Step 1: Getting started

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

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

|  |
| --- |
| **Task 2.1**Write down how you currently manage your climate risk e.g. to manage drought you bring in water.* *Wear hats in hot weather*
* *Rain days*
* *Installation of a heat pump*
* *Shade*
* *Water tanks*
 |

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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)****Approx 7°C* | * *Not very cold*
* *Frost unlikely*
* *Less chance of dangerous driving conditions to school due to frost*
 | * *Keeping a comfortable learning environment when cold*
 |
| **Average high (maximum) temperature- summer *(e.g. 22°C)****Approx 25°C* | * *Warm weather for lunchtimes*
 | * *Sunburn/heatstroke*
* *Keeping a comfortable learning environment when hot*
 |
| **Prevailing wind *(e.g. westerlies)****Varies throughout the year* | * *Lessens the heat of summer*
 | * *Risk of damage to buildings, or hazards like trees falling in strong wind*
 |
| **Average rainfall *(e.g. 1,200 mm/year)****1400 mm/year* | * *Considerable precipitation*
 | * *Chance for drought/flooding not even throughout the year*
 |
| **Dry times *(e.g. Jan-March or 25% of normal)****Dryer over summer* | * *Less chance of flooding at some times in the year*
 | * *Higher chance of drought at certain times*
* *Risk of fire increased*
* *Drought/water shortages*
 |
| **Wet times *(e.g. Jan-March or 150% of normal)****Wetter over winter* | * *Less chance of drought at some times of the year*
 | * *Flooding, particularly with the river close-by to the school*
* *- Rain days*
 |
| **Other *(e.g. frost/hail/snow)****Very high sunshine hours* |  | * *Sunburn*
 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Part B: Extreme Weather Event** | **Impact** | **Critical threshold reached?** | **Opportunities** | **Challenges** |
| **Extreme temperature** *e.g. 2020 heatwaves- three consecutive days over 25°C* | *Some of the warmest summers in New Zealand.*  | *Cooling unit/ heat pump no longer works* |  | *- Difficulty for children to focus**Keeping a comfortable learning environment throughout summer* *Too hot to play outside sometimes* |
| **Extreme wind** *Eg. 1982, 1988, 2005 wind* | *High winds can cause damage to property and people. For example, falling trees.*  | *Level of wind that would cause damage to the property* |  | *Damage to infrastructure**Danger to people**Financial impact**Relocation* |
| **Heavy rain***Eg. 1982, 1988, 2005, 2015, 2021 flooding* | *Flooding, particularly due to the close proximity to the river.*  | *Amount of rain that would cause flooding and river overflow* | *Can be used for water storage* | *Civil defence spot so need this to be safe and dry* |
| **Drought** | *Lack of water, water tanks emptier* | *Water shortages for school needs* |  | *Increased risk of fire* |
| **Frost/Snow/Hail** | *Frost, snow, and hail can make driving to school dangerous.* *Snow and hail can damage property.*  | *Frost and snow very unlikely**Hailstones 2.5cm in diameter or larger most likely to cause damage to property* |  |  |
| **Other** |  |  |  |  |

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

|  |
| --- |
| **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) e.g. hotter summers* | *B) Drier summers* | *C) More extreme rainfall events* | *E) Windier* |
| **Amount of change and timeframe** |  *+1°C by 2050* | *Drought probability up 50-70% by 2090* | *Moderate amounts of rainfall increased, extreme rainfall more common.*  | *Extreme winds speeds increase by 10%* |
| **Impacts on your business/ organis-ation** | ***Task 3.2*** | **Vulnerable assets/ elements** | *Less days outside, sunburn, cooling failure* | *Empty water tanks* | *River bordering school – risk of flooding* | *Trees**Building damage* |
| **Potential critical thresholds** | *Temps above 30 degrees* | *No rain for a month* | *When the river reaches the school* | *When damage occurs* |
| **Timeframe for critical thresholds** | *Multiple times a year by 2050* | *5-20% more time in drought* |  | *Frequency of extreme winds likely to increase in summer by 2040* |
| **Opportunities** |  |  |  |  |
| **Risk** | ***Task 3.3*** | **Likelihood** | *Likely* | *Likely* | *Likely* | *Likely* |
| **Consequence**  | *Moderate* | *Moderate* | *Moderate* | *Significant* |
| ***Task 3.3*** | **Risk** | *High* | *Medium* | *Medium* | *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** |
| *Extreme rainfall leading to flooding of river beside school* | *Sand bags around the river**Riparian planting**Evacuation* | *What levels of rain will cause flooding* | *1/4* |
| *Increased chance of damage due to stronger winds* | *Cut down unstable trees**Improve roof strength* |  | *3/4* |
| *Increased frequency of heat waves in summer* | *Sunscreen, sunhats and shade available for outside.* *Windows open or air conditioning on for classrooms.* *Temperature when school shuts.*  |  | *2/4* |
| *Drier summers* | *Water tanks filled* | *How to fill tanks in extended period of drought* | *4/4* |

