Step 1: Getting started

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| --- | --- |
| **Task 1.1**What do you want to use the Toolbox for? | Education [ ] Information access [ ] Adaptation to climate change [x] Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [ ]  |
| **Task 1.2**What do you want to achieve by using the Toolbox? | How climate change affects me [x] Identify climate change risks [ ] Decision-making to build resilience [ ] Formulate an adaptation plan [x] Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [ ]  |
| **Task 1.3**Who do you want to work with on the Toolbox?  | Family [x] Neighbours [x] Community [x] Councils [x] Industry groups [ ] Iwi [x] Organisations [ ] Businesses [x] Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ [ ] List of specific groups: |

Step 1 checklist

At the end of step 1 you should:

* know what climate change adaptation is and reasons for you and your organisation to adapt
* know what you would like to use the toolbox for.

Step 2: Current climate effects

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| **Task 2.1**Write down how you currently manage your climate risk e.g. to manage drought you bring in water.* *Community meetings to discuss climate change, impacts and community members ideas.*
* *Working on flood evacuation plan.*
* *Discussing town sustainability options eg. Relocation, stilts.*
 |

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| **Task 2.2** Identify and read through any information that you have on your local climate, weather, environment, or any related information. See the Resources section as part of the Toolbox to get started. Businesses, organisations, your local council, friends and family may also be able to help. Use Table 2.2 in the Taskpad to record how climate and weather affect you and your business/ organisation. You may want to make notes here, including where you got your information from, any limits to it, and what further information you need. |

**Table 2.2**

Use the following table to record how climate and weather presently affect you and your business/ organisation (Part A is your current climate and Part B is extreme weather events).

|  |  |  |
| --- | --- | --- |
| **Part A: Current Climate** | **Opportunities** | **Challenges** |
| **Average low (minimum) temperature- winter *(e.g. 5°C)*** | *Cold enough for snow – skiing/snowboarding, brings money into the community* |  |
| **Average high (maximum) temperature- summer *(e.g. 22°C)****Average high – 22 degrees* | *Warm summer destination for tourism.* | *Risk of sunburn and heatstroke in summer* |
| **Prevailing wind *(e.g. westerlies)****North-East/Westerlies* | *Typically winds not very strong so less risk of damage to property due to wind.*  | *Weak winds in summer make temperatures feel warmer.*  |
| **Average rainfall *(e.g. 1,200 mm/year)****750mm/year* | *Enough rain for viticulture.* | *Low rates of rainfall increase risk of drought.*  |
| **Dry times *(e.g. Jan-March or 25% of normal)****Slightly drier over summer* |  | *Risk of drought.*  |
| **Wet times *(e.g. Jan-March or 150% of normal)****Slightly wetter over winter* |  | *Flooding risk if high levels of rain.* *Lake can remain at high levels for prolonged periods – days to weeks.* *River flooding.**Debris build up.* |
| **Other *(e.g. frost/hail/snow)*** | *Snow – good for tourism.* | *Frost – dangerous driving, danger to people by falling.**Snow – dangerous driving, can block roads, danger to people by falling.* |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Part B: Extreme Weather Event** | **Impact** | **Critical threshold reached?** | **Opportunities** | **Challenges** |
| **Extreme temperature** *e.g.* *2020 heatwaves- three consecutive days over 25°C* | *Water shortages* | *Three consecutive days over 25°C* | *Good for tourism* | *Health impacts of extreme heat.* *Can make drought worse.* *Increased cooling degree days.*  |
| **Extreme wind**  | *Damage to property and harm to people.*  | *Gale force above 61 km/hr* |  | *Potential damage to properties and harm to people.* *Prevent tourism activities.* |
| **Heavy rain** | *Higher lake levels.* *Flooding inland for up to weeks.* *Risk of landslides.**Damage to bridges.* *Risk of flooding.*  | *1m above the average depth of the lake causes inundation.*  |  | *Flooding and damage of property.**Risk of harm to people.* *Relocation.* *Blockage of road in/out of the town.* *Landslide risk of damage to people/property.* *Landslide further risk of isolating this community.* *Risk to agriculture/viticulture/horticulture.*  |
| **Drought** | *Increased wildfire risk.* *Dries out grass, crops.* *Lack of water.*  | *Meteorological/agricultural threshold for drought* |  | *Risk to agriculture/viticulture/horticulture.*  |
| ***Frost/Snow/Hail*** | *Build up of snow in mountains.* |  | *Snow is good for tourism.*  | *Blockage of road in/out of the town.* *Risk of avalanche in nearby mountains.* *Risk to agriculture/viticulture/horticulture.*  |

Step 2 checklist

At the end of Step 2 you have:

