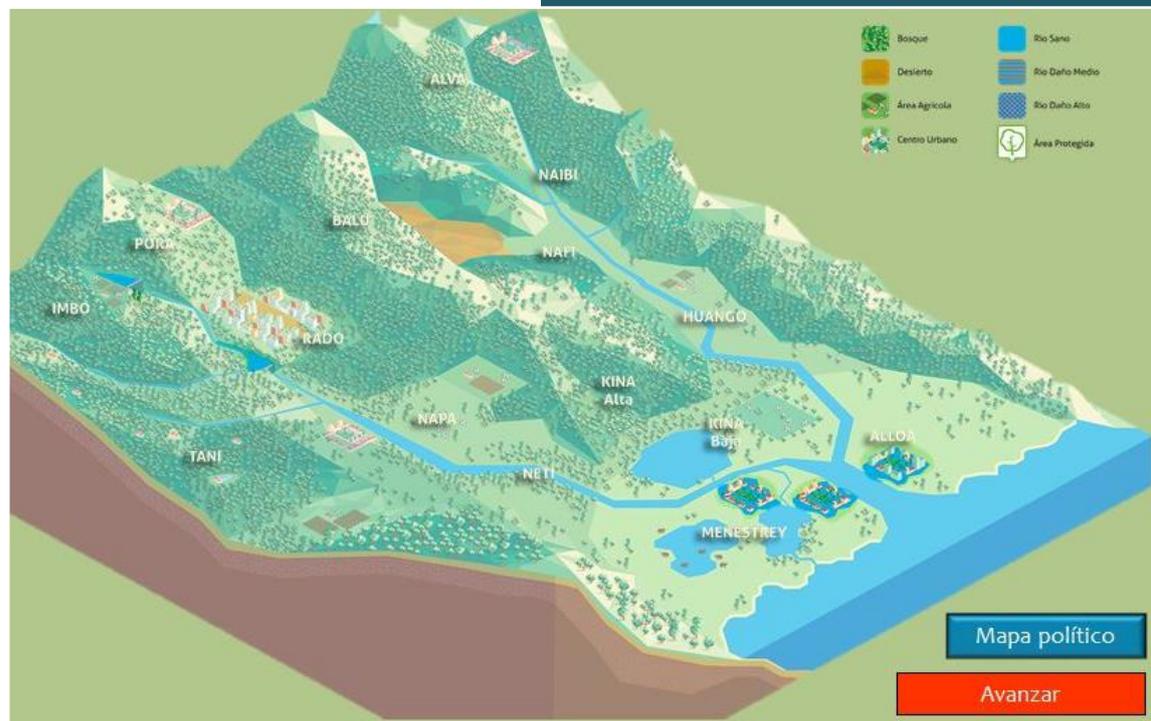


SimCuenca

Manual for moderators



Joanne Craven

The Nature Conservancy Colombia

10/27/2015

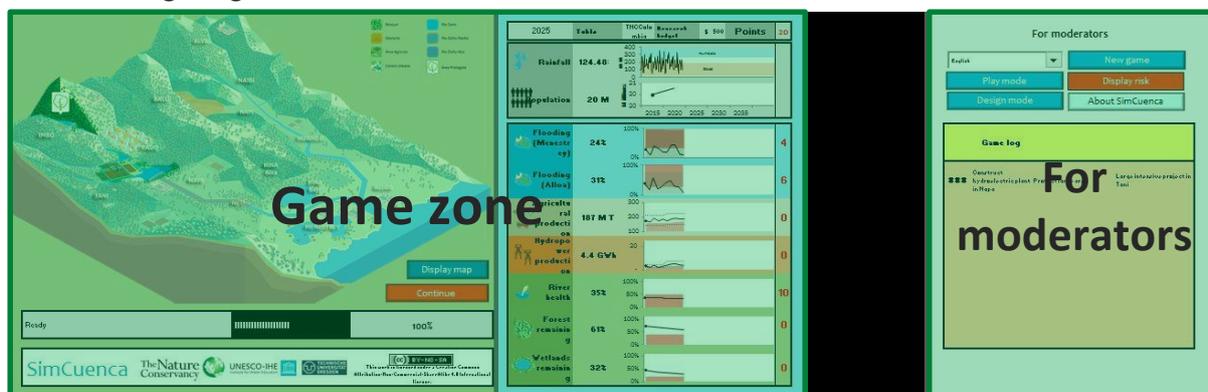


Contents

A. Operating the interface	5
B. Leading the discussion.....	7
C. Interpreting the results	7
D. FAQs.....	9
Q. Why do options not have prices?.....	9
Q. What is the difference between the grey zone and the black line?	9
Q. How is the grey zone calculated?.....	9
Q. Why is there no grey zone for the environmental indicators?	9
Q. How is “River Health” calculated?.....	9

