SoilWealth | ICP
nurturing crops · protecting crops

FACT SHEET | MAY 2024

Building resilience to climate extremes

Overview: Getting ready for changing conditions

About the Building Resilience Series

The five-part series from the Soil Wealth ICP project presents a risk-based approach to assessing resilience to climate extremes and impacts for vegetable and melon businesses. The series encourages growers to complete their own risk assessment and action plan for improving resilience as required. It presents a model of farm resilience that focuses on four interlinked areas of a business:

- Overview: Getting ready for changing conditions
- Part 1: Financial risk and resilience
- Part 2: Farm management risk and resilience
- Part 3: Personal and social risk and resilience
- Part 4: Environmental risk and resilience

Links to additional resources are provided in each fact sheet.

The Building Resilience Series has been produced to help Australian vegetable and melon growers to:

- Look at risk and resilience across multiple connected areas of the business

(continued on next page)

KEY MESSAGES

- Farmers have proven their resilience through many challenges such as droughts, floods, a global pandemic and market fluctuations.
- Resilience means being prepared and able to cope and adapt when unexpected and extreme events happen.
- Climate extremes are already causing financial stress for farmers. Events like water shortages, strong winds, unseasonal and heavy rain, fires and floods are predicted to become more severe, worsening vulnerabilities.
- Resilience must be embedded into all aspects of the operation in an integrated, whole of business approach.
- This guide serves as a framework for vegetable growers looking to assess their business's risk and resilience to many possible impacts. It is intended as a starting point for assessing your business' risk and resilience.
- The guide provides resources and suggestions on assessing and improving business resilience through risk-based planning and actions.

Hort Innovation

This project has been funded by Hort Innovation using the vegetable and melon research and development levies and contributions from the Australian Government. Hort Innovation is the grower-owned, not-for-profit research and development corporation for Australian horticulture.

RMCG

ahr applied horticultural research

- Create a useful action plan for addressing individual risks and improving overall adaptability to climate extremes
- Find other helpful sources of information and support on the areas of risk and resilience.

This Overview of the Building Resilience Series presents a holistic model of farm business risk and resilience, and suggests a method for carrying out an individual risk assessment. It also provides links to other useful tools that have been developed for Australian farmers to assess and improve their risk and resilience to the effects of climate extremes.

Why care about resilience?

Australian farmers are known for their hardiness and resilience. Through successive droughts, wet years, a global pandemic, and strong market fluctuations they have continued to adapt and rebound.

However, we know that weather conditions are set to become more uncertain. The likelihood of extreme events like droughts with irrigation water shortages, strong winds, unseasonal and heavy rain, hail, frost and floods is increasing in many parts of the country[1].

Research from Australia's government-led agricultural sciences institute has shown that the post-2000 shift in climatic conditions led to a drop in farm profits by an average of 23% per farm per year for broadacre and livestock farmers when other factors were held constant[2].

It's likely that vegetable producers are also experiencing climate related challenges to farm profitability. Vegetable farmers responded to below average rainfall conditions in 2017-2019 by increasing their use of irrigation water to maintain crop yields[3]. Stronger reliance on irrigation can increase a farm's energy costs and may leave farms vulnerable to shortages of irrigation water.

One way to approach the increasing uncertainty of the nature and extent of future climate impacts is to look at business resilience with a risk-management approach – one that assesses uncertainties and vulnerabilities in all aspects of the operation and plans actions to reduce risks wherever possible

What is climate resilience and why does it matter?

Resilience measures the ability of a system, such as a business, to absorb, respond to and recover from shocks[4].

In agriculture, this is influenced by the degree of a farm's overall risk, the ability to reduce risks and to adapt to change in the medium to long-term.

1 Commonwealth Scientific and Industrial Research Organisation (CSIRO) 2018, State of the Climate: Future climate, accessed via csiro.au/en/research/environmental-impacts/climate-change/state-of-the-climate/previous/state-of-the-climate-2018/future-climate

2 Hughes, N and Gooday, P 2021, *Analysis of climate change impacts and adaptation on Australian farms*, Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES), Department of Agriculture, Water and the Environment, Australian Government

3 Department of Agriculture, Fisheries and Forestry 2021, Farm Surveys and Analysis: Vegetable Industry, Australian Government, accessed via https://www.agriculture.gov.au/abares/research-topics/surveys/vegetables#detailed-farm-financial-performance

4 Hughes, N, Burns, K, Ying Soh, W and Lawson, K 2020, Measuring drought risk: the exposure and sensitivity of Australian farms to drought, Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES), Department of Agriculture, Water and the Environment

RISK AND RESILIENCE: NEED TO KNOW

- Resilience frameworks look at all aspects of a farm business, including:
  - Financial
  - Farm management
  - Environmental
  - Social and personal
- Risks can be looked at in terms of tiers:
  - **Tier One:** Risks within your sphere of influence, that you have some potential to change.
  - **Tier Two:** Risks outside your direct sphere of influence, such as regulatory, policy and legal aspects.
- Tier Two risks can include factors like the cost of labour, red tape, deregistration or failure of crop protection products, changes in supply chains and markets or a pandemic.
- This factsheet series is concerned mostly with Tier One risks. Improving your resilience to these risks can improve how well you can adapt to Tier Two risks.

