



**Food and Agriculture  
Organization of the  
United Nations**

**BUILDING RESPONSIBLE  
GLOBAL VALUE CHAINS  
FOR SUSTAINABLE  
TROPICAL FRUITS**

**WEBINAR ON RESILIENCE AND CLIMATE CHANGE ADAPTATION IN THE ASIA-PACIFIC REGION  
SUPPORTED BY THE INTERNATIONAL TROPICAL FRUITS NETWORK (TFNet)**

**Summary report**

**24 November 2022, 09.00-10.15 Rome (UTC+2), on Zoom**

Background

As part of the outreach strategy for the Responsible Fruits Project in the Asia-Pacific region, online technical webinars and capacity development workshops have been organized in partnership with the International Tropical Fruits Network (TFNet). On 28 September 2022, a capacity building workshop was held to support tropical fruit companies interested in carrying out due diligence to reduce sustainability risk and increase resilience to shocks. Building from this webinar, on 24 November 2022, another technical peer learning webinar was held focusing on the two interlinked topics of resilience and climate change adaptation.

This session served to introduce members of TFNet to the topics of resilience, climate change risks and adaptation strategies for avocado and pineapple value chains, complementing the series of peer-learning events and working group sessions organized by the project in other regions. These topics were included in the project in response to the growing need to build resilience to external shocks following the COVID-19 pandemic, climate hazards and economic slowdown, as well as prioritization of climate change by the participating companies as one of the main sustainability challenges they face.

The webinar mostly targeted pineapple export companies given the importance of the pineapple sector in the Asia-Pacific region, as well as research institutions engaged in tropical fruit research. A discussion was facilitated around resilience and climate change impacts in the tropical fruit sector, to share experiences and approaches to building resilience and adapting to climate change impacts. Inputs from this webinar will be used to inform the development of a technical guide on climate change adaptation for the avocado and pineapple industry and a study of resilience issues facing both value chains. Other ongoing work of the project was also discussed, and participants invited to participate in future activities and consultations planned in the Asia-Pacific region.

The session also served to discuss the linkages between the resilience and sustainability work of the project, and how embedding resilience into business operations, for instance through due diligence practices, is needed to make progress towards sustainability.

### Session objectives

The purpose of the webinar was twofold:

1. Introduce participants to the activities comprised in the resilience component of the project, which focuses on strengthening the resilience of avocado and pineapple value chains to external shocks and stressors.
2. Present the Technical Guide on Climate Change Adaptation for the avocado and pineapple industry under development by the project.

### Participation

Sixteen participants joined the webinar, representing producer organizations, packers, processors and research institutions from China, Indonesia, Malaysia, the Philippines and Viet Nam.

### Summary

The event agenda is presented in Annex 1. All presentation slides are available by sending a request to [Responsible-Fruits@fao.org](mailto:Responsible-Fruits@fao.org). The event and its context in the framework of the Responsible Fruits project were introduced by FAO. After this, FAO familiarized participants with the specific topic of resilience, highlighting its importance for tropical fruit value chains and its alignment with sustainable practices and responsible business conduct (Part 1). A short discussion section followed to explore the main resilience challenges faced by the pineapple sector as perceived by participants, and to reflect on their readiness to prepare for and adapt to future shocks and stressors (Part 2). In Part 3, FAO presented the ongoing work on Climate Change Adaptation. It was discussed why climate change risks, impacts and adaptation strategies must be considered as an integral part of any resilience strategy, as the tropical fruit sector is particularly at risk of rising temperatures, extreme weather events and associated challenges such as water stress and pest and disease outbreaks. Businesses in the tropical fruit sector can adapt to climate change by introducing practices to help them cope with these effects (e.g., drought-resistant varieties, irrigation technologies, integrated pest management and weather monitoring and insurance among others) and reduce the likelihood of exacerbating existing risks. The fourth part involved an open discussion that revolved around understanding the climate risks that businesses are facing and validating the risks found in literature for the Asia-Pacific region. Lastly, FAO outlined the next steps for the project, including the preparation of a Technical Guide on Climate Change Adaptation and a study on resilience.

