# Meeting note 27/2/2015, Tony, Barry, Jen, Mike, Baihua

An integrated model for the Namoi scenario paper is near complete. We met to discuss some questions Mike has, as well as talk about the framing of the paper. Here are some main points.

1. Paper framing

Potentially there are two papers for this work. The first is on the integrated model, model evaluation and scenario run. This paper focuses on ‘is model certainty sufficient to discriminate among scenarios’. The second can be more sophisticated uncertainty assessment for scenarios. This thinking is in line with the discussion Joseph and Baihua had in December last year. Baihua will bring this out to discussion in next meeting.

For the first paper we think that the main purpose of the paper is to investigate the importance of various sources of uncertainty (parameters or model components) in identifying trade-offs (e.g. farm profit, ecological outcomes, hydrological outcomes) among different scenarios (e.g. different climate, extraction rules, crop price etc). A parameter/model component is considered important when within their plausible uncertainty ranges, the trade-off outputs (illustrated in a radar plot) for a scenario are significantly different. This is to say, due to uncertainty we cannot have a consistent story in the trade-off outputs. The results can be illustrated in the diagram below:

|  |  |
| --- | --- |
| Parameter | Value of parameters (e.g. as it move from low (left) to high (right). |
| Parameter1 | … |
| Parameter2 | … |
| … | … |

Note: each polygon (red, blue etc) within the radar plot represents a scenario. The uncertainty of that parameter is important when the shape of the radar plot changes dramatically when we vary that parameter within its plausible range. In the above diagram parameter 2 is important because the trade-offs under purple scenarios change a lot as this parameter value increases.

1. Case study: Maules creek or hypothetical case

Water allocation rules in Maules Creek is too simplistic, making it as a case study is not very interesting. One way to deal with this is to start with general situation in the lower Namoi (which is in line with the farmers survey) and argue that our analysis shows what will happen through a hypothetical area within the lower Namoi. Another option is to use Maules creek as the case study and then create more complex rules for hypothetical scenarios.

1. Scenarios to explore

The model will be run over about a 30 year period. The aims of the scenarios is to look into the effects of the following on the economic, hydrological and ecological impacts for the case study catchment. We would like to add a social element to compare the outputs but are not sure just yet what we can do with the data we will be generating.

* Three or more climate scenarios (probably a wet/dry/average sequence), potentially also a ‘historical’ benchmark. This can be done through varying rainfall and pan evaporation/temperature. Barry has data for rainfall scenarios, and possibly pan evaporation or temperature.
* Water use efficiency – we can bring Takuya into the conversation. Given that different irrigation options are mentioned below in the ‘investments’ scenario, here the scenarios could include exploring the variation in the efficiency of flood irrigation itself, which is said to vary between 50% and 80% according to Peter Smith the local agronomist.
* Costs and crop prices – the costs and crop prices will be varied between what are reasonable maximum and minimum values from recent history, and will be set constant for a scenario run (for this paper at least).
* Investments in drip, spray and dam (MAR) etc. Here we can explore the option of the person who does not make any investment into drip, spray irrigation or MAR, the person who waits say 5 or 10 years to make the investment, and the person who makes the change in practice ‘today’ (at the start of the scenario run). Initial costs in making these changes should be included, and can then be compared in combination with the climate scenarios in particular.
* Rules – carry over, allocations, supplementary flow. We can explore the effect of varying these rules in a simplistic way, through essentially putting bounds on the amount of water that can be extracted in a particular scenario.

We need to know more about what the model is like to be able to better specify scenarios etc.

1. Actions

* Mike to finalise the integrated model.
* Jen to look into the farm survey and identify any information that might be useful for this paper.
* Baihua to look into the 2100 climate scenario data.
* Tony to talk to Bryce and Allen on this paper.