



International
Labour
Organization

VISION ZERO FUND

Methodology for OSH hazard identification and risk assessment and evaluation in the coffee sector



Methodology for OSH
hazard identification
and risk assessment and
evaluation in the coffee
sector

Acknowledgement

This publication was made possible by the Occupational safety and health in the coffee supply chain project, implemented in cooperation with the Ministry of Labour of Colombia, and the Vision Zero Fund's (VZF) Improving occupational safety and health in the coffee value chain project, implemented with funding from the European Union. The present document reflects the outcomes of conversations and debates with various stakeholders in the coffee value chain, which enabled the development of a practical occupational safety and health risk management methodology.

Special thanks are owed to the following officials in the Ministry of Labour: Ángel Custodio Cabrera Báez, Minister of Labour; Isis Andrea Muñoz Espinosa, Deputy Minister for Labour Relations and Labour Inspection; Letty Rosmira Leal Maldonado, Director for Occupational Risks; Jorge Enrique Fernández Vargas, Promotion and Prevention Coordinator; and Marcela Soler Guio, Specialist; and to the ILO team: Ítalo Cardona, ILO specialist on labour law and administration; Rodrigo Mogrovejo, Chief Technical Advisor, Vision Zero Fund; Schneider Guataqui Cervera, national coordinator, Vision Zero Fund; and Yuber Liliana Rodríguez Rojas, consultant.

Contents

Acknowledgement	6
Occupational safety and health management in the coffee sector	9
Definitions of hazards and risks	11
Implementation of the methodology	11
Step 1. Hazards map	12
Step 2. Risk assessment	17
Step 3. Evaluating the risks and deciding on action	20
Step 4. Hierarchy of controls	21
Step 5. Outcome of the measures taken	22
Appendices	23

Tables

Table 1. Comparison of the definitions of “hazard” and “risk”

Table 2. Identifying activities

Table 3. Hazard symbols

Table 4. Classification of hazards associated with coffee production

Table 5. Hazard identification and risk assessment and evaluation

Table 6. Evaluating measures

Illustrations

Illustration 1. Steps to be followed when using the OSH risk management methodology

Illustration 2. Chart showing the procedures involved in coffee production

Illustration 3. Cartesian graph of a risk assessment

Illustration 4. Example of a risk assessment using a Cartesian graph

Illustration 5. Risk assessment interpretation

Illustration 6. Risk evaluation interpretation

Illustration 7. Hierarchy of controls

Occupational safety and health management in the coffee sector

According to recent estimates published by the International Labour Organization (ILO), 2.78 million workers per year have fatal occupational accidents (2.4 million of them disease-related) and diseases and 374 million have non-fatal occupational accidents. The number of working days lost amount to about 4 per cent of global gross domestic product (GDP) and, in some cases, as much as 6 per cent or more (ILO 2019b).

Occupational accidents and diseases have a significant impact on individuals and their families, not only from the economic point of view but also with regard to their long- and short-term physical and emotional well-being. They can also have serious consequences for enterprises: they affect productivity, interrupt production processes, undermine competitiveness and damage the reputation of enterprises throughout a value chain. This has implications for the economy and, more broadly, for society.

The Resolution concerning the recurrent discussion on social protection (labour protection), adopted at the 104th Session of the International Labour Conference, states: “Labour protection is at the heart of the mandate of the ILO. It is instrumental for achieving decent work and for contributing to social justice and social peace” (ILO 2015).

The Centenary Declaration for the Future of Work, adopted at the 108th Session of the International Labour Conference, states: “All workers should enjoy adequate protection in accordance with the Decent Work Agenda, taking into account: (...) safety and health at work” (ILO 2019a).

According to the report of the Global Commission on the Future of Work, rural economic development – on which the future of many of the world’s workers depends – should become a priority (ILO 2019b). Agriculture has been identified as one of the ILO’s priority sectors owing to the sector’s size in developing countries and to the high rate of exposure to occupational risks and incidence of injuries and diseases associated with this type of work.

Improving and promoting a culture of occupational safety and health (OSH) in the coffee sector will contribute to the achievement of Goal 8 of the Sustainable Development Goals (“Decent Work and Economic Growth”) and of target 8.8 (“Protect labour rights and promote safe and secure working environments for all workers”).

An estimated 1.3 billion people worldwide work in the agriculture sector, most of them on family farms where the farmers and their workers lack the knowledge and the means to prevent occupational risks. The agriculture sector is associated with a wide range of occupational risks, including exposure to hazardous machinery and tools, chemicals and other toxic and carcinogenic substances, infectious diseases, pests and parasites, dust, insufficient access to clean water and sewerage, repetitive and unnatural movements and postures, confined spaces, noise and vibration (ILO 2000).

Coffee is one of the most important of the global supply, food and agriculture chains and warrants special attention since over 80 per cent of global coffee production is sold internationally. This production is growing, having increased from 105.21 million 60 kilo bags in 2003–2004 to about 158.56 million in 2017–2018. Coffee is one of the most often sold and consumed food products in the global supply chains of both producing and importing countries. In both cases, this creates an opportunity for highly visible initiatives with a positive impact ranging from global supply chains to local communities (International Coffee Organization, 2020).

