



**JNCC Report 797**

**A Consultation on the Global Environmental Impacts of Consumption Indicator**

**Ethan Workman and Maddie Harris**

**July 2025**

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ISSN 0963 8091

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**For further information please contact:**

JNCC, Quay House, 2 East Station Road, Fletton Quays, Peterborough PE2 8YY.

<https://jncc.gov.uk/>

[Communications@jncc.gov.uk](mailto:Communications@jncc.gov.uk)

This report was produced by JNCC for Defra through the Global Environmental Impacts of Consumption indicator project.

**This document should be cited as:**

Workman, E. & Harris, M. 2025. A consultation on the Global Environmental Impacts of Consumption indicator. *JNCC Report 797*. JNCC, Peterborough, ISSN 0963-8091.

<https://hub.jncc.gov.uk/assets/82aec43a-e299-457f-ab26-575590396b3e>.

**Acknowledgements:**

We thank all those who completed the survey and were involved in the usability testing that is reported on within this document. We thank partners at SEI York for inputting to the survey questions and Bernardo Loureiro (Global Canopy) for providing very useful insight on running usability testing sessions. We thank the Defra Sustainable Commodities team for funding the work.

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## Summary

The [Global Environmental Impacts of Consumption \(GEIC\) indicator](#) provides data on the biodiversity loss, water use, and deforestation associated with a country or territory's consumption. This report gives results on a consultation of the indicator, looking to assess how the indicator is being used, how user-friendly the dashboard is, how the outputs are being interpreted, and the value the indicator is perceived as having.

The consultation consisted of two parts:

- An online survey looking at who was using the indicator and how, gauging its perceived value, and providing an opportunity for user feedback.
- One-on-one usability testing sessions, run through an online call, assessing the usability, accessibility and interpretability of the dashboard.

Overall, the survey provided evidence that users find the GEIC indicator to have high value. Examples of its use were given across a wide range of areas, including informing Free Trade Agreements, designing forest risk commodities legislation, and citation in a wide range of impactful reports. The relatively low proportion of survey respondents who had heard of the indicator before completing the survey (and the high proportion of these who said they would be interested in using it in future) suggests that general awareness about the tool remains low and that further communication activities would be beneficial.

Results from the usability testing show that the dashboard is largely accessible, user-friendly and being correctly interpreted, but with some key points for improvement identified, particularly related to the process around switching between different data models to access data from a wider range of countries.

The project team thank all those who were involved in this consultation and look forward to integrating the feedback received as far as possible into our work.

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# 1. Introduction

The [Global Environmental Impacts of Consumption \(GEIC\) indicator](#) is a Defra-funded tool produced by JNCC and SEI York, with support from Trase and the GCRF (Global Challenges Research Fund) Trade Hub. The indicator provides data on the biodiversity loss, water use, and deforestation associated with a country or territory's consumption. It combines physical and monetary trade flow data with impact-specific datasets to model the environmental impact of agricultural and timber commodities, where this impact is occurring, and which country or territory is responsible through their consumption. Full methods can be found in the technical document and the full, global dataset can be visualised and explored using the openly available dashboard.

This report gives results on a consultation of the indicator, looking to assess how the indicator is being used, how user-friendly the dashboard is, how the outputs are being interpreted, and the value the indicator is perceived as having.

Work on the indicator started in response to the need for data detailing the magnitude and location of consumption impacts beyond a country or territory's borders. This need was apparent in the [25 Year Environment Plan](#) – “avoid improving our domestic environment at the expense of the environment globally”, and retained prominence in its update, the [Environmental Improvement Plan](#). Crucially, the associated [Outcome Indicator Framework](#) called for a way to measure the UK's environmental impact globally. The need to understand the sustainability of consumption is also highlighted in international commitments including the [Global Biodiversity Framework \(GBF\)](#) and the [Sustainable Development Goals](#).

Between 2022 and 2025, the GEIC Indicator was included as a 'component' (or voluntary) indicator of Target 16 of the Convention on Biological Diversity (CBD) GBF, “Enable Sustainable Consumption Choices To Reduce Waste and Overconsumption”, a target with no 'headline' (or compulsory) indicators. Whilst removed following discussions at CoP16.2, the dashboard continues to act as a tool that can be used by countries to report on their overseas consumption impact as a national indicator, for example, their total water use, deforestation area, and biodiversity loss. The UK is planning to use the GEIC Indicator to report on these impacts within the voluntary section of the CBD National Report, due to be submitted in Spring 2026.

The indicator also provides information on the producer locations and commodities linked to a country's consumption impact. This can be used by governments to highlight environmental impact hotspots and to target policy. This could be used by policy areas such as the formation of Free Trade Agreements, how overseas aid is spent, and public procurement policy. In practice, this could mean a government identifying the countries they could partner with to work towards sustainable solutions that would make the biggest difference, both to the environment and to the resource security of the consumer country and economic stability of the producer country.

The above use-cases, plus a range of other potential uses, highlight the importance of the dashboard. To be used effectively, the dashboard needs to be accessible and easy-to-use, and the outputs it produces need to be understandable and interpreted correctly.

Additionally, results from the consultation were used as one piece of supporting evidence for the decision-making process during the indicator's transition from an [Official Statistic in Development](#) to an [Official Statistic](#) in December 2024, so publication of this report provides transparency of a part of that process. Based on the [Code of Practice for Statistics](#), Official Statistics must be trustworthy, of high quality, and provide value.

