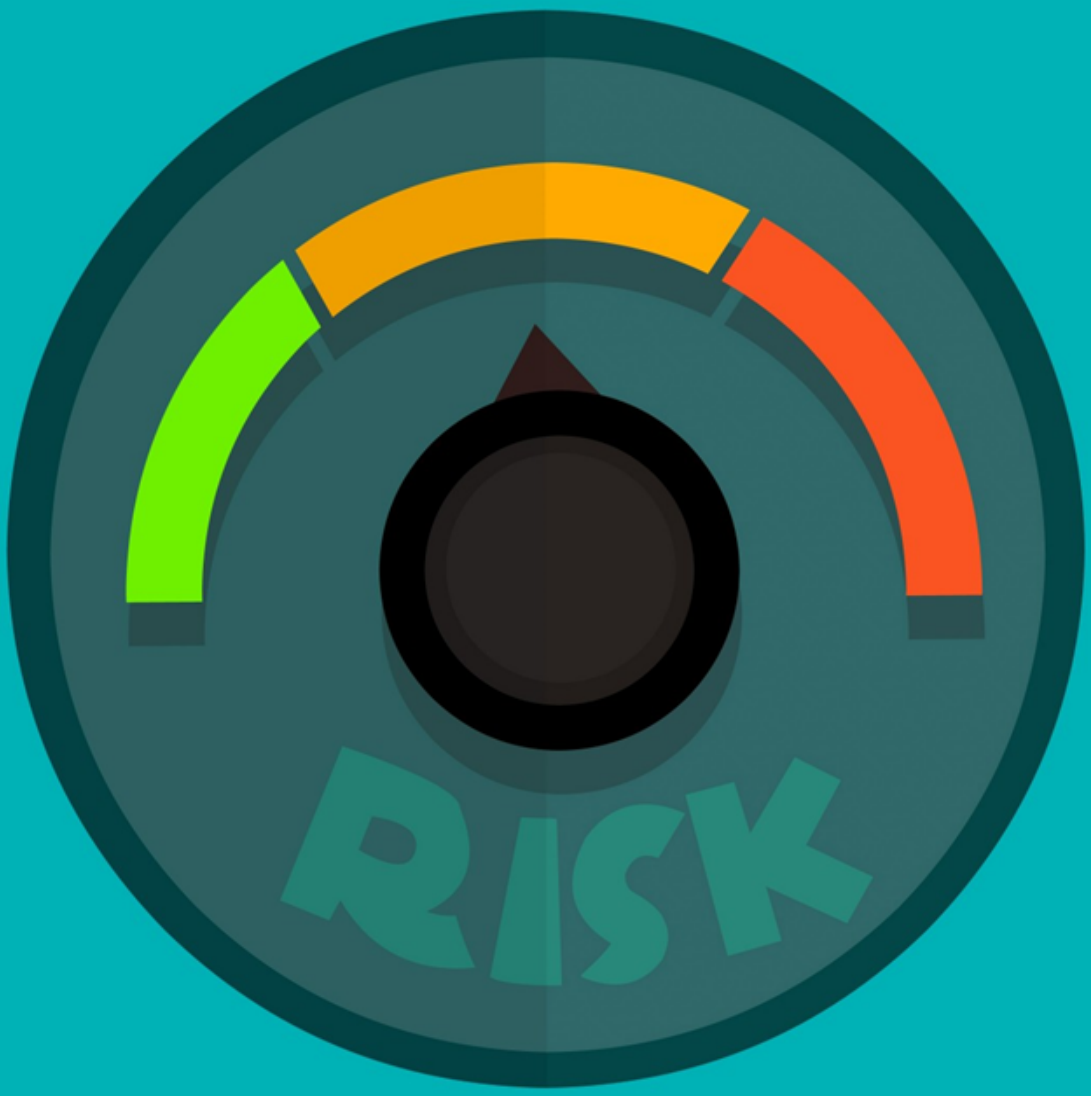

Analysis Method/Tool

GUIDELINES FOR IDENTIFICATION OF THE RISKS, ITS PROBABILITY AND IMPACT (Pilot cases of the project BAPR - Baltic Phytoremediation)