Operating the interface

The interface has two “zones”: the game, which will be visible to the players, and to the left, a “for moderators” zone which will be off-screen during the game, to prevent buttons accidentally being clicked during the game.



Game zone

Within this zone, there are only two buttons.

- **Continue:** this will display the decision screen (see below).
- **Political map:** this toggles an overlay map illustrating the regions of the basin

“For moderators”

As a moderator, you should not need to use this part during the game: it should be set up before the workshop by the organiser. However, if you want to use it, you can simply use the arrow keys to move across the screen.

- **Language dropdown:** here, you can select a language for the interface. This can be done even during the game.
- **Play mode:** removes menus and scroll bars and sets Excel to fullscreen.
- **Design mode:** resets Excel to a “normal” view with menus and scroll bars
- **New game:** displays a dialog asking for a basin name. When this is entered, a new WEAP scenario will be created and the game interface will be reset.

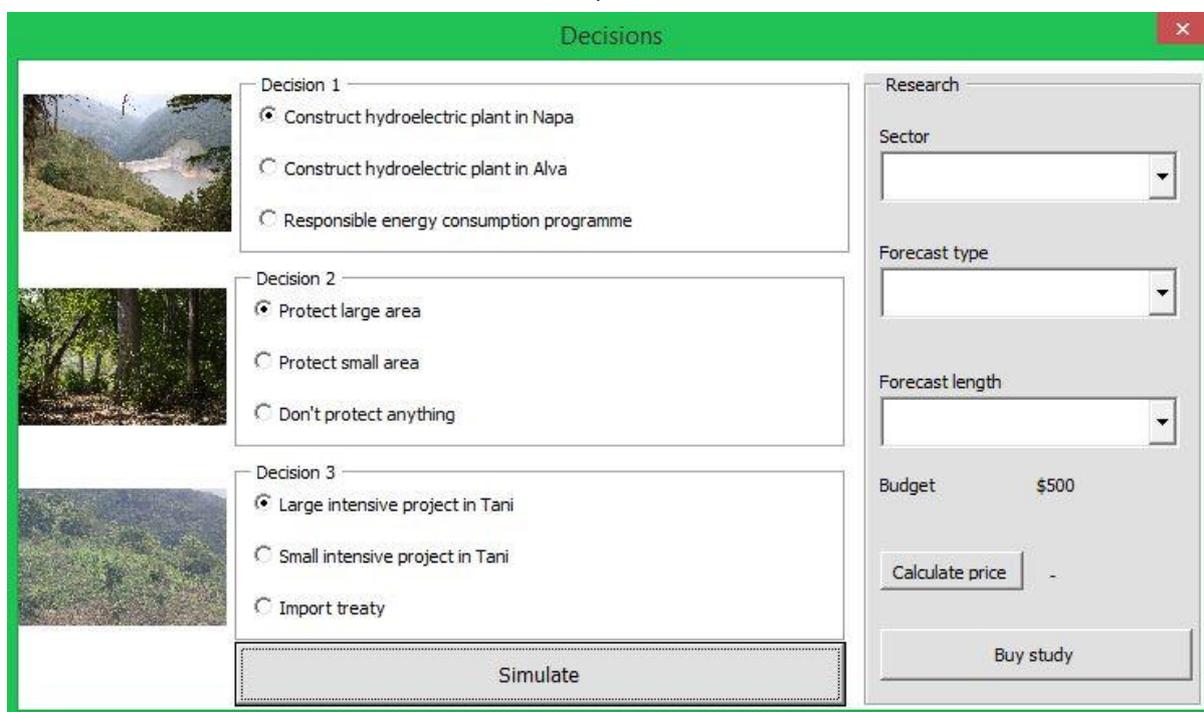
↳ NOTE: when this is done, the model containing the players’ decisions is still saved in WEAP. However, the interface will be reset and the graphs can only be recovered by repeating the game with the same sequence of decisions. You should save the worksheet before doing this if you want to keep the original sequence.

