Approach 2

Options-based Catchment Reconciliation

Overview

Integrated planning is based on creating synergies between strategic plans to allow for efficient overall improvements in positive environmental outcomes.

This approach, referred to as Approach 2, provides an alternative to integrated modelling. It offers a comparison of potential option portfolios through a structured, weighted assessment, based on professional expert judgement. We tested this approach through a proof-of-concept application in the River Nene catchment.

The stepped approach

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	
Data collection	System concept & mapping • Option grouping • Metrics Selection • Option Scoring	Baseline assessment	Scenario assessment	Option assessment	Portfolio assessment	Results & inclusion in statutory (investment) plans

Step 1: Data collection

Compile data required for analysis. The focus was on identifying interventions/options from the various plans that were considered.

In this trial we selected options from the following plans: Strategic Flood Risk Assessments; River Basin District Flood Risk Management Plans; River Basin Management Plans; Local Flood Risk Managment Strategies; Surface Water Management Plans; Water Cycle Studies; Drainage and Wastewater Management Plan (DWMP); Water Resources Management Plan (WRMP); Catchment Based Approach Partners and Local Plans.

Step 2: Systems concept / Participatory Systems mapping (PSM)

Undertake a systems mapping exercise using PSM. The systems mapping exercise was important within this approach, with the main outputs being:

- **Option grouping**

It was important to group options so that there are a manageable number of option types that were taken forward into the analysis. The project team pre-emptively grouped options that behave similarly and have similar impacts to provide stakeholders with a starting point. The systems mapping workshop then allowed stakeholders to review these groupings and the reasons behind them – option types with similar links in the systems maps were grouped together.

- **Metrics selection.**

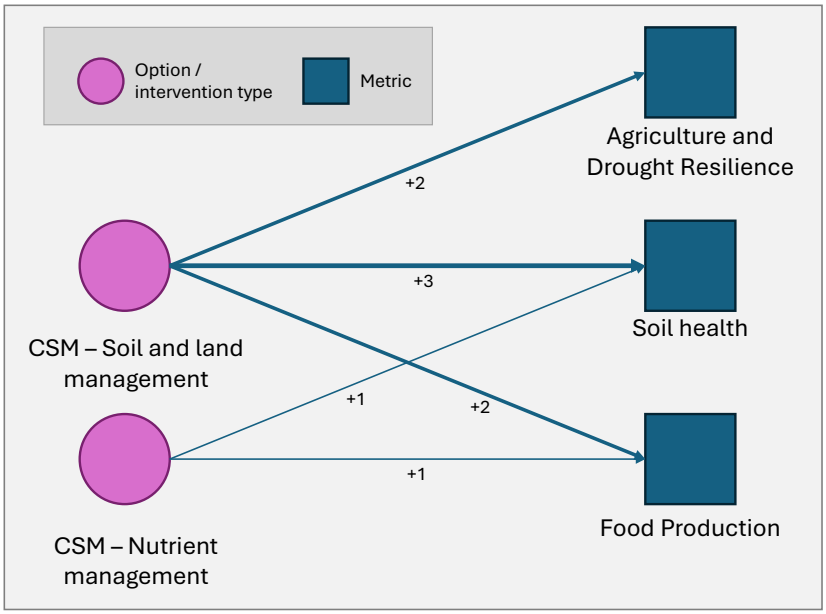
The system maps helped stakeholders to review the metrics that had been selected for option and portfolio scoring and the justification for their selection.

- **Option scoring (the starting point of step 5)**

Option scoring was the primary focus of the stakeholder engagement.

This focused on reviewing the assigned score (+3 to -3) that each option was expected to have on each metric. These are generic scores, and at this point did not consider the specific context.

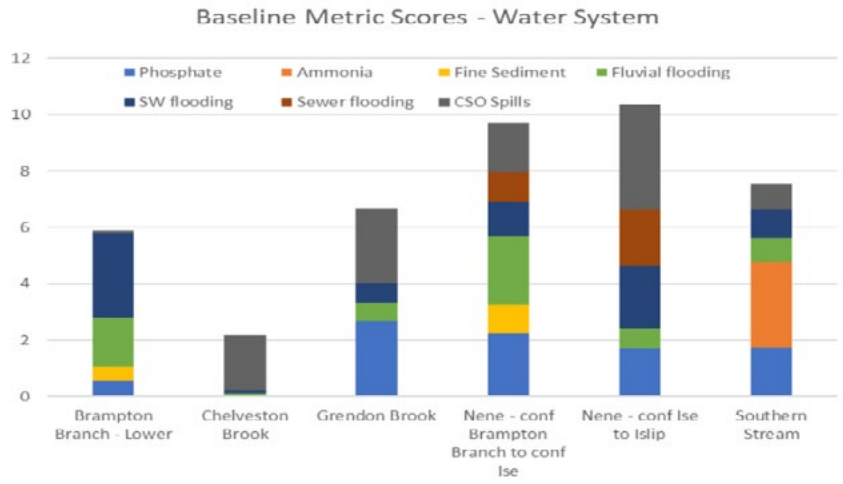
Participatory Systems Mapping PDF



Step 3: Baseline assessment

The purpose of the baseline assessment was to determine the key challenges within the waterbody.