Over the past decade, coffee has experienced increasing product differentiation which is closely linked to growing consumer concern about the social and environmental conditions under which products are grown and manufactured and to the subsequent high penetration of private certification standards; coffee is one of the four foods with the highest sustainability standard penetration rates (Raynolds, Murray and Wilkinson 2007).

This desire to address social and environmental concerns creates an opportunity to promote the current global initiatives for improving OSH within the value chain.

Most coffee producers are small or medium-sized and operate plantations that do not normally receive institutional support for the prevention of occupational accidents and diseases. Education and training, language and cultural barriers, limited access to infrastructure (e.g. water and roads) and income levels are additional factors that make it more difficult for farmers and agricultural workers to identify and control risks effectively.

In order to address these needs, the Vision Zero Fund (VZF), through its Global Prevention Initiative, has strengthened projects designed to improve farmers' living conditions by addressing OSH deficits in global supply chains. The VZF is also part of the Group of 20's commitment to safe and healthy workplaces. To that end, a project entitled "Improving occupational safety and health in the coffee value chain" has been developed through the VZF and in cooperation with the European Union (EU) with the goal of reducing work-related accidents and

diseases in global coffee value chains. In cooperation with Colombia's Ministry of Labour, another project has also been developed with a view to the implementation of a strategy for creating safe and healthy working conditions in the coffee sector.

In addition, a case study conducted as part of the joint ILO – EU project identified various drivers and constraints for OSH improvement in the coffee value chain, including the fact that producers and workers on farms do not have adequate information on their rights, duties and actions with respect to health. Moreover, since almost none of the coffee farming population has occupational risk coverage, access to information and advice on OSH matters is also very limited; efforts to improve OSH with the involvement of and in coordination with numerous stakeholders throughout the value chain and their institutional environment are needed (ILO 2017).

For these reasons, the present methodology is an adaptation of the one developed by Colombia and provides a number of tools designed to facilitate, both pedagogically and in practice, the management of OSH risks in the coffee sector.

Definitions of “hazard” and “risk”

The ILO defines the terms “hazard”, “risk” and “risk assessment” as follows:

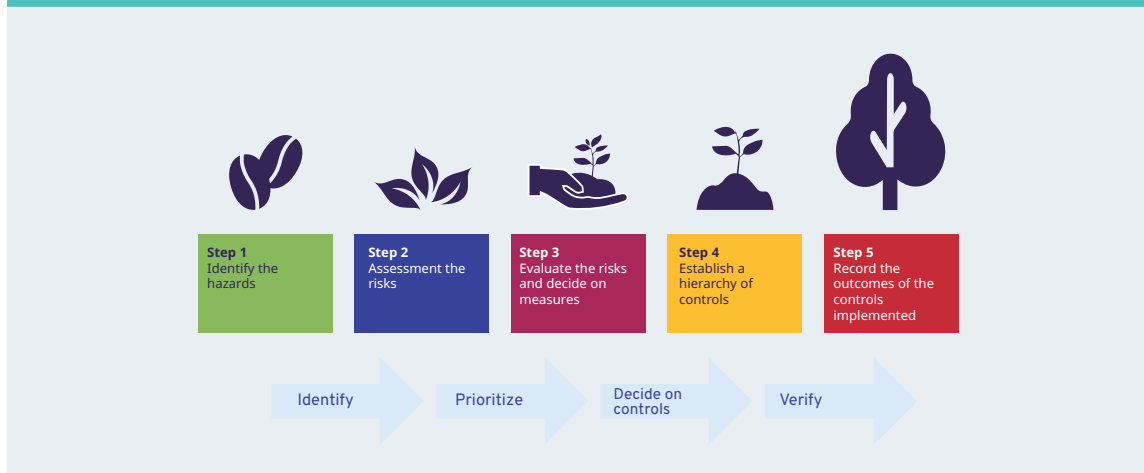
Table 1. Comparison of the definitions of “hazard” and “risk”

Concept	ILO
Hazard	Anything with the potential to cause harm (ILO 2018)
Risk	The combination of (a) the likelihood that a hazardous event will occur and (b) the severity of the harm that could occur, including long-term consequences. (ILO 2018)
Risk assessment	A careful examination of what, in the workplace, could cause harm to people. It enables a weighing up of whether enough precautions are in place or whether more should be done to prevent harm to those at risk, including workers and members of the public (ILO 2014)

Implementation of the methodology

The methodology comprises five steps that are used to identify hazards, assess and evaluate risks and decide on controls as seen from the following illustration:

Illustration 1. Steps to be followed when using the OSH risk management methodology



Step 1. Hazards map

Identifying activities

Hazard identification begins with a list of all of the workplace activities included in the coffee

production process. This procedure is set out in the first part of Appendix 1, as seen from the following example:

