

Risk prioritization in phytosanitary management

A step-by-step guide on prioritizing border management activities for phytosanitary agencies



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Contents

Section 1	Introduction	6
	Definitions	8
Section 2	Risk analysis and the application of phytosanitary measures	9
	Risk assessment	9
	Risk management	10
	Risk communication	11
Section 3	Risk prioritization	12
Section 4	Process of risk prioritization	14
	Who will establish the risk prioritization?	14
	Where will the data come from?	15
	How is the information used?	16
	How will the decision be validated and maintained?	18
	How is the entire process of risk prioritization audited and verified?	18
Section 5	Putting it all together	20
Section 6	References	22

This guide was developed to assist plant health services in emerging economies in Europe and Central Asia in prioritizing their border interventions to focus on high risk trade.

It presents information on risk analysis, risk prioritization, and risk-based inspection. The implementation of risk-based border measures is key to improving the efficiency and effectiveness of plant protection services while facilitating safe trade.







Section 1 Introduction

The establishment of a risk prioritization plan is an essential element to the modernization of phytosanitary services. Many phytosanitary agencies are under growing pressure to manage increasing volumes of imports and exports. Global trade has made the international movement of plants and plant products increasingly commonplace. Since 1950, world trade has grown 30-fold ([International Trade Centre, 2020](#)). Trade in live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage has increased from about U.S. \$8.8 million in 2001 to U.S. \$20.6 million in 2019 ([International Trade Centre, 2020](#)). Very rarely do phytosanitary agencies receive funding for the resources required to keep pace with the increases in volumes of trade.

The complexity of trade has equally increased. Many countries now produce a vast array of agricultural products and export them to an increasing number of international markets. Climate change, too, is affecting the distribution and complexity of pests moving with trade. Finally, and perhaps most importantly, risk prioritization is critically important to meeting obligations in facilitating safe trade. The World Trade Organization (WTO) [Sanitary and Phytosanitary \(SPS\) Agreement](#) requires members to establish sanitary and phytosanitary measures that are least restrictive on trade, while ensuring security and safety. Similarly, the [WTO Trade Facilitation Agreement](#) (WTO TFA), which came into force in February 2017, is a cornerstone in making trade more efficient while more

effectively managing security priorities, including plant health. The TFA Article 7.4 (**Box 1**) states that border agencies including phytosanitary agencies should, where feasible, undertake a similar assessment to concentrate their measures on high-risk consignments and expedite the release of low-risk goods. Such a process is becoming more and more important given increasing trade and static phytosanitary resources.

Box 1: Excerpt of text from the WTO Trade Facilitation Agreement

Article 7: Release and clearance of goods

4. Risk management

4.1 Each Member shall, to the extent possible, adopt or maintain a risk management system for customs control.

4.2 Each Member shall design and apply risk management in a manner as to avoid arbitrary or unjustifiable discrimination, or a disguised restriction on international trade.

4.3 Each Member shall concentrate customs control and to the extent possible other relevant border controls, on high-risk consignments and expedite the release of low-risk consignments. A Member also may select, on a random basis, consignments for such controls as part of its risk management.

4.4 Each Member shall base risk management on an assessment of risk through appropriate selectivity criteria. Such selectivity criteria may include, inter alia, the Harmonized System code, nature and description of the goods, country of origin, country from which the goods were shipped, value of the goods, compliance record of traders, and type of means of transport.



Beyond the obligations in the TFA, phytosanitary agencies are increasingly working to improve management systems given fixed budgetary resources. Rather than relying on prescriptive policies that prescribe routine inspection, sampling or testing of commodities, agencies are increasingly evaluating the results of inspections, sampling, and the outcomes of testing, and then prioritizing border interventions to address the highest risks. This process of risk prioritization can help phytosanitary agencies focus resources while at the same time facilitating safe trade¹. This reduction in activities on lower risk commodities is important in reducing the market costs of imports.

¹ Although the establishment of risk prioritization will assist agencies in developing a more targeted use of their human resources, at the outset of implementation agencies may need additional human and financial resources to undertake assessments and to collect sufficient data to support the ongoing prioritization process

Definitions

Hazard

Any condition, situation, practice, behavior that has the potential to cause harm, including injury, disease, death or environmental, property, and equipment damage.