FIgure 1: Four areas of Tier One risk and resilience, and examples of Tier Two risks.

Identifying risks in each of the areas in figure 1, and working to improve or overcome them, will help your farm business to become more resilient when it comes to absorbing and recovering from the impacts of climate extremes.

Resilience means being prepared and able to adapt when unexpected events happen.

Farm businesses need to reduce their risks as much as possible in all areas and plan for change so that knowledge gaps can be filled in a timely manner, and good decisions can be made quickly before a situation escalates.

RISK AND RESILIENCE: OTHER FACTORS

- Farm businesses may need to call on resources and assistance to recover well and reduce long-term harm. It is important to plan ahead of time where this support may come from.
- Addressing one area and neglecting others may leave a business vulnerable to impacts that could be felt across many areas, possibly reducing long-term viability.

Planning and prioritising risks

Working on a climate risk assessment for a vegetable business is a helpful way to look at each of the possible areas of vulnerability, identify potential risks, and come up with strategies and actions to improve resilience by minimising risks.

The following factsheets in this series look at each of the four tier 1 risk and resilience areas in more detail, with suggested questions and actions to consider. They include case studies and links for further information.

Note that the prompts in the factsheets are suggestions, and businesses are encouraged to come up with their own tailored risk assessment based on their individual circumstances, risks and opportunities.

Some factors to keep in mind as businesses work on their own risk assessment:

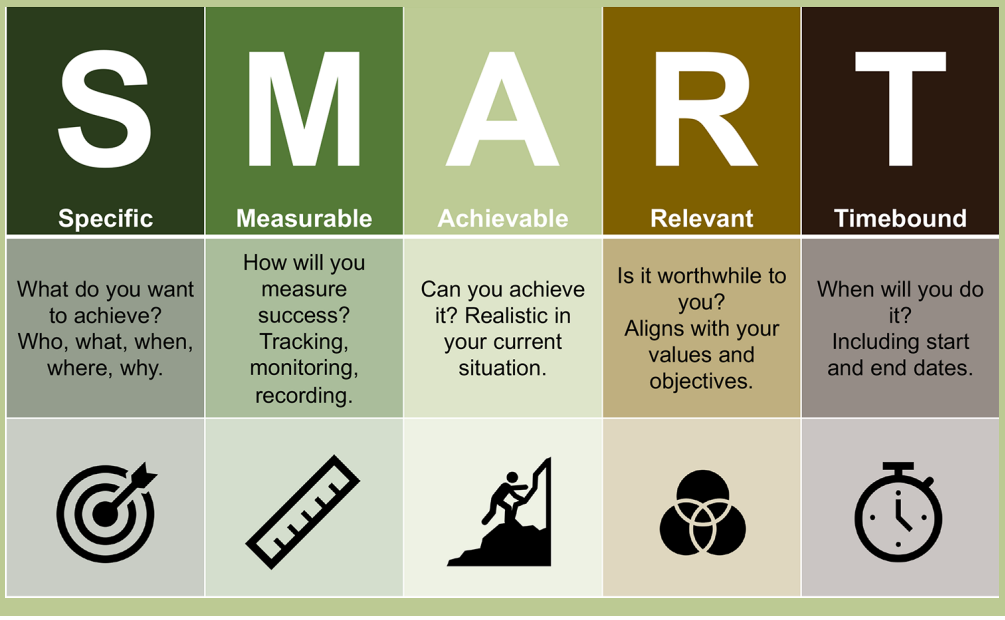
- It can be useful to think about a vison or longer term goals for the business as a first step.
- It can be helpful to address the most pressing gaps first, then progress to other areas.
- Think about the consequences of a risk not being addressed, and the likelihood of these risks occurring. This can help to identify priorities. The greater the likelihood and the more severe the consequences, the greater the overall risk.
- Many of the risks and actions overlap – increasing resilience in one area will benefit more than one aspect of the business.
- Some events that may be unlikely but have catastrophic consequences (e.g., a pandemic or biosecurity incursion) may also be prioritised.

