

Treatment of negative monetary values in the SEEA-EA aligned UK Natural Capital Accounts

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1. Introduction

Monetary valuation of ecosystem services remains one of the most challenging aspects of Ecosystem Accounting, with chapters 8–11 of [United Nations \(UN\) System of Environmental-Economic Accounting Ecosystem Accounting \(SEEA-EA\)](#) currently being recognized by the United Nations Statistical Commission (UNSC) as internationally agreed principles and recommendations rather than a binding statistical standard.

The topic was part of the London Group (LG) [2022-2025 work plan](#), and it has been discussed extensively during previous meetings. The [SEEA Monetary Valuation of Ecosystem Services and Assets for Ecosystem Accounting report](#) similarly emphasises that valuation methods support countries undertaking monetary ecosystem accounts, while noting that valuation remains an area where some issues are under review and further country experience is needed (United Nations, 2024).

This paper offers a concrete example of the challenges encountered by the UK Office for National Statistics (ONS) in applying SEEA-EA consistent methods to estimate monetary values connected to ecosystem services, building on previous contributions to LG research in this area, and the ONS's presentation (Carrera et al. 2026) at ISTAT's workshop "[Challenges in the Measurement of Nature in Official Statistics](#)" in May 2026. It addresses a technical problem that leads directly to a communication challenge: what should compilers do when a method commonly used to value provisioning ESs produces a negative monetary value?

This matters because monetary valuation is an important route through which ecosystem accounting becomes visible to decision makers. SEEA-EA complements the SEEA Central Framework and the System of National Accounts (SNA) by organising information on ecosystem extent, condition, services and assets through an approach that is consistent with the SNA accounting principles. Monetary estimates help connect physical flows to economic aggregates, and aid users understanding the dependency of economic activity and human well-being on nature (United Nations et al., 2024).

However, the same feature that makes monetary valuation attractive also makes it potentially misleading. A monetary value appears precise and comparable, but the number depends on the valuation concept and on the institutional setting through which prices and income flows are observed. Femia and Capriolo (2022) argue that ecosystem accounting should move away from treating all estimates as if they were simply "the value" of ecosystem services and should instead recognise the wider set of monetary values connected to or dependent on ecosystem services. Femia et al. (2025) extend this plural-values argument for discussion at the 2025 London Group, proposing that monetary values be classified according to what they

measure and how close they are to accounting concepts of exchange value, with Oras et al. (2025) proving empirical applications of the framework for multiple economic values associated with ecosystems.

This is highly relevant for the Residual Value approach, or Resource Rent (RR). Residual Value is one of the 'top-tier' methods in the hierarchy provided by the SEEA-EA (9.23). It is attractive to compilers because it can be calculated using sectoral revenues, costs and returns to produced capital, making it both consistent with the SNA and relatively easy and quick to calculate from National Accounts data. However, recent literature questions whether Residual Value methods can validly estimate exchange values in relation to ecosystem services. Pascoe et al. (2026) argue that the Residual Value method does not explicitly treat the ecosystem service as an input into production and may return negative ecosystem service values. This critique is especially important where residual estimates are applied in market structures far removed from a competitive price-setting model. They conclude that exchange values for ecosystem services should instead be based on other SEEA EA-endorsed approaches where possible.

The UK ONS's Natural Capital Accounts (NCAs) (ONS, 2025a) provide a practical case study, with RR producing negative monetary values for the water provisioning ecosystem service in the 2025 edition, adding to the same issue being noted by several others in literature, for example Edens and Graveland (2014) and Chang et al. (2025).

The UK NCAs make the contribution of nature visible in decision-making and define natural capital as natural resources and processes that support human life, society and the economy, while recognizing that monetary valuations are a partial or minimum valuation of nature's services (ONS, 2025a). The accounts include habitat extent, annual flows in physical and monetary terms, and asset values across 16 ecosystem services. They are published as an extended or satellite account to the UK National Accounts ([ONS, 2025b](#)) and feed into broader ONS measures of inclusive income and wealth ([ONS, 2025c](#)).

As noted above, negative values in the NCA create a communication challenge. If ecosystem accounting aims to make nature count, users may interpret a negative value for an indispensable natural resource such as water as suggesting that not only it has limited or no economic value, but that the economy and, by inference, society would be better off without it. This is especially problematic when the negative estimate is disconnected from physical flows or ecosystem condition.