Intended use

Declared purpose for which plants, plant products or other articles are imported, produced or used. (**Food and Agriculture Organization, 2019**)

Pest risk analysis

The process of evaluating biological or other scientific and economic evidence to determine whether an organism is a pest, whether it should be regulated, and the strength of any phytosanitary measures to be taken against it. (**Food and Agriculture Organization, 2019**)

Pest risk assessment

Evaluation of the probability of the introduction and spread of a pest and the magnitude of the associated potential economic consequences. (**Food and Agriculture Organization, 2019**)

Risk

Likelihood and impact that occurs from exposure to a hazard.

Risk assessment

Process of assessing the risks associated with hazards and generally describing the severity and impact that could result from the hazard.

Risk management

Evaluation and selection of options to reduce the risk of introduction and spread of a pest (**Food and Agriculture Organization, 2019**). This includes actions to reduce the risk and/or those to prevent increase of the risk.

Sanitary and phytosanitary measures

Any measures applied to protect animal or plant life or health within the territory of the Member from risks arising from the entry, establishment or spread of pests, diseases, disease-carrying organisms or disease-causing organisms. (**World Trade Organization, 1995**)



Section 2 Risk analysis and the application of phytosanitary measures

The pest risk analysis (PRA) process is well described in several International Standards for Phytosanitary Measures (ISPM), including the [**ISPM 2, Framework for pest risk analysis**](#) and [**ISPM 11, Pest risk analysis for quarantine pests**](#).

The process combines three independent but integrated activities:

1. risk assessment
2. risk management and
3. risk communication

It includes a technical analysis of the potential for a pest to move in trade, establish and cause economic or environmental damage and the potential options related to managing the risk.



Risk assessment

Pest risk assessment is an objective analysis of the risk of a pest to move on plants or plant products and to become established in the country (of import). The assessment considers climatic and environmental conditions, the availability of host material and other factors, which would favor establishment and spread. It is important to note that pest risk assessment is a tool, not a solution.

[**ISPM 32, Categorization of commodities**](#) provides guidelines on how to assess possible pest risks that might be

involved with a specific trade. ISPM 32 identifies four categories that group commodities according to their level of pest risk (two each for processed and unprocessed commodities). This concept of categorization of commodities also includes a consideration of whether the commodity is processed or not and if so, the effect on pest risk of the method and degree of processing.

The categorization also considers the intended use of the commodity and its potential as a pathway for the spread of pests. The intended use of a commodity may be for:

- planting
- consumption and other uses (e.g. crafts, decorative products, cut flowers)
- processing

Some intended uses of a commodity are associated with a higher probability of a regulated pest moving with the commodity, entering a new area, and establishing there. For example, propagative plant material that is intended for planting may be infested with a pest and is therefore more likely to spread this pest than a pest associated with a dried fig intended for consumption or wood chips intended for use as a fuel. Of course, transport, storage, treatment following import and other factors influence the risk of all commodities but the intended use may result in the application of different phytosanitary measures for each commodity. Deviations from intended use after import (e.g. grain for milling used as seed for sowing; potatoes for consumption used for planting, etc.) are not considered in the ISPM, but these are very important in understanding a product's risk. When considering these risks, management measures should separate those procedures required to mitigate risks for legitimate trade, and those required to reduce non-compliant behaviors. The latter generally include punitive actions.

Risk management

ISPM 32 provides useful information when considering the inherent risk of a specific imported commodity in the pest risk assessment phase. It provides the context for a decision but not the outcome. A decision on the application of management measures is made following a consideration of the potential options to mitigate the risk, the views of stakeholders, and evaluation of the potential impacts of the mitigation options. The risk manager must then make a regulatory decision about whether imports should be allowed and under what conditions, if any.

Risk mitigation options can include:

1. The risks are acceptable (i.e. the outcome of the activity creating the hazard(s) is worth the risks),
2. The risks can be reduced (i.e. actions can be used to reduce the risks to an acceptable level),
3. The risks can be avoided (i.e. a different approach may be taken with the same outcome but with a more acceptable level of risk),
4. The risk can be transferred (i.e. another party takes on the risk),
5. The risks are unacceptable and cannot be mitigated (i.e. trade is not permitted),
6. The risk is unacceptable but must be accepted because it cannot be mitigated (e.g. natural spread of pests).





