

Hawke's Bay Horticultural Sector: Economic recovery following Cyclone Gabrielle

Summary of findings and recommendations
May 2023





Context of this report

Hawke's Bay recently suffered from the effects of Cyclone Gabrielle, the worst storm to hit New Zealand (NZ) this century. The cyclone triggered a national state of emergency for only the third time in NZ's history and caused loss of life, damage to key infrastructure and significant impact to several sectors in the region, including the c.\$1.2 billion horticultural industry.¹

Boston Consulting Group (BCG) undertook this social impact project to rapidly develop the evidence base and recommendations for the horticulture industry to support discussions with government and private sector stakeholders (e.g., banks, insurers). These materials sit separate to but support more specific proposals for government assistance, focusing on BCG's initial assessment of the cyclone's economic impact on the Hawke's Bay horticultural sector, and the possible policy and funding levers to support a long-term target state vision to "grow back better".

This report synthesises BCG's findings and recommendations following this six-week engagement with the sponsorship of Rokit Global Limited (Rokit) and the support of a wide range of industry stakeholders. The information presented in this report is based on data collected until March 31, 2023. The report reflects findings up to this specific date only.

This report has six sections:

- Executive Summary
- The contributions of Hawke's Bay horticulture to the national economy and the associated economic impact of Cyclone Gabrielle
- The key challenges for the sector in recovering without assistance, and the case for additional support or interventions
- The aspirational vision for Hawke's Bay horticulture by 2030
- The suite of potential solutions to realise the Grow Back Better vision

¹ Stats NZ, Horticulture NZ, Ministry for Primary Industries. Analysis used MPI National Horticulture export revenue forecast from 2004 – 2024; assumes exports account for c.90% of total economic value for most fruit types (remaining c.10% is domestic sales); calculated Hawke's Bay share of economic value using share of horticulture land in Hawkes Bay

Section 1. Executive Summary

The Hawke's Bay horticulture sector contributes c.\$1.2 billion annually to the economy and directly employs c.6,700 people in permanent roles (8% of the total regional workforce), plus several thousand more in related sectors. This has meaningful flow on effects for the region, including creating ancillary jobs and supporting social infrastructure.

Cyclone Gabrielle is understood to have impacted c.35% of local crop production value, with an estimated \$920 million+ critical response and replanting (like-for-like replacement) costs plus \$500 million in economic losses in FY23. Growers will be disproportionately impacted by the cyclone, as they have already incurred the majority of costs for the harvest year.

The sector has been rocked by this crisis. After two challenging growing seasons in 2022–2023 with unseasonably high rainfalls, it is in a highly fragile state. Many growers have low capital reserves and lack the ability to fund clean-up and replanting, and given the extreme nature of Cyclone Gabrielle, many of the losses, including crop yields and growing infrastructure on land (e.g., posts, wires) are not covered by traditional insurance.

As a result, in the absence of interventions, the sector is not expected to fully rebuild. Without interventions it is estimated to lose \$3.5 billion in cumulative value over 2024-2030, as investment into the sector is reduced and land is not regenerated or is put to lower value uses (e.g., cropping, sheep farming) which have lower capital outlay.

With targeted support from private and public sector stakeholders, there is opportunity to support the sector to 'grow back better' – restoring and protecting industry participants in the short-term, and creating a higher value, more resilient and innovative sector in the medium-long-term. The Grow Back Better plan aims to achieve a target-state aspiration that would enable the sector to grow around 20% above pre-cyclone 2030 forecasts, based on economic value. This growth may lead towards a projected Hawke's Bay horticulture industry worth \$2.5 billion in 2030.

To deliver the solutions outlined in the Grow Back Better plan, growers in the sector require c.\$650 - 960 million of government funding support to address the constraints on recovery and maintain downstream volume capacity and in-market demand. Assuming constraints are addressed (and long-term investments are made for resilience activities), the plan could add \$2.4 billion–3.6 billion cumulatively above base case between 2024–2030. These solutions require policy and funding decisions to be made collaboratively between central and regional government, iwi, and private sector stakeholders. The key areas of action are:

- Critical response activities (requiring \$230 – \$340 million government support) including immediate clean-up programs as well as schemes to ensure production reinstatement, including employment sustainability
- Short-term reestablishment activities (requiring \$420 – \$620 million government support) including a replanting program incentivizing optimal land use, including higher value crops where appropriate, urgent clarity on land and water use changes, as well as short-term risk mitigation schemes
- Additionally, long-term resilience activities for infrastructure, innovation and disaster planning may deliver \$600 million – \$1000 million cumulative value in 2024–2030



Section 2. The contributions of Hawke's Bay horticulture to the national economy and the associated economic impact of Cyclone Gabrielle

The Hawke's Bay horticulture sector contributes c.\$1.2 billion to New Zealand's economy, with significant ancillary social and economic value

Before the cyclone, the horticulture sector in Hawke's Bay contributed c.\$1.2 billion to the NZ economy in 2022, with a growth rate of 9% per annum (pre-COVID). The region represents 15% of horticultural land in New Zealand.²

Horticulture in Hawke's Bay is a core sector for the region and directly employs 6,700 people in permanent roles (8% of the total regional workforce), plus several thousand more in processing facilities and the wider supply chain. The sector is a significant employer of Māori and Recognised Seasonal Employer (RSE) workers, often from the Pacific Islands. This has meaningful flow on effects for the region, including creating ancillary jobs and supporting social infrastructure.³

Hawke's Bay has become an important contributor to New Zealand's horticulture export market (c.\$1.1 billion of \$7 billion per year), particularly through its reputation for premium products, including Dazzle, Envy, and Rokit apples, Marron d'Or squash, and Syrah and Bordeaux-style wines.⁴

The region is a leader in growing techniques, such as 2D canopies in apples. It supports New Zealand's role as a horticultural innovation centre through viticulture expertise at the Eastern Institute of Technology (EIT) and research and development (R&D) strength in bio-protection, regenerative agriculture, and food innovation.

² Stats NZ, Horticulture New Zealand, see footnote 1 for methodology

³ Statistics New Zealand, Horticulture New Zealand

⁴ BCG analysis, Hawke's Bay Horticulture Sector Stakeholder interviews, Statistics NZ



Cyclone Gabrielle is understood to have impacted a significant number of local crops, with an estimated \$920m+ critical response and replanting costs plus \$500m economic losses in FY23

The negative economic impact of Cyclone Gabrielle in 2023 on the Hawke's Bay horticulture industry is estimated to be over **\$1.4 billion** in 2023. In the short term, these costs will be incurred through critical response efforts, replanting and reinstating lost and damaged crops, and direct economic losses.⁵