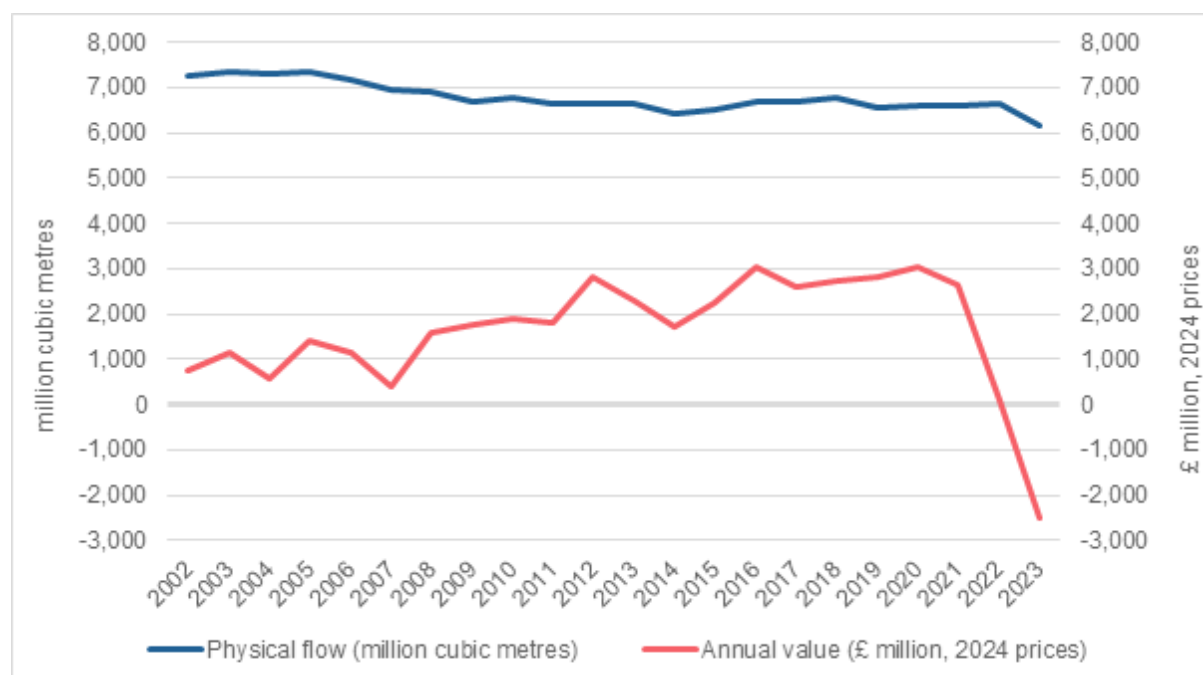
The ONS water provisioning example therefore provides an empirical basis for considering whether SEEA-EA guidance would benefit from being strengthened on method selection, treatment of negative values and the use of multiple monetary values.

2. Negative valuation of water provisioning in the UK Natural Capital Accounts

Water provisioning is clearly an economically important ecosystem service. Abstraction from rivers, reservoirs, groundwater and other sources supports household consumption, public services and business activity.

In the UK NCAs, water provisioning covers public water supply and is measured through both physical flows and associated monetary values. The physical flow for 2023 was around 6,146 million cubic meters, while the monetary value derived using the RR approach was negative, at around negative £2.5 billion for 2023 – a negative value that did not reflect a corresponding magnitude of decline in physical water flows.

Figure 1. Water provisioning ES, UK: physical and monetary flows



Source: Office for National Statistics (ONS), UK

The RR method starts from the gross value added or gross operating surplus associated with the marketed good for which the ecosystem service is an input, and deducts the cost of other inputs, including labour, intermediate consumption, produced assets and depreciation.

In the ONS application for the water provisioning service, the relevant industry is Water collection, treatment and supply (SIC 36). The annual value is calculated as:

$$\text{Annual value} = \text{Gross Operating Surplus} + \text{Taxes less Subsidies} - \text{Consumption of Fixed Capital} - \text{Return to Produced Assets}$$

The return to produced assets is calculated as net capital stock multiplied by the UK 10-year bond yield. When the return to produced assets and depreciation exceed the positive components of the calculation, the residual becomes negative, even if water provisioning remains physically stable. In the UK NCA case, the net capital stock and consumption of fixed capital in the water industry have increased in the latest part of the time series, with a marked acceleration after around 2018. Bond yields also rose sharply, from an average of around 1.7% during 2016 to 2022 to around 4.8% in 2023 to 2025. The negative RR is therefore driven by the dynamics of produced capital and financial-market conditions rather than by a fall in the quantity of water supplied or a directly observed degradation of the water provisioning service.

The regulated nature of the UK water sector is likely to provide an interpretation for this, as already observed in literature, for example by Edens and Graveland (2014) and Chen et Al. (2025). In a regulated market, governments may cap prices while quantity demanded is led by consumers at those prices, with providers obliged to meet that demand subject to capacity and service standards. Quantity therefore follows demand and regulatory obligations, rather than producer optimisation as in a fully competitive market, which reduces operating surplus. As the observed residual surplus available to providers is affected by regulation, the RR is

pushed close or below zero, despite the ES providing an indispensable service to the economy and society.