Experience and perspective are important in decision-making. Consistency in decision-making is also an important underlying principle that allows trading partners and traders to fully comprehend the decision and to ensure that an appropriate balance between safety and security has been achieved. Not everyone views risk the same way (risk averse vs. risk-taker).

Other factors that can influence decision-making include: social implications, costs and benefits of the actions taken to mitigate the risk vs. the resulting impacts, personal choices of those in position to make the decision, and the views of stakeholders. Ultimately any phytosanitary measure applied should be least restrictive to trade and proportional to the pest risk identified.

The application of measures often includes both measures at pre-export in the country of origin or country of re-export, at entry to the country of import and sometimes post-entry.

These measures could include inspections, treatments, quarantines, sampling and testing, etc. In many cases, inspection, sampling and testing are applied by the exporting country in relation to certification activities, but also at the time of import or following import to validate that the consignment is compliant with import requirements or is pest free. This application of measures for pre-exit and post-entry are for different purposes. Export inspections are performed by authorities familiar with the pests of concern in the region and therefore can more easily validate that risks have been managed. Import inspections are performed to validate that pre-export measures, if required, have been effective or where no export measures have been applied that the material is generally free of pests.

Risk communication

Risk communication is a critical component of the entire risk analysis process. It provides information towards the assessment and in deciding the measures to be applied. It also enables the risk manager to communicate the processes of assessment and decision-making, the reasons for the decision, and the outcome. Finally, it is also a critical part of the ongoing evaluation of the decision and whether adjustments should be applied.

Communicating the outcomes of the policy ensures that stakeholders including traders understand that decisions are fair and result in needed protection.

In modernized risk management the role of the trader (including producers or processing facilities) has changed from simply regulated parties who follow the requirements to a collaborator in managing risk. Many organizations reward compliant behaviors (e.g. with reduced supervision, etc.), while scaling up from deterrence to punitive measures for non-compliance. This approach of performance-based management allows good performing companies to share the role of managing the risk, while reducing the sum of the costs associated with border interventions and delays.



Section 3 Risk prioritization

With the increasing use of automation, regulatory authorities have access to more and better-quality data on commodities moving in trade. Compliance data collected by field staff, laboratories and other regulatory agencies (including Customs authorities, etc.) provides useful information for the prioritization of border activities. This process of operational evaluation and adjustment of activities is referred to as risk-based border management.

It is dynamic and focuses operational resources on the highest risks. Risk analysis provides a result on addressing a specific commodity or pathway. The risk prioritization process takes the analysis one step further by evaluating the risks across all the commodities imported with a consideration of the overall resources available to mitigate the risks and where best this may be done. A simple example of prioritization is provided in **Box 2**.



Box 2: Example of a risk-based consideration

A plant commodity of low risk has been inspected 100 times from the same exporter going to the same importer. Is it necessary to conduct inspection 101? Although future inspections may be needed to confirm the assumption that shipments continue to pose a lower risk, redeployment of resources to a higher risk item, when shipment 101 arrives is likely a better use of the organization's staff.

Factors such as compliance, the availability of resources at specific locations, the seasonality of the trade, the level of activities required to monitor specific commodities, can be used to enable countries to better prioritize their activities.

The extent to which inspections, sampling and testing are required should consider the:

1. Risks of the commodity in relation to other imports;
2. Risks presented by the origin;
3. Extent of the measures applied prior to export;
4. Quality of export procedures in the country of export;
5. Compliance rate of the commodity;
6. Compliance rate of the specific exporter and importer.

Validating that the decisions were made correctly and continue to be correct is essential to an effective risk management program. This monitoring and review should be a part of an everyday management program.

Decisions should not remain static but should use all data available to generate an ongoing assessment of risks in comparison to all the activities of the agency. This process of ongoing evaluation and adjustment of risk management is part of an overall management strategy incorporating risk prioritization and implementation of a risk-based border management.

An example of the application of risk-based border management is provided in **Box 3**.