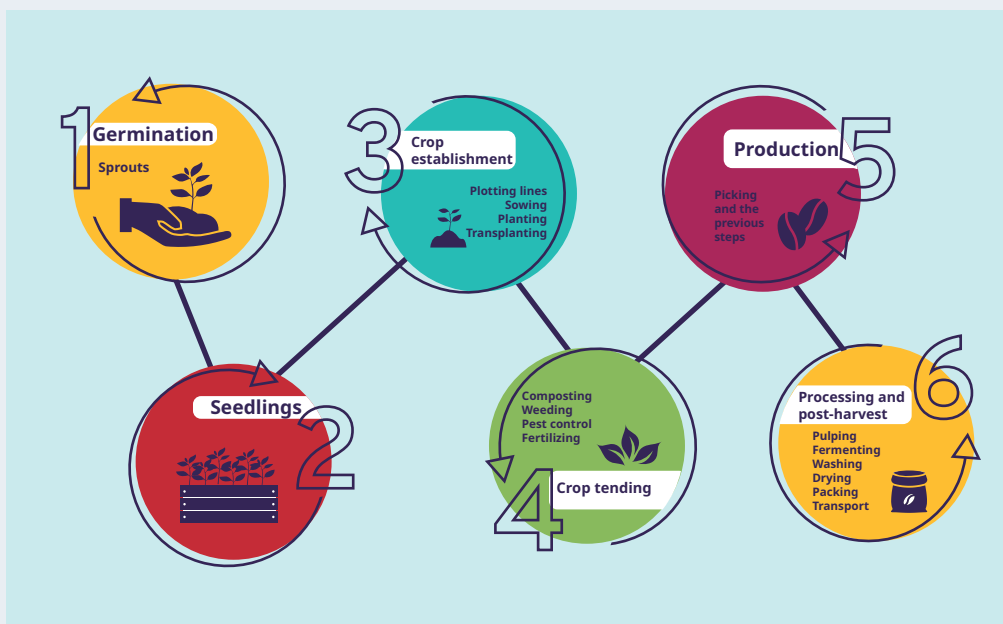
Table 2. Identifying activities

Activity no.	Name	Frequency (X)	
		Often (routinely)	Occasionally (not routinely)
1	Crop establishment	X	
2	Crop tending	X	

The following is an example of a chart showing the procedures and some of the activities involved in

coffee production, which might be taken into account in preparing Table 2:

Illustration 2. Chart showing the procedures involved in coffee production



Identifying hazards

Once the activities have been described, the hazards associated with each of them should be identified by asking:








- Are there established procedures for the activity?
- How is the activity carried out?
- Who might be injured and whose health might suffer?

- How could the injury or ill health occur?
- When could the injury or ill health occur?

Hazard symbols

This section introduces the hazard symbols to be identified for each activity in the coffee production process. The table is divided into two columns showing the name of the hazard and the image or symbol that identifies it.

Table 3. Hazard symbols

Hazard	Symbol
Biological hazard	
Physical hazard	
Chemical hazard	
Psycho-social hazard	
Biomechanical hazard	
Safety hazard	
Natural phenomena hazard	

*A full-page printable copy of the list of hazard symbols is provided in Appendix 3 for easy use in assessing risks.

Classification of hazards by activity

The following table may be used to classify the hazards associated with the coffee sector. This should be done for each of the activities currently under way in order to identify the relevant hazards:

Table 4. Classification of hazards associated with coffee production

In your opinion, what types of hazards do you encounter?		Yes	No
Activity	Agent		
Biological hazard	1. Viruses, bacteria, mould and parasites		
	2. Insect and other animal bites		
	3. Snake and other animal bites		
	4. Fluids and excrement		
Physical hazard	1. Noise		
	2. Vibration		
	3. Underground work		
	4. Poor lighting		
Chemical hazard	1. Fertilizers, pesticides, fungicides, herbicides and other chemical products, such as disinfectants		

Table 4. Classification of hazards associated with coffee production

In your opinion, what types of hazards do you encounter?		Yes	No
Activity	Agent		
Psycho-social hazard	1. Conflicts with co-workers or with the owner of the farm		
	2. Long working hours		
	3. Perceived physical assault or sexual/psychological harassment by co-workers or farm-owners		
	4. Overwork		
	5. Monotonous, repetitive work		
	6. Low income		
Biomechanical hazard	1. Standing, kneeling or squatting for more than two hours during the working day		
	2. Above-the-head arm movements		
	3. Repetitive hand and arm movements		
	4. Heavy lifting (e.g. bags or sacks of coffee), carrying loads, pushing or dragging heavy objects		

Table 4. Classification of hazards associated with coffee production

In your opinion, what types of hazards do you encounter?		Yes	No
Activity			
Hazard	Agent		
Safety hazard	1. Use of machinery, vehicles, machetes, sickles, chain saws and other items that can wound, bruise or crush body parts		
	2. Electrical contact or shock		
	3. Inadequate order and cleanliness		
	4. Public order (theft, robbery, delinquency, fighting or illegal armed groups)		
	5. Falls (on uneven ground)		
	6. Work at heights (over 1.5 m.)		
Natural phenomena hazard	1. Landslides, floods, fires and other natural disasters or emergencies		

*This list does not include all existing agents involved in coffee production. Additional agents present in the workplace should be added. This document is reproduced in Appendix 4.