### **Opening**

**Jesper Karlsson, FAO and Yacob Ahmad, TFNet**

The tropical fruit sector has been particularly affected by compounded disturbances, such as extreme climate events and other shocks including the COVID-19 pandemic and economic slowdown that have caused disruptions to supply chains and constrained import demand through reduced purchasing power. The tropical fruit sector is particularly vulnerable due to the perishable nature of its produce, the relatively high prices of tropical fruits compared to other fruits or staple commodities, and the heavy reliance on manual labor for production and harvesting, all of which put at risk its continuity when shocks or long-term stressors occur.

Despite this exposure to compounded risks, actors in tropical fruit value chains do have the ability to respond and adapt to the different shocks faced. Some producers have already adopted new practices that promote the sustainable use of natural resources and address issues related to water scarcity and soil degradation. Some value chain actors have also been proactive in conducting risk analyses to better understand their vulnerabilities and how to manage these in a timely manner.

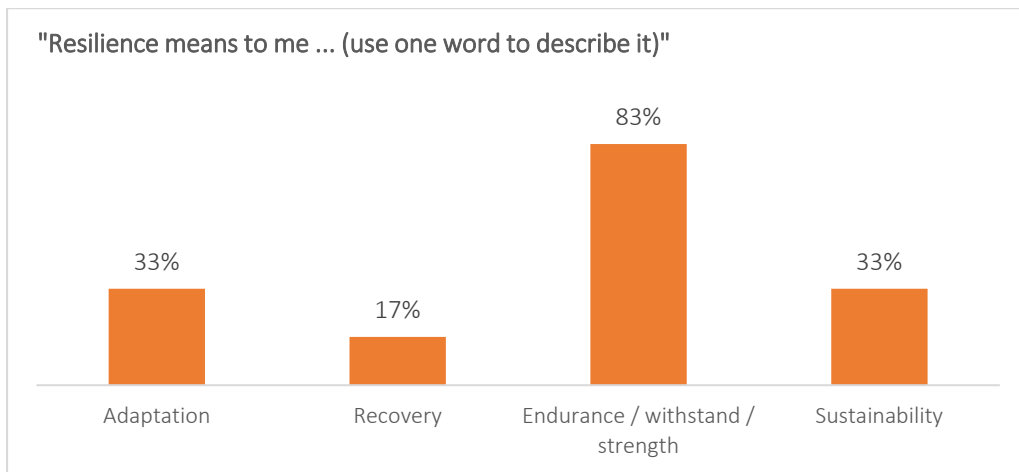
Aiming to strengthen the resilience, including the adaptation capacities of value chains actors and operation, the project and TFNet are working together with businesses operating in the avocado and pineapple sectors in the Asia-Pacific region to be better able to respond and adapt to future risks, including climate change and extreme weather events.

**Part 1 - Resilience: What and why?**

**María Hernández Lagana, FAO**

Resilience is understood as the ability of systems or system components to prevent, anticipate, absorb, adapt and transform when faced with a wide range of risks while maintaining an acceptable level of function, without compromising long-term prospects for sustainable development and well-being for all.<sup>1</sup> This definition of resilience embeds a component of change and transformation and goes beyond the simplified concept of the ability to “bounce back” or merely coping with an event. This difference is particularly important, as once recovered, the system (or its components) can still be exposed and/or vulnerable to recurring shocks or long-term threats, such as climate change.

The definition is aligned to companies’ understanding of resilience as shown in the Word Cloud exercise (Figure 1), where most participants defined resilience with words related to the capacity to withstand shocks. There was also mention of adaptation and recovery. However, neither anticipation nor prevention were included, as was the case when the exercise was conducted with pineapple and avocado producers in Latin America.



