the CET are clear to all participants through the analysis of theory, exercises and examples.
- Participants can assess and use the tool in conjunction with targeted SMEs.

Over the past years, many consultants in Central Asia have been trained, forming a network of so-called Climate Experts. Many of them are part of the "Regional Environmental Expert Network of Central Asia" ***(green-ca.net)***.

Case study from Tajikistan

Co-funded by the European Union

ҳамкории ОЛМОН DEUTSCHE ZUSAMMENARBEIT

Assessment of climate risks and adaptation options for the Asadi Zafarobod cotton processing plant

Tajikistan, Khujand
Advisory on developing climate change adaptation strategies for companies

CLIMATE EXPERT

This example was developed by the Non-Profit-Cooperative (NCC) Bio-Kishovarz in the frame of the Integrated Rural Development Project (IRDP) / Towards Rural Inclusive Growth and Economic Resilience (TRIGGER), co-financed by the European Union and the German Federal Ministry for Economic Cooperation and Development. The project aims to increase the added value of agricultural production in Tajikistan, which also includes strengthening local capacity to develop and implement climate-resilient business models.

To develop a climate risk adaptation strategy, the Climate Expert tool was selected to assess the climate risks of SMEs and select the most suitable adaptation options. This approach includes qualitative and quantitative methods, such as multi-criteria analysis and cost-benefit assessment. This allows the selection of the most beneficial adaptation options to reduce key climate risks.

A full assessment requires 8 to 14 full working days. It includes all steps of the tool. For a brief assessment, 6 to 8 full business days are recommended. It includes a risk assessment and a brief selection of adaptation measures, as well as a cost-benefit analysis and development of an adaptation strategy.

Company facts

Asadi Zafarobod Limited Liability Company (LLC) is a small enterprise founded and registered in 2020 in the Zafarabad district of the Republic of Tajikistan. The company processes raw cotton. The main processing products are cotton fiber and cotton seeds.

One of the founders of Asadi Zafarobod LLC is Biokishovarz NCC. The company was established to reduce the risk of contamination of genetically modified organisms (GMO) during the processing of organic cotton and to improve the quality of cotton fibre. Moreover, the need for affordable services for farmers in raw cotton processing and aspects related to the Better Cotton Initiative (BCI) could be addressed. Currently, Asadi Zafarobod LLC is the only fully modernized cotton plant in the Sughd region.

Location
Zafarobod district, Tajikistan

Sector
Agriculture

Products
- Cotton fibre
- Cotton seeds
- Cotton lint
- Cotton down

Company size
Annual turnover: not specified
Staff: 20 employees
(3 permanent and 14 seasonal)

Cotton processing area, 2022

The effect of climate change on the company

Hazards

Average temperatures are rising and heat extremes are becoming more frequent. In autumn, early fogs, cold snaps, heavy rains and winds are more frequently observed in the region. Extreme weather events such as heavy rains and cyclones regularly occur during the harvest season.

Work area for receiving and storing cotton, 2022

The company operates in the field of primary processing of agricultural products, in particular raw cotton. Climate change affects the company's activities in two ways:

At the level of cotton producers (farms)

The activity of the plant depends on the supply of raw materials grown by farmers. An increase in the intensity of rains, the number of days with abnormally low and high temperatures, and an increase in storm winds during growing and harvesting contribute to a decrease in yields and the supply of raw materials to the plant. In addition, adverse conditions affect the quality of products.

At the level of the company itself (reception, storage, and processing of raw materials)

Heavy rainfall during the cotton reception adversely affects the storage and processing and leads to a decrease in the quality of the products obtained. This triggers frequent equipment breakdowns, a decrease in productivity, and a rise in non-production costs. An increase in the number of storm winds leads to forced downtime of the enterprise due to the inability of receiving and storing products.

Climate change risks and adaptation measures

Hazard	Risks caused	Adaptation measures
Early frost in autumn	Decrease in yield leads to a decrease in the supply of raw materials	Providing farmers with seeds of early maturing varieties
Increased rainfall during the harvest period	Decrease in harvested cotton Decrease in quality of collected and stored raw material due to high humidity	Making mobile dryer available to farmers Purchase of equipment for extracting air from bale Buying a tarp to cover cotton bale
Heavy rains	Equipment failures in the processing line and the possibility of fiber combustion due to high humidity of raw material	Purchase of equipment for drying raw cotton before processing
Storms	Damage to crop production and crops, thus inability to receive raw materials, forced plant downtime, reduced profitability, and decrease in working conditions	Construction of sheds and premises for receiving and storing raw materials

Climate change adaptation strategy

The «Climate Expert» assessment of risks and adaptation options made it possible to identify the main climate risks and suitable measures for adapting to these risks. The strategy includes a selection of the highest priority measures. These measures were prioritized based on a multi-criteria and cost-benefit analysis. The latter allowed the company to see the losses that the company incurs in view of climate change, as well as the benefits that the company can receive if they implement adaptation measures. Thus, it became clear that some of the measures had to be urgently implemented. As a result, two adaptation measures were implemented in 2022:

a) **tarpaulins were purchased to cover cotton bales and;**
b) **equipment for extracting moist air from cotton bales was repaired.**

Adaptation measures Short-term	Timing	Cost-benefit analysis Calculations for a 10-year period, non-discounted Currency TJS	
		Costs	Benefits
Shelter of cotton bales (purchase of tarpaulins)	2022, done	Not carried out, as the measure is easy to implement	
Repair of humid air extraction equipment	2022, done	Not carried out, as the measure is easy to implement	
Extraction of moist air from bales (purchase of the necessary equipment)	2023	**Total costs 380,000** Investment costs 35,000 Operation costs 345,000	**Total benefits 715,000**
Drying of raw cotton before processing (purchase of equipment for drying cotton)	Next 2-4 years	**Total costs 137,000** Investment costs 57,000 Operation costs 80,000	**Total benefits 505,000**
Providing farmers with seeds of early-ripening cotton varieties (purchase of seeds)	Next 2-4 years	**Total costs 520,000** Investment costs: 190,000 Operation costs: 330,000	**Total benefits 15,500,000**

Tarpaulins to cover cotton bales, 2022

Equipment for extracting moist air from cotton bales, 2022

After prioritizing adaptation measures to reduce climate change risks, the Asadi Zafarobod LCC cotton processing plant developed a communication plan to raise awareness among workers and financial institutions about the need for financing. The next step included the identification of financing options and procurement of equipment to implement short-term adaptation measures.

The company now faces the task of purchasing two additional humid-air extraction machines for cotton bunches and for drying cotton before processing. This is a part of medium-term adaptation measures. As a result, the company will be able to increase the amount of processed raw cotton and improve the quality of products.

The identified measures require significant financial costs for their implementation, and therefore, are difficult to implement for the company at the moment. However, the company's management aims at finding the necessary financial and other resources in the near future (including through savings from the introduction of short-term measures and improvement of product quality) to meet the objectives. This will improve the company's and farmer's performance.