The key conceptual challenge is that negative values in SEEA-EA are more readily understood in contexts involving negative physical flows, externalities or ecosystem disservices. For example, a regulating service may have a negative net value if the measured physical flow is negative, although SEEA-EA recommends that the value should be set to zero in such cases. However, in the ONS example, water provisioning ES has a positive physical flow, and the negative value arises from using residual valuation. Externalities, such as pollution-related welfare losses, are not being recorded directly in the account. The negative estimate therefore does not mean that water provisioning has a negative contribution to the economy and society; it means that the valuation method is not isolating the contribution of the ecosystem service in a way that is meaningful for this institutional/regulatory setting.

3. Should we give the RR approach a second chance?

Despite the limitations highlighted above, there are good reasons why RR remains widely used. It is relatively inexpensive, compared with bespoke modelling or primary valuation surveys. It can be repeated annually. It draws on data that are usually closer to the National Accounts than many welfare-based methods. For national statistical offices under resource constraints, these are substantial advantages. As previously mentioned, this approach is also towards the top in the order of preference in the SEEA-EA, reflecting the proximity to the preferred valuation method of observed market prices.

Nevertheless, the water provisioning case exposes a significant limitation. The Pascoe et al. (2026) critique is directly relevant: the residual value method does not explicitly model the ES as an input into production, and the residual can include many things other than the ecosystem's contribution. Because it is a residual, it inherits all measurement error and institutional features of the production account. In the water sector, those institutional features influence how prices, returns and investment are determined.

3.1 OECD guidance and the limits of treating negative rent as a compilation issue

While not produced with direct reference to SEEA-EA, recent OECD guidance on measuring natural resources and depletion in SNA recognises that negative or volatile RRs may arise and provides practical compilation guidance for investigating them. This is useful and should be part of the SEEA compiler's toolkit as well as the SNA one. In many cases, negative RRs may reflect data problems, boundary issues, cost allocation, volatile prices, the timing of investment or the treatment of taxes and subsidies. It is therefore appropriate that compilers check the data and the assumptions before deriving asset values or drawing conclusions from negative rents.

However, the UK water case suggests that such guidance should not be interpreted as implying that negative RR is always primarily a data or compilation problem. Here, the negative value arises from the interaction between a residual method and the institutional characteristics of a regulated, capital-intensive utility sector. The issue is not simply that one input in the calculation is inaccurate. Rather, the method is using a producer residual to infer the value of an unpriced ecosystem service in a setting where the producer residual is shaped by regulation, infrastructure investment, depreciation and financial-market conditions.

Setting negative values to zero, as recommended in the OECD Depletion guidance if previous checks do not expose a compilation issue, does not resolve the problem. It may

avoid publishing an intuitively confusing negative number, but it would still indicate that this ecosystem service made no monetary contribution in that year. For a provisioning service such as water, that seems unsatisfactory, as the service is a positive input to economic activity and human consumption. A zero value risks understating the importance of water provisioning to the economy and society, even if it is less counterintuitive than a negative value.

3.2 Why the current return to produced assets calculation matters

In the ONS RR calculation, the return to produced assets is calculated by multiplying the net capital stock by the nominal UK 10-year bond yield. This is coherent with established approaches in which the opportunity cost of capital is re-evaluated each year using the prevailing rate. In a simple example, if fixed capital is £1,000 million and the bond rate is 3%, the opportunity cost is £30 million. If the following year the capital stock rises and the bond rate changes, the current approach reapplies the new rate to the whole net capital stock.

However, this approach effectively treats fixed capital as if it were a liquid financial asset that could be redeployed each year at the prevailing bond rate. That assumption is particularly problematic for water infrastructure. Water sector assets include treatment works, reservoirs, pumping stations and large pipe networks. These assets are highly specific, geographically embedded and cannot be freely liquidated. A buried pipe network cannot realistically be sold and redeployed into an alternative use each year in response to changes in bond yields.

This matters because recent increases in bond yields have amplified the return to produced assets subtraction in RR calculations. Together with rising net capital stock and consumption of fixed capital, this pushed the RR into negative territory even though physical water supply remained substantial. The method therefore introduces volatility driven by financial-market movements rather than by changes in ecosystem condition or physical service flows.

3.3 An 'incremental approach' to return to produced assets

ONS has begun testing an alternative incremental approach to calculate the return to produced assets, to address the issue described in section 3.2. The approach does not change the broader RR formula. Instead, it changes the treatment of the opportunity cost of produced capital. Rather than applying the current 10-year bond yield to the entire net capital stock each year, this incremental approach applies the prevailing yield only to newly created capital stock and retains the rate associated with earlier tranches of investment for the relevant period.