- **\$370 million+** in critical response costs to remove silt, slash and other debris from farms, vineyards and orchards and evacuate contaminated crops that pose health risks
 - Costs for critical response activities range from \$10,000 to \$100,000+ per hectare depending on the type of crop and extent of damage. The breakdown of critical response costs by sector is shown in Figure 1.
- **\$550 million+** in replanting and reinstatement costs for growers to reset all the crops that are damaged, submerged or permanently lost with like-for-like replacements. There is potential for additional costs if more plants are lost due to a delay in cleanup efforts.
- **\$500 million** in direct economic losses to the industry, reducing the economic value of the Hawke's Bay Horticulture Industry to \$0.9 billion in 2023 (its expected value was \$1.4 billion). This is shown in Figure 2:
 - Growers will be disproportionately impacted by the cyclone, as they have already incurred non-harvest costs for the year, resulting in a significant reduction in net profit (approximately \$130 million). The extent of the impact will vary across growers, with some likely to become unviable without additional support
 - Wine producers will also be impacted by reduced tonnage and yield
 - Demand for harvesting labour will also decrease by c.35% due to the loss in yield, resulting in \$40 million in economic losses to employment. This may be potentially offset by clean-up activity
 - \$120 million will be lost due to the reduction in post-harvest activity (e.g., packing, cool storage)
 - \$100 million of the economic impact will be felt by the players across the supply chain (e.g., platforms, distributors, retailers, exporters). Reduction in yields will directly impact bottom line, assuming significant portion of costs are fixed and working expenses will continue to be paid to maintain in-market demand and infrastructure capacity for future volumes
 - There will be a \$110 million reduction in tax revenue for the government associated with reduced income at all stages of the value chain

⁵ BCG analysis of data collected from Hawke's Bay Horticulture stakeholder interviews, industry body surveys and reports, and a BCG primary survey of Hawke's Bay growers

Figure 1 - Costs of critical response and crop replanting & reinstatement

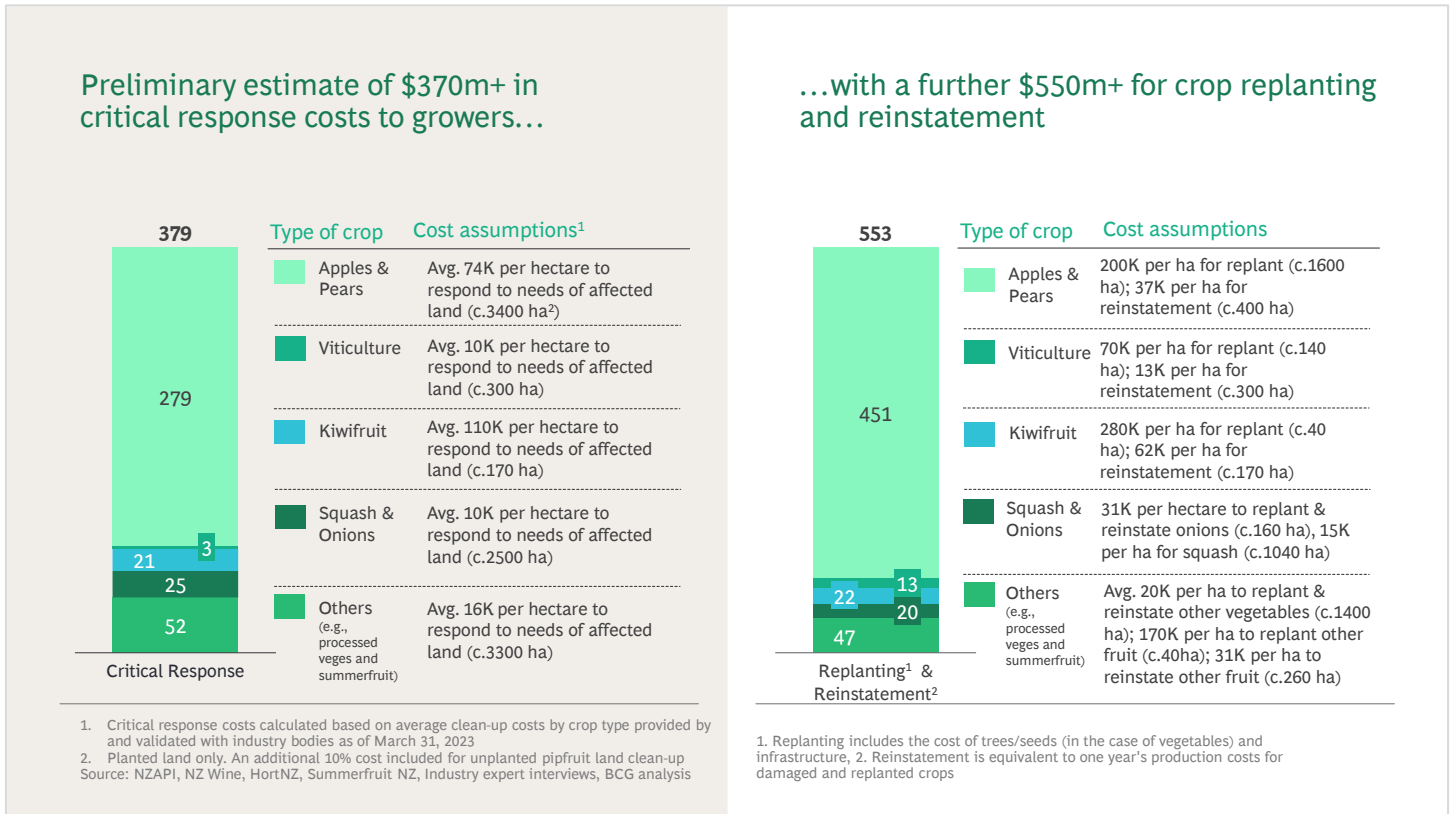
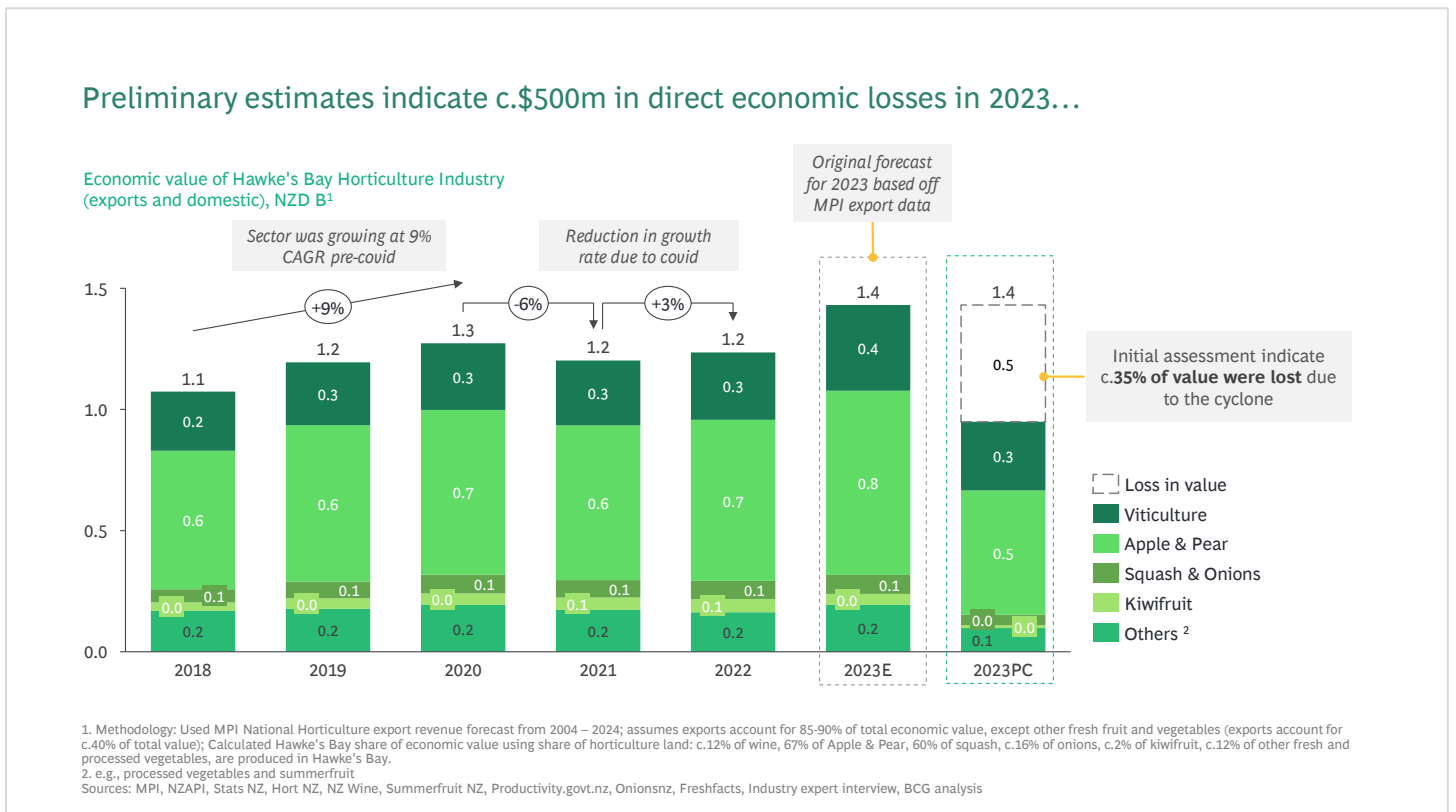