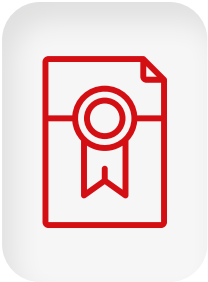
CONCLUSION AND RECOMMENDATIONS

Uzbekistan and Kazakhstan will face multiple challenges related to climate change in the coming years and decades, aggravating the existing environmental problems and resource scarcity. This will have adverse consequences for nature, economy, and communities as a whole.

In the light of climate change, efficient use of resources is essential for the sustainable development of the regional business community, especially in sectors with high water usage and consumption.

SMEs must develop strong adaptation strategies to deal with the climate change impacts and to ensure long-term resilience of their businesses. The Climate Expert approach represents an effective tool in this regard, with an easy and flexible step-by-step process which requires little expenditure from the company. It can be used as standalone assessment tool or as part of other risk / quality management processes.

SMEs are encouraged to conduct the Full Company Assessment using the CET together with trained consultants. These can often be contacted via local professional associations and service providers in the region.



Service providers shall qualify their consultants through conduction of a Training of Consultants (ToC) on the CE. Alternatively, consultants can qualify themselves by using the training materials, which are generally self-explaining hence applicable for self-learners. It is further recommended to exchange with already trained consultants, the Climate Experts in Central Asia.

SMEs shall base their investment decisions for the implementation of determined adaptation measures on the results of the Full Company Assessment. Further, companies are encouraged to research potential financing options including governmental funds.

APPENDIX

ANNEX 1: Climate Expert Tool (Excel Tool)

ANNEX 2: Climate Expert Tool – Excel Tool Manual

ANNEX 3: Materials for the conduction of a Training of Consultants (ToC)

- » **Annex 3.1**: Training Presentations (in ppt)
- » **Annex 3.2**: Training Exercises (in ppt)
- » **Annex 3.3**: Additional materials

LIST OF REFERENCES

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ANNEX 1 - CLIMATE EXPERT TOOL (EXCEL TOOL)

Excel sheets for full company assessment

English version

https://www.climate-expert.org/en/home/tools-trainings/full-company-assessment-excel

ANNEX 2 - CLIMATE EXPERT TOOL EXCEL TOOL MANUAL

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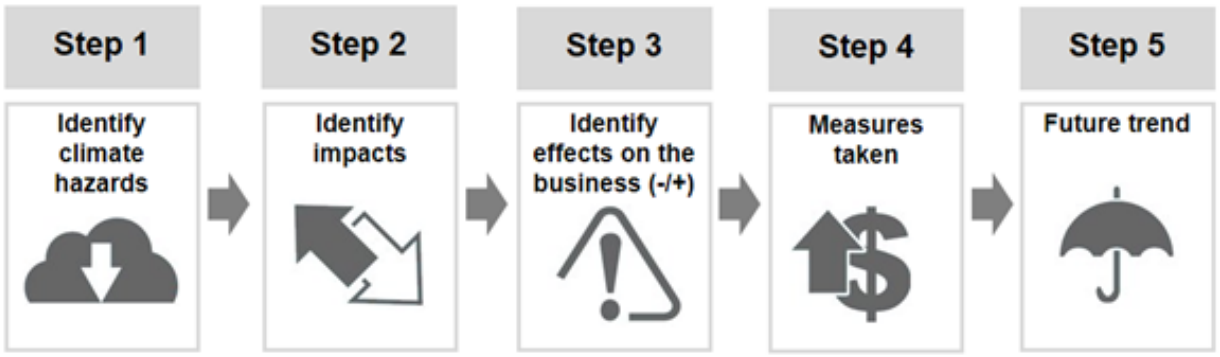
CLIMATE CHANGE, IMPACTS, AND EFFECTS ON THE BUSINESS

Worksheet 1 – Past and Future Impacts



Step 1: Climate hazard

Climate hazard

Firstly, please add climate hazards which the company has observed in the past. Also think of locations where the companies' value chain partners are located.

Then please think of additional hazards that might occur in the future. This does not refer to the future development of climate hazards which you have already identified (these will be described in column G) but to changes that have not happened yet but are projected for the future.

A climate hazard is an observable climate event or trend resulting from climate change.

For example:

- increase in average temperature
- increase in short but heavy rainfalls
- ea level rise

Point in time

Please add when this climate hazard has happened / is expected to happen and how often.

Step 2: Climate impacts

Climate impacts

Please add the impacts that the climate hazard has on human or natural systems that are relevant for your company.

Please note: You should mention the respective climate hazard in parentheses in order to remind yourself of the underlying cause of the climate impact.

For example:

- flooding (due to heavy rain)
- heating up of indoor temperatures (due to heat wave)

Please use a new line for each impact.

Please note: In this methodology, an "impact" does not affect your company directly - rather it affects critical infrastructure, resources and other aspects of the environment in which your company operates.

If no information on local climate change impacts is available online, you can speak to local meteorological experts, environmental departments, climate councils, etc. to identify possi-

ble impacts together; use examples from other countries and apply them to your context; or simply use the most obvious and easily understandable climate change impacts (e.g., „road damage due to flooding“)

Step 3: Experienced negative or positive effects on the company

Experienced negative or positive effects on the company

Please describe how the climate impacts have (negatively or positively) affected your company.

Please note: You should mention the respective climate impact in parentheses in order to remind yourself of the underlying cause of the negative business effect.

For example:

- Supply shortage (due to road flooding)
- Reduced productivity of workers (due to high indoor temperatures)

Please use a new line for each effect.

Please note: You can also think backwards - write down in this column how your company is affected by the climate and then determine underlying climate hazards and their impacts.

Step 4: Subsequent measures taken

Subsequent measures taken

Please add how your company has reacted to past negative or positive effects of climate change on the business.

For example:

- Increasing storage area (to cope with supply shortages during rainy periods)
- Installation of air conditioning (to reduce employees‘ heat stress)

Please use a new line for each measure. For use in later sheets, it is helpful to mention the effect in parentheses.

Step 5: Future trend

Future trend

Please describe how the hazard identified in column B is expected to develop in the future, i.e., how the climate is anticipated to change in the next 1, 5 or 10 years.

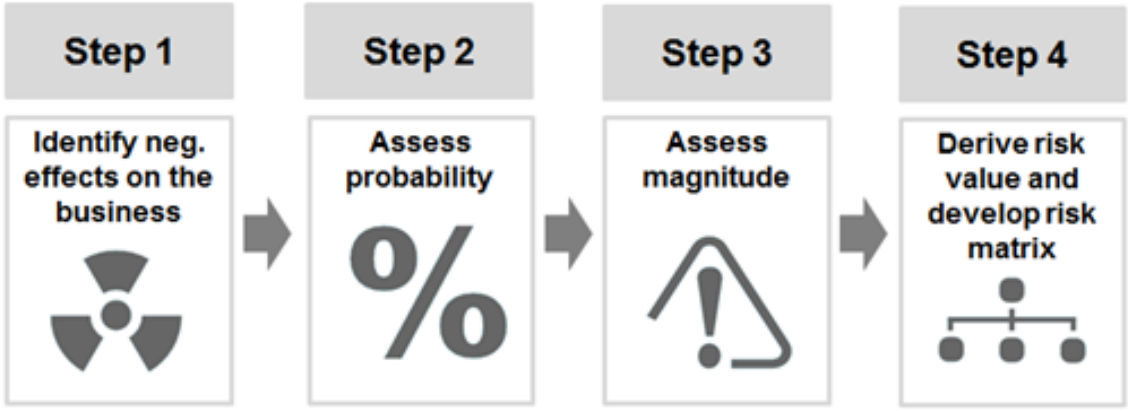
You should ask yourself:

- Is the hazard likely to become stronger?
- Is the hazard likely occur more often?