The logic is analogous to a fixed-rate bond and to the way investment decisions are made in practice. The UK 10-year bond yield reflects the return on a fixed-term, locked-in investment. If capital was committed in a previous year, it is not methodologically consistent to re-price that same capital each year as if the investment decision were being remade at the current rate. Each unit or tranche of capital should instead carry the rate that was available when the investment was made. This is particularly relevant for water infrastructure, where fixed capital is not freely liquifiable and cannot be reallocated without cost.

Operationally, the incremental approach calculates the annual change in net capital stock and applies the prevailing nominal bond yield to the new capital formed. The return to produced assets in a given year is then built up from the return on new capital over the previous 10 years, reflecting the horizon of the 10-year bond yield. In simplified terms, the approach is:

*Return to Produced Assets = sum over the previous 10 years of [(Net Capital Stock in year t - Net Capital Stock in year $t-1$) * UK bond yield in year t]*

or

$$RPA_t = \sum_{\tau=0}^9 [(NCS_{t-\tau} - NCS_{t-\tau-1}) * GY_{t-\tau}]$$

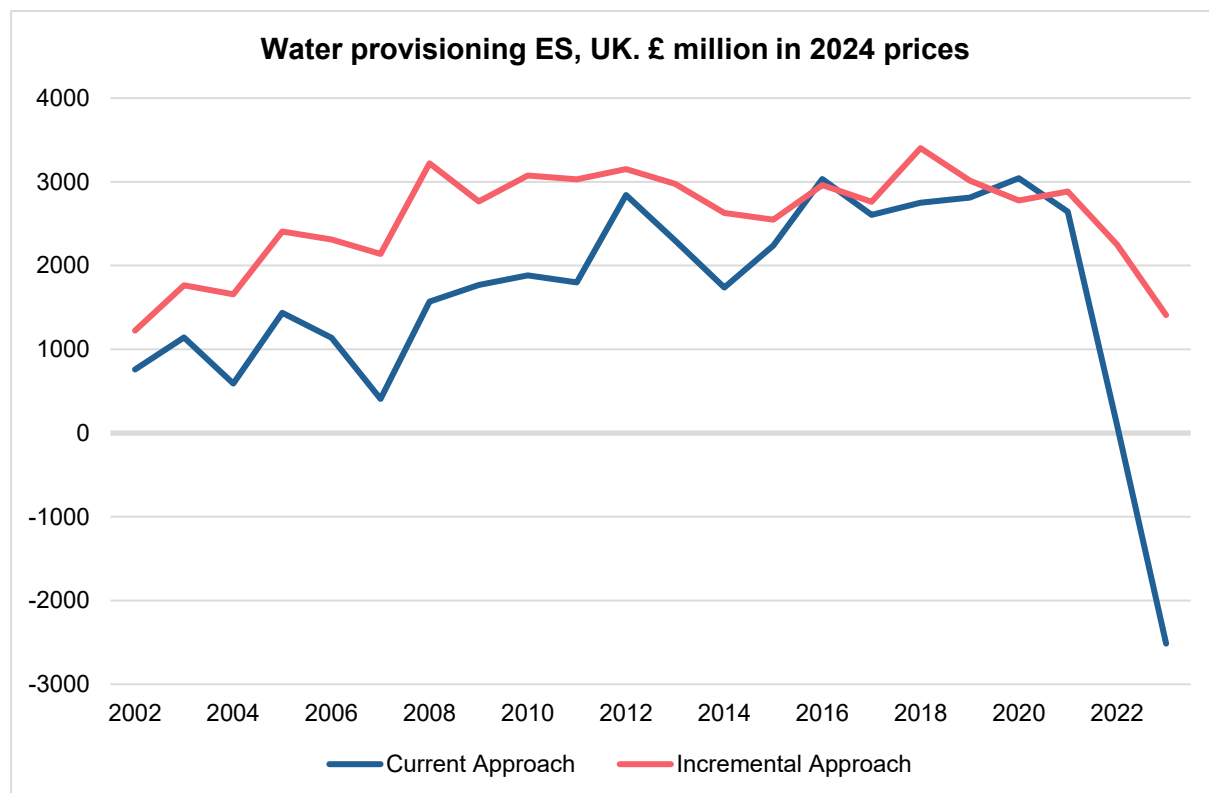
Whereby:

- RPA_t is the return to produced assets in year t
- NCS_t is the Net Capital Stock in year t
- GY_t is the UK 10-year bond yield in year t

This preserves the idea of an opportunity cost of produced capital but avoids applying the current rate to assets that were already committed in earlier periods. It therefore isolates the opportunity cost to what was genuinely foregone at the time of investment, rather than modelling a hypothetical annual redeployment of the entire capital stock.