Figure 2 - Economic value of Hawke's Bay Horticulture Industry



This economic impact will also have socio-economic impacts on the broader region:

- **Reduced economic activity:** Each dollar generated by the horticulture sector has a 1.9X effect on regional economic contribution, meaning the direct economic impact is likely to be felt across multiple industries in the Hawke's Bay. SMEs are particularly vulnerable to this impact and may be potentially forced to downsize or close due to reduced demand for their products and services⁶
- **Reduced regional development:** Funding intended for regional development will be diverted to re-building core infrastructure; potential investors could become less inclined to fund new businesses in the region
- **Increased unemployment and welfare⁷:** Cyclone Gabrielle will affect income negatively in both the short and long-term. The decline in revenue for the industry may lead to 600-1500 permanent horticulture jobs lost in the short-term. The decrease in yield associated with Cyclone Gabrielle may have a continuing impact on unemployment in the long-term and could result in 2,500–3,500 fewer people employed in permanent horticulture jobs in Hawke's Bay in 2030 vs. pre-cyclone forecasts. The reduction in employment will lead to wider social challenges including up to c.\$15-40m in welfare cost to the government in 2023 (in addition to loss of income tax revenue from these workers)
- **Increased social costs:** Based on past natural disasters, it is likely that communities affected by a natural disaster face difficult social issues for years. As an example, the estimated lifetime cost of mental health issues, alcohol consumption and domestic violence following the 2010 floods in Queensland, Australia exceeded \$6 billion. The floods themselves caused \$6 billion in direct damages.⁸
- **Stagnant innovation:** Investors will be increasingly reluctant to invest in horticulture across NZ, due to lack of certainty. This limits investment in supply chain capacity and brand reputation required to support long-term economic sustainability. Funding intended for innovation and R&D may now need to be funneled into recovery efforts.



⁶ BCG analysis, IBR report on Kiwifruit industry used as a proxy for wider horticulture sector

⁷ Permanent jobs: Assumes reduction in economic value of industry correlates to the decrease in permanent jobs. Assumes 11,000 perm jobs required in 2030 based on pre cyclone forecast of \$2.1bn industry in 2030, 6,700 jobs now in a \$1.2bn industry; likely industry value is \$1.5bn in 2030 post cyclone implying 8,000 jobs only which is 3,000 less than pre-cyclone forecast. Assumes welfare payment of \$500 per week (Single jobseeker 25+ incl accommodation supplement)

⁸ Australian Business Roundtable: The Economic Cost of the Social Impact of Natural Disasters. March 2016 Report.

Section 3. The key challenges for the sector in recovering without assistance, and the case for additional support or interventions

Without targeted interventions, the sector is not expected to fully recover by 2030

The impact of this crisis on the horticulture sector cannot be understated. The sector is already in a highly fragile state following two challenging growing seasons in 2022–2023 with unseasonably high rainfalls. It has also faced 2–3 years of tough economic conditions, including increased export costs, limited labour availability, more erratic weather, and reduced demand for apples from Europe (following restriction on sale of Apples into Russia creating saturated supply in Europe from local growers).⁹

These conditions have created volatile financial results for many Hawke’s Bay horticultural businesses and have led to less favourable access to bank loans and other sources of capital particularly with tightening capital reserve requirements in New Zealand. This access will now be further challenged by reduced revenues following Cyclone Gabrielle and the resulting impact on growers’ gearing ratios. Many growers have low capital reserves and will not be able to fund clean-up and replanting. Many losses, including crop yields and infrastructure on land (e.g., posts, wires) are not covered by traditional insurance products.¹⁰

In the absence of interventions, the sector is not expected to fully rebuild. As a base case, it will suffer from **\$3.5 billion** in cumulative losses over 2024–2030 as land is not replanted or is put to lower value uses (e.g., cropping or sheep farming) with lower capital outlay, and investment into the sector reduces.¹¹ Losses may be higher if the sector recovery rate is below base case assumptions.

- Without recovery support, the industry may lose up to \$610 million+ per year against pre-cyclone forward projections along with a slowdown in industry growth rate. This is shown in Figure 3.