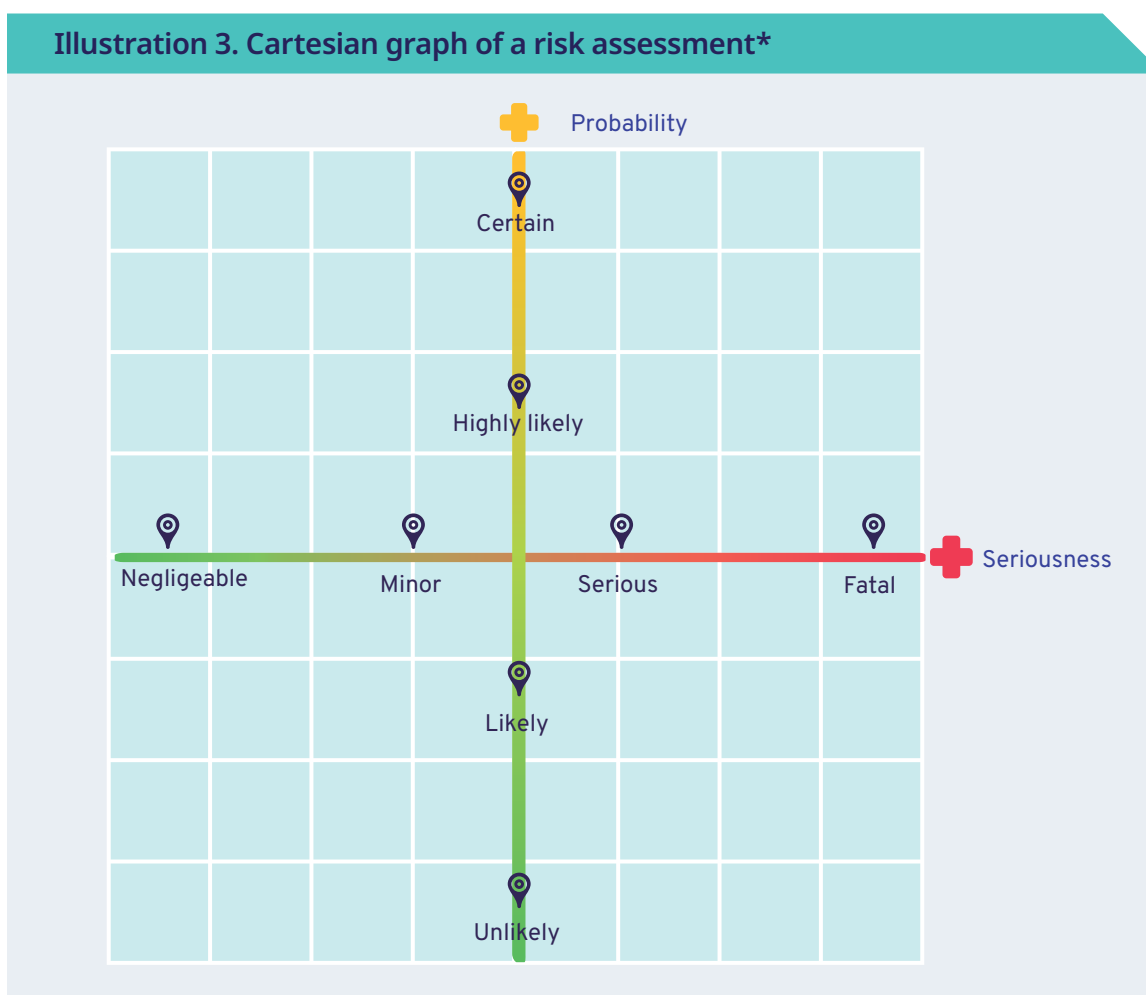
Step 2. Risk assessment

Description of risk assessment

Once the hazards associated with each of the activities have been identified, a risk assessment can be conducted based on the probability of these events

(work-related accidents and diseases) and on the seriousness (severity) of their consequences.

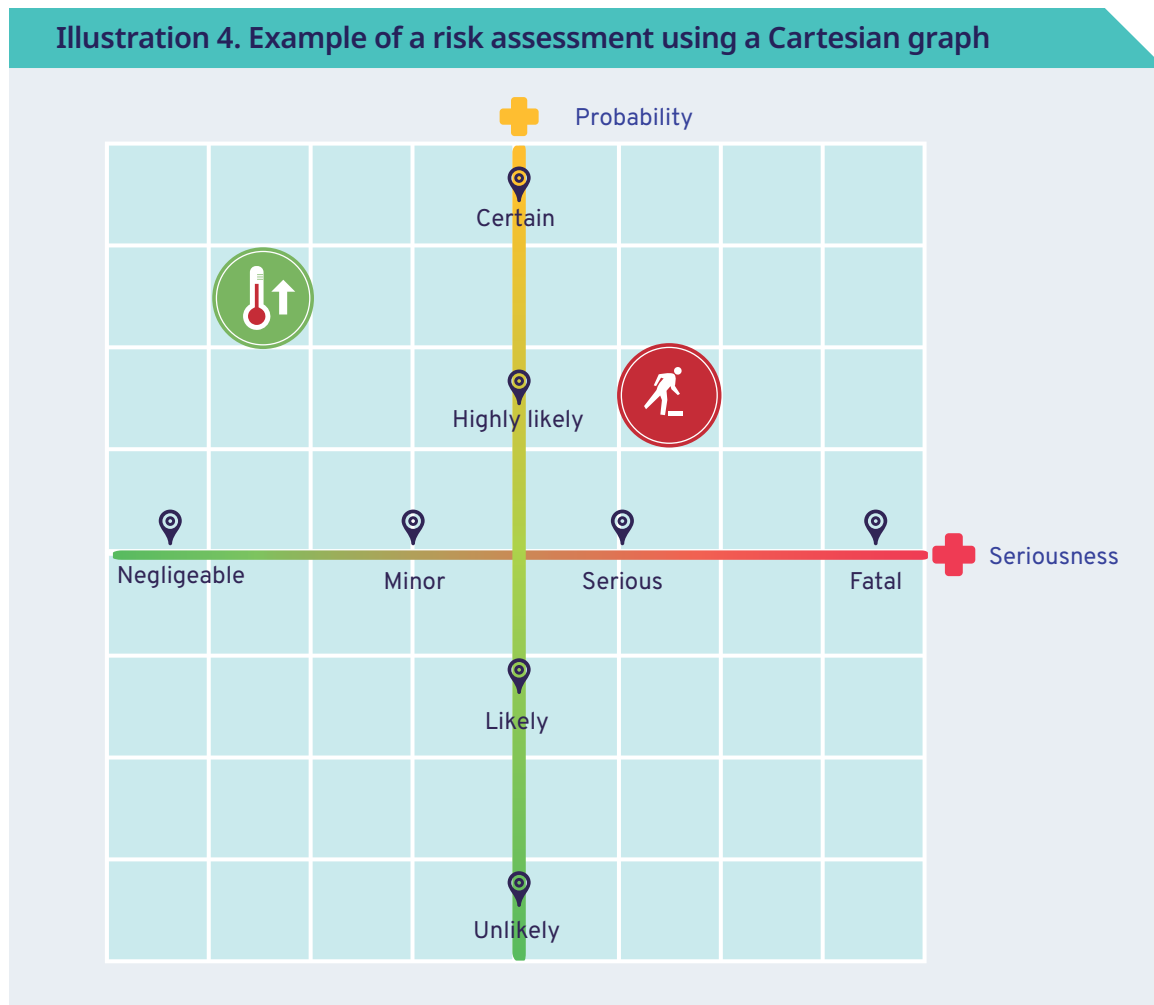
The probability of their occurrence ranges from *unlikely* to *certain* while their seriousness (severity) ranges from *negligible* injuries to the *death of a worker*. These definitions are reflected in following illustration of a risk assessment:



* A full-page printable copy of this Cartesian graph is provided in Appendix 5 for easy use in assessing risks.

In this step, for each activity that has been determined to be part of the production process and applicable to the workers, the symbols of the hazards identified should be placed on the Cartesian

graph in light of the definitions on the Y (probability) and x (seriousness) axes, as seen from the following example:



Explanation of the risk assessment: It was determined that one activity, crop establishment, posed a bio-mechanical hazard and a risk assessment found that its occurrence was *highly probable* and that it would have *serious* consequences. It was also determined that there was a physical hazard and that its probability was *certain* and its seriousness *negligible*.

Risk assessment interpretation

The interpretation is divided into three levels, described below:

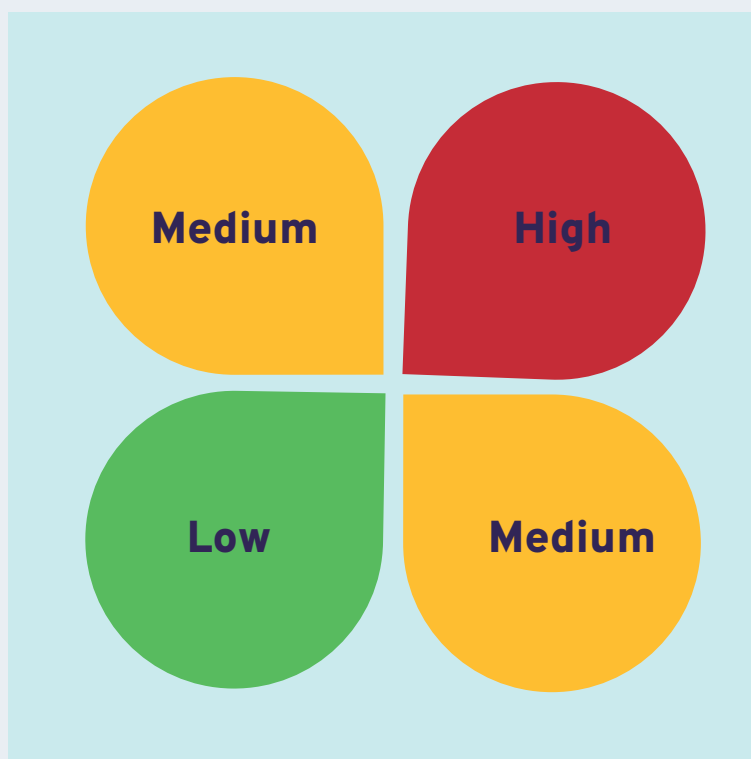
1. Low risk: action is needed in order to promote the health and protect the lives of workers;
2. Medium risk: intervention with a preventive

approach is needed since the lives and health of workers may be affected;

3. High risk: immediate intervention is needed since the lives and health of workers are in jeopardy.

The following illustration of a risk assessment interpretation should be used, selecting the quadrants corresponding to the hazards identified:

Illustration 5. Risk assessment interpretation



Step 3. Evaluating the risks and deciding on action

Using the risks assessed in the previous step, each risk is evaluated and the following three types of intervention are considered:

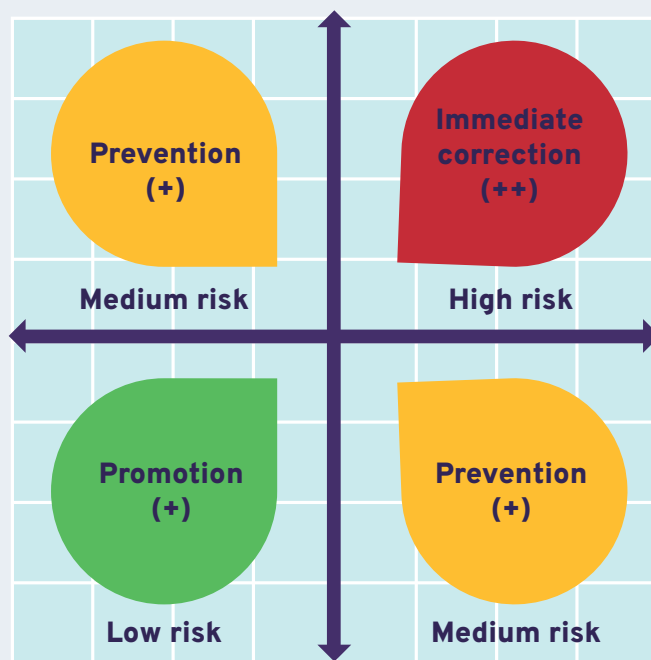
1. Correction: immediate action taken in order to address the hazard(s) that caused the event;

2. Prevention: action taken in order to eliminate or mitigate the cause(s) of the event;

3. Promotion: action taken in order to promote good health and prevent the event from occurring.

In so doing, Illustration 6 on interpreting a risk evaluation should be used, selecting the quadrant corresponding to the hazards identified:

Illustration 6. Risk evaluation interpretation



*A full-page printable copy of this risk assessment interpretation is provided in Appendix 6 for easy use in assessing risks.

The information resulting from the hazard identification and risk assessment and evaluation should be recorded in Appendix 1, as seen from the following example:

Table 5. Hazard identification and risk assessment and evaluation

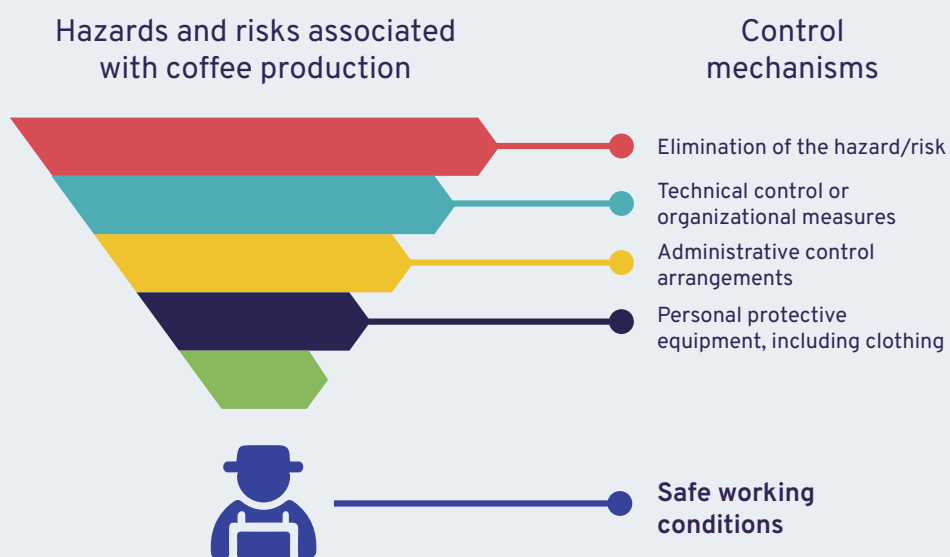
Hazard	Agent no.*	Risk level	Risk evaluation
Biomechanical	1 and 2	High	Correction
Physical	1	Medium	Prevention

* For the agent, only the number described in Table 4 (Classification of hazards associated with coffee production) should be recorded.

Step 4. Hierarchy of controls

Based on the risk evaluation, prevention and control measures are determined according to the following hierarchy:

Illustration 7. Hierarchy of controls



The following description of each category in the hierarchy of controls reflects the Guidelines on occupational safety and health management systems (ILO 2001):



1. eliminate the hazard/risk;
2. control the hazard/risk at source through the use of engineering controls or organizational measures;
3. minimize the hazard/risk by the design of safe work systems, which include administrative control measures; and
4. where residual hazards/risks cannot be controlled by collective measures, the employer should provide for appropriate personal protective


equipment, including clothing, at no cost and should implement measures to ensure its use and maintenance.


Step 5. Outcome of the measures taken


The measures determined and implemented require an evaluation process in order to demonstrate their effectiveness. To that end, they must be listed and placed into one of three categories: 1. *Good outcome*; 2. *Average outcome*; and 3. *Poor outcome*. It is also important to record the factors that facilitated or hindered implementation of the measure (see Appendix 2), as seen from the following example:

Table 6. Evaluating measures

Measures taken	Evaluation	Facilitating factors (+)	Hindering factors (-)
Personal protection equipment			The workers say that they do not use it because it makes them feel too hot
Sunscreen		Easy and convenient to use	

Good outcome 

Average outcome 

Poor outcome 


Appendices


Appendix I. Hazard identification and evaluation


Stage I							
Activity no.	Name	Frequency (X)		Hazard (see Table 4)	Agent no. (see Table 4)	Risk level (high, medium or low; see Illustration 6)	Risk evaluation (correction, prevention or promotion; see Illustration 6)
		Often (routinely)	Sometimes (not routinely)				