* Recognised how you manage risk and your attitude to risk
* Identified how climate and weather extremes affect your land/organisation/ business, what the consequences are, and what actions you have taken
* Identified any critical thresholds where the effects or impacts of climate and weather had a significant impact once exceeded
* Listed what further information you need and whether there are any information gaps/limits

Step 3: Future climate effects

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| **Task 3.1:** Find out the expected changes in New Zealand’s climate in coming decades, e.g. 2050 and 2090, and specifically for your area. Record your responses in Table 3.1.**Task 3.2:** Identify what assets/elements of your business/organisation could be affected by climate change. Consider any critical thresholds that could affect the assets e.g. 100mm of rain can lead to the dam breaking; a temperature of -2°C can lead to frost sensitive crops dying.**Task 3.3:** Assess the risk (likelihood and consequence) of each climate change effect listed in Table 3.1. Use the risk table provided in the toolbox website to estimate the risk (low, low-medium, medium, medium-high or high).  |

**Table 3.1**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Climate change effect** | ***Task 3.1*** | **Expected change in climate** | *A) Increase in hot days* | *B) More extreme rainfall events and an overall increase in rainfall* | *C) Increased risk of landslides.* | *D) Reduce in snow days/frost days* |
| **Amount of change and timeframe** | *Up to 25 more hot days by 2040 and up to 50 by 2090.* | *20% increase in annual rainfall by 2090* | *Related to rainfall intensity.* | *Decrease of frost days most prevalent in cold areas* |
| **Impacts on your business/ organis-ation** | ***Task 3.2*** | **Vulnerable assets/ elements** | *People, agriculture, viticulture* | *Roads, property, people, lakes* | *Roads, property, people* | *Driving, tourism through snow sports*  |
| **Potential critical thresholds** | *Three consecutive days over 25 degrees.* | *Enough rain that causes 1m rise in river/lake level* | *Extreme rainfall* | *Insufficient snow for skiing/snowboarding* |
| **Opportunities** | *Tourism* |  |  |  |
| **Risk** | ***Task 3.3*** | **Likelihood** | *Very likely* | *Likely*  | *Likely* | *Very likely*  |
| **Consequence**  | *Minor* | *Severe* | *Significant* | *Moderate* |
| ***Task 3.3*** | **Risk** | *Low Medium* | *High* | *Medium High* | *Medium High* |

**Task 3.4**

In Table 3.4 below list the climate risks (from Table 3.1 above) affecting your business/organisation – add rows to the table if you need to. Note how you could potentially manage these risks.

**Task 3.5:**

Prioritise the most significant climate risks from Tasks 3.4, using the column in Table 3.4 for ranking them by importance.

List high and low priority risks in different colours e.g. red for high risk, green for low risk.

Table 3.4:

|  |  |  |  |
| --- | --- | --- | --- |
| **Climate risks and timeframe** | **Potential risk management**  | **Uncertainty/ additional resources needed**  | **Priority of importance** |
| *Lack of tourism due to poor conditions skiing/snowboarding* | *Advertise other tourist activities in the area* | *Finances, Marketing teams* | *3/4* |
| *Flooding of the town*  | *Relocation of the town away from flood prone areas* | *Land, Te Tiriti, Payment of land to those by lake, Iwi/council/govt perspective* | *1/4* |
| *Isolation of nearby town through landslide or flood on sole road* | *Construction of an additional road to avoid isolation* | *Cost, location, Te Tiriti, Iwi/council/govt perspective* | *4/4* |
| *Impact of heat on agriculture/viticulture* | *Plant heat resistant crops for agriculture* | *Best crops for this area**Is there some kind of grapes that could be used?* | *2/4* |

Step 3 checklist

At the end of step 3 you should have:

* an understanding of how New Zealand's climate is expected to change
* identified key climate impacts in your area and to your business/organisation
* understood your climate risk, and its importance in relation to other risks
* identified priority risks that require action
* an awareness of information gaps and uncertainties associated with the information you are using

Step 4: What actions should you take?

**Task 4.1**

What are the possible ways you could adapt to the climate change risks you identified in Step 3. Try working with others in your area or industry to identify as many options as possible. Use Table 4.1 to record your answers.

There are many ways you can incorporate adaptation into your business or organisation, such as:

* reviewing your regular business/organisation plan and practices
* creating contingency plans for storms, droughts, floods etc.
* incorporating actions into your financial and growth plans
* taking out insurance against climate impacts
* undertaking training yourself or for your employees
* exploiting new opportunities
* offsetting losses by sharing or spreading the risk
* avoiding or reducing exposure to climate risks
* accepting the impacts, and planning ahead.

Think widely at this stage, don't limit your options. Use Step 1 to help you identify options, for instance research or training, as well as actions such as changing land-use practices.

**Task 4.2**

Write down when you need to act (or not act) and prioritise your actions. Use Table 4.1 to record your answers.