The aims of this consultation were therefore to:

- Determine how the indicator is being used, and by whom.
- Assess the accessibility and usability of the dashboard.
- Assess the interpretability of the dashboard's outputs.
- Assess the extent to which users and potential users find value in a tool such as the GEIC indicator.
- Highlight key stumbling blocks to direct improvement efforts.
- Publicly provide evidence of the indicator's value, as transparent rationale towards its recent transition to an Official Statistic.

## 2. Methods

To fulfil the range of aims described above, the consultation was split into two parts:

- An online survey looking at who was using the indicator and how, gauging its perceived value, and providing an opportunity for user feedback.
- One-to-one usability testing sessions, run through an online call, assessing the usability, accessibility and interpretability of the dashboard.

### 2.1. Survey

A short survey was created using Microsoft Forms (full question list in Appendix 1). The questions were designed to answer the above aims. This was shared with the Four Countries Sustainable Consumption group (a platform for updates and knowledge exchange across the UK's Four Country Governments and public sector bodies, with quarterly online workshops) and with stakeholders that had previously engaged with the indicator and/or wider work. Stakeholders that had not previously been involved were also identified and contacted through LinkedIn, based on professional or personal connection to sustainable consumption. A total of 25 responses were obtained.

### 2.2. Usability testing

Usability testing sessions were 30–45 minutes long and contained a mixture of questions that assessed a range of the dashboard's aspects (full script in Appendix 2). Sessions started with opening questions to determine existing familiarity and expertise. Users then shared their screen of the dashboard and were asked several singular fact-finding questions. This was followed by presenting them with scenarios, through which the user answered multiple questions using the same dashboard parameters. This attempted to mimic how a real user may need multiple metrics to answer one question. The questions across the scenario and singular question sections were designed to test the full range of the dashboard's capabilities.

The scenarios were followed by a few standalone questions targeted at specific aspects of the dashboard, for example the usability of the frequently answered questions (FAQ) section. To finish the sessions, users were asked open-ended questions on what they liked about the dashboard and where they felt improvements could be made, as well as given an opportunity to feed back on the consultation process.

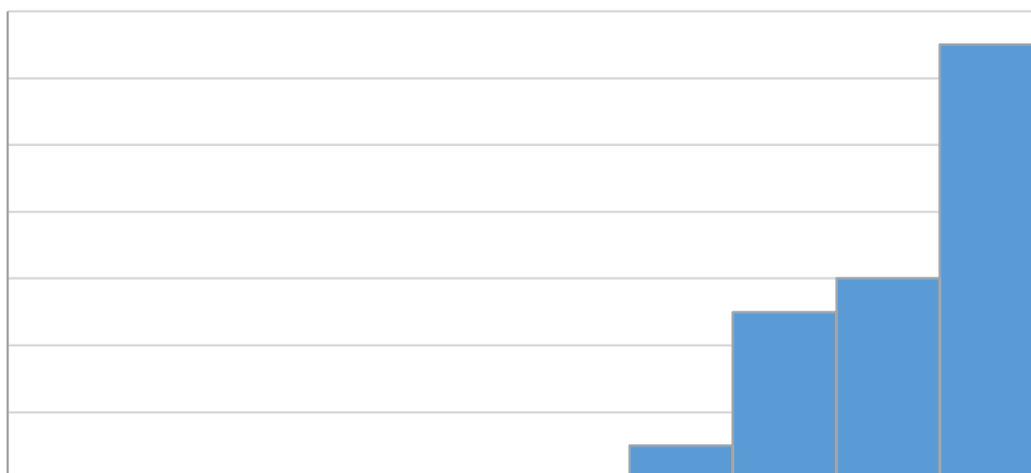
As with the survey, test users were recruited through existing connections and via LinkedIn. The aim was to recruit a mixture of those that were familiar with the dashboard and/or had expertise in the area, and those that had never seen it before and/or knew nothing about sustainable consumption. Sessions were undertaken with five users.

## 3. Results and discussion

### 3.1. Survey

#### 3.1.1. Value of the indicator

Respondents were asked to assess how valuable it is to have a tool providing the information that the GEIC indicator does, on a scale of 1 to 10. The average score was 9.24, with 76% of respondents answering nine (24%) or ten (52%) out of ten.



**Figure 1.** The value (scored out of 10) of a tool providing the information that GEIC does, as assessed by survey respondents.

#### 3.1.2. Impact on work without the indicator

Respondents that had used the GEIC Indicator were asked what impact the hypothetical scenario of the tool being discontinued would have on their work. All but one of these respondents felt that losing access to the indicator would have a significant impact on their work. Impacts ranged from straightforward, for example making it “difficult to find evidence on the deforestation impact of different commodities” or “limit[ing] our understanding of international impacts [... this] would be a significant loss”, to more severe perceptions, for example “lack of information will destroy biodiversity on earth”. See Appendix 3 for a full list of responses.

In these answers, respondents described the indicator as a “significant resource”, “the only tool capable of giving us some answer on UK biodiversity footprinting outside of the UK at a commodity level”, and “one of the most comprehensive and customisable data sources that [they’re] currently aware of for assessing consumption impacts/footprints of trade on natural capital and environmental variables”. Without it there is “no pathway or mechanism to integrate potential global impacts of domestic strategies”, which would impact the depth of reporting possible on the sustainability of national diets and food security.