Please note: You might have already identified some future climate hazards in column B. Here you can add more detail on these phenomena. Otherwise, just work with those that your company has already observed in the last years.

ASSESSING CLIMATE CHANGE RISKS

Worksheet 2a – Risk Assessment



Step 1: Climate Impact / Negative business effect / Description / Timeframe considered

Climate impact

Climate impacts listed in sheet 1 „Past and future impacts“ will be transferred automatically.

Negative business effect

Please insert the negative business effects of climate change which the company is predicted to face in the future.

Please note: In sheet 1 „Past and future impacts“ we have already identified previously experienced negative effects. If climate change will only change the probability of the past negative effect to reoccur in the future (not its type / characteristics), please transfer the negative business effects from sheet 1. However, if future climate change affects the characteristics of the negative effect (e.g., from „water entering the room through holes in the roof“ to „uplifting of the entire roof during storm“) it is necessary to reformulate the effect accordingly.

Description

Describe the negative business effect in more detail. Please also consider the climate trends identified in sheet 1. If the climate hazard and its impacts are likely to become stronger in the future, the negative effects on the company are likely to increase.

Timeframe considered

Please indicate which timeframe you consider for the respective risk (e.g., next 10 years).

Step 2: Probability

This step allows you to assess how likely it is that the negative business effect will occur in the future.

Probability: Assess the probability using scores between 1 and 5.

- **Probability of 1**
  - The occurrence of the negative effect on the business is not very likely
  - It has not occurred in the past and

is not expected to occur in the next 1-2 years
    - Once the related climate hazard occurs, the negative effect on the business does not follow directly

- **Probability of 3**
    - The occurrence of the negative effect on the business is deemed possible
    - It has occurred in the past and /or it is expected to occur but not in the next 1-2 years
    - Once the related climate hazard occurs, the negative effect on the business follows with only a short delay

- **Probability of 5**
    - The occurrence of the negative effect on the business is deemed very likely
    - It has occurred in the past and/or it is expected to occur in the next 1-2 years
    - Once the related climate hazard occurs, the negative effect on the business follows directly and immediately after

The in-between scores of 2 and 4 should be given if in comparison with other risks the likelihood is deemed higher or lower, or if not all three of the respectively higher likelihood criteria are fulfilled.

Step 3: Magnitude

Magnitude

This step allows you to assess how extensive the expected business effect is if it occurs (within the timeframe you have determined in column E).

Please, assess the probability using scores between 1 and 5.

Magnitude of 1:
- Negative effects occur but their effect on the bottom line is limited
- Production processes and/or value chain are not interrupted
- Stakeholder relations are not affected

Magnitude of 3:
- Negative effects occur and have a significant effect on the bottom line, endangering its growth potential
- Production processes or value chain are interrupted
- Stakeholder relations are affected and necessitate countermeasures

Magnitude of 5:
- Negative effects occur and endanger the survival of the company
- Production processes and value chain are interrupted
- Stakeholder relations are endangered and the licence to operate is in question

The in-between scores of 2 and 4 should be given if in comparison with other risks the potential magnitude is deemed higher or lower, or if not all three of the respectively higher criteria are fulfilled.

Step 4: Risk / Priority / Risk matrix

Risk

Automatically calculated product of probability and magnitude.

Priority

Please indicate which priority each of the identified risks has, i.e., which should be first and which last.

A suggestion regarding risk categories:

- **A = Risk is to be addressed directly**
- **B = If necessary, measures to be taken and to be observed**
- **C = Observing; if necessary, no-regret measures**

Prioritization should follow the general rule "the higher the risk score, the higher the priority".

Risk matrix

Please transfer the identified risks (i.e., negative business effect caused by underlying climate impacts) from sheet 2a „Risk assessment" into this table.

Risks should be filled into the cell that corresponds with the probability and magnitude of the risk that you have identified in sheet 2a.

ASSESSING CLIMATE CHANGE BUSINESS OPPORTUNITIES

Worksheet 2b New Business Opportunity

Step 1: Climate hazards

Climate hazard

Climate impacts listed in sheet 1 „Past and future impacts" will be transferred automatically. Please add any missing phenomena that affect your markets and customers.

Step 2: Expected changes markets / conditions

Expected changes in markets or production conditions

Please describe how the climate hazard will affect your company's current or potential future markets and/or production conditions.

For example (market condition): Increasingly frequent heat waves will increase demand for health services to prevent and treat heat-associated morbidity.

For example (production condition): Increasing sunshine will reduce the time for drying coffee cherries.

Step 3: Business opportunity

Business opportunity

If climate change affects the market demand, please describe ideas for new services or products that reflect the new market situation.

For example: Develop new health services

If climate change positively affects some of your production conditions, describe measure for how your company can use these changes.

For example: Increase outside drying area for coffee cherries.

Type of product / service innovation

In case that a new product / service will be offered, please indicate whether the new product / service helps customers because it:

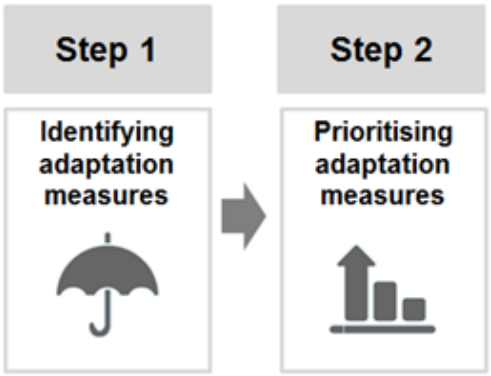
- » has properties with reduced climate vulnerability (e.g. more heat resistant plant species, more corrosion-resistant metal)
- » facilitates adaptation (e.g. flood gates, ultralight clothing against heat, air conditioning systems)
- » other

Timing / urgency

Describe by when the new product / service has to be provided in order to be competitive on the market.

IDENTIFYING AND PRIORITISING CLIMATE CHANGE ADAPTATION MEASURES

Worksheet 3a Measures – Risks



Step 1: Risk / Priority / Adaptation measures (risks)

Negative business effect

Negative business effects / risks from sheet 2a „Risk assessment“ will be transferred automatically.

Priority

The respective priority of the business effect will also be transferred automatically.

Adaptation measure

Please identify measures for tackling the identified negative business effects of climate

change. These can be the same or similar measures as described in sheet 1. Yet, you should also brainstorm what kind of new, effective measure there are to prepare your company for climate change!

For example: Installation of flood gates to protect the company from floods; insurance for risks that cannot be avoided

Please use a new line for each measure.