*Figure 1. Participants’ understanding of resilience through a Word Cloud exercise*

Resilience building is important, primarily to prevent disasters from occurring, which in turn will only materialize when pre-existing vulnerabilities are present. Put another way, vulnerability is a precondition to crises. Sources of vulnerability are

<sup>1</sup> United Nations. 2017. Adopting an analytical framework on risk and resilience: a proposal for more proactive, coordinated and effective United Nations Action. New York.

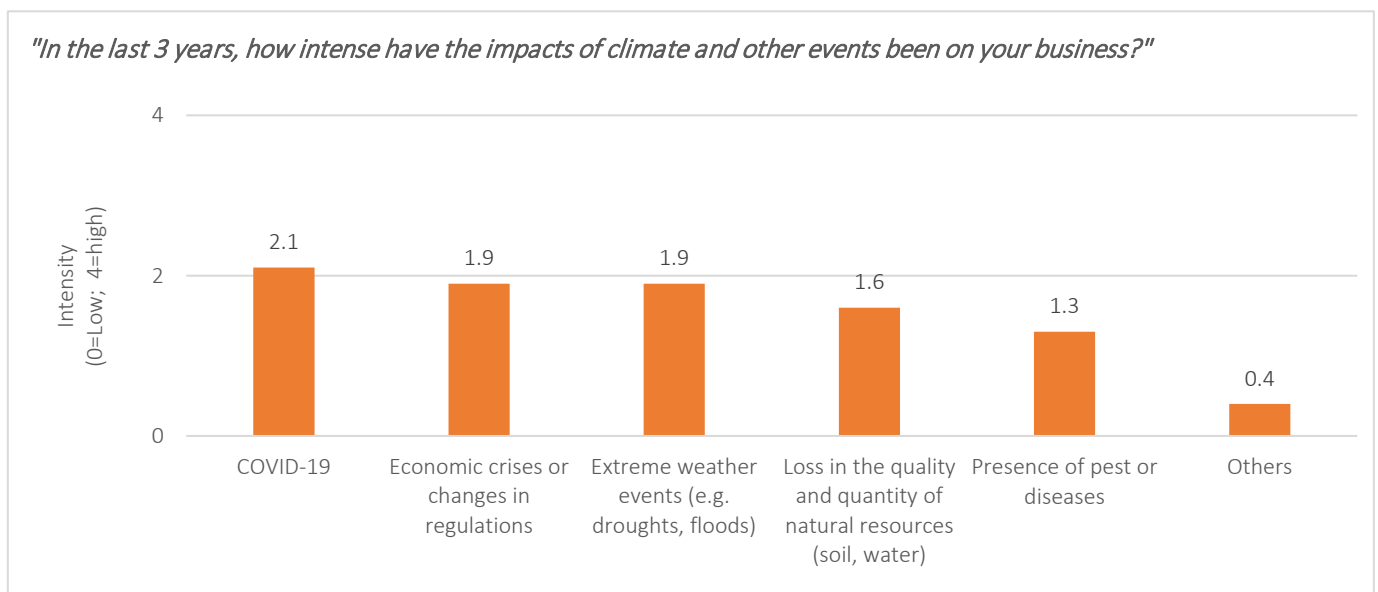
mostly linked to the lack of power of certain actors (or inadequate distribution of it) and limited resources (e.g. financial, knowledge, physical) allowing preparedness to future shocks. This may include inadequate infrastructure, access to education or to information services, among others. Thus, no matter the severity of the shock, disasters can be avoided by building resilience and addressing the root causes of vulnerability. If resilience is not prioritized as part of the sustainability strategy, the pineapple sector will become more vulnerable to future shocks and will likely struggle to manage their impacts.

Resilience should use a sustainability lens. Lack of resilience may force a value chain to focus on short-term actions and minimum requirements needed to survive when shocks occur. However, a reactive behavior may prevent companies from taking more proactive, forward-looking steps to engage in sustainable practices (e.g. due diligence processes, climate adaptation and mitigation approaches) that ensure their long-term continuity.