### 3.1.3. Reports using the indicator

Respondents were asked to list any projects or pieces of work that had involved use of the GEIC Indicator. Below is a collection of these, plus outputs we were aware of through other channels. As this demonstrates, the indicator is used as a key resource in scientific papers, government reports, NGO publications and other impactful pieces of work. It provides crucial baseline data from which to produce policy recommendations (as in the [UK Food Security Report](#) and this [House of Commons Committee report](#)) and facilitates the tracking of progress against government targets (as in this [Office for Environmental Protection Annual Report](#)). Outside of the public sector, it is used in a variety of ways: from providing facts in engagement pieces targeted at the general public (e.g. this [factsheet on commodities](#) by Friends of the Earth), to establishing context and quantifying risk in scientific papers (like this [paper on sustainable farming](#)).

**Table 1.** A list of known projects and reports that have cited the GEIC indicator.

Project/ report title	Link (if available)
Forest Governance Markets and Climate (FGMC2) programme	<a href="https://www.gov.uk/international-development-funding/forest-governance-markets-and-climate-fgmc2-programme-accountable-grants">https://www.gov.uk/international-development-funding/forest-governance-markets-and-climate-fgmc2-programme-accountable-grants</a>
Government Food Strategy	<a href="https://www.gov.uk/government/publications/government-food-strategy/government-food-strategy">https://www.gov.uk/government/publications/government-food-strategy/government-food-strategy</a>
Implementing due diligence on forest risk commodities: Consultation document	<a href="https://consult.defra.gov.uk/international-biodiversity-and-climate/implementing-due-diligence-forest-risk-commodities/supporting_documents/implementingduediligenceconsultationdocument.pdf">https://consult.defra.gov.uk/international-biodiversity-and-climate/implementing-due-diligence-forest-risk-commodities/supporting_documents/implementingduediligenceconsultationdocument.pdf</a>
IPBES Transformative Change Assessment	<a href="https://www.ipbes.net/transformative-change-assessment">https://www.ipbes.net/transformative-change-assessment</a>
Loss and damage finance should apply to biodiversity loss	<a href="https://www.nature.com/articles/s41559-023-02088-8">https://www.nature.com/articles/s41559-023-02088-8</a>
Measuring up: The potential of targets to reduce resource use	<a href="https://green-alliance.org.uk/wp-content/uploads/2024/06/Measuring-up.pdf">https://green-alliance.org.uk/wp-content/uploads/2024/06/Measuring-up.pdf</a>
Office for Environmental Protection Annual Report	<a href="https://www.theoep.org.uk/report/government-remains-largely-track-meet-its-environmental-ambitions-finds-oep-annual-progress">https://www.theoep.org.uk/report/government-remains-largely-track-meet-its-environmental-ambitions-finds-oep-annual-progress</a>
Planet over Profit Commodities Factsheet	<a href="https://groups.friendsoftheearth.uk/sites/default/files/documents/2023-03/Planet%20over%20Profit%20Commodities%20Factsheets.pdf">https://groups.friendsoftheearth.uk/sites/default/files/documents/2023-03/Planet%20over%20Profit%20Commodities%20Factsheets.pdf</a>
Policy guidelines on national implementation of Target 16 of the Kunming-Montreal Global Biodiversity Framework	<a href="https://wwfint.awsassets.panda.org/downloads/policy-guidelines-on-national-implementation-of-target-16-of-the-kunming-montreal-global-biodiversity-framework.pdf">https://wwfint.awsassets.panda.org/downloads/policy-guidelines-on-national-implementation-of-target-16-of-the-kunming-montreal-global-biodiversity-framework.pdf</a>

Project/ report title	Link (if available)
Report of the expert workshop on the monitoring framework for the post-2020 Global Biodiversity Framework	<a href="https://www.cbd.int/doc/c/3190/c3f4/1d9fe2d2dedc8c8b97023750/id-om-2022-01-02-en.pdf">https://www.cbd.int/doc/c/3190/c3f4/1d9fe2d2dedc8c8b97023750/id-om-2022-01-02-en.pdf</a>
Sustainable high-yield farming is essential for bending the curve of biodiversity loss	<a href="https://royalsocietypublishing.org/doi/10.1098/rstb.2023.0216">https://royalsocietypublishing.org/doi/10.1098/rstb.2023.0216</a>
The Environment Strategy for Scotland: Delivering the Environment Strategy Outcome on Scotland's Global Footprint - Evidence Base & Policy Levers	<a href="https://www.gov.scot/publications/environment-strategy-scotland-delivering-environment-strategy-outcome-scotlands-global-footprint-evidence-base-policy-levers/">https://www.gov.scot/publications/environment-strategy-scotland-delivering-environment-strategy-outcome-scotlands-global-footprint-evidence-base-policy-levers/</a>
The UK's contribution to tackling global deforestation	<a href="https://publications.parliament.uk/pa/cm5804/cmselect/cmenvaud/405/report.html">https://publications.parliament.uk/pa/cm5804/cmselect/cmenvaud/405/report.html</a>
Trade Tools Navigator	<a href="https://tools.tradehub.earth/">https://tools.tradehub.earth/</a>
UK Food Security Report	<a href="https://www.gov.uk/government/news/uk-food-security-report-2024-published">https://www.gov.uk/government/news/uk-food-security-report-2024-published</a>
Uncovering Sub-Regional Drivers of Deforestation in the Amazon: A Tool for Targeted Solutions	<a href="https://resources.trase.earth/documents/Briefings/WWF_Technical-Brief-Amazon-Deforestation-CBD-COP16.pdf">https://resources.trase.earth/documents/Briefings/WWF_Technical-Brief-Amazon-Deforestation-CBD-COP16.pdf</a>
Who pays the price for the loss and damage of nature?	<a href="https://www.iied.org/sites/default/files/pdfs/2024-05/22421iied.pdf">https://www.iied.org/sites/default/files/pdfs/2024-05/22421iied.pdf</a>
House of Commons Committee report: The UK's contribution to tackling global deforestation	<a href="https://publications.parliament.uk/pa/cm5804/cmselect/cmenvaud/405/report.html#footnote-137">https://publications.parliament.uk/pa/cm5804/cmselect/cmenvaud/405/report.html#footnote-137</a>
Walk Lightly on the Earth (WWF)	<a href="https://wwfint.awsassets.panda.org/downloads/wwf-discussion-paper_walk-lightly-on-earth_footprint-of-oecd-countries_october-2023-final.pdf">https://wwfint.awsassets.panda.org/downloads/wwf-discussion-paper_walk-lightly-on-earth_footprint-of-oecd-countries_october-2023-final.pdf</a>
Deforestation exposure of US direct imports from October 2021 to November 2023 (Trase)	<a href="https://resources.trase.earth/documents/Briefings/US_FOREST_Act_analysis_report_V4.pdf">https://resources.trase.earth/documents/Briefings/US_FOREST_Act_analysis_report_V4.pdf</a>
UK Soy Manifesto	<a href="https://www.uksoymanifesto.uk/">https://www.uksoymanifesto.uk/</a>