A subset of the metrics selected in Step 2 was used for this task. The purpose of this was to highlight where the new portfolios will need to ensure they concentrate on finding benefits. Through the case study the project team undertook this assessment across six waterbodies. In a real world scenario all waterbodies within the catchment would be assessed and baselined.



Step 4: Scenario assessment

Climate Change

Factoring in climate change via Moata3 Met Office data was considered, however was not taken forward. This was due to the complex nature of climate change and the number of assumptions required to reach a quantitative output capable of scaling in line with each waterbody baseline. We would suggest that even in a real-world application of this approach, the factoring in of climate change is not done due to the abstract nature of the process that would need to be followed.

Economic/ population growth

A generic assessment against the project scenarios was undertaken for each metric. During this process a determination is needed to identify which metrics behave independently to their specific location, and which ones scores are catchment or waterbody reliant.

Step 5: Option assessment via Participatory Systems Mapping (building on step 2)

In step 2 the option types that are to be considered in the process were listed out and scores derived for each of them based on an estimation of their impact on each metric in a generic sense.

In this step, through use of the produced systems maps, the options were scored for their performance within each waterbody (that was appropriate for them to be located).

Participatory Systems Mapping

CSM Nutrient Management	Habitat restoration	Wastewater network capacity
CSM Soil and Land Management	Natural flood management	Wastewater process enhancement
Farm reservoir storage	PCC reduction	Wastewater treatment capacity
Flood alleviation	River restoration	Wetland restoration and creation
Flood risk planning policies	SuDS	Woodland creation
Flood storage reservoir	Surface water flood risk reduction	Flood Forecasting and warning
Floodplain restoration	Surface water removal	Property level resilience

Step 6: Portfolio assessment

The options that are selected to be considered as part of a portfolio can be done in a variety of ways.

For example, by selecting:

- a style of intervention (e.g. natural)
- those included in existing plans
- the top xx% of options
- a targeted output of the portfolio
- the challenges identified in waterbodies

These criteria for selection were either applied across the whole catchment or each waterbody.

The trial defined 5 portfolios:

Business as usual	Option type were selected for this portfolio if they were identified as present in existing plans for a waterbody.
Carbon positive	Option types which highlighted as having the greatest potential to sequester carbon or provide indirect carbon benefits. Consistently applied
Natural capital	Option types which have a primary focus on nature recovery or biodiversity. Consistently applied across the whole catchment.
Sustainable land management	Option types which have a primary focus on water-land interactions and sustainable land management measures. Consistently applied
Waterbody bespoke	Option types vary dependent on the challenges presented in the waterbody baseline metrics.