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.**Practicing evacuation plan for flood* | *Drier period of the year now so not too much urgency but would be good to do before winter.*  | *Low* | *Damage to people and personal property* | *Quick win* | *Medium priority* |
| *2.**Riparian planting/**sandbags* | *Good to get done by winter* | *Low to medium, just need to purchase plants/sandbags* | *Damage to property* | *Major project* | *High priority* |
| *3.* *Purchases eg. Sunscreen, sunhats, heatpumps, water tanks* | *Urgent, summer just beginning* | *Low to medium* | *Sunburn, heat stroke* | *Quick win* | *Very high priority* |
| *4.* *Planting trees for shade* | *Urgent, summer just beginning* | *Low to medium* | *Sunburn, heat stroke* | *Quick win* | *High priority* |
| *5.* *Removing an unstable tree that could cause damage in high winds* | *Sooner the better, but can use temporary measures until time and finances ready* | *Medium* | *Physical injury and damage to property* | *Major project* | *Medium priority* |
| *6.* *Strengthening the roof* | *In 5 years* | *High* | *Roof coming off in high winds* | *Major project* | *Medium 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. Purchases eg. Sunscreen, sunhats, water tanks, heat pumps* |  | *Staff, suppliers for bulk orders* | *Within the next week* | *$20,000* | *Any deals for bulk orders?* | *Each child having a hat and sunscreen that is put on before lunchtime or going outside* |
|  | *1.1 Place order for one hat per child in the school* |  |  |  |  |  |
|  | *1.2 Purchase sufficient sunscreen for the summer* |  |  |  |  |  |
|  | *1.3* *Purchase water tanks* |  |  |  |  |  |
|  | *1.4* *Purchase and install heat pumps* |  |  |  |  |  |
| 1. *Planting trees for shade*
 |  | *Staff, gardeners* | *Within the next month* | *$5,000* | *Number of trees required for enough shade for 30 children* | *Sufficient trees for children to eat lunch under* |
|  | *2.1* *Decide tree species* |  |  |  |  |  |
|  | *2.2 Purchase trees* |  |  |  |  |  |
|  | *2.3 Gardeners plant trees* |  |  |  |  |  |
| 1. *Riparian planting and sandbags along the river*
 |  | *Staff, gardeners, council* | *Over the next 6 months* | *$1000* | *Talk to council about logistics of doing this around the river* | *Protection against flooding and the river bursting its banks* |
|  | *3.1 Purchase plants and filled sandbags* |  |  |  |  |  |
|  | *3.2* *Plant riparian plants as dense as possible* |  |  |  |  |  |
|  | *3.3* *Fill in gaps with sandbags* |  |  |  |  |  |
| 1. *Tree removal of the trees that looks unstable in strong wind*
 |  | *Tree removal company* | *Before winter* | *$1500* | *Best company to use* | *Tree removed* |
|  | *4.1* *Hire tree removal company* |  |  |  |  |  |
|  | *4.2* *Tree removal company cuts down and removes tree* |  |  |  |  |  |
| *5.**Practicing evacuation plan for flood* |  | *Staff, students* | *Next school year* | *$500* | *Evacuation location* | *Successful run through of a practice evacuation* |
|  | *5.1**Formulate a plan* |  |  |  |  |  |
|  | *5.2* *Purchase any supplies required to execute the plan* |  |  |  |  |  |
|  | *5.3* *Discuss with whanau, neighbours, and community so they know the plan* |  |  |  |  |  |
|  | *5.4 Practice a drill* |  |  |  |  |  |
| *Strengthen the roof* |  | *Builders* | *In 5 years* | *$50,000* | *Roof survey* | *New strong roof* |
|  | *6.1* *Roof survey* |  |  |  |  |  |
|  | *6.2* *Schedule roof replacement during Christmas holidays* |  |  |  |  |  |
|  | *6.3* *Replace/ strengthen roof* |  |  |  |  |  |

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.** **Purchases** | *Each child having a hat and sunscreen that is put on before lunchtime or going outside.* | *Water tank, heat pump, sunscreen and hats all purchased* | *Cost $2000 more than expected* | *Very high priority* | *Low* | *Repurchase sunscreen as it runs out* |
| **2.****Planting trees for shade** | *Sufficient trees for children to eat lunch under.* | *Trees purchased and planted* |  | *High priority* | *Low* | *More trees required if school roll increases.*  |
| **3.****Riparian planting and sandbags along the river** | *Protection against flooding and the river bursting its banks* |  | *Taking longer than expected, about halfway through this project.* | *High priority* | *High priority* | *Continue working on this* |
| **4.****Tree removal** | *Tree removed* | *Cheaper than expected* |  | *High priority* | *Low priority* |  |
| **5.****Practicing evacuation plan for flood** | *Successful run through of a practice evacuation.* | *Practice run through went well* |  | *Medium priority* | *Low medium priority* | *Practice evacuation once or twice a year* |
| **6.****Strengthen the roof** | *New strong roof* |  | *Delays to the process so haven’t started yet* | *Medium priority* | *Medium priority* |  |

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!