Box 3: Example of risk-based border management

The import of strawberries from a neighboring country may present a risk for the movement of a serious weevil. Strawberries may be imported from several other countries which are also risks for insect movement and establishment in the importing country and the same pre-exit measures are required from all the countries. Import inspections have historically demonstrated that strawberries from the neighboring country are almost always free of pests and that pre-exit certification of the commodity is enough to address the risks. The importing country therefore has reduced the import inspection frequency for the commodity when it is shipped from the neighboring country. Random inspections are still performed to validate that the compliance rate remains high. Strawberries arriving from several other countries are considered higher risks for several reasons: compliance has not been as high and certain exports have been found to be non-compliant. For these reasons, import inspections are conducted frequently, if not always. As time progresses the importing country collects further data indicating that one other country is also a reduced risk for pest entry. Consequently, the importing country can further reduce border inspections of strawberries from this second country replacing them with market surveillance.

Crucial to establishing such an approach is the adequate collection of import-related data and statistics. Agencies are often in possession of operational data and may have systems to collect import-related data. In this regard, many agencies establish specific risk units to monitor information that supports the risk decision-making. These units collect data related to imports and export activities, assess compliance rates, monitor for changes to threats, initiate revised assessments, and recommend changes to ongoing management approaches. These units may not require new staff but may redeploy existing staff to focus on data collection and analysis.

Section 4

Process of risk prioritization

Establishing a risk prioritization process requires the phytosanitary agency to consider some key questions:

1. Who will establish the risk prioritization?
2. Where will the data come from?
3. How is the information used?
4. How will the decisions be validated and maintained?
5. How is the entire process of risk prioritization audited and verified?

In the following sections, we will explore how to best address these important questions.

Who will establish the risk prioritization?

Often a team of risk managers or senior staff that have experience in evaluating phytosanitary risks, establishing phytosanitary policy, and advising policymakers and stakeholders on phytosanitary decisions are tasked with developing a risk prioritization framework.

The risk prioritization framework sets out the overall policy of how and what information will be used to guide the development of more specific procedures and practices in relation to operational policy. Often the mandate to undertake the process comes from the most senior executive in the organization.

Where will the data come from?

Data to carry out the prioritization can come from many sources. The implementation of electronic single windows provides an opportunity to compile data more efficiently and to access sources of information that may not be currently available to phytosanitary authorities.

The framework will set out:

- Overall purpose and objectives of establishing a risk prioritization framework;
- When and how the prioritization will be undertaken and by whom;
- How the decisions included in the strategy will be validated;
- How the information should be used by field staff;
- How the strategy will be communicated to stakeholders.



As noted earlier, the most relevant information should be information collected by the organization related to imports. This could be done by establishing common spreadsheets for use by port offices, utilizing data collected by customs agencies, and developing in-house systems. Generally, an analysis of the last three years of import information will yield vast amounts of information on risk of commodities imported.

Data collected should provide a good understanding of:

- Numbers of imported consignments and lots;
- Categories, types and species of plants or plant commodities;
- Volumes in a consignment;
- Countries of export;
- Countries of origin;
- Names and contact information of exporters and importers;
- Volumes of plant material inspected;
- Results of phytosanitary checks (including volume of the commodity checked, documentary problems, pests detected, pests submitted for laboratory confirmation, pest species confirmed by laboratory identification, etc.);
- Results of any sampling and testing conducted;
- Volumes of samples collected.

From this information, risk managers can make informed decisions on whether some imports present lower risks, while others present higher risks.

The nature of non-compliances or rejections can also provide useful information regarding the risks of commodities. For example, documentary issues may not identify high risk threats but may warrant a higher inspection of documents or further engagement between the importing and exporting country. **ISPM 13, Guidelines for the notification of non-compliance and emergency action** provides guidance on notifying the exporting country of non-compliant shipments. Timely notification is essential to ensuring that the exporting country can adjust its procedures to ensure compliance with import requirements.



The import records of other countries (e.g. [European Union Interceptions of harmful organisms in imported plants and other objects](#)) and reports by Regional Plant Protection Organizations (RPPO) (e.g. [EPPO reporting service](#), [NAPPO Pest Alert System](#), etc.) on compliance can provide useful information to conduct risk prioritization. The [IPPC official pest report \(Art. VIII.1a\)](#) can also provide useful information. Many countries also regularly provide information about the phytosanitary situation in the country. This information is often published on country websites or on the websites of [Regional Plant Protection Organizations \(RPPOs\)](#) or [the International Plant Protection Convention \(IPPC\)](#).

