Integrated Impact Assessment (IIA) Framework
Draft: July 2023

The integrated impact assessment framework (IIA) has been developed alongside key stakeholders to aid policy-makers in regional and central government, as well as other stakeholders, to provide a consistent framework for evaluating scenarios about future developments in land use. The integrated impact assessment (IIA) framework covers social, economic, cultural, and environmental impact of changes to land use, with an education focus.

The framework therefore shows the impact of land use changes in the economic, social, cultural and environmental indicators. The land uses and indicators in the framework were chosen by the stakeholders. Where possible the information on which the indicators has been is from secondary sources or based on literature. This is especially the case with economic indicators and some environmental indicators. However, many of the social and some environmental indicators are scales which where possible have been informed by literature and also consultation. Thes may well vary according to circumstance and as such are an educational tool which can be altered. This identifies the key gaps in data and inform the development of new information on the impact of land use change. It must also be stressed that whilst many indicators are interrelated, this has not been captured directly in the framework but is highlighted in the results.

The framework has been developed for two case study regions, the Ashburton district and Mosgiel. The particular issues were examined to aid the development of the framework were the impact of land use changes associated with nitrate leaching and peri-urban development.

The following is a guide to operating the framework.

Getting Started

Introduction

The purpose of this framework is to allow exploration of scenarios where Land Use is changing for a specified region of New Zealand.

There are:

- three ways for specifying scenarios,
- a form for applying region specific data
- two Dashboards providing overviews and detail signalling likely impacts.

The tool enables users to …

User Interface Overview

This framework tool has been developed in Microsoft Excel and uses macros to provide functionality. Please note when first opening the workbook you will be prompted with a Security warning:
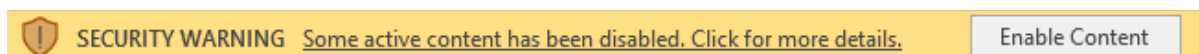
Figure 1 – Security warning seen opening a Microsoft Excel Macro-Enabled Workbook

Provided you trust the source of this workbook, please click the **Enable Content** button to enable use of the macros.

The sheets of the workbook include:

- **Welcome Sheet** – a quick overview of the purpose of the tool and buttons linking to three main entry points to using the tool
- **Example Scenarios** – simple scenarios demonstrating the Integrated Impact Assessment Framework
- **Quick Scenario** – form to quickly enter a scenario for a region where land is changing from one Land Use to another
- **Full Scenario** – form for full specification of a scenario across the sixteen land uses, including baseline data
- **Dashboard** – an overview of possible impacts across the Wellbeing domains including charts and overview of possible benefits and negative impacts
- **Details Dashboard** – a more detailed dashboard presenting assessed scores and measures across the Wellbeings
- **Adjust Base Data –** a form for updating base data used in the framework assessments

Welcome Sheet

*Figure 2 – The **Welcome** sheet*

The Welcome Sheet provides a quick overview of the purpose of the tool and provides buttons linking to three main entry points to using the tool.

Example Scenarios

Figure 3 – The **Example Scenarios** sheet

The **Example Scenarios** sheet presents scenarios demonstrating the Integrated Impact Assessment Framework to help users get an understanding of the tool.

There are two example scenarios under the themes of:

- **Nitrate Limits** in **Ashburton District**, and
- **Peri-Urban Development** in **Mosgiel**.

Simply select a scenario by clicking on it, then click on the **See Results** button to be taken to the Dashboard sheet to see results for that scenario.

Quick Scenario

Figure 4 - The **Quick Scenario** sheet

The **Quick Scenario** sheet allows you to quickly enter a scenario for a region where land is changing from one Land Use to another.

The **Region** is the region in which the scenario is applied. This is selected from a dropdown box, currently limited to **Ashburton District** or **Mosgiel**.

The **Change** is specified as a percentage of the current area for one of the land uses. This is selected from a dropdown box with levels of **-50%, -20%, -10%, -5%, +5%, +10%, +20%, +50%**.