Initial results show that the incremental approach substantially reduces the recent fall in water provisioning values for the UK. Under the current approach, the 2023 resource-rent estimate falls to around negative £2.5 billion. Under the incremental approach, the 2023 estimate remains positive, at around £1.4 billion. The alternative approach therefore reduces the effect of the sharp rise in bond yields and produces a monetary series that is less dominated by financial-market volatility.

Figure 2. Monetary values of water provisioning ES based on RR and incremental RR approach



Source: Office for National Statistics (ONS), UK

However, the incremental approach does not solve all the conceptual limitations of RR. In particular, it does not fully address the issue that residual value methods fail to model the ecosystem service explicitly as an input into production.

In the UK, it also leads to different outcomes by nation, with the values for Scotland remaining negative in the ONS calculations, potentially reflecting the institutional structure of its water market, with a *de facto* state-owned monopoly provider.

The incremental approach should therefore be viewed as a possible refinement of RR in capital-intensive sectors, not as a full solution to the deeper limitations of residual valuation, especially in heavily regulated market conditions. We can also expect that, if the bond yield remains high or even increases in a 10-year period, the outcome of the incremental RR approach may still result in negative values in future years.

The London Group's feedback would be particularly valuable on this approach. In particular:

- Is the incremental approach a suitable refinement of the standard RR method?
- Is there an interest to further test this approach among LG participants, potentially for SEEA-EA guidance to recommend it in future for sectors with long-lived, illiquid produced assets?
- Where the incremental approach still produces negative values in some institutional settings, does this suggest a more fundamental unsuitability of RR for regulated markets, and therefore should SEEA-EA provide additional caveats on the institutional and market settings where RR should be avoided?

4. Alternative methods for estimating monetary values related to water provisioning ecosystem services

The ONS has also explored alternative monetary valuation techniques for water provisioning, though commissioned academic research via the Economic Statistics Centre of Excellence (ESCoE) (Bartolini et.al 2026). These estimates are initial research outputs for England only (excluding Scotland, Wales and Northern Ireland due to data availability), include the whole water abstraction sector and available up to 2018 because of data availability. The methods explored are: abstraction charges, replacement cost based on desalination, and value transfer from a systematic literature review, alongside RR.

4.1 Methods explored for England public water supply

Abstraction charges

The first method uses abstraction charges or licence fees paid by water companies for public water supply. These are observable payments connected to the right to abstract water. Their advantage is that they provide a clear, positive monetary transaction connected to water abstraction. Their limitation is that they are likely to significantly undervalue the water provisioning ES. The research results show annual values of around £40 million to £44 million between 2009 and 2018, far below the values produced by the other methods. This reflects the fact that water abstractors pay licence fees rather than a full price per unit embodying scarcity, dependency or the value of water to society.

Replacement costs

The second method is replacement cost, based on desalination. This estimates the cost of replacing water provisioning with an alternative economic activity that would avoid the need for the ecosystem service in the hypothetical scenario where it was unavailable. The research uses desalination costs derived from a proposal for a major seawater desalination

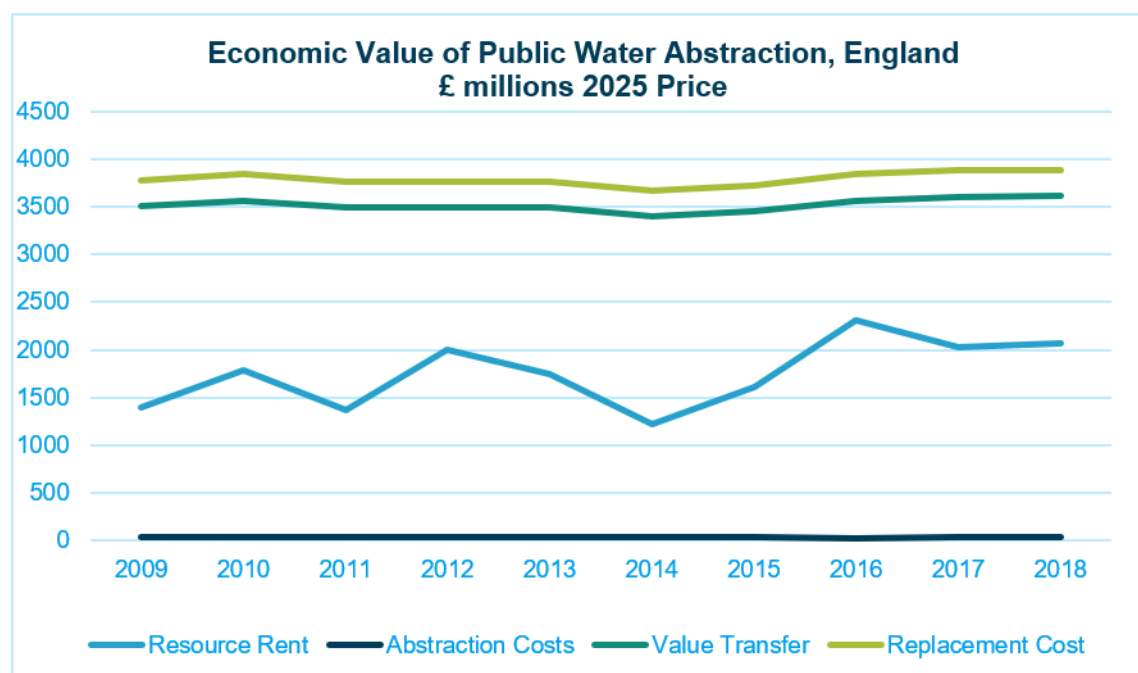
project developed by a water company in England. The resulting annual estimates are around £3.7 billion to £3.9 billion between 2009 and 2018. This method has intuitive appeal because water is indispensable and replacement costs can indicate the scale of dependency. However, the estimate is likely to represent an upper value. It depends on the feasibility, likelihood and scalability of desalination as a substitute, and it may not be applicable to the whole of England or the UK.