You may want to consider:

* any current weather or climate related issues you are facing
* how soon (or how likely) you expect climate risks to exceed any critical thresholds
* how long it will take to plan and implement solutions - consider pathways for adapting over time
* reducing risk by modifying regular maintenance to take climate change into account
* incorporating climate considerations into long lived decisions, such as business remodelling.

**Task 4.3**

Compare the costs of acting with the impacts you avoid (or the income you might realise) to estimate the benefits of acting. Think about the level of adaptation you want, as well as the potential for under- or over-adapting. Add these to Table 4.1.

**Task 4.4**

Consider which of your adaptation options are a priority for you currently based on weighing the level of risk, as well as the cost of acting vs. the avoided impacts. You can use the action priority matrix in the Toolbox to assist you, and then prioritise your actions in Table 4.1.

Descriptions for the action priority matrix are as follows:

* **Quick wins (high impact, low effort):**are the most attractive projects, because they give you a good return for relatively little effort. Focus on these as much as you can (e.g. minimising water usage by fixing leaky taps and pipes).
* **Major projects (high impact, high effort):**these give you good returns, but they are time-consuming. This means that one major project can "crowd out" many quick wins (e.g. building a major permanent stop bank).
* **Fill ins (low impact, low effort):**Don't worry too much about doing these activities – if you have spare time, do them, but drop them or delegate them if something better comes along (e.g. building a small temporary stop bank).
* **Thankless tasks (low impact, high effort):**Try to avoid these activities. Not only do they give little return, they also soak up time that you should be using on quick wins (e.g. short-term replacement/repair of infrastructure in flood prone locations).

**Table 4.1:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Adaptation options (Task 4.1)** | **When- urgency (Task 4.2)** | **Cost of acting (Task 4.3)** | **Avoided impacts (Task 4.3)** | **Result from the action priority matrix (Task 4.4)** | **Priority for implementation plan? (Task 4.4)** |
| 1. *Advertise other tourism activities in the area.*
 | *Not urgent but could be worthwhile starting soon* | *Low to moderate cost for designers and tourism experts but expected revenue high* | *Loss of tourism to the area* | *Quick win* | *Medium priority* |
| 1. *Relocation of vulnerable areas of town away from flood prone areas.*
 | *Large, complex task with many factors to consider so will be a long process – potentially decades* | *High cost but will save damage costs in the long run*  | *Damage to property and harm to people from flooding* | *Major project* | *Medium priority* |
| 1. *Investigation of other viticulture/agriculture options for the area.*
 | *Within a year* | *Low cost* | *Drought resistant crops and possibly other options for viticulture will reduce economic losses to climate change* | *Quick win* | *Medium priority* |
| 1. *Stilts for houses in flood zones*
 | *10 years* | *High cost* | *Flooding of houses* | *Major project* | *Medium High priority* |
| 1. *Raising flood banks*
 | *5 years* | *High cost* | *Flooding of the town* | *Major project* | *Medium High priority* |

**Task 4.5**

Use your responses from Table 4.1 and the rest of the Taskpad to develop your climate change adaptation implementation plan for your priority actions. A template for an implementation plan is provided in Table 4.5 below, but feel free to revise it to fit your needs.

Include ways to integrate climate adaptation into your business-as-usual activities now or over the next 12 months i.e. business/organisation planning, scheduling, maintenance, financial plans, changing management practices, new buildings, new products, training, disaster recovery, or any other management plans.