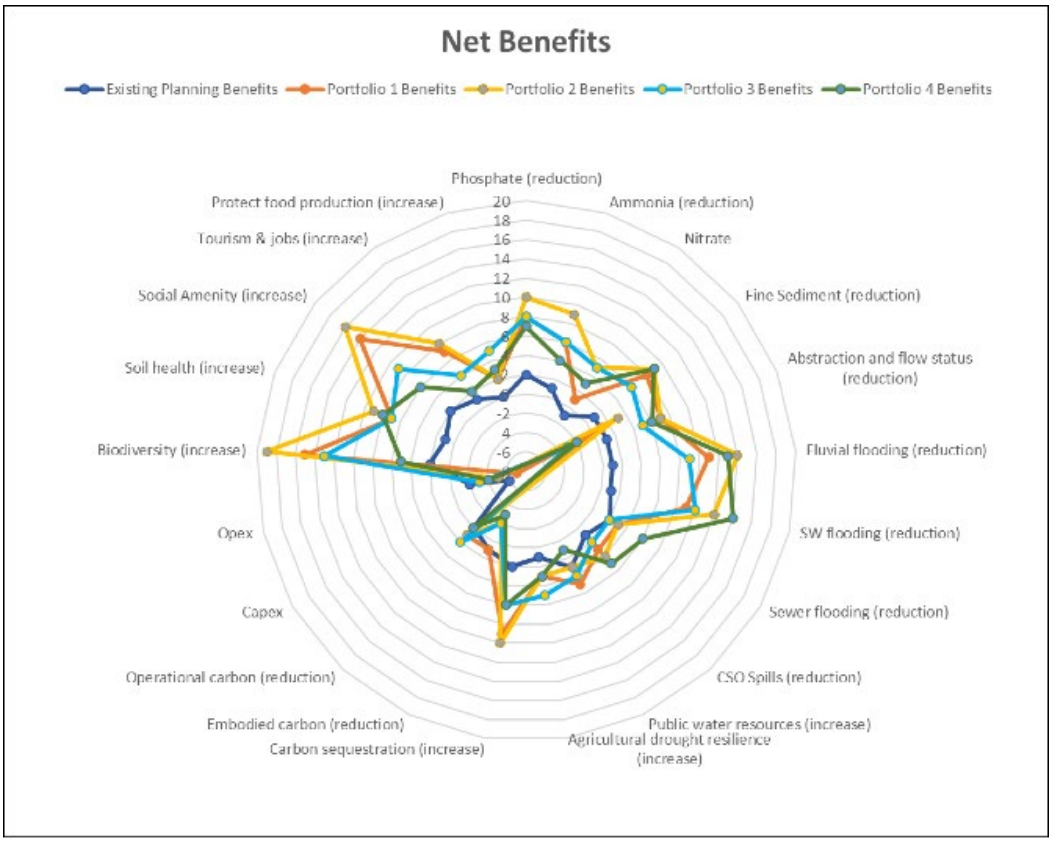
Step 7: Results

The results are presented waterbody by waterbody.
Either in the form of line graphs or radar charts.

Net Benefits

You can see in the radar chart to the right, each 'portfolio' is presented as a line. This gives fantastic visualisation of the various portfolios in comparison to each other.

One of the challenges to interpreting the results is you have to consider each of the water bodies and how they each react to each portfolio. So there is no 'one answer'.



Lessons, recommendations and conclusions

Process

- The process is easy to follow and can be administered by someone with basic data processing and facilitation skills. This is a real benefit of the approach, keeping it simple will help to make it transparent for all stakeholders.
- Once a new portfolio is designed it is easy to assess with this method because of the basic processing power needed (Excel spreadsheet).
- The process can be seen as a small step on from the basic participatory systems mapping process, but we believe that it provides a much better insight to local needs and the effects of proposed interventions.
- The lack of modelling does present a challenge in that we are unable to consider the upstream and downstream effects of interventions, which is a major factor in catchment planning.
- Due to the lack of detailed quantification (beyond basic marks out of 3) there is no way of knowing if the interventions have fixed an issue. Water discipline specific modelling would then need to be carried out to confirm full benefits.
- When adding multiple interventions into a water body, we have not defined a way to mitigate potential double counting of benefits. However this might be achievable in a future deployment of the method.

Resources

- The approach is straight forward to administer and would not require any specialist skills.
- This approach would require an additional investment of time from all the key stakeholders, along with agreeing responsibility for hosting and facilitating the process. We think that the benefits of a more coordinated plan, both in terms of the environment and perhaps economies of working together would outweigh this.

Cross-disciplinary engagement

- The process has been considered very helpful for engagement across organisations and to help understand the wider influence of an intervention.
- The time spent together by stakeholders and industry experts, considering the positives/benefits of the different option types, has helped develop a broader understanding of the whole system impacts of interventions.
- The participatory systems mapping exercise gives a good structure to facilitated engagement on a topic.

Data

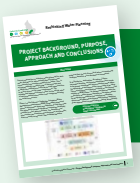
- Data standards for this approach are low, only locations and a general view of each intervention is required.
- However, due to the low data resolution needed there is little ability to scale interventions, this is a potential drawback of the approach.
- In some cases, due to the timing of the project, data on intervention measures, i.e. through WINEP, wasn't available. Real world application of this approach would need to be run at the most optimal time for data inclusion.
- The trial used broad assumptions to determine if an intervention would be suitable for a waterbody, greater detail would be required to make this decision in practice.

Conclusions

The approach provides a quick and simple way of conceptualising the benefits, disbenefits, and trade-offs of a variety of intervention portfolios. It would provide a good starting point to aid discussions about the types of interventions stakeholders would like to implement in waterbodies, and to agree an aligned target. However, due to the low-resolution scoring, lack of options scaling, and lack of certainty about meeting waterbody needs, this approach is best suited as an engagement tool, rather than being used to direct catchment planning.

The project

Project background and purpose



Project background, purpose, approach and conclusions PDF

Techniques applied in the trials

Integrated Modelling summary PDF

Participatory Systems Mapping PDF

Trialling ways to achieve the ambition

Approach 1: Systems Approach to Integrated Water Management (SIWM) PDF

Approach 2: Options-Based Catchment Reconciliation PDF