Hawke’s Bay as a region will suffer from c.**\$3.8 billion** in direct and indirect losses:

- **\$2 billion** or 60% of the \$3.5 billion are losses that would usually have been spent locally in other Hawke’s Bay sectors. The other 40% is usually spent outside of the Hawke’s Bay.
- This \$2 billion loss is expected to have a 1.9x¹² multiplier effect on the regional economy resulting in a further c.**\$1.8 billion** in cumulative losses from 2024–2030

The extent of the recovery depends upon the sector's ability to address constraints to the economic recovery¹³:

- **Funding for land availability/clean-up:** Following the Cyclone, some crops remain inaccessible and are at risk of suffering long-term damage if not accessed promptly. With

⁹ BCG analysis, Hawke’s Bay Horticulture Sector interviews, Desktop Research

¹⁰ BCG analysis, Hawke’s Bay Horticulture Sector interviews, BCG survey of growers

¹¹ BCG analysis of data collected from MPI, Statistics NZ, Horticulture NZ, Productivity NZ, industry interviews, New Zealand Winegrowers

¹² Taken from the IBR Report on Kiwifruit Industry as a proxy

¹³ Synthesis of Hawke’s Bay Horticulture Sector interviews and BCG survey of growers

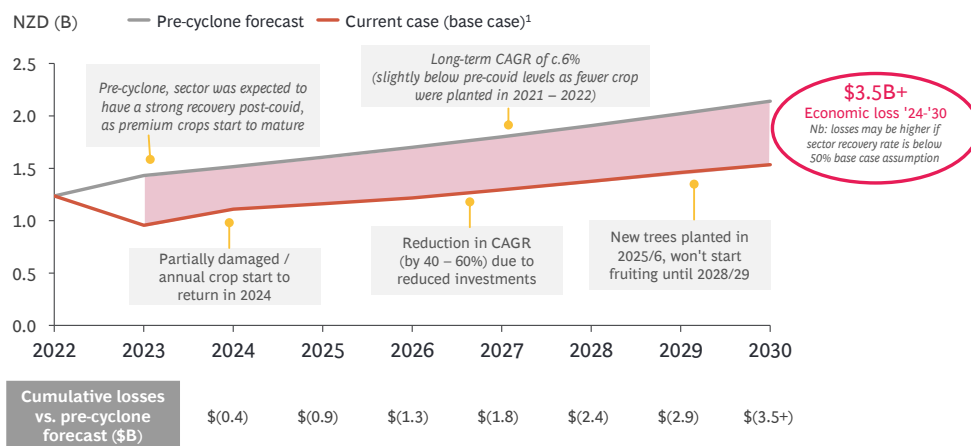
current level of government support, a large proportion of growers will not be able to meet the costs required for critical response and crop replanting

- **Nursery plant supply:** Current apple nursery stock is only enough to replant a small proportion of the permanently damaged crops in 2023/2024 and there are lengthy lead-times for apple and grape nursery plants (2+ years)
- **Farming technology:** Low adoption of new technologies may result in not capturing the full potential yield rates on plants
- **Planning and infrastructure:** There are challenges for the sector to maintain a continued growth rate despite the potential occurrence of future natural disasters, emphasising the need for explicit disaster planning and infrastructure defenses to minimise the impact of such disasters
- **Risk management:** Hawke's Bay horticulture businesses will face difficulty in obtaining appropriate insurance coverage and capital due to their elevated risk profile given recent economic conditions and Cyclone Gabrielle
- **Human capability:** Some workers and business owners may be considering relocating from the Hawke's Bay following Cyclone Gabrielle, but it is important to retain a sufficient workforce to support the clean-up, replanting, and future growth of the industry
- **Innovative capital investment:** There is likely to be a funding gap between total cost of recovery and grower, government and insurance contributions for critical response and crop replanting activities

Figure 3 - Projected Economic value of Hawke's Bay Horticulture Industry

On-going economic impact | \$3.5B+ in cumulative economic losses from 2024-30 due to constraints in land, plant supply and technology

Projected economic value of Hawke's Bay Horticulture Industry (exports and domestic), NZD B



1. Base case assumes that only 50% of the sector will be able to recover without additional government assistance (impact will vary across growers, with some growers likely becoming unviable without additional support, and others who can recovery with minimal additional assistance)
Source: MPI, NZAPI, Stats NZ, Hort NZ, NZ Wine, Summerfruit NZ, Productivity.govt.nz, Onionsnz, Freshfacts, Industry expert interview, BCG analysis

Constraints to the economic recovery

Funding for land availability / clean-up

- Funding constraint for significant proportion of growers who do not have the means to clear up land for recovery and replanting

Nursery plant supply

- Supply constraint of apple nursery plants; of the c.4m trees required (2.5K per ha), only c.400K available in 2024, and c.1m available annually thereafter
- 2 year wait to source new grape vines

Farming technology

- Lack of financing for new, higher productivity systems and technologies (e.g., 2D systems) will result in stagnant yield and maturation rates for plants

Other

- Increased climate risk, infrastructure deficits, loss of workers and reduced industry investment will result in a decrease in the underlying growth rate

Section 4. The aspirational vision for Hawke's Bay horticulture by 2030

The sector can 'grow back better' with collaboration between government and private sector

With targeted support from private and public sector stakeholders, the sector can 'grow back better', restoring and protecting industry participants in the short-term, and creating a higher value, more resilient, and innovative sector in the medium-long-term.

The vision to 'grow back better' provides a target state for short-term recovery and long-term resilience, and has three milestones of growth for the Hawke's Bay horticulture sector:

1. In 2023–2024, the sector maximises yields from existing crops, assists affected land and business owners with short-term viability challenges (through labour and financial support), and supports regional employment and job security for impacted workers
2. By 2025–2026, the sector replants more crops with higher productivity systems and has planted 100% of the land available before Cyclone Gabrielle. 500 additional permanent jobs are created (vs. 2022 levels)
3. By 2030, the sector has grown 20% above pre-cyclone 2030 forecasts based on economic value to \$2.5 billion (i.e., \$1.3 billion additional economic value vs. 2022). 2,000 permanent jobs above pre-cyclone forecasts, (6,000 jobs above 2022 levels)



These milestones and underpinning objectives are shown in Figure 4. The underpinning objectives summarise the target state across several dimensions. Four important dimensions are listed below:

- **Employment:** The region needs to rapidly bolster its workforce to support efficient industry recovery. Currently, 6,700 people are employed in permanent growing roles and many more jobs are supported by the sector, including 4,000 RSE workers.¹⁴ Ongoing employment for these people relies on quick, sustained, and sufficient supply of labour to undertake clean-up, rebuilding and replanting activities. Longer term, the workforce will become larger and more highly skilled, with potentially 70% of the workforce engaged in skilled roles such as tech-enabled farming, horticulture science and data analytics.¹⁵
- **Value:** A significant portion of land has been damaged by Cyclone Gabrielle and requires replanting. When selecting crops for this damaged land, the sector must consider factors such as soil type, owner's experience and skills, water use, and time to full productivity to determine the highest-value crops that are most optimal for that land:¹⁶
 - Premium apples (e.g., Envy) have higher value per hectare than other crops (2x viticulture, 4x onions, 10x squash), but can take 4-6 years to reach full maturity
 - Viticulture has optimal value uplift considering water constraints but require differentiated land management, skills, and equipment
 - Vegetables such as onions and squash reduce value earned per/hectare (\$10,000–\$60,000/ha) but have quicker time to maturity (less than a year)
- **Partnership:** The Hawke's Bay horticulture sector benefits greatly from the contributions of Māori, who make up a significant proportion of landowners, and its workforce (4,000 employed).¹⁷ Local iwi will continue to play a crucial role. In particular, there is significant potential to increase productivity on Māori freehold land that has traditionally been held back by barriers like restricted access to capital. These obstacles can be overcome by partnering with horticultural players, insurers, and banks. The accelerated development of high-value crops will have numerous benefits for local iwi, including land improvement, increased income, employment opportunities, and upskilling prospects. At the same time, this will also contribute valuable land to the sector's rebuilding efforts.¹⁸
- **Innovation and leadership:** Hawke's Bay growers have a reputation as leaders of the NZ horticulture industry in key segments using innovative and high-tech practices. This will continue following Cyclone Gabrielle, with growers expanding the roll-out of technologies that uplift yield, increase light use, reduce labour costs, and reduce water use. These technologies include analytical monitoring of crops (soil condition, rainfall etc.), and automated harvest activities such as robotic picking, irrigation drones and autonomous picking carts.