Value transfer

The third method is value transfer as determined through a systematic literature review. This approach uses unit values derived from more than 50 international studies and applies them to England public water abstraction volumes. The resulting estimates are around £3.4 billion to £3.6 billion between 2009 and 2018. Value transfer is recognised in SEEA EA as a practical approach where primary valuation is not available, but its reliability depends on the comparability of study sites, populations, institutional settings and water scarcity conditions. In this case, the main limitation is transferability: international source studies may not reflect UK water institutions, public supply characteristics or user preferences.

Results based on these methods are also compared to those obtained by applying the RR (in its standard approach). In the results for England up to 2018, standard RR values are positive, ranging from around £1.2 billion to £2.3 billion. However, the subsequent UK time series shows that the method can fall sharply and become negative when capital stock, depreciation and bond yields increase.

Figure 3. Estimates of water provisioning ES based on alternative valuation methods. England, 2009 to 2018



Source: Office for National Statistics (ONS), and Economic Statistics Centre of Excellence (ESCoE)

Based on the research findings from ESCOE, the ONS plans to further investigate the suitability of these methods to estimate monetary values for water provisioning ecosystem

services in the UK, and the feasibility of applying those to annual production of its NCA, potentially in view of replacing the current methodology.

4.2 Interpreting these methods through the connected-values framework

The work by Femia et al. (2025) and Oras et al. (2025), presented at last year's LG, provides a useful framework to consider the alternative methods explored by the ESCoE research, as it avoids presenting these four methods as competing estimates of a single true value. Instead, it frames them as representing different monetary values connected to the same ES, each reflecting a different aspect of the ES being measured.

While not originally designed to fit with the 'connected values' framework, the ONS work can benefit from being interrogated in this perspective in order to consider how best to use the results from the alternative methods produced by the research.

Abstraction charges fit most naturally in the category where ecosystem services are traded as private usage rights. They are actual observed transactions in the scenario where the ecosystem service exists. They do not measure the full value of water provisioning, but they do record a positive institutional price connected to access to the resource.

RR fits in the category where the ecosystem service is used for producing other goods and services. Both the standard and incremental versions remain producer-side residual approaches, but the incremental version changes how the return to produced assets is calculated.

Replacement cost fits into the category where an economic activity would appear to avoid the need for the ecosystem service in a hypothetical scenario where it did not exist; desalination is the substitute activity considered in the research.

Value transfer is harder to place precisely. It draws on external literature and transfers unit values to the UK context, so it is best treated as a broader connected monetary value rather than as a direct observed transaction in the UK water sector.

Table 1. Monetary valuation methods explored by ONS for water provisioning ES in the 'connected values' framework

			ES in Scenario	
			ES exists	ES doesn't exist Hypothesis
Connected monetary value in scenario	Exists (scenario coincide with reality)	ESs are traded as private usage rights	Abstraction prices	
		ESs are potentially traded as private usage rights		
		ES is used for producing other goods or services	Resource Rent – standard & incremental	
		Other (outside or inside of SEEA-EA, within SEEA CF, other satellite accounts or SNA)		
	"Would appear" (does not exist in reality, does in the scenario)	Economic activity that avoids the need for the ES		Replacement costs (desalination)
		ES restoration as economic activity		
		Marketisation of the ES (with or without perfect price discrimination)		
	"would disappear" (exists in reality, is lost in scenario)	Existing economic activities can no longer thrive, and/or assets are damaged («other negative changes in value») because of the lack of the ES		

Source: ONS elaboration of Femia et al. (2025)

This framework can also support communication. A user seeing abstraction charges, RR and replacement cost side by side may ask which is “right”. The connected-values answer is that they are right or wrong only relative to the question being asked. Abstraction charges answer a question about observed access payments. RR answers a question about residual producer surplus. Replacement cost answers a counterfactual question about substitute supply. Value transfer answers a question about the use of external valuation evidence. The policy usefulness of each method depends on whether that question matches the decision context.