- **Show risk:** takes you to the “Risk” sheet where the multisectoral risk has been calculated.
- **About SimCuenca:** displays a dialog with information about the game and contributing organisations

Decision screen

This displays different decisions each round. You can open and close it as often as you like before the decisions are made.

- **Decision radio buttons:** choose one decision for each round. If you choose nothing the simulation will still run, but will not implement anything.
- **Simulate:** writes the decisions to the model and runs it. The worksheet will minimise to display the model. Once the model has run, it should pop up again. If it doesn't you can maximise it from the programs bar. It will then start to calculate the results, and you can see the progress on the status bar under the map.
- **Research menus:** select the kind of forecast you need, and how far into the future it should go.
- **Calculate price:** displays the price of the study you have selected.
- **Buy study:** displays the selected forecast on the graphs on the main page (if you wish you can close the decision screen to look at it).



The screenshot shows a window titled "Decisions" with a close button in the top right corner. The window is divided into several sections:

- Decision 1:** Includes a small image of a river valley. Options: Construct hydroelectric plant in Napa, Construct hydroelectric plant in Alva, Responsible energy consumption programme.
- Decision 2:** Includes a small image of a forest. Options: Protect large area, Protect small area, Don't protect anything.
- Decision 3:** Includes a small image of a forest. Options: Large intensive project in Tani, Small intensive project in Tani, Import treaty.
- Research Panel:** Located on the right side. It contains:
 - Sector: A dropdown menu.
 - Forecast type: A dropdown menu.
 - Forecast length: A dropdown menu.
 - Budget: A text field containing "\$500".
 - Buttons: "Calculate price" (showing "-") and "Buy study".
- Simulate:** A large button at the bottom center of the window.

Help! What to do in emergencies

- **I clicked "Simulate" by mistake:** Decisions which have been made cannot be undone, except by someone who knows the game and WEAP well. However, decisions left blank can be fixed. Click "Cancel" to stop the model run but let Excel calculate the results as normal. Then, type the round's year into the "Year" box at the top of the interface (e.g. if you are in 2025 it will have advanced to 2030, so set it back to 2025). Click "Continue" and the decision screen will come up again with the same decisions. Now, select *only* the options you missed last time and run the simulation again.
- **I bought the wrong forecast:** close the decision screen, change the value of "Budget" on the home screen to refund the players, reopen the decision screen and buy the correct forecast.
- **Error "Microsoft Excel is waiting for another application to complete an OLE action":** this can appear if your computer is running slowly. Click OK to get rid of the message; it will not affect the running of the game.



Leading the discussion

Each round should last about 15 minutes (though the first rounds will probably be longer than later rounds while the players get the hang of the game), including the following steps:

Minutes

0	Give the players the material for the round and ask a player to read the narrative.
1	
2	3 minutes for an initial discussion.
3	
4	Click "Continue" to display the decision screen.
5	Ask if they would like to buy any information. Allow 2 minutes for them to decide which.
6	
7	
8	5 minutes to finalize the decisions and enter them into the game.
9	
10	
11	Click "Simulate". While it runs ask the players what they expect from their decisions.
12	
13	2 minutes to go over the results of the simulation, the map and uncertainties.
14	Player discussion of the results and tradeoffs (or mention these explicitly)

Interpreting the results

This section is intended to help the interpretation of the results of the decisions made. A key point to emphasize is that the position of the grey band is a result of the decisions the players took or did not take, whereas the position of the black line is a result of the climate.

Flooding (Menstrie and Alloa)

Indicator value: The indicator represents the percentage of the village flooded, estimated from the volume of floodwater modelled by the WEAP model. This may be high even in dry years because even when the total amount of precipitation is low, the rainiest event may still be large.

Failure threshold: the red threshold line (which you should try to remain below) represents the level of flooding the public are willing to accept. This stays constant in this trial version of the game. However, in real life this could be changed by implementing flood resilience measures, through flood zoning, flood proofing buildings, or insurance programmes



Impacts of decisions: to reduce flooding, you can build a dyke or protect the wetlands upstream of the villages, which increases storage of the flood wave. This may have a smaller effect than building the dyke but the impact on the river is also less. Remember that flood defence upstream may have consequences downstream.