**Table 4.5** **Implementation Plan template:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Priority Action(s)** | **Steps to achieve this** | **Key stakeholders involved** | **Timeframe** | **Budget** | **Additional information required** | **What success looks like** |
| *1. Advertise other tourism activities for the community* |  | *Community, marketing, tourism experts*  | *Years, ongoing project* | *$20,000 initially*  | *Activities in the area* | *Influx of tourists for activities other than snow sports* |
|  | *1.1 Hire marketers and tourism experts* |  |  |  |  |  |
|  | *1.2 Discuss tourism activities that could bring more revenue to the area when skiing gets harder.* *Focus on warm weather activities* |  |  |  |  |  |
|  | *1.3 Begin advertising campaign* |  |  |  |  |  |
|  | *1.4 Invest in infrastructure as required* |  |  |  |  |  |
| *2. Relocation of properties in the flood zone* |  | *House owners/ tenants, council, government, iwi, other community members* | *10 years* | *$50 million* | *Local regulations, Treaty of Waitangi, land* | *No houses in the areas with a high likelihood of flooding* |
|  | *2.1 Hui with community, house owners, iwi, council* |  |  |  |  |  |
|  | *2.2 Legal determination of where to put houses* |  |  |  |  |  |
|  | *2.3 Talk to houseowners about risk* |  |  |  |  |  |
|  | *2.4 Buy land off houseowners willing to move* |  |  |  |  |  |
|  | *2.5 Building of houses in the designated area of land* |  |  |  |  |  |
| *3.**Other options for viticulture and agriculture* |  | *Farmers, vineyard owners, community, scientists* | *Personal choice whether farmers/ vineyard owners change but knowledge given out within a year* | *$20,000* | *Research surrounding best options* | *Farmers, vineyard owners aware of their options* |
|  | *3.1 Pay scientists to research and write up other options* |  |  |  |  |  |
|  | *3.2 Present this information to farmers/ vineyard owners* |  |  |  |  |  |
| *4.* *Stilts for houses in flood zones* |  | *Home-owners, builders, council* | *10 years* | *$20 million initially* | *Consent from appropriate home-owners, funding* | *All houses in flood zones with stilts* |
|  | *4.1**Discuss logistics surrounding cost from builders* |  |  |  |  |  |
|  | *4.2* *Acquire funding – insurance, government, council?* |  |  |  |  |  |
|  | *4.3* *Consent from land owners* |  |  |  |  |  |
|  | *4.4 Construction of stilts* |  |  |  |  |  |
| *5.**Raising flood banks* |  | *Council, iwi, builders, engineers* | *3 years* | *$15 million* | *Engineer plans* | *Reduced risk of flooding due to higher flood banks* |
|  | *5.1* *Engineering plan made* |  |  |  |  |  |
|  | *5.2* *Builders bought in* |  |  |  |  |  |
|  | *5.3**Flood bank raised and also extended further up the river* |  |  |  |  |  |

Step 4 checklist

At the end of step 4 you should have:

* Decided what you want to do, based on the information you have
* Determined the timeframe for actions
* Identified possible adaptation measures, costed these (if possible) and selected priority climate risks
* Your responses should set out:
* actions you can take now to adapt to climate change
* longer-term actions to ensure you are resilient to climate change
* possible barriers to action and how to overcome them
* how you are going implement your actions and the resources needed.

# Step 5: Long-term planning and monitoring

**Task 5.1**

### Analyse your key climate uncertainties and information gaps in detail and get expert help, if needed. Ask yourself the following questions:

* **What are the key uncertainties and information gaps** in the work you have done? Consider the:
* effects of climate change in your area
* impacts on your production system
* ways to manage the impacts
* costs and benefits
* priorities
* thresholds or residual risk.

## Task 5.2

## Develop an effective monitoring and evaluation programme or include within the existing measurement systems you have. You may use Table 5.2 below as a monitoring and evaluation template, and adjust as required. It may also be helpful to go back and revise your implementation plan (Table 4.5) and other previous tables in the Taskpad, as part of the monitoring and evaluation process.

A monitoring programme should:

* Be clear about what success means for you and the actions you choose. You may need to revise this overtime.
* Describe how the review will feed back into business or organisation decisions.
* Show changes in risks (including opportunities) and options.
* Monitor sources for new information on climate change (i.e. MfE, Regional Councils, NIWA).

### **Task 5.3**

### Alter your previous responses based on your monitoring and evaluation plan, and new information you have collected.

**Table 5.2:**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Previous actions** (as per Table 4.5) | **How success was defined** (as per Table 4.5) | **Successes achieved** (what worked well) | **Challenges encountered** (what didn’t work so well) | **Previous priority level** (as per Table 4.1) | **Revised priority level** (if applicable) | **Revised action** (if applicable) |
| ***1.*** ***Tourism*** | *Influx of tourists for activities other than snow sports* | *Lots of tourists starting to visit for other activities* | *Limited tourism in winter months*  | *Medium* | *In progress* |  |
| ***2.*** ***Relocation*** | *No houses in the high-risk flood area* | *Less houses prone to flooding* | *Some house owners didn’t want to move* | *Medium* | *In progress* |  |
| ***3.******Agriculture/viticulture*** | *Information given to all relevant people* | *Information given to all relevant people* | *Limited options for viticulture* | *Medium* | *Low* |  |
| ***4.******Stilts for houses*** | *Stilts for all houses in flood zones* | *Financial assistance received from government* | *Some home owners don’t want stilts* | *Medium High* | *In progress* |  |
| ***5.******Raising flood banks*** | *Reduced risk of flooding due to raised flood banks* | *Engineer plan completed and builders have started process* | *Cost more than expected* | *Medium High* | *In progress* |  |

Step 5 checklist

At the end of step 5 you should have:

* developed an effective monitoring and evaluation programme
* gone back through steps 1 to 4 of the Toolbox and updated any previous responses based on your monitoring and evaluation plan, and new information you have collected.

## Congratulations, you have completed the New Zealand Climate Change Adaptation Toolbox!