4.3 Can connected values provide lower and upper boundaries for estimates?

Despite the benefit in communicating multiple values just highlighted, the ONS, as many National Statistical Institutes (NSIs), face practical demands for the communication clarity offered by a single headline figure, rather than multiple values or a more a complex dashboard.

In this context, perhaps there is a potential compromise in using connected values to set defensible lower and upper boundaries if the interpretation and limitations of each valuation method are clearly explained.

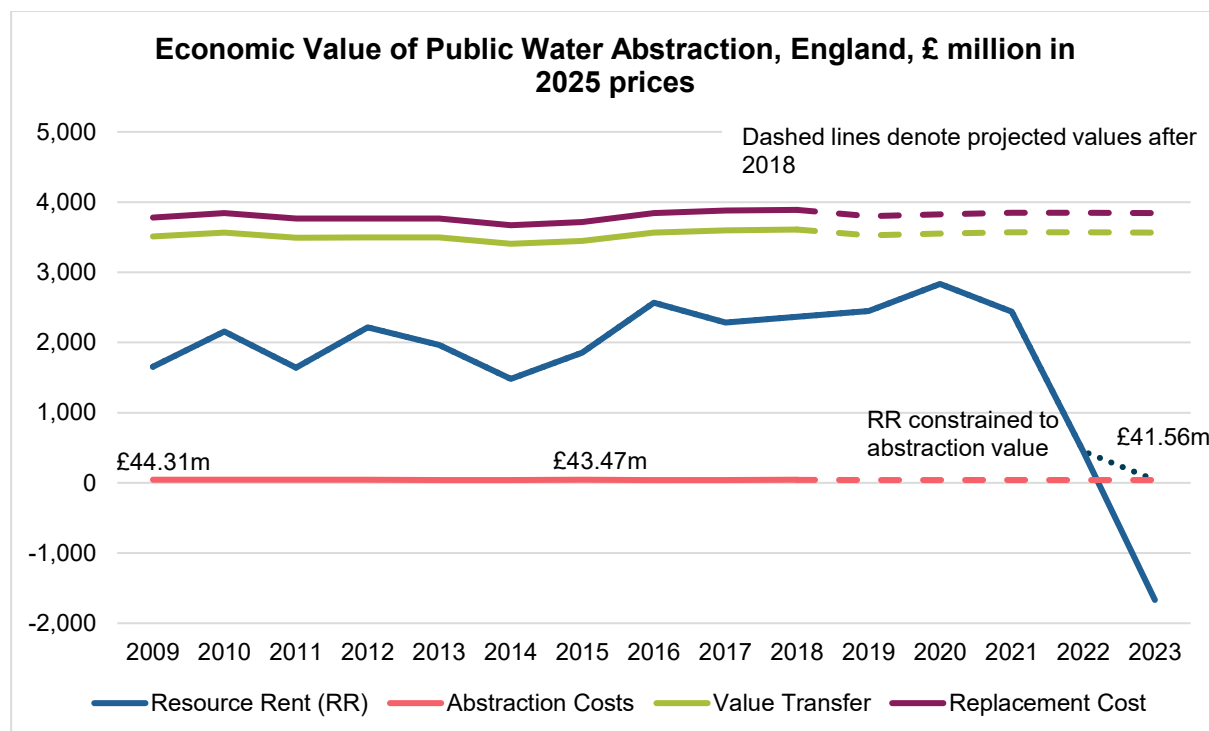
For water provisioning, abstraction charges could provide a lower boundary. They represent observed positive transactions connected to access to the resource. This does not imply that abstraction charges are the full value of water provisioning, rather they are likely to be very low because they reflect licence fees rather than the level of scarcity or dependency.

However, they provide a minimum positive monetary value connected to the ecosystem service. If the residual RR is negative, the abstraction-price estimate can help demonstrate why the negative residual should not be interpreted as a negative value of the service itself. This approach could help overcome the inherent limitation of RR highlighted by the residual-value critique that the ecosystem service itself is unpriced in the residual framework.

Replacement cost based on desalination could provide an upper or complementary boundary, rather than a central estimate. The values are much higher and reflect the cost of substitute provision under a hypothetical scenario. They are useful for communicating the economic dependency on water provisioning, but they depend on assumptions about feasibility, scalability and whether desalination is the relevant marginal substitute. Value transfer may provide another comparative estimate but should be treated cautiously because of transferability concerns.