**Part 2 - Discussion**

**María Hernández Lagana, FAO and all project participants**

Following the presentation, a discussion was facilitated to better understand the exposure and the resilience of pineapple value chains. The first question asked about **the intensity of the impacts** of climate change and other shocks the pineapple businesses and operations (Figure 2).



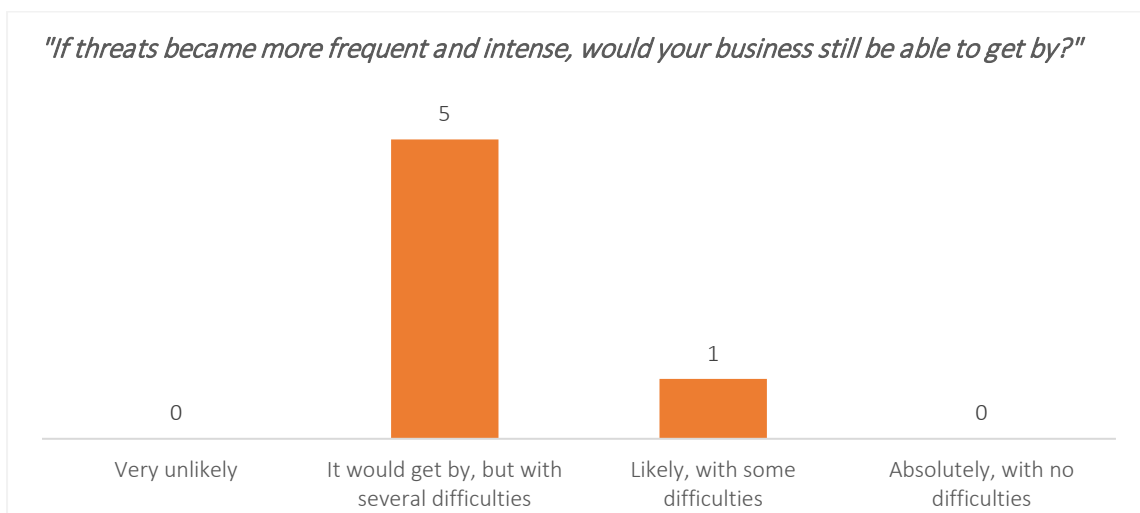
*Figure 2. Self-assessment of the intensity of climate and other events on avocado and pineapple businesses*

Participants highlighted that COVID-19, together with extreme weather events such as floods, and economic factors have been particularly harmful to operations in the pineapple industry. During the discussion, participants highlighted many points, including:

- The COVID-19 outbreak hit the pineapple sector hard, as demand from importing countries decreased and so did prices, while fruit waste was on the rise in some companies. The outbreak and following lockdowns also disrupted the trade of agricultural inputs and freights, increasing the production costs.

- Extreme weather events, such as floods, have affected the quality of the farmland, exacerbating land degradation processes (e.g. loss of topsoil after heavy rains, waterlogging, etc.). However, the effects of climate and how climate change is felt varies among producing countries and within them, largely due to the presence of micro-climates.

The second question explored the **adaptive capacity** of avocado and pineapple value chain actors by asking them whether their business would still be able to continue functioning if threats became more frequent and intense (Figure 3). The large majority of participants (83 percent) indicated that their business would probably be able to “get by” but it would be very difficult, whereas only one participant (17 percent) said that their business would likely recover with few challenges.



*Figure 3. Self-assessment of the adaptive capacity of avocado and pineapple businesses*

### Part 3 - Technical Guide on Climate Change Adaptation

Marlo Rankin, FAO

The impact of climate change on fruit crops is likely to be more detrimental than on annual crops. In comparison to annual crops, developing a new variety of a perennial fruit crop can take 15 to 20 years, making it more difficult for it to compete with obstacles brought on by climate change. Climate has an important role on plants physiology, phenology and fruit quality, among others, affecting production and thus continuity of business operations.