In performing the risk prioritization, the following elements should be considered:

- The practical experience of inspectors and others working at the phytosanitary agency and the experience of other countries, especially those with similar imported commodities;
- Biological conditions in countries of origin – certain life-stages of a pest may have a seasonal factor to movement and spread and therefore present a lower risk at certain times of year. During these lower risk periods, inspections can be reduced in frequency and/or intensity; and
- Timing of imports – seasonal factors could also reduce the potential for pest establishment. For example, commodities moved in winter when pest spread is unlikely and the commodity is likely to be consumed before pests can be spread, may be a lower risk.

How is the information used?

Once the sources of information have been identified, the risk managers can then move to developing a risk prioritization for the imported commodities. Depending on the outcome of non-compliances, the information provided from other sources, and experiences of the staff, the commodities can be ranked in low, medium and high-risk consignments. An initial listing is often undertaken by a group of experienced risk managers who debate the appropriate priority of the commodities and the resulting interventions which may be applied to each.

Box 4 provides a simplified example of a plan. The values provided are for illustration purposes only. The resulting frequency of inspection depends on several factors including the volumes of trade, the inherent pest risks associated with the commodity, the likelihood of a pest moving from the commodity to a vulnerable host, etc.



Box 4: Example of a risk-based border management plan

Commodity	Origin	% Compliance	Length of Compliance Data Collected	Resulting Inspection Frequency ²
Roses	Country B	100	Average of 30 consignments per month collected for 3 years	1/10 shipments
Apples	Country B	87	Average of 100 consignments per month collected for 2 years	½ shipments
Apples	Country A	100	Average of 20 consignments per month collected for 7 years	1/10 shipments
Apples	Country C	Insufficient data collected	Total of 30 consignments inspected	All

Greater risk prioritization can be undertaken by considering the compliance of specific exporters or importers, whether alternative measures can be applied, etc. For example, in the table above imports of apples from country B may only reflect non-compliances associated with imports for a specific exporter or importer. When those consignments are removed, compliance may be 98%. In this case, it would be valid to treat all imports as in the case of apples from country A, apart from those imports associated with the higher non-compliant shipments which may be subjected to 100% inspection.

Additionally, although reduced frequencies are proposed for roses from country B, it may be that the plant protection service considers roses a slightly greater risk than apples. For this reason, although the frequency of import inspection has been reduced to a similar level as apples from country A, the plant protection service may undertake inland monitoring of the roses to more thoroughly assess the validity of the decision.

² The frequencies need not be applied in an even distribution, but could be adjusted to account for seasonal variation in trade, volumes through a specific port, time of year, etc. For example, during periods of higher volumes of trade, the frequency could be increased, then reduced during lower risk periods resulting in a cumulative frequency that meets the target.

How will the decisions be validated and maintained?

As noted earlier, often phytosanitary agencies establish risk analysis units to monitor information and adjust actions based on new or improved data. Units may consist of a team of risk managers receiving data in real time from frontline staff and by combing through other useful data such as relevant information published by RPPOs and the IPPC. However, it may also be a single staff member dedicated to analyzing data collected and submitted on spreadsheets on a monthly basis. Whether this should be a team, or an individual risk manager greatly depends on the amount of data being analyzed and how frequently analysis is conducted. For example, countries with large import volumes usually use more staff to manage the information. Once the data is analyzed, the inspection approach may be updated monthly, quarterly or annually. However, if a serious threat is detected, the agency should have contingency plans to address the threat in a timely manner (e.g. an email sent to frontline staff, affected traders, and trading partners [as per [guidance of the WTO](#)] notifying them of the changes).

How is the entire process of risk prioritization audited and verified?

The validation of decisions made should be undertaken by establishing key performance measures to ensure that safe trade has been maintained. Internal surveillance systems offer a good means of monitoring for pests which can be potentially introduced with imports. Post-entry audits can also monitor imported commodities. Agencies can establish audits at destination to verify risk prioritization decisions continue to be valid.

The mechanisms used to validate the decisions should review the entire process of data collection and analysis, conclusions that were drawn, whether the decision-making process is sound and of the process of prioritization. Whenever necessary, the process should be amended or updated accordingly.