BAPR BALTIC PHYTOREMEDIATION
Interreg South Baltic
EUROPEAN UNION
European Regional Development Fund

GUIDELINES for ANALYSIS METHOD/TOOL

IDENTIFICATION OF THE RISKS, ITS PROBABILITY AND IMPACT (BAPR PILOT CASES)

BAPR – Baltic Phytoremediation EU-project

Linnaeus University
Department of Biology and Environmental Science
Kalmar

2023

RISK ANALYSIS TOOL FOR BAPR PROJECT PARTIES

IDENTIFICATION OF THE RISKS, ITS PROBABILITY AND IMPACT (BAPR PILOT CASES)

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1 Abbreviations

Ac	Activity
AF	Application Form
BAPR	Baltic Phytoremediation project
D	Deliverable
EU	The European Union
WP	Work Package

2 Introduction

The risk – it's a combination of a chance event with negative consequences and the probability for that event. In general, the risk definition is built on two aspects: the value aspect and the chance of that aspect. A problem with the definition is that it does not cover all aspects of risks. There are a number of factors that are not incorporated, such as free will, perceived control, knowledge and potential of catastrophic consequences. Yet, the definition has characterized many approaches within field of risks (Landell, 2016). ISO 31000 standard "Risk management" and the following standard ISO 2010 IEC/ISO 31010:2009 explains the risk as it is about effect of uncertainty on objectives. The risks are explained as the consequence of an organization setting objectives against an uncertain environment. The uncertainty comes from both internal and external factors that the organization does not completely control and which may impact the organizations ability to achieve its objectives or cause delay in doing so. Therefore we need to understand that how we see risks differ between different people. This is called risk perception and is about how we perceive, evaluate and understand risks.

There are many approaches to deal with the risk management. The risk matrices are one of the most common ways to assess the risks within the organizations. A risk matrix is a table with categories for probability (or likelihood or frequency) on one axis and with impact (or severity or consequences) on the other axis. Risk matrices are often part of risk management standards and guidelines and are also often used as the organizations formal risk acceptance criteria (Landell, 2016).

Baltic Phytoremediation is an Interregional EU project co-financed by the South Baltic programme. The objective of the project is to raise cross-border awareness of available green phytoremediation technologies to clean soil from pollutants such as oil, industry related contaminants, heavy metals, nutrients and microplastics through new arenas of cooperation that focus on a circular economy approach. By doing so, BAPR will increase the usage of green technologies for Phytoremediation and energy production from grown crops to clean polluted soil and host a network to showcase solutions and exchange cross-border knowledge through best practices. The analysis tool for phytoremediation implementation is combined with risks analysis in each case and overview of issues identified during the pilots and solutions (Table 1).

***Table 1**- Structure of the analysis tool within BAPR project*

Introduction	Short information of the tool instruction
Disclaimer	Programme general information related to communication and dissemination
Key project data	Technological problem/Methodological issues of the pilot case
Economic	Costs calculation
Risk analysis table/ tamplet	Tool
Risk analysis tool for BAPR example	Deatailed analys example
Attachments	Overview of issues identified during the pilots and solutions, BAPR example

2 Key factor

One of the key activities in the project is the practical implementation of pilot cases in AP (Ac 4.4, WP4) where a key preliminary factor is to not only identify risks, but also to manage and mitigate them as well as estimate monetary cost if the risk would occur from a business perspective. The purpose of the tool/template

is to at an early stage of planning (Ac 4.1, WP4) map and evaluate all potential technical, social and economic risks.
The tool is intended to be used by project partners when analyzing potential risks in their pilot cases as follows.