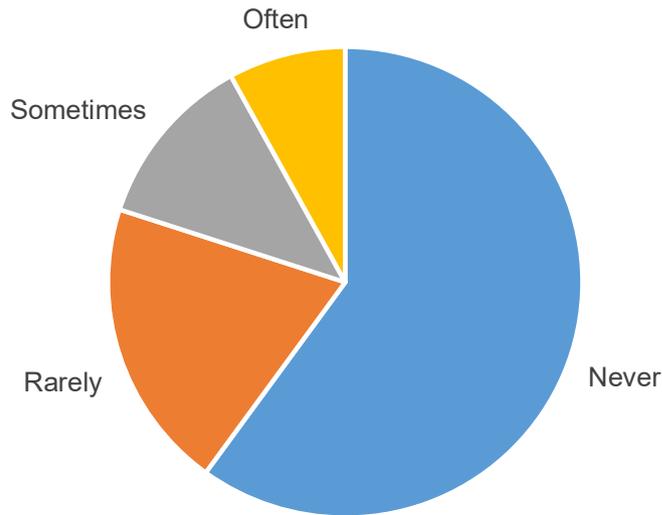
Project/ report title	Link (if available)
Monitoring Offshore Environmental Impacts of Trade (G20)	<a href="https://t20ind.org/research/monitoring-offshore-environmental-impacts-of-trade/">https://t20ind.org/research/monitoring-offshore-environmental-impacts-of-trade/</a>
Foul play: Exposing Cargill and Moy Park links to deforestation (Mighty Earth)	<a href="https://mightyearth.org/wp-content/uploads/2024/10/ME_REPORT_FOUL-PLAY_Sept24-1.pdf">https://mightyearth.org/wp-content/uploads/2024/10/ME_REPORT_FOUL-PLAY_Sept24-1.pdf</a>
Informal Working Group on trade and biodiversity statistics	<a href="https://unctad.org/meeting/fourth-meeting-informal-working-group-trade-and-biodiversity-statistics">https://unctad.org/meeting/fourth-meeting-informal-working-group-trade-and-biodiversity-statistics</a>

### 3.1.4. Use of the indicator

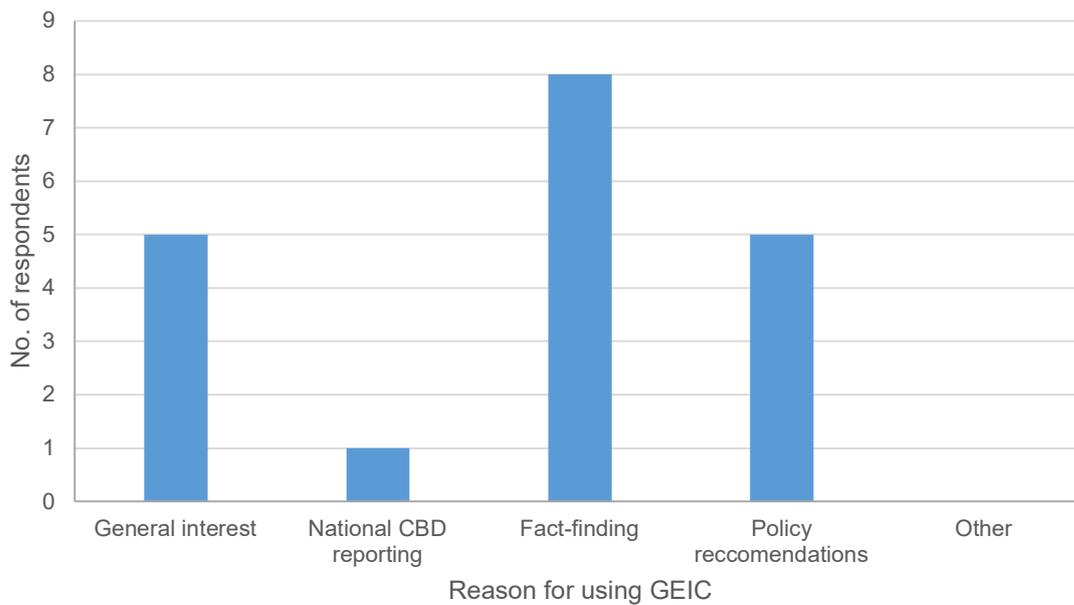
Over half of the 25 respondents (15) had never used the indicator before. Of the 10 that had, two use it often, three sometimes use it, and five rarely use it (Figure 2). Those that have used the indicator were asked what they use or had used it for (Figure 3). The most popular use of the indicator was as a fact-finding tool for reports and presentations, with eight respondents using it in this way. This was followed by 'general interest' and for making policy recommendations (both answered by five respondents each). Only one respondent had used the indicator for national CBD (Convention on Biological Diversity) reporting. As this is a relatively niche use, only likely to be conducted by people in specific roles, this is unsurprising.