Technology level

Please indicate whether the measure is low-, medium- or high-tech. For example:

- Health and safety trainings for employees (low-tech)
- Installation of flood gates (medium-tech)
- Installation and integration of new energy-efficient machinery (high-tech)

Step 2: Prioritizing adaptation measures (risks)

Now please assess the identified adaptation measures which the case company could implement to address the previously identified risks. Scores differ between the following two categories:

- For effectiveness and feasibility, we suggest scores from 1-5 (these are the core criteria for selecting measures!)
- For positive and negative side effects we suggest scores from 1-3, since these are "only" side effects – weighing them too strongly could draw attention away from the core indicators

Effectiveness

Suggestion: use score between 0 and 5:

- 0 = no effect for reducing the concerned risk
- 1 = very little effect for reducing the concerned risk
- 2 = little effect for reducing the concerned risk
- 3 = medium effect for reducing the concerned risk
- 4 = large effect for reducing the concerned risk
- 5 = very large effect for reducing the concerned risk

As the effectiveness is the most important criterion for prioritising your adaptation measures, extra weight is given to measures which are highly effective by multiplying their values by 2.

For „insurance", please assess to what degree potential losses and damages caused by climate events could be compensated by insurance. This typically depends on the type of insurance your company gets and the premiums that it pays. You could conduct this analysis for different insurance options, if available.

Feasibility

Please indicate whether the company possesses all required

- technical means and core competences
- organisational / management capacities

Suggestion: use scores between 0 and 5:

- 0 = not feasible
- 1 = very difficult to implement
- 2 = relatively difficult to implement
- 3 = implementation possible
- 4 = relatively easy to implement
- 5 = very easily to implement

Please also indicate whether your company would be able to pay for the initial investment costs, using scores from 0-5. If it cannot do so from internal resources, please assess whether it would be possible to obtain external financing. However, please note that finding external financing is a comprehensive process (see

worksheets 5a-b) that may lead to results only after some research and exchange with finance providers. Hence, please do not categorically exclude (i.e. rate 0 or 1) measures for which external finance is needed.

Negative side effects

Suggestion: use scores between 0 and 3:

- 0 = no negative side effects for the company
- 1 = very limited negative side effects
- 2 = medium negative side effects
- 3 = strong negative side effects

Positive side effects

Suggestion: use scores between 0 and 3:

- 0 = no additional benefits for the company
- 1 = very limited additional benefits for the company
- 2 = medium additional benefits for the company
- 3 = strong additional benefits for the company

Sum: The assigned points will be added up automatically.

Priority: A suggestion regarding risk categories:

- **A = Measure should be implemented with high priority**
- **B = Measure should be implemented once high-priority measures are implemented or planned**
- **C = Low priority measures; only implement if considered useful and feasible after the measures of higher priority have been implemented**

Prioritization should follow some general rules:

1) When comparing different adaptation measures for the same risk, follow the rule „the higher the score, the higher the priority" - this allows you to identify the „best" adaptation measure for one risk.

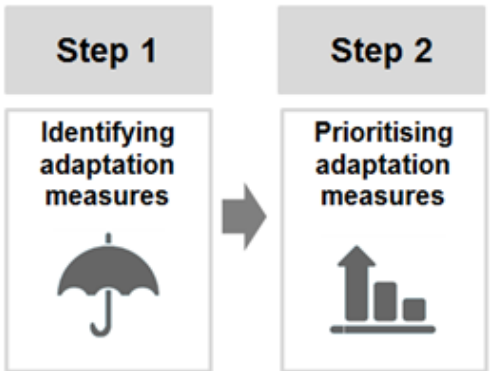
2) When comparing different risks, all measures that score highly and that address priority A risks should be given an „A" because of course the company should adapt to all of its most important risks.

Conduct CBA? Please indicate whether you want to conduct a CBA for the adaptation measure.

Suggestion: Start with measures that directly reduce costs or generate revenues independently of climate change. These measures will be beneficial for your company no matter whether climate change occurs as predicted or not.

For example: Installation of more energy efficient equipment - reduces dependence on electricity supply AND reduces electricity costs.

Worksheet 3a Measures – New Opportunity



Step 1: Risk / Priority / Adaptation measures (opportunities)

Opportunity

Opportunities from sheet 2b will be transferred automatically.

Timing / urgency

Please copy the timing / urgency from sheet 2b

Step 2: Prioritizing adaptation measures (opportunities)

Additional profits

Please indicate how much additional profit this measure would generate for the company. Profit is defined as revenues minus costs. The additional profit should be compared against the company's regular profits to assess its relevance.

In case of a new product / service, please take market demand and competition into account when assessing potential revenues. High market demand and low competition positively affect revenue potential, while low market demand and high competition can severely hamper revenue potential.

Suggestion: use score between 1 and 5

For values 1, 3 and 5 the following descriptions can serve as reference:

- **1: The additional profits would only be of marginal interest to the company.**
  - a) The revenue would only be of marginal interest to the company, e.g. because the market demand for the product, service or innovation does not yet exist and/or because there is very strong competition from other companies.
  - b) The costs for implementing the measure would be high both at the beginning and over the lifetime over the measure.

- **3: The additional profits generated would be relevant for the company.**
  - a) The revenue generated would be relevant for the company, e.g. because the market demand for the product, service or innovation already exists and/or because competition is at a medium and manageable level.
  - b) The costs for implementing the measure are still relatively highly but can probably be recuperated within the next 10-15 years.

- **5: The additional profits would be important and could shift its core business.**
  - a) The revenue generated would be important and could shift the core business of the company, e.g. because the market demand for the product, service or innovation is already strong and/or because there is virtually no competition.
  - b) The costs for implementing the measure are low compared to the additional revenue and can be recuperated immediately or within the first year.

The in-between scores of 2 and 4 should be given if only one criterion of the higher score is fulfilled. In case of measures with very good revenue but high costs, and vice versa, you could apply a score of „3“ or use a higher/lower score depending on whether you want to place more emphasis on revenues or costs. In any case, please explain such specificities in the comments.

Technical feasibility

Please indicate how easy it is to install and use the technology required for this measure. Suggestion: use scores between 0 and 5.

Organisational feasibility

Please indicate how easy it is to plan and realize organisational and management-related aspects of the measure, e.g. selecting adequate marketing and delivery channels for new products. Suggestion: use scores between 0 and 5.

Sum

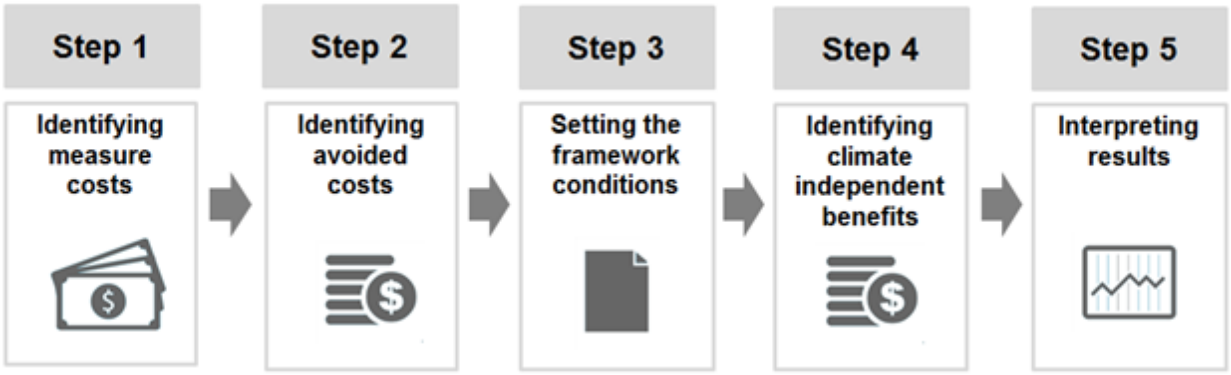
Points will be added up automatically.