¹⁴ Horticulture NZ

¹⁵ Estimate based on National Apples and Pears Industry Transformation Plan – additional permanent jobs for 2030 projections and NZ census data on Level of qualification amongst work force

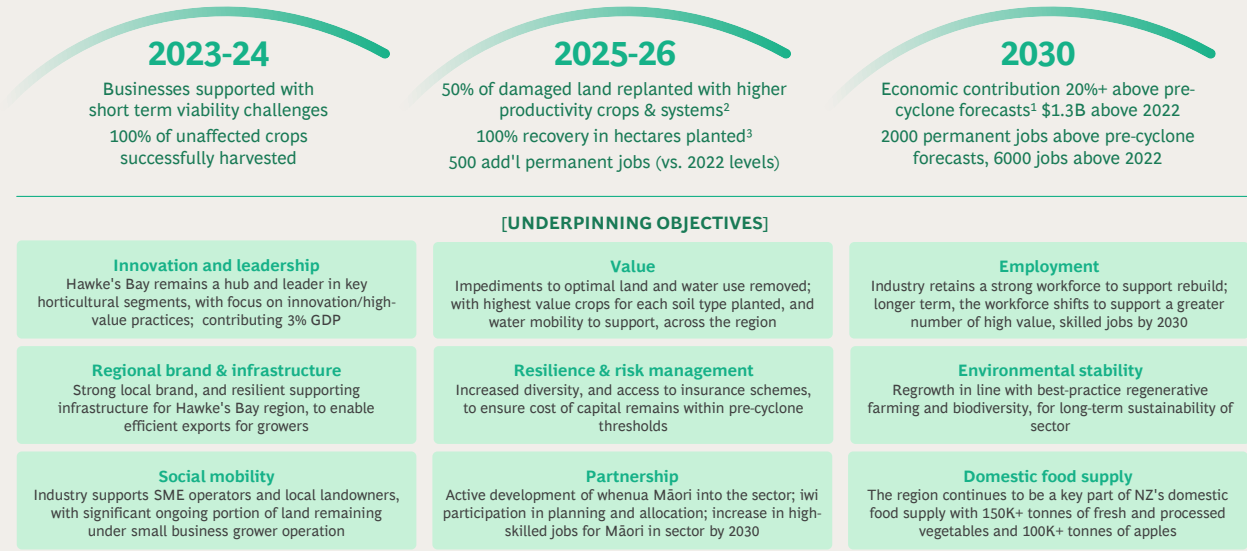
¹⁶ National Crop Estimate Report 2023; Stats NZ

¹⁷ Stats NZ

¹⁸ Hawke's Bay Horticultural Sector Stakeholder interviews

Figure 4 - Target state objectives 2023 to 2030 for sector recovery

"Grow back better" seeks to outline a potential target state aspiration for short-term recovery and longer-term resilience in the Hawke's Bay region



1.2030 forecast based on extrapolation of 2017-2022 sector growth 2. For applicable crop types 3. Includes land that has been clear up, and awaiting nursery plants that have been ordered for planting





Embargoed until 10am on Tuesday the 9th of May, 2023

Section 5. The suite of potential solutions to realise the ‘Grow Back Better’ vision for Hawke’s Bay

Implementing potential solutions for consideration in line with this aspirational vision may enable the economic value of the sector to grow toward \$2.5 billion by 2030. This growth generates an additional \$2.4 – 3.6 billion in cumulative value to 2030, compared to the scenario where the sector recovers without assistance

The suite of potential solutions to help the sector grow back better, delivered in collaboration with central and regional government, iwi, and private sector stakeholders, outline a plan to rebuild the horticulture sector in the Hawke’s Bay. This Grow Back Better plan could help the region’s horticultural industry reach 20% above pre-cyclone economic value forecasts for 2030 – **contributing \$2.5 billion** to the economy annually by 2030.

As shown in Figure 5, this would imply growth of the economic value of the industry by \$1.3 billion from 2022 value; adding \$2.4 billion – \$3.6 billion in cumulative value to 2030 than if it were to recover without interventions from government and stakeholders (base case). Under this scenario, the horticulture sector would likely employ **14,000 people in permanent roles** by 2030 implying 6000 additional permanent jobs above the base case. The workforce would be supplemented by about **20,000 seasonal workers**; 8,000 roles more than base case.¹⁹

The Grow Back Better plan will require funding from multiple sources. The New Zealand Government, through the Ministry of Primary Industries, has already committed \$51 million in recovery funding across the agriculture and horticulture sectors – up to a maximum of \$40,000 per business. This funding is intended for critical response activities such as water infrastructure repairs and removing silt from trees and vines.²⁰

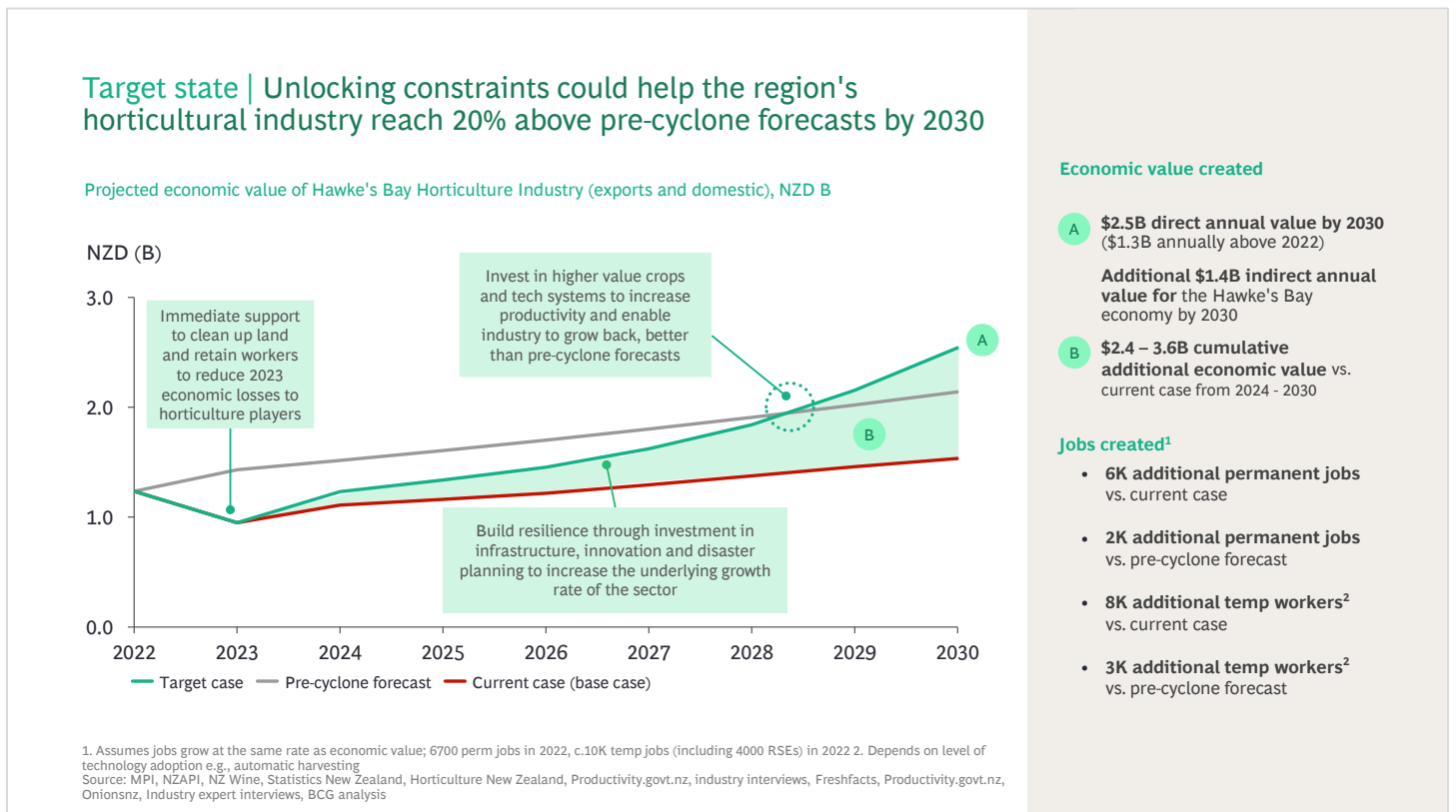
¹⁹ BCG analysis of data collected from MPI, Statistics NZ, Horticulture NZ, Productivity NZ, industry interviews, New Zealand Winegrowers. Assumes jobs grow at the same rate as economic value; 6700 perm jobs in 2022, c.10K temp jobs in 2022