Appendix II. Evaluating measures

Hierarchy of controls	Evaluation	Facilitating factors (+)	Hindering factors (-)

Good outcome 

Average outcome 

Poor outcome 

Appendix III. Hazard symbols

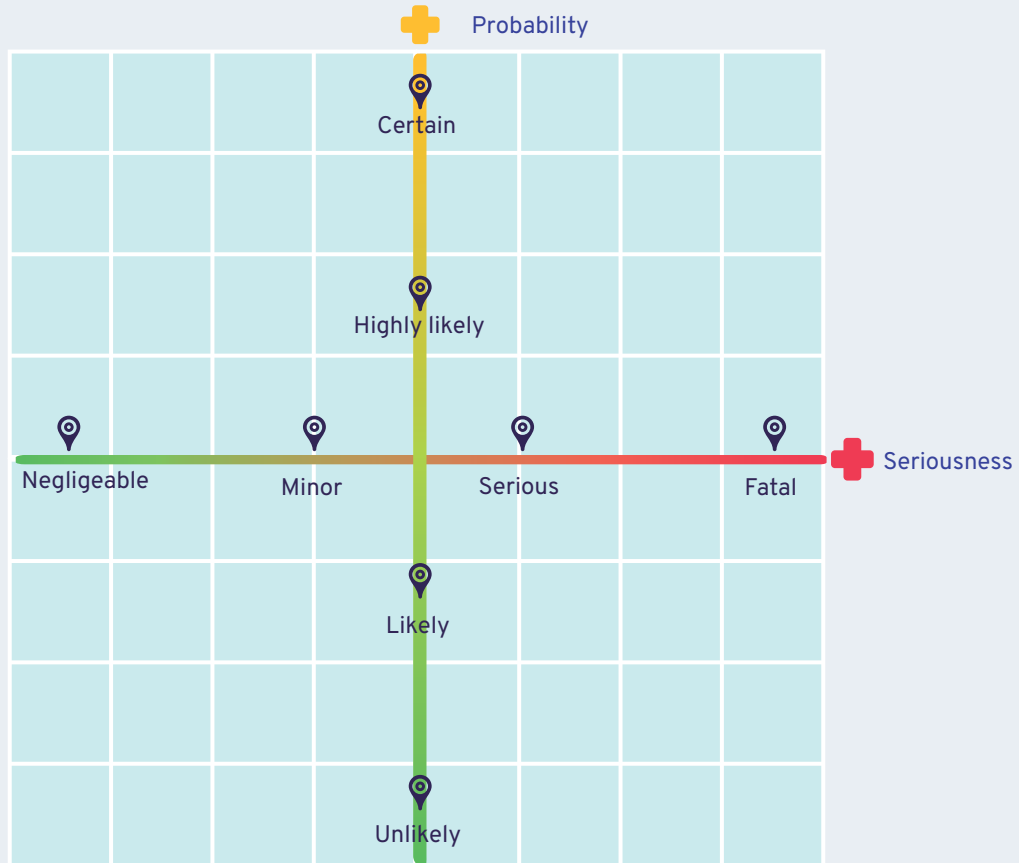
Hazard	Symbol
Biological hazard	
Physical hazard	
Chemical hazard	
Psycho-social hazard	
Biomechanical hazard	
Safety hazard	
Natural phenomena hazard	