Priority

Prioritization should follow the general rule "the higher the score, the higher the priority".

COST-BENEFIT-ANALYSIS (CBA)

Worksheet 3b – CBA - Costs



Step 1: Costs of adaptation measure

Currency

Please indicate which currency you will use to express the monetary costs and benefits of adaptation. This can be USD or any other currency.

Negative business effect

Please transfer the identified negative business effect from Sheet 2a.

Adaptation measure

Please transfer the respective adaptation measure for that negative effect from Sheet 2a.

I. Investment costs

Please note down which type of investment costs the company will incur for preparing and taking into operation the adaptation measure.

For example: Purchasing, delivery and/or installation costs.

Then insert the respective monetary costs.

Please note: Investment costs occur only once at the beginning of the measure (now!). Thus, the cost fields for years 1-10 are crossed out.

II. Operating costs

Please note down which type of operating

costs the company will incur for keeping the adaptation measure running for the next 1-10 years.

For example: Electricity, labour, maintenance and/or repair costs.

Then insert the respective monetary costs.

Please note: Operating costs do not occur at point 0, which is when the measure is being implemented / installed. Hence, the first line is crossed out. However, operational costs will most likely occur throughout the entire lifetime of the measure.

Undiscounted total costs per year

These columns will fill up automatically as you insert the investment costs and annual operating costs. For each year, the average total costs will be calculated.

Please note: These costs are undiscounted, which means that the natural loss in value of money over time is not represented yet.

Worksheet 3b – CBA - Benefits

Step 2: Benefits of adaptation measures (i.e. avoided costs)

Avoided costs of the negative effect

The benefits of the adaptation measure equal the costs or losses that the company would incur if it did not take any measures to address the risk. The benefits of adaptation are thus the „Avoided costs of the negative effect" for 10 years.

For example:

- Lost revenue (revenue lost from productivity decrease or production interruption.
- Repair/replacement costs (e.g. costs for repairing or replacing damaged machinery)
- Other costs (e.g. additional production costs through increased water or electricity price).

Benefits do not occur at point 0, which is when the measure is being implemented / installed. Hence, the first line is crossed out.

Please fill in the costs only for the baseline scenario, even if you expect stronger climate change events to occur over the next 10 years. Higher costs caused by severe or drastic events are expressed through the impact factors!

Step 3: Framework conditions

Fill in the CC matrix

First, all impact factors have to be filled in, then all effectiveness values, then the annual probability. See sheet „3b - CBA - Example" for a simple example.

Impact factor:

The impact factors express by how much the costs caused by a severe or drastic climate change event are higher than those caused by the weaker event in the baseline scenario.

The impact factor for the baseline scenario is always 1.

If the impact factor of a severe event (for example a storm) is 2, it means that the costs caused by this severe storm are twice as high as the costs of a storm in the baseline scenario.

Effectiveness of measure:

The „effectiveness of measure" expresses by how much the adaptation measure under consideration can reduce the costs caused by the climate change event.

100% means that all costs can be avoided. An effectiveness value of 50% means that, despite the adaptation measure, only half the costs can be avoided.

Annual probability:

The annual probability expresses how likely it is that the climate change event occurs once a year.

If the probability is 100% then the event will definitely occur once every year over the next 10 years. If the probability is 50% then the event will occur every 2 years.

To calculate the probability, divide the number of times that the event occurs in 10 years by 10.

For example:

- (once every year, so 10 times over 10 years): 10/10 = 1,0 = 100%
- (once every 2 years, so 5 times over 10 years): 5/10 = 0,5 = 50%

How to obtain the values for impact factor, effectiveness, and annual probability

If you are working with the provided case study, the numbers are "hidden" in the text. Look for sentences such as "in case of severe flooding, total costs would rise from to USD 8,000 to 32,000". This means that the impact factor for the severe scenario is 4 – since 4 x 8,000 = 32,000.

If not working with the case study, these numbers have to be based on your educated guess – there are no databases which provide the numbers exactly as they are required here.

Impact factor: Estimate the costs of the baseline, severe and drastic scenarios. Then divide the severe costs by the baseline costs (impact factor for the severe CC scenario) and do the same with the drastic costs (impact factor for the drastic CC scenario).

Effectiveness: Estimate whether the measure will allow your company to fully avoid all costs and damages (effectiveness = 100%) or not. If it is not 100%, you have to ask in more detail: E.g. how many of the predicted 30 sick days can be avoided? By how much can I reduce the repair cost for broken machinery, if only one machine is affected, not two? Etc.

Annual probability: This information can be entailed in local or regional climate change predictions. If detailed information is not available, you can look at the annual probability of past climate events (e.g. annual probability of floods was 10%) and then increase the probability (e.g. to 15% or 20%). Such predictions should be informed by more general climate change information – e.g. if stronger but more erratic rainfall is predicted, this will probably lead to more frequent flash floods, because large amounts of rainwater cannot easily be absorbed by the ground.

You can also try out different numbers and observe how the results change.

Step 4: Climate independent benefits

Fill in the „climate independent benefits"

The climate independent benefits occur independently of any climate change events. Hence, they are not affected by the CC matrix. They are simply added to the annual costs without weighting.

Climate independent benefits include benefits that the company could realize through the adaptation measure even if climate change would not happen.

For example:

- Cost savings (e.g. lower production costs due to better energy efficiency of new machine)
- Additional revenue (e.g. increased output of new machine)

Benefits do not occur at point 0, which is when the measure is being implemented / installed. Hence, the first line is crossed out.

Aggregated benefits / year (considering scenarios):

These columns will fill up automatically as you insert the avoided costs and climate independent benefits. For each year, the average total benefits will be calculated.

Please note: These benefits are undiscounted, which means that the natural loss in value of money over time is not represented yet.

Worksheet 3b – CBA – Results

Step 5: Results

In this step you will interpret the results of your cost-benefit analysis.

This means that you should first **determine for each individual measure** whether it makes sense economically (Does it have a positive Net Present Value? Is the Cost Benefit Ratio <1?). Then, you can **compare all measures that lead to positive results** and select the one(s) that lead(s) to the best results in regard to the financial ratios (e.g. higher Internal Rate of Return).

However, please note that the **results of the multi-criteria analysis** may be just as important! If you have two alternative adaptation measures, you should choose the one that is the most economically favourable AND that is most feasible and helpful according to the multi-criteria analysis.

Discount rate:

The discount rate expresses the loss in the value of money over the years and makes future costs and benefits comparable with today's. If the discount rate is 3%, it means that costs (or benefits) of US$100 occurring next year are as "painful" (or as great) as US$100/(1+0,03)^1 = US$97 today. Similarly, a cash flow of US$100 occurring five years from now is worth US$100/(1+0,03)^5=US$86 today.