There are two **Land Use** dropdown boxes, the first is the Land Use the change is based on, the second is the Land Use the land is changed to or from. For example, in the screenshot above, **20%** of the current land used for **Dairy 4 & 5** is **changed to Wetlands**.

Click on the **Apply Scenario** button to run the scenario and be taken to the Dashboard sheet to see results.

Full Scenario

*Figure 5 - The **Full Scenario** sheet*

The **Full Scenario** sheet allows full specification for a scenario across the sixteen land uses within the tool.

The **Region** is the region in which the scenario is applied. This is selected from a dropdown box: **Ashburton District**, **Mosgiel** or **User Specified**. If User Specified is selected, the user is prompted to provide a Region Description for records.

The **Scenario Description** allows the user to label their scenario and any relevant notes. If none is provided, a description automatically generated when the scenario is run.

For each of the sixteen **Land Uses** in the tool, the user can specify the area used for that purpose in the scenario (Scenario) and in the current use (Baseline).

The Scenario can be provided as an area (hectares) for each Land Use (**Scenario**), or as a percentage relative to current usage using the sliders.
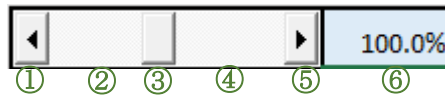
Using the Sliders to specify Change in Land Use

Figure 6 - The slider for adjusting scenario percentage change relative to current usage (Baseline)

- Clicking on the ◀ button ① will decrease the usage by a small amount (0.1%).
- Clicking on the **track *left* of the thumb** ② will decrease by 10%.
- The **thumb** ③ can be dragged along the track
- Clicking on the **track *right* of the thumb** ④ will increase by 10%.
- Clicking on the ▶ button ⑤ will increase the usage by a small amount (0.1%).
- The desired value can be typed in the box on the right ⑥.

The Slider allows percentages from 0% of current usage (i.e. no usage) up to 200% of current usage (i.e. doubled), however the Scenario (hectares) is unconstrainted.

There are buttons to **Reload** the last scenario applied, and to **Reset** all sliders to 100%.

The current area of land used for that purpose (**Baseline**) is listed in the far-right column (hectares). For Ashburton District and Mosgiel region, this is loaded automatically however can be adjusted. For User Specified regions, this is cleared for the user to provide current usage.

Click on the **Apply Scenario** button to run the scenario and be taken to the Dashboard sheet to see results.

Users are expected to assess the viability and suitability of scenarios, however the tool checks that the total area assigned to a Scenario matches the total area described in the Baseline land uses (i.e. no land can be created or lost in a scenario).

If a violation of this rule is detected, then a warning message is displayed over the 'Apply Scenario' button to inform the user of this and what change to the scenario needs to be made.
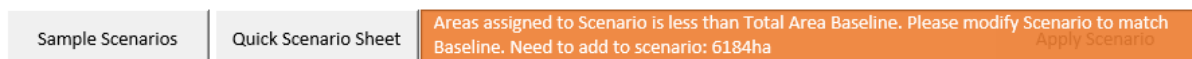
When the Land Uses are balanced, the Apply Scenario button is available to go to the Dashboard
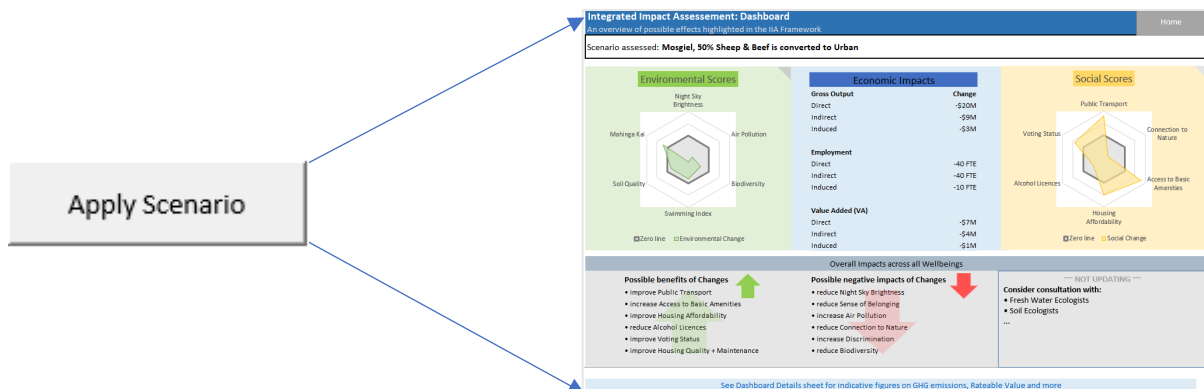
Dashboard