Appendix IV. Classification of hazards associated with coffee production

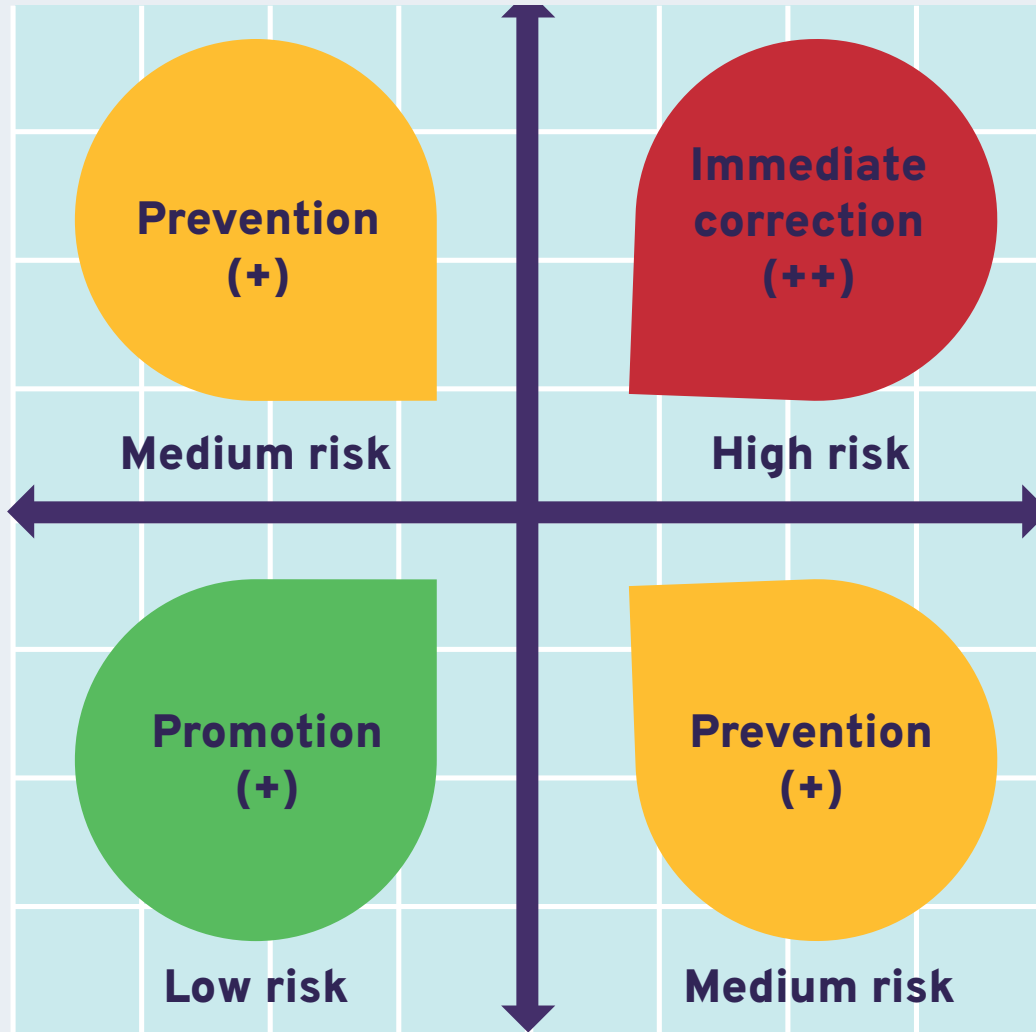
In your opinion, what types of hazards do you encounter?		Yes	No
Activity	Agent		
Hazard			
Biological hazard	1. Viruses, bacteria, mould and parasites		
	2. Insect and other animal bites		
	3. Snake and other animal bites		
	4. Fluids and excrement		
Physical hazard	1. Noise		
	2. Vibration		
	3. Underground work		
	4. Poor lighting		
Chemical hazard	1. Fertilizers, pesticides, fungicides, herbicides and other chemical products, such as disinfectants		
Psycho-social hazard	1. Conflicts with co-workers or with the owner of the farm		
	2. Long working hours		
	3. Perceived physical assault or sexual/psychological harassment by co-workers or farm-owners		
	4. Overwork		
	5. Monotonous, repetitive work		
	6. Low income		
Biomechanical hazard	1. Standing, kneeling or squatting for more than two hours during the working day		
	2. Above-the-head arm movements		
	3. Repetitive hand and arm movements		
	4. Heavy lifting (e.g. bags or sacks of coffee), carrying loads, pushing or dragging heavy objects		
Safety hazard	1. Use of machinery, vehicles, machetes, sickles, chain saws and other items that can wound, bruise or crush body parts		
	2. Electrical contact or shock		
	3. Inadequate order and cleanliness		
	4. Public order (theft, robbery, delinquency, fighting or illegal armed groups)		
	5. Falls (on uneven ground)		
	6. Work at heights (over 1.5 m.)		
Natural phenomena hazard	1. Landslides, floods, fires and other natural disasters or emergencies		

* This list does not include all existing agents involved in coffee production. Additional agents present in the workplace should be added.

Appendix V. Cartesian graph of a risk assessment



Appendix VI. Risk assessment interpretation



Bibliography

International Coffee Organization. 2020. *Trade Statistics Tables* (London).

ILO. 2001. *Guidelines on occupational safety and health management systems*, ILO-OSH 2001, second ed. (Geneva).

___. 2014. *A 5 Step Guide for employers, workers and their representatives on conducting workplace risk assessments* (Geneva).

___. 2015. Resolution concerning the recurrent discussion on social protection (labour protection). International Labour Conference. 104th Session.

___. 2017. "A Case Study of Drivers and Constraints for OSH in the Coffee Global Value Chain from Three Producing Regions of Colombia" in *Food and agriculture global value chains: Drivers and constraints for occupational safety and health improvement, Volume Two: Three case studies* (Geneva).

___. 2018. *Improving the safety and health of young workers* (Geneva).

___. 2019a. ILO Centenary Declaration for the Future of Work. International Labour Conference. 108th Session.

___. 2019b. *Work for a brighter future – Global Commission on the Future of Work*.

___. 2000. *Safety and health in agriculture* (Geneva).

Raynolds, L.; Murray, D.; Wilkinson, J. 2007. *Fair Trade: The Challenges of Transforming Globalization* (New York: Routledge Taylor).

VISION ZERO FUND

International Labour Organization

Labour Administration, Labour
Inspection and Occupational Safety and
Health Branch (LABADMIN/OSH)
Route des Morillons 4
CH-1211 Geneva 22
Switzerland

VisionZeroFund.org
vzf@ilo.org

Oficina de la OIT

para los Países Andinos
Calle 84A No. 12-18 Of 504
Bogotá, Colombia
Tel: +57 6237524

<http://www.ilo.org/lima>

Funded by the
European Union



El empleo
es de todos

Mintrabajo



International
Labour
Organization

+
SAFETY
HEALTH
FOR ALL

Vision Zero Fund is part of Safety & Health for All,
an ILO flagship programme building a culture of
safe, healthy work.