In a business context, discounting is usually done using the market interest rate. Yet, when it comes to climate change, a "social discount rate" should be used that is lower than the market interest rate. This is done to make adaptation measures with future benefits more attractive today.

Discount factor:

The discount factor is the ratio of the net present value of a future cash flow to its value if the cash flow were occurring today.

Interpretation: The discount factor of a cash flow occurring now (or in the current year) is 1, and the discount factor for following years is an exponential function of the discount rate and the time elapsed (in years). For instance, if the discount rate is 3%, the discount factor decreases exponentially by 3% each year,

so that it is 1 today, but 0.97 next year, 0.94 in the year after that, and 0.86 after five years have elapsed.

Net present value (NPV):

Difference between discounted costs and discounted benefits of a measure over its entire lifetime. By using discounted costs and benefits the NPV accounts for the fact that costs and benefits accruing in the future are worth less today.

The lowest NPV is calculated by subtracting the highest discounted costs from the lowest discounted benefits. The highest NPV is calculated the other way round.

Interpretation: If the result of the NPV is positive, the adaptation measure is economically feasible in absolute terms. The higher the NPV, the higher the net benefits of this measure.

Cost-benefit ratio (CBR):

Ratio of discounted costs of the measure over the discounted benefits of the measure for its entire lifetime. It expresses how much money has to be spent in order to create one unit (in monetary terms) of benefit.

Note that the lowest CBR is calculated by dividing the highest discounted costs by the lowest discounted benefits. The highest CBR is calculated the other way round.

Interpretation: The adaptation measure is cost-effective if the CBR < 1, meaning that costs are smaller than benefits.

Internal Rate of Return (IRR):

Discount rate which will cause the NPV of the risk mitigation measure to equal zero. Calculating the IRR relies on an iterative solution to determine what discount rate will cause the NPV of the project to equal zero. The IRR can be calculated by trial and error by varying the discount rate in the NPV formula until the NPV is equal to 0.

The IRR can be used to compare different adaptation options with each other.

Note that the lowest IRR is calculated by subtracting the lowest annual cash flows from the highest initial investment costs. The highest IRR is calculated the other way round.

Interpretation: The higher the IRR, the greater the returns of the investment.

Return on Investment (RoI):

Money saved with the investment, measured in % of the total investment. ROI is calculated by dividing the NPV by the discounted costs over the entire lifetime of the investment.

Note that the lowest RoI is calculated using the higest costs and lowest benefits. The highest RoI is calculated the other way round.

Interpretation: The higher the RoI, the higher the returns of the project in relation to the invested sum.

For example: A 60% RoI means that the cost of the project and another 60% of these costs have been recovered.

But: RoI is always dependent on the invested sum. A higher RoI does not necessarily mean that a measure generates more absolute savings than another measure with a lower RoI.

Payback Time (PT):

The payback time is the time it will take for the undiscounted annual cash flows (i.e. benefits minus costs) to equal the initial investment costs. In other words, after how many years the company will realise net benefits. Note that you should subtract low benefits from high costs and vice versa to get the respective minimum and maximum figures.

Cost-Benefit-Analysis for opportunities

The cost-benefit analysis, as described previously, is focused on measures addressing risks. The tool can, however, also be used to assess the economic feasibility of measures for seizing the potential opportunities of climate change. For this purpose, you have to adapt the following:

Step 2: Benefits of adaptation measures: Instead of inserting the "avoided costs of the negative effect" note down the additional revenues generated through the measure.

Step 3: Framework conditions: For the impact factor, consider whether and by how much the additional revenues will be higher in case the severe or drastic scenarios materialize.

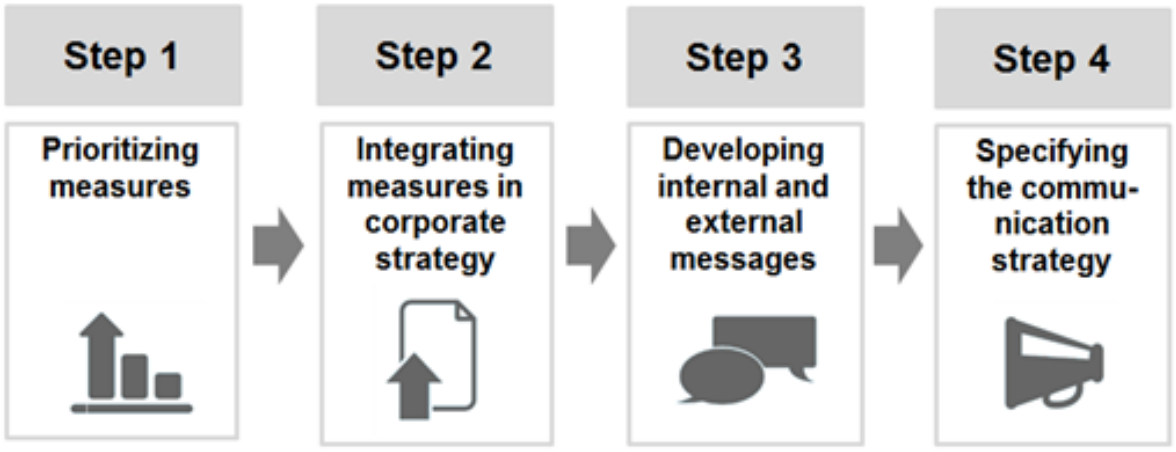
For the effectiveness you can insert 100% for all three scenarios, as the effectiveness of your solution (and, thus, demand for it) should be reflected in the figures on expected revenues.

For the annual probability you can use 100% if your new product or service addresses a slow-onset climate change hazard (e.g. better insulation to reduce indoor heat trapping caused by rising average temperatures). If the demand for your solution depends on specific climate events, then you can type in the annual probability of the specific type of event your product addresses (e.g. refreshments to reduce workers' heat stress during heat waves).

Alternatively, you can leave the CC matrix "neutral" by typing in 1 for all impact factors, and 100% for effectiveness and annual probability. In this case, you should reflect changes in demand in the figures on additional revenues that you insert for years 1-10.

DEVELOPING AN ADAPTATION STRATEGY AND COMMUNICATION PLAN

Worksheet 4a - Strategy



Step 1: Prioritizing adaptation measures – Sheet 4a

Adaptation measure / Opportunity:

Please insert the adaptation measures or business opportunities that you suggest should be implemented immediately, e.g. within the next year.

Priority:

Please note which priority the adaptation measure has, based on the risk or opportunity assessment

Ranking of measure according to CBA:

Please note which rank (e.g. 1, 2, 3, …) the adaptation measure achieved according to the Cost-Benefit Analysis.

This ranking will most likely be based on the overall outcomes of the CBA - the better the financial ratios, the more economically attractive the measure. Yet, some of the financial variables might be more important to some SMEs than others (e.g. payback period more important than IRR), depending on the company's situation. Individual investment criteria have to be considered when analysing the results of the CBA.

Step 2: Integrating measures in corporate strategy

Potential barriers and conflicts:

Please identify potential barriers and conflicts for the implementation of this measure. Such challenges could arise, for example, from the feasibility level or negative side effects identified in Sheets 3a.