1. The first step is to identify all potential risks based on prior and ongoing experiences. It is important to note that all risks may not become obvious prior to the implementation, and that new risks most likely will be added as the installation process continues.
2. The second part of the process is to estimate the severity of the risk, i.e. the actual impact/consequence if the risk would occur. Please see the categories below and relevant examples for BAPR:

Insignificant: Risks that bring no real negative consequences, or pose no significant threat to the organization or project. Example: Bad weather which might cause delays in the implementation process.
Minor: Risks that have a small potential for negative consequences, but will not significantly impact overall success. Example: Delays in public procurement processes where the delay occurs due to administrative issues for example.
Moderate: Risks that could potentially bring negative consequences, posing a moderate threat to the project or organization. Example: Technical issues or incorrect initial planning prior to initiating the implementation of the case.
Critical: Risks with substantial negative consequences that will seriously impact the success of the organization or project. Example: Not finding needed technology providers to install the pilot case.
Catastrophic: Risks with extreme negative consequences that could cause the entire project to fail or severely impact daily operations of the organization. These are the highest-priority risks to address. Example: Not receiving the required permits to install your pilot case.

3. The third part is to estimate the probability (X-Y %) of the risk actually occurring. The categories are as follows:

Unlikely: Extremely rare risks, with almost no probability of occurring. 0-10%.
Seldom: Risks that are relatively uncommon, but have a small chance of manifesting. 10-30%.
Occasional: Risks that are more typical, with about a 50/50 chance of taking place. 30-70%.
Likely: Risks that are highly likely to occur. 70-90%.
Definite: Risks that are almost certain to manifest. Address these risks first. 90-100%.

4. The fourth and final part of the process is to give each risk a specific level code. This is based on the previous two steps above (2 and 3). It is important to note than one might use a numeric scale as well, but the purpose here is to once again revise and estimate the actual risk level from a holistic perspective. There might be surrounding circumstances that may result in change of risk level even though that a specific probability as well as severity has been stated. The categories are as follows:

Low: The consequences of the risk are minor, and it is unlikely to occur. These types of risks are generally ignored, and often color-coded green.
Medium: Somewhat likely to occur, these risks come with slightly more serious consequences. If possible, take steps to prevent medium risks from occurring, but remember that they are not high-priority and should not significantly affect organization or project success. These risks are often color-coded yellow.
High: These are serious risks that both have significant consequences, and are likely to occur. Prioritize and respond to these risks in the near term. They are often color-coded orange.
Extreme: Catastrophic risks that have severe consequences and are highly likely to occur. Extreme risks are the highest priority. You should respond to them immediately, as they can threaten the success of the pilot case. They are often color-coded red.

Once you have ranked your risks, you can make a risk response plan to prevent or address those that are "high" or "extreme." You may not need to respond to risks ranked "low" or "medium" before you actually start implementing your pilot case (Table 2).

	Risk analysis matrix			RISK LIKELIHOOD KEY					
				IMPROBABLE	POSSIBLE	PROBABLE	RISK LEVEL KEY	acceptable to proceed	
				1	2	3			
	RISK SEVERITY KEY	ACCEPTABLE	1	1	2	3	LOW	YES	
		TOLERABLE	2	2	4	6	MEDIUM	YES	
		UNDESIRABLE	3	3	6	9	HIGH	NO	
		INTOLERABLE	4	4	8	12	EXTREME	NO	
REF/ID				PRE-MITIGATION					DEPARTMENT / LOCATION
	Risk group			Risk description			RISK SEVERITY	RISK LIKELIHOOD	RISK LEVEL	ACCEPTABLE TO PROCEED?

***Table 2**-The sheet "Risk Management Martix" – identification of the risks in pilot case*

Please also note that the template takes into consideration pre- and post-mitigation actions. We also recommend for you to use the second and third part of the template where you create specific mitigation plans with a responsible person managing the risks as well as take into consideration business risks of your BAPR pilot case.

3 BAPR risk assessment tool identification

The risk assessment tool purposed for the identification of potential risks of the BAPR project and its pilot cases is organized accepting the well-known risk evaluation matrix, type 3 by 3, with the addition of the common types of risks used for all types of the projects and its implementation (Indeed, 2021), with the exception of the one element according to the specificity of the BAPR project.