To respond to some of the climate challenges the pineapple sector is facing, the Responsible Fruits project is working on a Technical Guide on Climate Change Adaptation with the following objectives:

1. Provide up-to-date information on recent and projected climate change effects in key avocado and pineapple producing and exporting countries.
2. Identify the associated risks with climatic effects to produce avocado and pineapple.
3. Identify adaptation practices and recommendations that can help address the associated risks.
4. Share good practices adopted by companies to address climate-related production risks.
5. Identify gaps in information, research and technical solutions needed to strengthen the availability and adoption of practices.

The guide builds on existing research on the impact and trends of climate change and will analyze how these trends and risks impact on production. The guide will be based on research to identify adaptation recommendations proposed in the

scientific literature and will also collect information from companies to identify good adaptation practices already implemented.

The guide cannot validate information in the field and therefore does not endorse particular practices carried out by companies, rather it will provide information for self-assessment. Likewise, it will not generate any form of certification or official endorsement for companies using the guide.

During this session some of the main risks of climate change and impacts on pineapple production identified in the scientific literature were presented and summarized in the table below.

Climate change effect	Country/Countries	Potential impact on pineapple production
High temperature	Philippines Thailand Malaysia	Sunburn; reduction of internal fruit quality Social impacts for workers from increased solar radiation
Increased humidity	Philippines Thailand	Increased fungal infections and pests Slower uptake of water and nutrients
Drought/lower precipitation	Thailand – El Nino (Chiang Rai) Philippines (Bukidnon)	Impact on yield; disrupts production cycle for some varieties (Phulae) Pineapple prefers well drained soils and has good adaptation to drought (Lagumbay et al, 2017)
Increased precipitation/flooding	Philippines Malaysia	Soil erosion Increase in diseases (soil fungi) and new pests Less natural flowers Delay in fruit ripening Less shelf-life due to excess water
Extreme weather events (EWEs) e.g. typhoons, floods, etc	Philippines	Loss of fruit Damage to plantations and infrastructure Loss of arable land (submergence)

The use of adaptation practices in pineapple production is necessary to reduce or mitigate the effects of climate change and extreme weather events. To this end, FAO presented some examples of adaptation practices in the pineapple industry identified in literature and through consultations with project participants in other regions. These practices included:

- Collecting climate data/using early warning systems to prepare for extreme weather events
- Changing farming practices to improve soil and water conservation, such as introducing composting, cover crops, and mulching
- Updating Integrated Pest Management (IPM) solutions to control new pests/deal with greater intensity of outbreaks through the use of microorganisms
- Research into new climate-tolerant varieties
- Managing excess water to prevent soil erosion and runoff – retention ponds, channels to divert water flow, etc.
- Diversifying production, inter-cropping or shifting production to new areas
- Changing marketing practices to deal with reduced quality/quantity, such as increasing pineapple processing for juice
- Changes to labor practices to protect workers such as protective clothing and rehydration stations in the field; shifting to mechanization to reduce exposure of workers to solar radiation.

- Use of climate insurance when available

#### Part 4 - Discussion

In this section the participants were encouraged to validate findings from the literature on the climate effects and risks for pineapple production, as well as the climate adaptation practices shared. Participants confirmed that the identified risks and impacts were aligned to what has been observed by many companies in the region, with reference given to:

- drought conditions in pineapple production areas in Southern China this year, compared to flooding in the same area last year;
- high temperatures in Malaysia;
- increased extreme weather events in the Philippines (typhoons); and,
- increased pests and diseases in Indonesia.