For example: Developing new products bears great risk as the company does not have experience with customers / market

Ideas for overcoming barriers:

Please identify ways of overcoming the barriers.

For example: Conduct market study to understand customer needs and potential for new product.

Integration possibility:

Please describe whether this measure can be integrated with any other strategy that you are currently implementing or activity that is on-going.

For example: Storing finished goods more safely and drying to protect it against flood can be part of general measures to improve storage and reduce spoiling of goods.

Success indicators, monitoring activities:

Please identify indicators (and, if possible, target values) for measuring whether the adaptation measure has led to success by reducing the negative effects of climate change on the company or by seizing opportunities.

For example: Indicator: Total cost of flood damage prevented; Target value: USD 50,000

Also note down, how and when the company's performance on these indicators will be measured.

For example: Constant monitoring of flood damages, evaluation of data and reporting of results every 12 months.

Worksheet 4b – Communication

Step 3: Internal and external messages

Issue / measure to communicate:

Please note which aspects you need to communicate internally (e.g. to employees) and externally (e.g. to clients).

Step 4: Communication strategy

Target group:

Please describe the exact target group of the communication measure.

Aim:

Please describe what you would like to achieve with this measure, particularly regarding what the target groups is meant to think, feel or do.

Means of communication:

Please note what kind of communication measure you are planning to apply (e.g. info meeting, brochures).

Time / frequency:

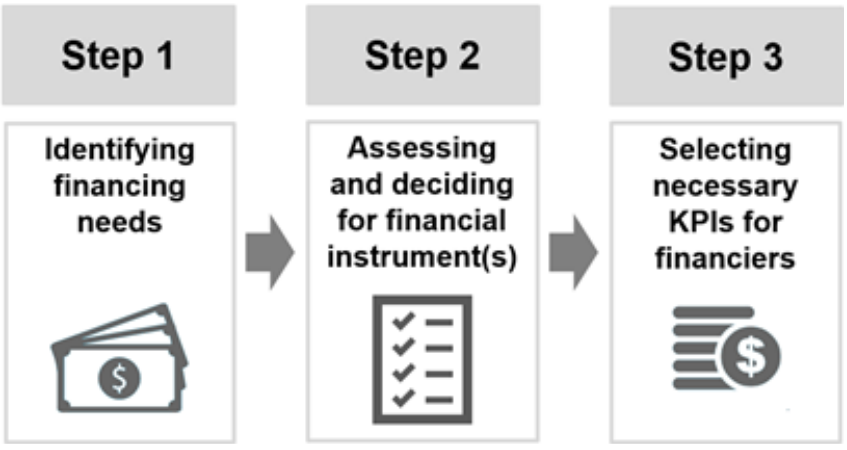
Please insert when and how often you will use the communication measure.

Responsibility:

Please determine who will be responsible for leading the development and implementation of the communication measure.

ACCESS TO FINANCE

Worksheet 5a – Financial Instruments



Step 1: Identifying financing needs

Adaptation measure:

Please enter the measure for which you would like to find financing.

Please note: If you want to finance several measures with only one financing option, you can aggregate them here.

Costs:

The amount of money you require to finance your activity. This encompasses the capital expenditure (Capex) that needs to be paid upfront, and potentially operational expenditure (Opex), unless there are none or they are financed through own funds.

Note: If you aggregated several measures, please provide the overall investment sum here.

Step 2: Assessing and deciding for financial instrument(s)

Instruments:

The listed instruments could be interesting for a company and adaptation measure.

If some of the instruments can be clearly excluded from the list, independently of the type of measure for which financing is needed, you can delete the respective rows. This could be the case, for example, if you are very certain that there are absolutely no grant schemes available or that your company would not at all comply with the requirements of venture capital investors. If you are uncertain, keep the instruments and assess them in more detail.

- **Grants:** Depending on the context, region and sector of an SME, grants - e.g. provided through specialised donor institutions - can be a useful source to finance particular endeavours. Yet, finding and applying for relevant programs can be time-consuming and proceeds might be earmarked for very specific investments. Grants can be structured in different ways. In addition to pure grants, there can be hybrid financing instruments that feature a grant and a debt element, or matching grants, in which public or private programs provide a proportion of funds obtained through private financing.
- **Equity investment:** For SMEs, the most relevant forms of equity investment include venture capital, angel investments, impact investments.
- **Other:** This could be, e.g. bond, public equity, project finance

Relevant?

Please indicate whether the financial instrument is generally relevant for your adaptation measure.

Suggestion: use scores between 0 and 1:

0 = the instrument is generally not relevant (e.g. „leasing“ if the financing is needed to implement a series of resilience trainings with your employees)

1 = the instrument is generally relevant (e.g. „grants“, „bank loans“ or „B2B/P2P lending“ for energy efficiency measures)

Available?

Please assess whether the instrument is generally available in your region, for your type of company and for the measure that is being proposed.

Use scores between 0 and 1:

0 = the instrument is generally not available

1 = the instrument is generally available

For example: Yes, internal resources are available (1); yes, bank loans are available for small-/medium-sized companies (1); no, there is no crowdfunding platform with projects in our region (0); no, there are no relevant grant schemes (0)

Please note: If internal resources are available, please take into consideration that you might also want to implement other measures. Internal resources might only suffice for some of them - not all.

Offer:

„Offer" refers to a concrete offer of the financial product that you are assessing. This could be a specific bank loan by bank X, a specific grant scheme by local authority Y, an option for equity investment through investor Z.

Assessing specific offers rather than general financial instruments will make it easier to determine Pro's and con's and will allow you to draw more concrete conclusions.

Provider, name:

Please insert the provider of the specific offer you are assessing. Also add its name if it has one (e.g. „Green SME Loan 2022").

Pro's:

Please assess and insert the potential advantages of the respective financing instrument.

For example: No repayment needed (e.g. grants, internal financing), relatively low interest rates, very common financial instrument with uncomplicated application process, etc.

Con's:

Please assess and insert the potential disadvantages of the respective financing instrument.

For example: High interest rates and/or collateral requirements (e.g. often the case for bank loans), funding cannot be limited to individual measure (e.g. impact investors often invest in a company more broadly, rather than in individual measures - this can be unattractive to companies which do not want general interference with their business operations)

It might be helpful to re-assess „feasibility" after you have gone through step 5c!

Feasible?

Based on the assessment of pro's and con's, please determine how feasible it would be for your company to use this financial instrument for the respective measure.

Please use score between 0 and 3:

0 = although generally relevant and available, we cannot use this instrument

1 = we can very likely not use this instrument because the disadvantages cannot probably not be overcome

2 = we could potentially use this instrument but will have to take some effort to adapt it to our needs

3 = the features of this instrument make it very easy / attractive for us to use

Score:

The score indicates which financing option is well suitable for financing the adaptation measure.

Decision:

Please indicate whether you have decided to use the respective financial instrument or not. Please chose „yes" only for one of the options. If more than one option fits your needs, you can choose „potentially" and then decide for one specific instrument later, e.g. based on information from step 5b.

Finance amount:

Please, enter the amount that you are planning to finance in case it is only partial amount of the adaptation measure. This means that to finance the measure you will choose a mix of several financing instruments.