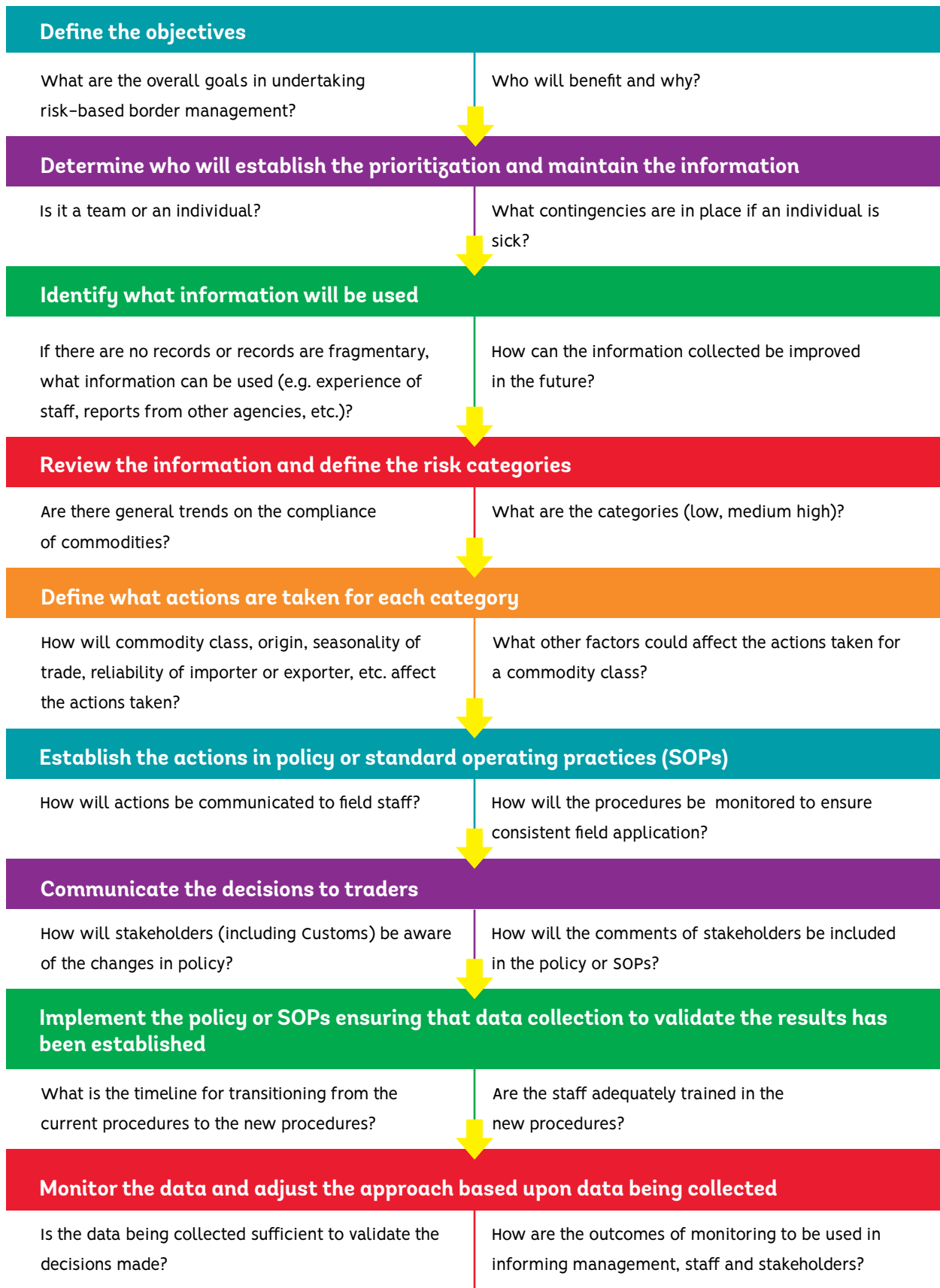




Section 5 PUTTING IT ALL TOGETHER

Establishing a risk prioritization process can be viewed as a step-by-step process. The following is a summary of the steps. It does not include all the potential considerations for undertaking a risk prioritization.

Figure 1: The risk prioritization process/steps



Section 6

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