It may also be worth thinking about corrective actions for the case that the business is affected by an event that it could not prevent (e.g., to a global situation, a change in regulations/policies or a weather event).

SMART GOALS – A KEY TO EFFECTIVE ACTION

The goal of a risk assessment is to produce a set of actions to improve resilience.

Actions should be **SMART: specific, measurable, achievable, relevant and timebound.**



A risk assessment could take the format shown in Table 1 or build on plans the business already has such as strategic or business plans, and property management plans.

The factsheets in this series are designed to provide suggestions and ideas for completing a farm business risk assessment.

Table 1: Example risk assessment table that you can complete for your farming business.

Area of risk/ resilience	Main risks related to climate factors	Gaps in current plans and knowledge to manage risks	Targeted learning or action needed to fill gaps
Environmental	Increase in soil erosion due to more intense rainfall events	Gaps in knowledge are climate projections for my region, factors affecting soil erosion and how to build organic matter	• Explore online climate projections for my region • Investigate and trial cover cropping for reducing erosion and increasing organic matter
Farm management	High and potentially inefficient use of fossil fuels, leaving business susceptible to price increases	Gap in current plans for replacing fossil fuels with renewable energy where possible, gap in knowledge around cost savings and incentives/ grants	• Investigate renewable energy incentives/grants • Compare renewable energy sources (solar, wind, heat pump) in terms of cost and suitability • Form a plan for financing renewable energy on farm

Further tools and support to address resilience

Drought Resilience Self-Assessment Tool

The Drought Resilience Self-Assessment Tool (DR.SAT) is a free online tool designed to help farmers assess their climate resilience across financial, personal and social, and environmental areas. The tool contains the following features:

- **Assessment of climate impacts for your farm** based on projected climate for 2030 and 2050.
- **Satellite imagery of your farm** to help you assess change in factors such as vegetation health, vegetation cover, land surface temperature and surface moisture.
- **Short resilience assessment quizzes** to help you quickly assess your resilience across many aspects such as water and soil management, vegetable crop performance and financial performance.
- **Target and goal-setting tools** to help you focus your effort and build a tailored resilience plan.
- **Activities and resources** tailored to your goals.
- **Personal farm reports** that you can share with your agronomist or consultant or use in your business plan.

Note that your data is only shared with government agencies or research organisations if you explicitly consent. Further detail on uses of your data can be found in the DR.SAT Privacy Policy.

Farm Business Resilience Program

The Farm Business Resilience Program is delivered by state governments and gives farmers access to subsidised learning and development opportunities in business management, natural resource management and personal and social resilience[5]. The program provides:

- **An assessment of business performance** to help identify pathways to building resilience.
- **Support to develop or improve farm business plans.**
- **One-on-one professional advice**, for example through a business coach.
- **Tools and resources** to continue improving.

The program will continue to be delivered in each state and territory until June 2024.

Regional Drought Resilience Planning

State governments are supporting regions to develop community-led Regional Drought Resilience Plans. These plans identify actions to help regions prepare for future drought and climate change, identify current risk levels and form regional needs and priorities[6]. Plans are being developed in collaboration with the agricultural sector.

Regional Drought Resilience Adoption and Innovation Hubs help farmers to prepare for drought and can connect farmers with agricultural experts, new practices and innovation, current local projects, news and resources.

5 Department of Agriculture, Fisheries and Forestry 2023, Farm Business Resilience Program, Australian Government, accessed via agriculture.gov.au/agriculture-land/farm-food-drought/drought/future-drought-fund/farm-business-resilience-program

6 Department of Agriculture, Fisheries and Forestry 2023, Regional Drought Resilience Planning, Australian Government, accessed via agriculture.gov.au/agriculture-land/farm-food-drought/drought/future-drought-fund/regional-drought-resilience-planning

Regional climate projections

There are a range of online tools for viewing future climate projections for your local region which vary in complexity. Two useful tools are described below.

- **My Climate View** is a climate projection tool for farmers which shows climate projections to 2050 tailored to your locality. Projections can also be tailored to a relatively small range of agricultural commodities. The tool displays data such as changes to annual rainfall, temperature, hot days, evapotranspiration, frost days, pollination events and wet days at planting/harvest (for certain commodities). This tool can give you a succinct and tailored summary to quickly inform you what your future climate might look like.
- **The Regional Climate Change Explorer** shows the variations in climate projected for regions around Australia, including rainfall, temperature, extreme temperature, drought, fire, weather and coastal conditions. The Climate Change in Australia website contains many more climate tools with varying degrees of complexity in their use. The website can provide highly detailed information about local climate projections and climate analogues for those interested.