The risk matrix purposed for the BAPR project parties it is organized in the well-known 3 by 3 risk matrix way (OctoPerf, 2014). The theoretical risk levels used for the assessment and identification of the potential risks are demonstrated in the Figure 1.

PROBABILITY⇨ / ⇩IMPACT	1 LOW	2 MEDIUM	3 HIGH
1 MARGINAL	LOW 1 X 1	LOW 1 X 2	MEDIUM 1 X 3
2 MODERATE	LOW 2 X 1	MEDIUM 2 X 2	HIGH 2 X 3
3 CRITICAL	MEDIUM 3 X 1	HIGH 3 X 2	HIGH 3 X 3

Figure 1**- The theoretical 3 by 3 risk assessment matrix**.

The 3 by 3 risk assessment matrix (risk assessment tool) purposed for the BAPR project parties it is organized using the 4 by 4 risk assessment matrix framework incorporating the risk types related to the BAPR project and its pilot cases (Table 2). The resulting Risk assessment tool (RAT) is provided in the Table 3.

	PROBABILITY				
IMPACT		LOW	MEDIUM	HIGH	EXTREME
	ACCEPTABLE				
	TOLERABLE				
	UNDESIRABLE				
	INTOLERABLE				

***Table 3**-BAPR project Risk assessment tool (BAPR-RAT).*

RISK ANALYSIS TOOL FOR BAPR PROJECT PARTIES

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The organized matrix of the BAPR risk assessment tool identifies high and moderate level risks of the following elements: Operational risks (high risk level), Performance risks (high risk level), Skill resource risks (high risk level), Scope creep risks (moderate risk level), Costs risks (moderate risk level) and the Health and safety hazards (moderate risk level). The risks associated with the high risk level shall be considered by the BAPR project parties and the special attention shall be given to the key aspects, which potentially can have the influence on the increase of the named risks during the project implementation and the implementation of the pilot cases.

The generalized mitigation options are suggested to minimize the named risk elements during the implementation of the BAPR project and its related pilot cases. These options are listed in the Table 4.

No	Risk type	Impact	Probability	Option
1	**Operational** *dieback due to drought*	High	Critical	monitoring of project during growing season by educated staff, use of plants adapted to local conditions, consider cost of possible irrigation measures in the economic planning
2	**Communication**	High	Moderate	carefull selection of partners and external providers of services and early on implementation of regular communications and feedbacks
3	**Skill resource**	Medium	Low	education of staff on different key aspects of the project to a degree possible and appropriate to increase possibilities for a temporal internal redistribution of tasks and responsibilities; plan for additional costs due to employer training or additional recruitments if necessary
4	**Scope creep**	Marginal	High	detailed and thorough initial planning of the project/ regular feedback from all partners involved and including reports of the current state and future plans to the project leader, defining milestones to minimize risk for scope creep
5	**Costs**	Moderate	Medium	Simplifying financial procedures within project bounds shall be applied. National or institutional support has the dominant effects on the project implementation. Project parties shall consider additional abilities facilitating the implementation of the pilot cases.
6	**Health & safety**	Critical	Low	fencing of the project site to keep away trespassers, providing clearly visible information at the site informing about the

	safety and health risk for the common puplic			ongoing project and safety risks and also reach the interested public via guided tours, information days, web site etc.

***Table 4**- Proposed option to mitigate the risks during the implementation of the BARP project and its pilot cases.*

The BAPR-RAT draws the generalized framework for the risk assessment related to the BAPR project pilot cases to be implemented. However, the project parties are encouraged to assess the potential risks at their facilities, especially paying the attention to the external specific elements that could influence the implementation of the pilot cases, on their own. The elements of the risk matrix can be interchanged depending on the specific experiences of the project parties, assigning the different risk levels to each element, although the description of the elements shall not be changed.

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