Many of the participants agreed that the adaptation practices identified in the literature and from companies in other regions were also relevant for their production conditions, but with local adaptation needed to suit their specific production conditions. For example, pineapple is commonly grown on peat soils in Malaysia and some parts of Indonesia. This requires careful water table management with efficient drainage systems and the adherence to regulations that disallow open burning of leftover crop stems and residues after harvest in order to avoid increased greenhouse gas emissions (GHG) and soil subsidence. This is especially so with the current standard 1:0 system (no ratoon crops) where cultivation is continuous with replanting activities following almost immediately after harvest.

It was agreed that further research is needed to develop transformative climate change adaptation practices that are suited to localized climate risks and that can be monitored and evaluated for long-term impact.

#### Part 5 - Next steps

##### Marlo Rankin and Maria Hernandez Lagana, FAO

The project presented the planned next steps around the work on resilience, including:

- The study of resilience issues of avocado and pineapple value chains through a desk review and consultations with producers, associations, processors and packers in the two value chains. The findings will be shared and discussed with TFNet in 2023.
- Elaboration of a technical guide and briefs with focus on resilience building based on the priority areas identified through the study and with participants.

On climate change, the project outlined the ongoing work on:

- The preparation of a Technical Guide on Climate Change Adaptation, with a validation workshop scheduled for the first quarter of 2023 to present and validate the main findings from the guide.
- The development of commodity-specific guides on Responsible Business Conduct (RBC) for avocado and pineapple to be finalized in 2023.

As always, the project team welcomes suggestions or questions on the project's activities at any time. Please contact us at: [Responsible-Fruits@fao.org](mailto:Responsible-Fruits@fao.org)

## Annex 1

Working languages

The online session was held in English.

Agenda

Section title	Speaker/Facilitator
<b>Welcome and introduction (5 mins)</b>	<b>Jesper Karlsson</b> , Project Officer, FAO and <b>Yacob Ahmad</b> , TFNet Advisor, TFNet
<b>Part 1: What is resilience and why is it important to pineapple value chains? (10 mins)</b> Provide an overview of what resilience is and why is it important in the context of the avocado and pineapple value chains. This will also serve to gather information from participants on what they understand by the term resilience.	<b>María Hernández Lagana</b> , Resilience Officer, FAO
<b>Part 2 Discussion (15 mins)</b> Together with participants, we will try to respond to the questions: <ul style="list-style-type: none"> <li>• How intense have been the impacts of climate and other events on your value chain / business in the Asia-Pacific region?</li> <li>• If threats became more frequent and intense, would your business still be able to get by?</li> </ul>	<b>María Hernández Lagana</b> and <b>all participants</b>
<b>Part 3. Climate Change Adaptation (15 min)</b> <ul style="list-style-type: none"> <li>• Introduction to the Climate Change Adaptation Technical Guide – background and purpose, workplan for development</li> <li>• Impacts of climate change on tropical fruit production – a discussion of risks from the scientific literature</li> </ul> Adaptation practices identified to address risks and gaps	<b>Dr Marlo Rankin</b> , Senior Agribusiness specialist, FAO
<b>Part 4. Discussion (20 min)</b> Together with participants, we will discuss the following questions: <ul style="list-style-type: none"> <li>• What changes have you noticed in terms of climate in the past 5-10 years in your production area?</li> <li>• What impact has this had on your production and trade of pineapple?</li> <li>• What changes in practices have you adopted to overcome these challenges and how effective have they been?</li> <li>• What are the main knowledge-gaps you face in addressing climate risks?</li> </ul>	<b>Dr Marlo Rankin</b> and <b>all participants</b>
<b>Way forward (5 min)</b> <ul style="list-style-type: none"> <li>• CCA working group</li> <li>• Ongoing resilience study and individual consultations with participants</li> <li>• Validation workshop</li> <li>• Thematic and commodity-specific guides 2023</li> </ul>	<b>Marlo Rankin</b> , <b>María Hernández Lagana</b> and <b>Yacob Ahmad</b>

For more information about the project or the webinar series, please contact: [Responsible-Fruits@fao.org](mailto:Responsible-Fruits@fao.org)