When asked for further details on their use of the indicator, multiple respondents described its use as an information tool for work on supply chains and trade flows, and quantifying the global impacts of consumption. Specific uses included exploring commodity tariff questions in impact assessments of Free Trade Agreements, designing forest risk commodities legislation, and to support discussions at United Nations Working Groups. See Appendix 3 for a full list of responses.

Respondents that had not used the indicator before were asked why this was, and whether they might in the future. Of the 15 who had not used the indicator before, 12 respondents had not heard of it and five stated they did not work in sustainable consumption (it was possible to select multiple answers; hence this does not add to 15). Respondents that do not work in sustainable consumption are unlikely to have heard of the indicator, or benefit greatly from its use, so this is of low concern. However, there are a considerable number of respondents that do and had not heard of the indicator. This highlights the potential need to raise the profile of the indicator with the stakeholders it is most relevant to. No respondents gave a lack of trust in its validity, not understanding how to use it, or it not answering the questions they needed answered as a reason for not using the indicator. When asked if they might use the indicator in the future, 6 (40%) answered that they would and 9 (60%) answered that they might, with none answering that they would not. While data on whether they have used it since this consultation brought it to their attention would be needed to properly assess this, this largely positive reaction suggests increasing awareness of the indicator could be an effective lever for increasing its use.



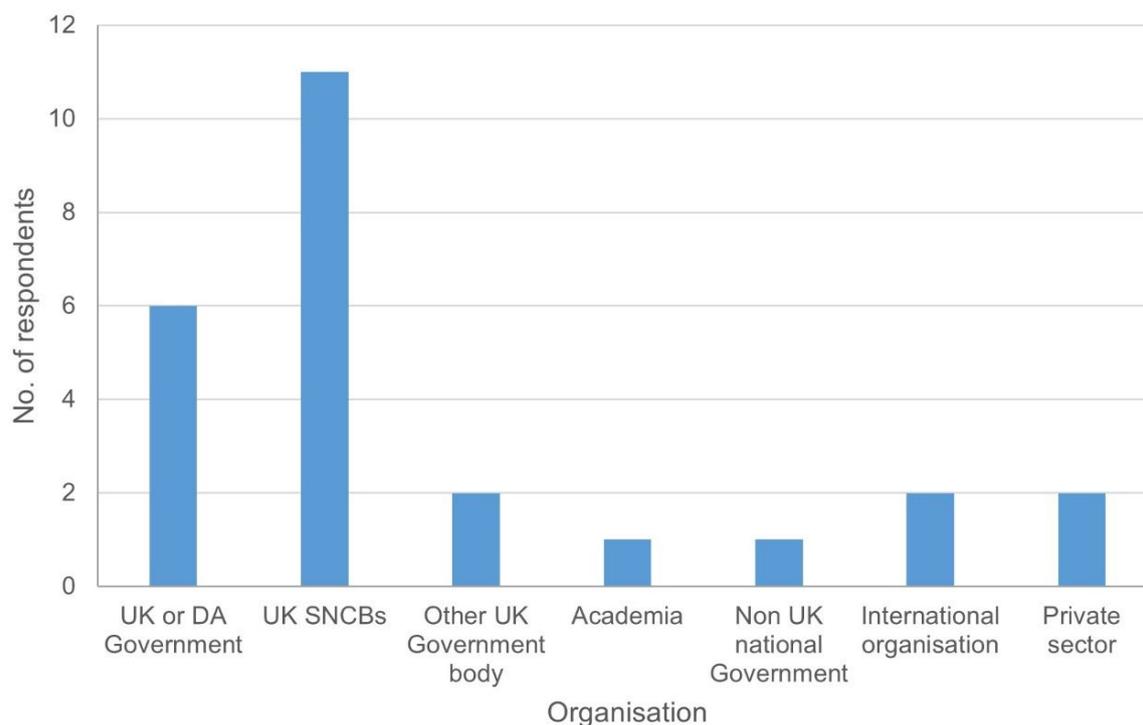
**Figure 2.** A breakdown of survey respondents by their previous level of usage of the GEIC indicator.



**Figure 3.** A breakdown of the reasons selected by survey respondents who had used the GEIC indicator previously for why they had done so (it was possible for one individual to select multiple answers).