²⁰ Ministry of Primary Industries media release: Cyclone Gabrielle farmer and grower recovery support

Despite these funding commitments and indications, a large proportion of growers do not have sufficient capital reserves or insurance settlements to meet the costs of recovery and be forced to exit the industry, having additional impacts on lost jobs for their employees. It is believed the amount of government support required to support these growers and meet the proposed Grow Back Better solutions is c. **\$650 million – \$960 million**²¹

It is critical to note that failure to implement these solutions would jeopardise the cumulative value of \$2.4 billion - \$3.6 billion that these measures may generate by 2030. This would result in the Hawke’s Bay horticulture sector being valued at only \$1.5 billion in 2030, instead of the projected \$2.5 billion under the proposed plan.

Figure 5 - Projected economic value of Hawke's Bay Horticulture Industry



²¹ Assumes only 50% of the sector will be able to recover without additional government assistance (impact will vary with some growers likely becoming unviable without additional support, and others who can recovery with minimal additional assistance) Source: BCG analysis, Hawke’s Bay horticulture sector stakeholder interviews, and BCG primary survey of Hawke’s Bay growers

These solutions allow the horticulture sector to remain a thriving, resilient and skilled industry, and a crucial pillar of the Hawke's Bay economy that supports multiple communities and whānau. They fall under the 3 categories outlined below and in Figure 6, with the underlying government support required outlined below and in Figure 7.

1. **Critical response solutions** aim to restore access to crops and mitigate the financial and social impact of flooding on crops and uninsured infrastructure. To complete these solutions, an additional \$230 million - \$340 million of government support is required. Solutions include:
 - A government funded clean-up program to re-instate critical access to crops for salvage and protection, replace core machinery, evacuate contaminated crops which pose long-term harm to soil health, and remediate the soil to maintain future capacity.
 - **Government support required to complete this solution:** Funding support required is estimated at \$150 million - \$230 million.
 - **How it could be implemented:** The Ministry of Primary Industries could extend the current agriculture and horticulture recovery fund.
 - Production reinstatement schemes aim to ensure Hawke's Bay horticulture businesses can remain viable and employers can retain their staff to support clean-up and crop reinstatement activities, limiting the consequences of the cyclone on employees and their whānau. Longer term, there is potential to extend the scheme to support the growth of higher productivity roles (e.g., tech - enabled farming, horticulture science).
 - **Government support required to complete this solution:** Funding support required is estimated at \$80 million - \$110 million for production reimbursement²² and possible targeted employee retention programs given the asymmetric impact of the cyclone
 - **How it could be implemented:** Government could align with previous production reimbursement schemes which followed natural disasters such as: Funding provided for crop reestablishment up to 90% of cost of damage & rural assistance payments provided to affected farmers up to 75% of unemployment benefits following the 2004 Manawatu Floods