Figure 4 provides a visual representation of this approach, applied to the UK water provisioning ES. As values for alternative valuation methods are only available to 2018, we extended these to 2023, based on a simple 5 year-average projection, to show what the outcome would be when the value obtained through applying the RR is negative.

Figure 4. Estimates of water provisioning ES using multiple values as lower and upper boundaries to RR-based estimates. England, 2009 to 2023 (based on projections)



Using connected values in this way would not eliminate the limitations of each method but could make them more explicit and potentially avoid misleading interpretations of a single value as a ‘true’ or ‘intrinsic’ value of water provisioning. Rather than presenting a single negative residual as the value of water provisioning, the account could explain that observed access payments provide a positive lower-bound value, RR provides a producer-side residual that may be distorted in regulated utilities, and replacement cost or value transfer reflects the scale of dependency.

5. Implications for SEEA EA guidance

The water provisioning case points to several improvements that could be made in future SEEA EA monetary valuation guidance, as well as areas where additional research would be beneficial.

Potential improvements to SEEA EA guidance could include:

- Greater clarity on the treatment of negative monetary values. It should explicitly distinguish between negative net flows that reflect a negative physical flow, and negative estimates for monetary values that derive from the application of valuation techniques, when the corresponding physical flows are positive.
- Strengthening method-selection criteria. Current materials describe valuation methods, but compilers also need suitability tests based on data and market and/or institutional settings. For RR, the suitability criteria could include, for example, whether prices are freely formed or regulated, whether the ecosystem input is explicitly represented, whether produced capital can be separated from the natural input.

- Additional diagnostics and checks that compilers can apply in case of RR (or other valuation methods) producing negative estimates, similar to what is provided in the OECD compilation guidance for depletion and natural resources, would be beneficial
- Unlike OECD depletion guidance, SEEA-EA valuation guidance should not rely on setting negative provisioning values to zero as the default solution. Zero may be preferable from a presentational perspective, but it still implies that the ecosystem service has no monetary contribution.

Additionally, areas for potential research include:

- the suitability of the RR for ES monetary valuation, the condition that should be satisfied for its use to be deemed acceptable, and the potential of mainstreaming the incremental approach described in this paper
- potential use of multiple values connected to ES to set defensible lower and upper boundaries when a single estimate is required.

Valuation of water ES is a particularly challenging area, as highlighted by this work and previous literature, and one that remains situated across SEEA-EA and the SEEA Central Framework (SEEA-CF). Further guidance is being developed as part of the SEEA-CF review. Its applicability to ES valuation and adoption in SEEA-EA should be a topic for future consideration.

6. Conclusions

Negative monetary values for provisioning services raise both theoretical and practical issues. Theoretically, a positive physical provisioning flow that supports economic goods and services should not normally be assigned a negative value unless the account is measuring a different concept. Practically, negative provisioning values risk undermining decision-maker confidence in ecosystem accounts and in the recognition of natural resources as economic providers.

In particular, negative monetary values, stemming from the application of the RR approach, present a case where market and institutional settings play a key role in determining the final values, while ecosystem service are not explicitly treated as an input into production, as argued by Pascoe et al. (2026).

The ONS water provisioning case adds to this body of literature and prompts to question if SEEA EA should revisit the prominence of RR and the criteria for its applicability. It also presents an incremental approach for the RR that may offer one practical refinement. By applying the rate of return only to new capital rather than re-pricing the entire capital stock each year, it better reflects the illiquid nature of water infrastructure and reduces volatility driven by financial-market movements. Initial results suggest it can prevent the recent UK water provisioning value from becoming negative. However, it does not fully resolve the underlying critique of residual valuation, and it may not remove negative values in all institutional contexts.

For water provisioning ES, ONS research (led by ESCoE) has produced initial monetary estimates based on abstraction charges, desalination replacement cost and value transfer alongside RR. This paper explores whether the framework of multiple monetary values connected to ES offers a complementary way forward, where different values connected to the same ecosystem service but stemming from different valuation techniques could help set lower and upper boundaries that meet the need for headline figures while recognising

method limitations. Future SEEA EA guidance should therefore address negative values, RR suitability, and the practical use of connected values in conjunction with one another.

We invite the London Group to consider the questions posed throughout this paper for future research and developments in SEEA-EA guidance:

- Is the incremental approach a suitable refinement of the standard RR method?
- Do you have appetite to further test this approach, potentially for SEEA-EA guidance to recommend it in future, for sectors with long-lived, illiquid produced assets?
- If the method still produces negative values in some institutional settings, does that suggest a more fundamental unsuitability of RR for regulated markets? Should SEEA-EA provide additional caveats on the institutional and market settings where RR should not be used?
- Do you support the idea of using the framework of multiple monetary values connected to ES to set lower and upper boundaries when a single estimate is required for an ES?

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