### 3.1.5. Make-up of respondents

Of the 25 respondents, 17 (68%) work in the UK Government or for one of the Statutory Nature Conservation Bodies (SNCBs; Figure 4). The SNCBs who responded included JNCC, Natural England, NatureScot and Natural Resources Wales. The remaining eight respondents (32%) are from a mixture of organisations including in the private sector, academia, foreign government and international organisations (such as UN Trade and Development (UNCTAD) and the European Environment Agency (EEA)).



**Figure 4.** A breakdown of survey respondents by organisation type.

This bias towards government and SNCBs is unsurprising given they made up a large proportion of the people contacted and are likely to be those most heavily involved in the indicator's development or use. In general, most of the respondents work for organisations with at least a partial focus on environmental improvement and/or nature conservation. This is likely to have influenced answers to questions such as the perceived value of a tool like the GEIC Indicator, with respondents more likely to be familiar with the impact of consumption on the environment and therefore highly value a tool that monitors this.

Given the tool's relevance to international trade and its potential use in national reporting and free trade agreements, it would have been useful to get the opinions of more people working for governments other than the UK, and those working in international organisations. These people were sent the survey, albeit in smaller numbers than UK government and CNCB staff, but only a small number of responses were received. More active engagement with these groups will be a key goal of future work.

### 3.2. Usability testing

Full notes from the usability testing sessions are provided in Appendix 4. Overall, the dashboard was found to be intuitive to use, with most of the challenges being overcome with little difficulty. The information was being correctly interpreted, despite only one of the five test subjects having used the dashboard before to answer questions or find data. While this was a small sample size, testing five users is generally considered sufficient to identify major usability issues in qualitative usability testing (Nielsen, 1989). Additionally, we were successful in recruiting participants from a range of backgrounds, with some participants being within our identified target groups, others with no specific experience within sustainable consumption or trade but with good general technical knowledge, and others completely new to both the tool and the wider area.

The most significant area of confusion came from the question that required people to find information on a country that does not have data available under Exiobase (the default model used when arriving at the dashboard) and requires users to switch the 'data model' to GTAP for a longer list of countries. Four out of five users did not manage to find the data being asked for at all, and one did so unprompted eventually but only after lengthy investigation. This strongly suggests that the current process for switching the model is not intuitive and that the explanation of this process is insufficient or difficult for users to find. Improving these aspects will be a key priority for future development work.

The other area that led to some degree of confusion was the question testing whether users could find a piece of information that was provided within the FAQ section. Some suggestions that test subjects provided for improving this included moving some aspects from the FAQ section into the methodology and scope section, production of factsheets, and including a link to the FAQ section nearer the top of the dashboard.

Other suggested improvements included:

- adding explanations, potentially in the form of 'tooltips', for commodities in cases where the commodity name does not make it fully clear what is covered (e.g. industrial roundwood),
- making it clearer that it is possible to click on the buttons for downloading graphs and data (e.g. changing the colour or shape of the buttons' borders),
- making use of an independent data assessor such as the OECD (Organisation for Economic Co-operation and Development),
- making it possible to download all data relating to a single country in one click, because the full dataset is too large to work with and the data possible to download from each graph only relates to one impact metric at a time,
- adding a metadata sheet to downloaded data files, including a suggested citation,
- the fact that decimal points are represented as commas rather than points in many European countries (with points commonly used to separate large numbers, as commas are used in many English-speaking countries), so including an explanation and/or adapting the datasheets when downloaded from the French and Dutch language versions of the dashboard,
- adding a visual indication that there is more information if you scroll down beyond the first graph (e.g. an arrow).

The project team will take this feedback on board and consider the practicalities of making these adaptations.

## 4. Conclusion

Overall, this consultation provides evidence that users find the GEIC indicator to have high value. Examples of its use were given across a wide range of areas, including informing Free Trade Agreements, designing forest risk commodities legislation, and citation in a wide range of impactful reports. The relatively low proportion of survey respondents who had heard of the indicator before completing the survey (and the high proportion of these who said they would be interested in using it in future) suggests that general awareness about the tool remains low and that further communication activities would be beneficial. Results from the usability testing show that the dashboard is largely accessible, user-friendly and being correctly interpreted, but with some key points for improvement identified, particularly related to the process around switching between different data models. The project team thank all those who were involved in this consultation and look forward to integrating the feedback received as far as possible into our work.

## References

Nielsen, J. 1989. Usability engineering at a discount. In Proceedings of the third international conference on human-computer interaction on Designing and using human-computer interfaces and knowledge based systems (2nd ed.). Elsevier Science Inc., USA, 394–401.