Agricultural production

Indicator value: the maximum agricultural production in the basin is determined by the area available for agriculture and the type of crop or livestock it is used for. However, shortfalls in rainfall during the year mean that the actual agricultural production will be less.

Failure threshold: the failure threshold indicates the demand, which increases as the population increases.

Impacts of decisions: the agricultural production will grow due to the expansion of agricultural areas included in the model. If you permit new areas or plant more intensive crops, you can speed up this increase. If you protect natural areas, it will slow down.

Hydropower production

Indicator value: the hydropower production can be increased by building new power plants. However, it will also be limited by water availability.

Failure threshold: the failure threshold indicates the demand, which increases as the population increases.

Impacts of decisions: building power plants will alter the rivers, reducing river health. However, some proposed projects have much larger impacts than others.

River health

Indicator value: the indicator shows the weighted average of a fragmentation indicator and an alteration indicator. As more reaches of the river become altered and network connectivity is lost, it becomes harder for the riverine ecosystem to survive.

Failure threshold: when river alteration reaches the threshold, it is supposed that fish populations would start to collapse.

Impacts of decisions: as land cover changes, the rivers will become altered. Infrastructure in the basin also affects the rivers. Dams remove the high and low flows from the river regime, which fish need to migrate and reproduce. Loss of wetlands and forests causes loss of river regulation, meaning that floods and droughts are more acute.



Forests / wetlands remaining

Indicator value: the % of forests or wetlands remaining compared to when you took over management of the basin. This will drop as the agricultural area of the basin expands.

Failure threshold: the threshold is meant to represent the point at which it becomes difficult to recover the ecosystem.

Impacts of decisions: protecting areas will slow the loss of natural areas, and restoring them will replace some of what is lost. However, restoration is expensive, so it is better to protect.

FAQs

Q. Why do options not have prices?

A. To keep the game realistic, the number of interventions the players makes needs to be limited. In real life, this limit is economic. One way of restricting the interventions made in the game would be to give players a budget to spend on interventions and price the interventions. However, this is not realistic because in real life the money comes from various sources and some projects provide future revenue. To avoid this, to make the learning curve shallower, and to reduce the range of possibilities for which the game needed to be tested, the game presents decisions as choices between 3 options which are assumed to be equally viable, for example between building a reservoir in one of three locations.

Q. What is the difference between the grey zone and the black line?

A. The grey zone shows what *could have* happened; the black line shows what *did* happen. The grey zone is affected by the players' decisions; the position of the black line within this zone is affected by the climate.

Q. How is the grey zone calculated?

A. The model is run for an additional 30 years beyond the 30-year game scenario. In this second 30 years, land-use cover does not change (the basin stays fixed in the state it is currently in), and so the only variability comes from the climate. The grey zone is determined from the maximum and minimum indicator values found within these 30 years.

Q. Why is there no grey zone for the environmental indicators?

A. For forest and wetland remaining, there is no grey zone because these parameters are not affected by relatively short-term (monthly or yearly) meteorological fluctuations as, for example, hydroelectric generation would be. For river health, there is no grey zone because the alteration in flow regime already takes 30 years of variation into account, and so an ensemble of climate futures would need to be modelled to estimate the variability.

Q. How is "River Health" calculated?

A. "River Health" is about how much the river has been changed from its original state: it's also an indicator of how well the river can support aquatic ecosystems (including fish populations). In reality, this is an extremely complex issue and subject to complex interdependencies and feedbacks. In the

game, two components are considered: flow alteration and river network fragmentation. These are averaged to give the indicator.

Flow alteration is a measure of how much the flow regime of the river is changed relative to a “natural” state (the “Baseline” scenario in the game model). A parameter known as “ecochange” is used. This is the normalised area between the original flow-duration curve and the altered flow-duration curve. The ecochange was calculated for a representative sample of river reaches and averaged.

River network fragmentation affects sedimentation and fish migration amongst other things. In the game it is measured by the longest free length of river of Strahler stream order four (for context, headwaters are order 1 and the Amazon is order 12). These are calculated from the real Magdalena-Cauca stream network (each reservoir in the game is based on a real-life reservoir, and the reservoirs are the interventions which interrupt the network).