Figure 7 - The Dashboard, showing an overview of possible impacts across the Wellbeing domains

The Dashboard shows an overview of possible impacts across the Wellbeing domains.

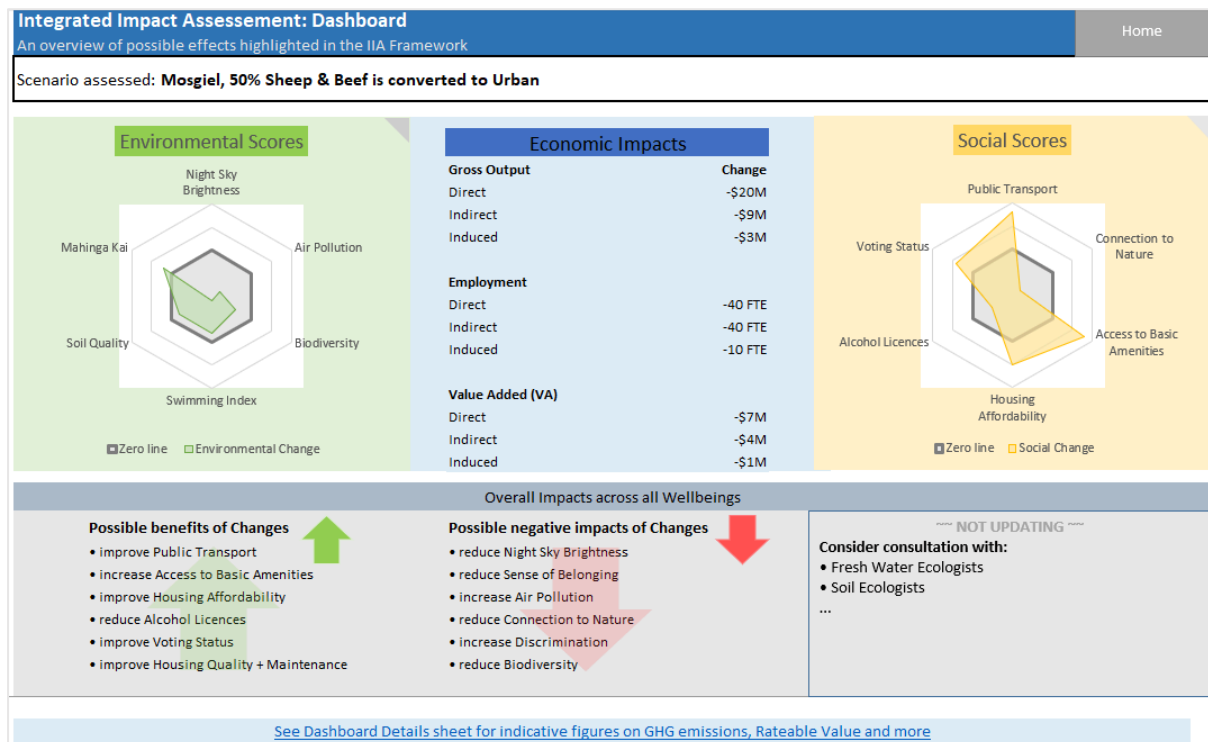Radar charts are provided for the biggest changes in the Environmental and Social Wellbeing domains. They show the neutral line for comparison against -- indicators outside this are improving, indicators within this are worsening – and the change for the six biggest changes in indicator score.