## Weblinks

**Table 2.** Full URLs for weblinks used in the text.

<b>Weblink text</b>	<b>Full URL</b>
25 Year Environment Plan	<a href="https://www.gov.uk/government/publications/25-year-environment-plan">https://www.gov.uk/government/publications/25-year-environment-plan</a>
Code of Practice for Statistics	<a href="https://code.statisticsauthority.gov.uk/">https://code.statisticsauthority.gov.uk/</a>
Environmental Improvement Plan	<a href="https://www.gov.uk/government/publications/environmental-improvement-plan">https://www.gov.uk/government/publications/environmental-improvement-plan</a>
Factsheet on commodities by Friends of the Earth	<a href="https://groups.friendsoftheearth.uk/sites/default/files/documents/2023-03/Planet%20over%20Profit%20Commodities%20Factsheets.pdf">https://groups.friendsoftheearth.uk/sites/default/files/documents/2023-03/Planet over Profit Commodities Factsheets.pdf</a>
Global Biodiversity Framework (GBF)	<a href="https://www.cbd.int/gbf">https://www.cbd.int/gbf</a>
Global Environmental Impacts of Consumption (GEIC) indicator	<a href="https://commodityfootprints.earth/">https://commodityfootprints.earth/</a>
GEIC as an Official Statistic	<a href="https://jncc.gov.uk/our-work/ukbi-global-biodiversity-impact/">https://jncc.gov.uk/our-work/ukbi-global-biodiversity-impact/</a>
House of Commons Committee report	<a href="https://publications.parliament.uk/pa/cm5804/cmselect/cmenvaud/405/report.html">https://publications.parliament.uk/pa/cm5804/cmselect/cmenvaud/405/report.html</a>
Office for Environmental Protection Annual Report	<a href="https://www.theoep.org.uk/report/government-remains-largely-track-meet-its-environmental-ambitions-finds-oep-annual-progress">https://www.theoep.org.uk/report/government-remains-largely-track-meet-its-environmental-ambitions-finds-oep-annual-progress</a>
Official Statistic in Development	<a href="https://osr.statisticsauthority.gov.uk/policies/official-statistics-policies/official-statistics-in-development/">https://osr.statisticsauthority.gov.uk/policies/official-statistics-policies/official-statistics-in-development/</a>
Outcome Indicator Framework	<a href="https://oifdata.defra.gov.uk/">https://oifdata.defra.gov.uk/</a>
Paper on sustainable farming	<a href="https://royalsocietypublishing.org/doi/10.1098/rstb.2023.0216">https://royalsocietypublishing.org/doi/10.1098/rstb.2023.0216</a>
Sustainable Development Goals	<a href="https://sdgs.un.org/goals">https://sdgs.un.org/goals</a>
UK Food Security Report	<a href="https://www.gov.uk/government/news/uk-food-security-report-2024-published">https://www.gov.uk/government/news/uk-food-security-report-2024-published</a>

## Appendix 1: Consultation survey questions

The text in this appendix is a copy of that used in the online survey looking at who was using the indicator and how, gauging its perceived value, and providing an opportunity for user feedback.

### Survey introduction

The Global Environmental Impacts of Consumption (GEIC) indicator provides data on the biodiversity loss, water use and deforestation associated with a country/territory's consumption. It can be accessed via [this dashboard](#) and has a number of potential uses. We want to understand whether, and how, the indicator is being used, as well as how it can be improved to better suit the needs of its users. Alongside useful insight, this will help inform the process of the GEIC Indicator becoming an Official Statistic.

The survey should take no more than 10 minutes, and we would really appreciate your input. It will close to new responses at midnight on XX/XX/XX.

Your participation in this survey is entirely voluntary and you are free to withdraw at any time, without reason. All data provided will be treated in strict confidence. No personal data are collected. Please note that the Data Controller for responses to the questionnaire will be JNCC. Further information about how we process your personal data is available via [JNCC's Privacy Statement](#).

If you have any questions about this survey, please contact [personal contact details were supplied].

### Survey questions

- Organisation
- Area of work/team name
- Have you used the Global Environmental Impacts of Consumption (GEIC) Indicator?
  - Yes, often
  - Yes, sometimes
  - Yes, rarely
  - No
- If Yes:
  - How have you used the GEIC Indicator?
    - National CBD reporting
    - Fact-finding for reports/presentations
    - Policy recommendations
    - General interest
    - Other
  - Can you provide more details on any of these use cases?
  - How useful do you find the GEIC Indicator for [use case selected]? (on a scale of 0 to 10)

- What would the impact on you/your work/your team be if production of the indicator were stopped tomorrow?
- Are there any pieces of work that you have used the GEIC Indicator for that you can link to? If it is not publicly available but you would be open to sharing it with the JNCC, please email [personal contact details were supplied].
- If no:
  - Why have you not used the tool before?
    - Hadn't heard of it before
    - I don't work in sustainable consumption
    - I work in sustainable consumption, but it doesn't answer the questions that I need to know
    - I don't trust its validity
    - I don't understand how to use it
    - Other (please specify)
  - Do you think you might use it in the future?
    - Yes
    - No
    - Maybe
- All respondents:
  - As a reminder, the GEIC Indicator provides data on the biodiversity loss, water use and deforestation associated with a country/territory's consumption. How valuable do you think a tool such as this is? (on a scale of 0 to 10)
  - If you have any additional comments or suggestions on how we could improve the indicator going forward, please use the box below.

Thank you very much for completing this survey.

## Appendix 2: Usability testing script

The text in this appendix is a copy of that used in the usability testing sessions assessing the usability, accessibility and interpretability of the dashboard.

### Introduction

Thank you for agreeing to help us test the GEIC Indicator dashboard. I'll be asking you a mixture of questions looking to assess the usability of the dashboard and how easy the outputs are to understand. I will try to give you as little help as possible. Please note, we are testing the website and not you. There are no right or wrong answers. If you are happy to, it would be great if you could talk through what you are doing on the website.

### Opening questions

- How familiar are you with the dashboard?
- What do you think this dashboard is showing?
- What potential uses does this dashboard have?