²² Equivalent to one year's production cost for damaged and replanted crops

Figure 6 – Suite of potential solutions

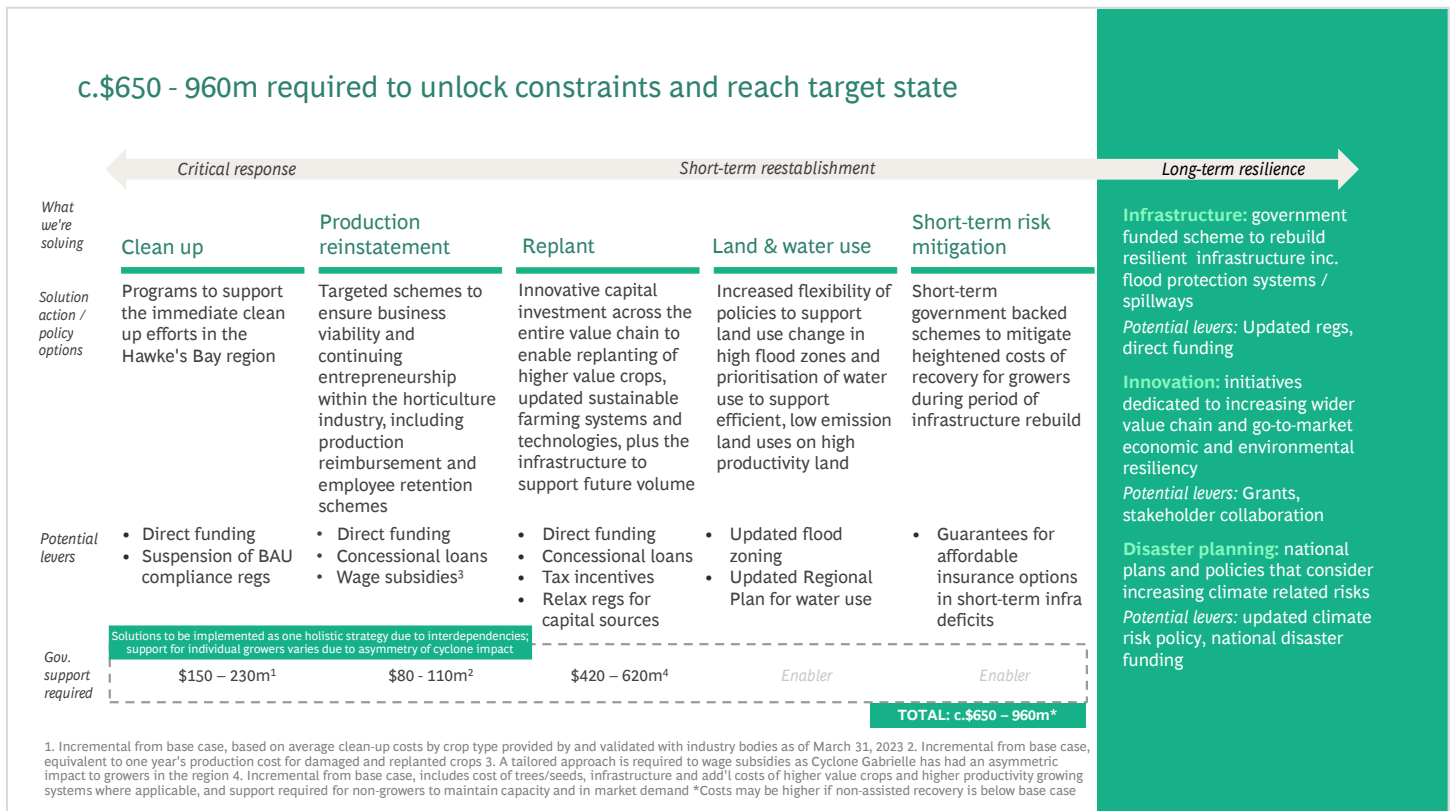
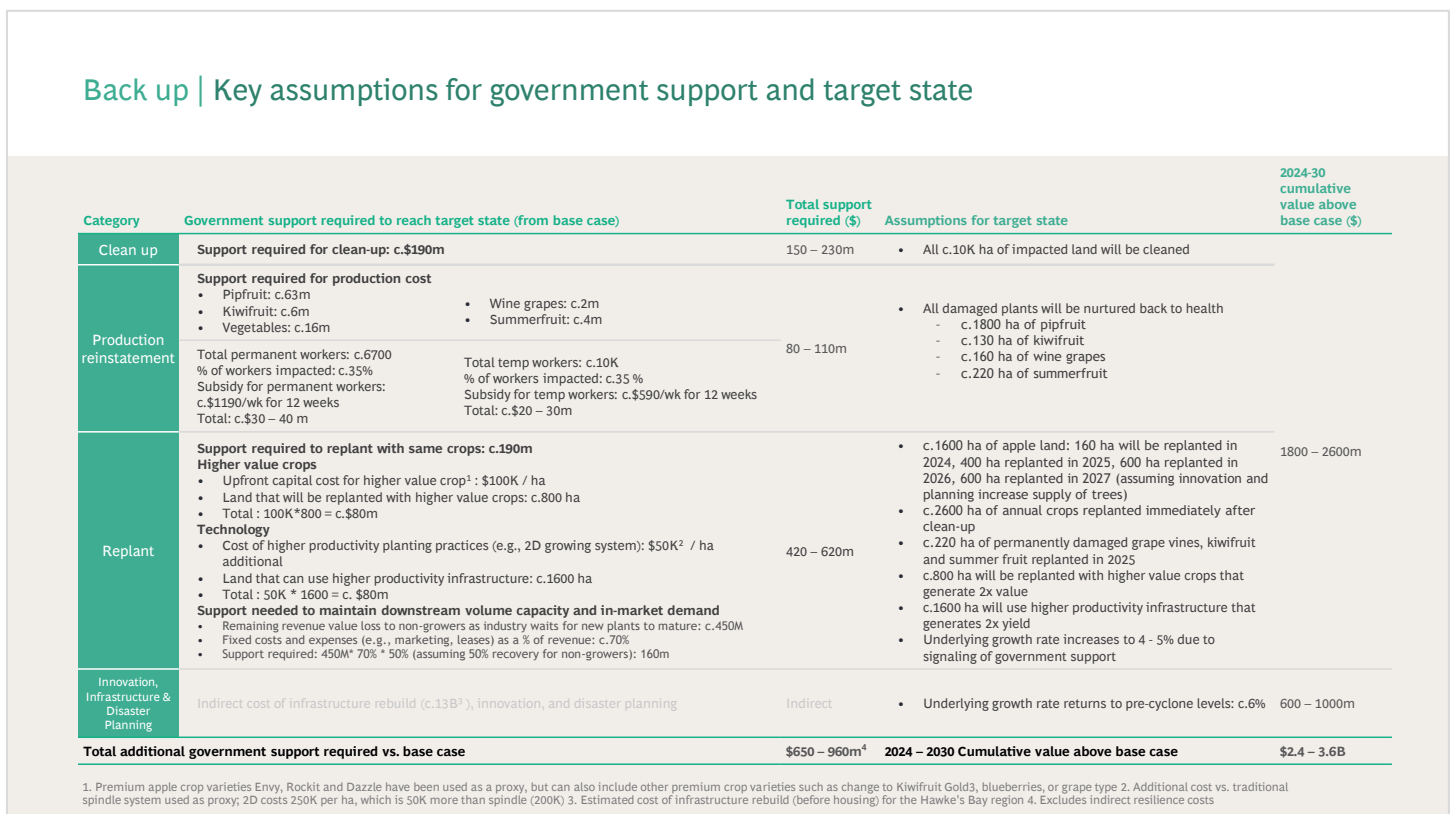


Figure 7 - Key assumptions to calculate cost and impact of solutions



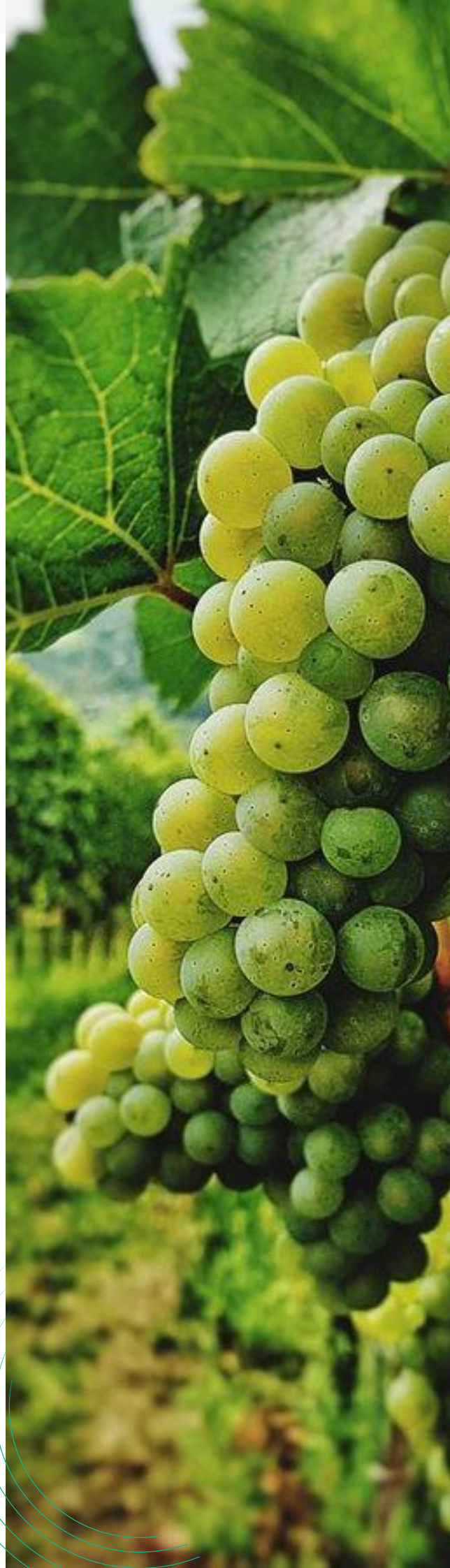
2. **Short-term reestablishment solutions** aim to return impacted land to productive capacity, improve water infrastructure, and provide business continuity support. To complete these solutions, an additional \$420 million - \$620 million is required. Solutions include:

- Innovative capital investment across the entire value chain to enable replanting of higher value crops, updated sustainable farming systems, technologies, and tools, plus the infrastructure to support future volumes. Investment will also help cover uninsured losses, rebuild on-farm infrastructure; replant and develop appropriate freehold land (including whenua Māori) to produce higher-value crops.

- **Government support required to complete this solution:** Funding support required is estimated at \$420 million –\$620 million for the cost of trees/seeds, infrastructure, additional costs associated with higher value crops and higher value productivity systems where applicable, and cost of maintaining downstream volume capacity and in-market demand.

- **How it could be implemented:** Potential for government to implement grants, subsidies, and innovative financial solutions such as tax incentives or concessional loans to growers and downstream providers to support investment in the sector. Consideration could be given to relax overseas investment regulations for Hawke’s Bay businesses.

- A government subsidy program could be based on the Agricultural Recovery Program offered following the 2004 Manawatu Floods where subsidies of up to 90% of costs were offered to growers to complete re-instatement activities. Similar programs existed following the Queensland and Victoria floods.²³



²³ Government sites, Newspaper articles

- A concessional loan program could be similar to the Small Business Administration ‘disaster loans’ in the USA which allow businesses affected by natural disasters (e.g., Hurricane Ida) to cover uninsured losses and business opex that could have been met had the disaster not occurred. These loans are to a maximum of \$2 million (dependent on extent of damages), have a maximum interest rate of 4% p.a. and are issued by a private bank but backed by the federal government.²⁴
 - Increased flexibility of policies that support land use change in high flood zones and the prioritisation of water use enabling efficient, low emission land use on high productivity land.
 - **Government support required to complete this solution:** There is no direct funding support required for this solution, but government and the horticulture sector will need to make rapid land and water use with corresponding flexibility in policies to allow the industry to move forward with confidence
 - **How it could be implemented:** Following the 2002 Elbe flood the German government introduced a Flood Control Act which restricted new development in designated flood prone areas and developed appropriate land use ordinances to reduce flood damage²⁵
 - Short-term government backed schemes to mitigate heightened costs of recovery for growers during period of infrastructure rebuild. This will provide growers protection from uninsured losses occurring because of natural disasters.
 - **Government support required to complete this solution:** No direct funding support is required for this solution, but it will likely require collaboration between government and private insurers. The scheme will provide growers confidence to embark on their clean-up and replanting programs while protective infrastructure is being rebuilt.
 - **How it could be implemented:** The scheme could be built on partnerships between government and private insurers such as the National Flood Insurance Program in the USA. A network of c.50 insurance companies and the Federal Emergency management Agency provide affordable flood insurance to property owners, and businesses in high-risk areas. The average cost of a FEMA flood insurance policy is <\$1000 annually and c.20,000 communities in the USA participate in the scheme.²⁶
3. **Long-term resilience building solutions** enable the sector to move forward with crops planted on appropriate land with required supporting infrastructure. They have a potential cumulative benefit of up to \$600 million–\$1000 million by 2030.
- A government fund to rebuild resilient infrastructure (e.g., high quality stopbanks)
 - **Government support required to complete this solution:** As major infrastructure projects, these will likely be funded through direct grants or funding packages. The total cost for all Hawke’s Bay infrastructure is estimated at over \$13 billion.²⁷
 - **How it could be implemented:** Following the 2011 Queensland floods (Cyclone Yasi) the Australian Government invested in rapidly improving disaster resilience and infrastructure improvement. \$6.8 billion AUD was invested and by end of year 96% of

²⁴ Small Business Administration web pages

²⁵ Government sites, Newspaper articles

²⁶ FEMA, A and N mortgage web page on Advantages of national flood insurance program

²⁷ BCG analysis, Stakeholder interviews, Desktop Research

affected roads (9,000km) and 92% of affected railways (4,500km) were rebuilt, and best practice stormwater management was integrated into rebuilt communities ²⁸

- Initiatives dedicated to innovation through physical and operational investment in value chain and go-to-market structure, allowing the horticultural sector to improve economic and environmental resiliency (e.g., through geographic diversification, professionalisation where appropriate, increased sales and marketing investment)
 - **Government support required to complete this solution:** Investment required from downstream platform providers to improve resiliency and innovation of the sector (e.g., enabling and supporting the piloting and adaptation of automation technology, investing in IP varieties and GTM innovation, and considering geographic diversification for infrastructure). This is likely enabled through grants, subsidies and innovative financial solutions backed by government.
 - **How it could be implemented:** Grant generating bodies can help wider value chain players maintain investment in the current market and provide forward-focused capacity for a resilient supply chain. Government programs include examples such as the New Zealand Trade & Enterprise Innovation Grant Fund, the Provincial Growth Fund, the Callaghan Innovation agency, and the Sustainable Food and Fibre Futures. Adjusting the eligibility categories for these grant funding schemes, such as Callaghan Institute stating that businesses who received government R&D funding greater than \$5k since 2019 are ineligible for their R&D grant, will increase the accessibility of these initiatives to wider value chain players post-Cyclone Gabrielle.²⁹
- Implement national plans and policies that consider increasing climate-related risks
 - **Government support required to complete this solution:** Regional and national government to lead risk mitigation and strategic planning following Cyclone Gabrielle. Plans and policies should consider the whole disaster life cycle – preparation, mobilisation, respond and recovery.
 - **How it could be implemented:** These plans would follow other jurisdictions who have faced recent natural disasters such as the Victorian Climate Adaptation Action Plan following the 2022 floods. This identified key climate risks and outlined a series of strategies to mitigate these risks across infrastructure, land use and governance.³⁰

The Grow Back Better Plan outlined in this report offers a comprehensive blueprint that can guide the Hawke's Bay horticulture sector in its discussions with government and other stakeholders. By implementing these solutions, the sector can not only recover from the impacts of Cyclone Gabrielle but also build resilience for the future. This plan can also serve as a model for other industries and communities affected by natural disasters, providing a framework for effective recovery and sustainable growth.

²⁸ Coast Adapt Fact Sheet on Cyclone Yasi

²⁹ Grant fund web pages, MBIE

³⁰ Victoria Government web pages: Victorian Climate Adaptation Action Plan

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