For Economic impacts, the magnitude of change is presented in terms of Gross Output, Employment and Value Added. For each of these, the direct, indirect, and induced impacts are shown.

In the bottom portion of the Dashboard, the Overall Impacts across all Wellbeings are presented in terms of possible **benefits** of changes and possible **negative impacts** of changes.
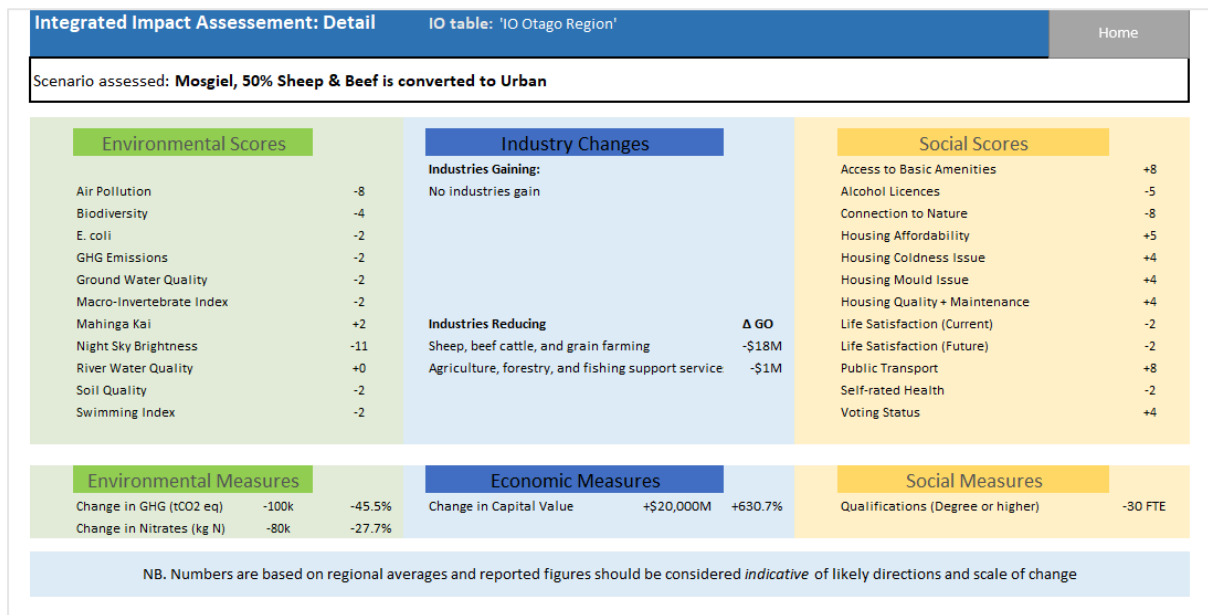
Details Dashboard

Figure 8 - The Details Dashboard, showing the assessed scores for the Environmental and Social wellbeings and select measures

The Details Dashboard shows the assessed scores for each of the Environmental and Social Wellbeing indicators. In the middle pane, it shows industries most likely to be affected positively and negatively by the changes to Land Use. And in the bottom pane it shows selected measures for each of the Wellbeing.

Adjust Base Data Sheet

Figure 9- The Adjust Base Data sheet allows users to update the tool with data more specific to their scenario

The base data used within the tool is based on national averages and best estimates. Users may provide data more specific to their scenario using the Adjust Base Data sheet.

The **Reset** button will reload the base data from the tool.

The **Apply** button will apply the variables provided on this sheet to the scenarios in assessments using the tool. To confirm that the update has been applied, the button will display 'Applied' and become inactive:
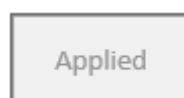
The User is responsible for checking the accuracy of the data.

Further questions

Please feel free to contact with any questions, comments or suggestions:

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