Notes: Please, enter any other notes that you find relevant.

Offer 2:

If a second offer of the same financial instrument is available, please assess its feasibility and then compare against the first offer.

You could copy paste columns J-O if you want to assess further offers.

Worksheet 5b – Financial Indicators

Step 3: Selecting necessary KPIs for financiers

Selected financing instrument

Please insert the financing instrument which you want to use.

You do not have to assess KPIs for internal financing - none are needed

Required:

Please specify, if in your context relevance is different than indicated in the „KPI typically relevant?“ column.

Helpful:

Although not all KPIs are necessary to obtain particular financing, some might be helpful or beneficial to have and can increase the likeliness of a financier to provide financing.

Data available:

Is the data point directly accessible or provided through your internal accounting or information system?

Data obtainable:

If the data point is not directly accessible, could you obtain it within a reasonable use of your means?

Data:

Please enter actual data, e.g. age (in years), size of collateral (in relevant currency), etc.

Note: Please leave this field blank if the KPI is not required

Proof/document:

Which document could be used as a proof to show or uphold your data for financial institutions?

Key Performance Indicators (KPIs)

- **Proof of registration:** Formal registration of your SME is a prerequisite for many financial instruments. Proof: E.g. memorandum or articles of association; Tax documents of last years; Business license; Personal data on the directors + shareholders; Registration showing directors + shareholders

- **Number of employees (full-time equivalents):** For financial institutions, the number of employees is a useful proxy of an SME‘s size. To increase comparability, please indicate the full-time equivalent of staff. Proof: E.g. organisational chart

- **Age:** If financing is provided to a natural person (rather than to a legal person/company), that person typically has to have a minimum age. Sometimes, a maximum

age is applicable. Proof: E.g. valid ID

» **Gender:** Some financial instruments may only be available for a certain gender, e.g. loans for „women-owned enterprises". Proof: E.g. valid ID

» **Nationality:** Financial institutions mostly require a statement on a borrower's nationality. Proof: E.g. valid ID

» **Living address:** Financial institutions mostly require borrowers to disclose their addresses. Proof: E.g. valid ID; registration book, etc.

» **Years of experience:** Some finance providers require the entrepreneur / company owner to have a minimum amount of experience in the respective sector or activity.

» **Personal liability/guarantee:** In some cases, e.g. regarding unregistered SMEs, financing providers ask for an entrepreneur's capacity for personal liability and a proof thereof. Proof: E.g. criminal record; Valid ID; Personal credit report

» **Time of being in business:** The time an SME is in business can serve as a proxy of an SME's ability to generate revenue for a financial institution.

» **Credit history or credit bureau check:** Especially for debt financing, information on the credit history is of use or required by financial institutions. A positive filing at a public or private credit bureau facilitates lenders' likeliness to provide a loan. Proof: E.g. credit bureau check

» **Amount of existing liabilities:** Many financial institutions request a listing of existing liabilities with (other) financing providers to assess an SME's overall debt burden. Proof: E.g. Information on loans with other institutions; Audited financial statements past 3-years; Bank statements for 12 months

» **Availability of cash or in-kind contributions:** Especially for smaller enterprises, financial institutions sometimes require a contribution to the overall investment sum, in cash or, if applicable, in-kind contribution. Proof: E.g. Audited financial statements past 3-years

» **Size and eligibility of collateral:** Especially for debt financing, financial institutions require SMEs to provide collateral. Collateral can consist of fixed or movable assets and often exceeds the value of the overall loan sum. Proof: E.g. ownership documents; Picture of the collateral; Personal Guarantee from Main Business Shareholder (If collaterals are owned by company)

» **Cash Available for Debt Service (CADS):** The CADS is a ratio that puts available cash in relation to the financial obligations of a business, including all interest and principal payments. Financial institutions prefer high CADS ratios; a CADS ratio below 1 means a company is not able to repay its debt. Proof: E.g. audited financial statements past 3-years; Most recent 6-months sales summary (seasonal business 12 months); Most recent 3-months sales invoice or most recent 3-months purchase summary & purchase invoices; Bank statements for 12 months; Information on loans with other institutions

» **Earnings Before Interest and Taxes, Depreciation, and Amortization (EBITDA):** EBITDA is a business indicator that measures a company's performance before financial deductions such as interest, taxes, depreciation and amortization are applied. The metric is used and widely understood as a measure of a company's profitability. Proof: E.g. audited financial statements past 3-years; Most recent 6-months sales summary

(seasonal business 12 months); Most recent 3-months sales invoice or most recent 3-months purchase summary & purchase invoices; Bank statements for 12 months; Information on loans with other institutions

» **Debt Service Coverage Ratio (DSCR):** The DSCR is another indicator that measures a business's ability to repay its financial obligations, depending on its level of income. It is calculated as the ratio of net operating income to total debt service, mostly incorporating financing obligations due within one year. Proof: E.g. audited financial statements past 3-years; Most recent 6-months sales summary (seasonal business 12 months); Most recent 3-months sales invoice or most recent 3-months purchase summary & purchase invoices; Bank statements for 12 months; Information on loans with other institutions

» **Value of items to be insured:** Insurances require a statement on the value of assets that is to be insured. Proof: E.g. Audited financial statements past 3-years

» **Exposure data:** In order to insure an SME against climate risks and determine an adequate insurance premium, insurers need to assess an SME's exposure to risks. In the context of climate change risks, this encompasses collecting data about SME's exposure to flooding, heavy precipitation, droughts, etc.

» **Vulnerability data:** Vulnerability refers to the part or percentage of the monetary value of an insured object that can be impaired through a particular event.

» **Historical loss data:** Value of damages during previous occurrences.

» **Amount willing to pay for premium payments:** Assess and indicate the amount you are willing to pay for a particular insurance or a set of insurances.

» **Max. preferred self-retention:** Amount which you can pay yourself before the insurance company starts paying.

» **Minimum & maximum probability of an event that should be covered by policy (i.e. loss return period):** To determine a suitable insurance policy, an SME needs to assess the kind of events it wants to insure regarding the probability of its occurrence. E.g., insuring against risks with a very small return period might not be worth the premium for an SME (e.g. flood risks in dry and land-locked areas with no historical records of flooding). Similarly, damages that occur often yet are small in monetary terms might not be worth the administrative costs of regularly reporting the same damage.

» **Type of insurance (indemnity vs. Index-based):** Some climate risk insurances are index-based and link payouts to predefined events, such as the occurrence of droughts in the agricultural sector. Although payouts might be lower, SMEs profit from quick disbursement of funds as the insurer does not need to verify damages. In contrast, indemnity-based insurances refund damages after assessing impacts, allowing clients to compensate for insured losses.

» **Impact-related KPIs:** It is sometimes required to prove how the activity / company that is financed contributes to positive environmental, social or governance impact. There is a very wide range of possible indicators, depending on the sector and the specific environmental/ social objectives. Check out the respective financial institution's environmental & social policy or eligibility criteria to identify relevant indicators.

ANNEX 3 - MATERIALS FOR THE CONDUCTION OF A TRAINING OF CONSULTANTS (TOC)

Please, see supplementary files

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