### Fact-finding questions

- What is the area of deforestation in Australia associated with UK consumption in 2021?
- What is the area of deforestation in Australia associated with France's consumption in 2021?
- What is the UK's total blue water use in 2021?
- What are the top three commodities responsible for this blue water use?
- Which country has the 3rd greatest predicted species loss due to USA consumption in 2021?
- Where does the USA rank in consumption-related predicted species loss in 2021?
- Has this changed between 2021 and 2005?

### Scenario 1

Imagine the UK is looking to reduce its environmental impact in Scandinavia (Denmark, Sweden, Norway):

- Which of the three countries experiences the greatest predicted species loss due to UK consumption?
- Was predicted species loss in Denmark due to UK consumption lower in 2007 than in 2021?
- Which 5 commodities are most responsible for predicted species loss across Scandinavia in 2021?
- What year did predicted species loss associated with UK consumption peak in Scandinavia?

## Scenario 2

Imagine the UK is looking to reduce its environmental impact of berry consumption (strawberry, blueberry and raspberry):

- Which of the three has the highest scarcity-weighted water usage?
- What is the general trend of scarcity-weighted water usage associated with the UK's berry consumption?
- Which country experiences the highest scarcity-weighted water usage due to UK berry consumption?

## Scenario 3

Attempts to conserve the Amazon will focus on environmental impacts of consumption in Brazil:

- Which country's consumption is most responsible for deforestation in Brazil in 2021?
- What are the top 3 commodities responsible for deforestation in Brazil?
- When did deforestation in Brazil peak?

## EXIOBASE versus GTAP

- Can you find the total area of deforestation associated with Ecuador's consumption?

## FAQs

- Imagine you wanted to know what types of deforestation are covered, could you find this information on the website?

## Processes

- Download a graph showing...

## Closing questions

- What bits of the dashboard did you find most useful/easy to understand?
- What could be changed to make this dashboard more user friendly?

## Appendix 3: Answers to free text survey questions

Whilst the main body of this report summarises the closed questions asked in the survey and provides examples of some free text responses, this Appendix lists all free text responses provided, for completeness. Any information that would make it possible to identify individuals has been redacted.

### Can you provide more details on any of these use cases?

- “Was not previously aware of this indicator so not used the indicator as yet - but it does represent significant value and interest to help understand the potential value chain impacts and dependencies”.
- “Facts on the overall impact of imported deforestation or consumption footprint”.
- “I've used the GEIC indicator when I've needed to find some information on trade flows and deforestation impact associated with them”.
- “Useful resource when considering supply chain and international impacts”.
- “General exploration of what the tool can do”.
- “The indicator and underlined data has been used for Impact assessments of FTAs, for specific questions on commodity tariffs and used in some of our simple frameworks/models”.
- “Towards scoping assessments, contributions to impact assessments for free trade agreements, and in assessments of other trade liberalisation measures and their possible environmental effects”.
- “Was interested in high quality official stats on the quantified long-term impacts of UK consumption so the JNCC data fit this brief well. We decided to use three data sets covering deforestation, biodiversity loss and water scarcity”.
- “Designing forest risk commodities legislation”.
- “GEIC was used to support discussions of the informal Working Group on Trade and Biodiversity Statistics, convened by UN Trade and Development, to identify current data on trade of biodiversity-based products and its social, environmental and economic impacts, and discuss possible data gaps”.

### What would the impact on you/your work/your team be if production of the indicator were stopped tomorrow?

- “No impact as yet but would be a missed opportunity as the indicator would be invaluable to understanding value chain impacts”.
- “Lack of information will destroy biodiversity on earth”.
- “It would make it difficult to find evidence on the deforestation impact of different commodities - this is useful for informing policy development”.
- “Loss of a significant resource which would limit our understanding of international impacts”.
- “No pathway or mechanism to integrate potential global impacts of domestic strategies”

- “Quite negative as this is possibly the only tool capable of giving us some answer on UK biodiversity footprinting outside of the UK at a commodity level (which is key in our work)”.
- “We would lose one of the most comprehensive and customisable data sources that we’re currently aware of for assessing consumption impacts / footprints of trade on natural capital and environmental variables. We don’t have the technical capability to run MRIO models, etc. Other data sources aren’t linked to specific commodities or specific producer and consumer countries in the same way. We would be less able to appraise the effects of trade liberalisation”.
- “This would affect the depth with which we’re able to publicly report on whether the UK is consuming a sustainable diet in our current report (the UK Food Security Report) as well as future iterations as we prefer to use data which measures long-term trends to give the most comprehensive and holistic view of UK food security”.
- “Limited ability to make the case for UK orientated domestic intervention to reduce global deforestation”.
- “Following the discussions of the informal WG, mentioned above, we are consulting GEIC indicators more frequently in our analyses. Some of the GEIC indicators have also been identified and shortlisted by the informal WG for further research on trade and biodiversity statistics. GEIC is also an indicator for GBF Target 16. For these three reasons, we think there will be a negative impact on our work if the indicator is discontinued”.

### **Additional comments or suggestions on how we could improve the indicator going forward**

- “Looks great - will have to think on potential future uses as only just discovering it. Well done!”
- “Link to the income deciles of the consuming country in order to be able to focus policy accordingly”.
- “We are starting our process to look at our biodiversity impacts and this looks like a very useful tool for businesses like this”.
- “Expansion of the environmental pressures assessed. Disaggregation to UK constituent countries”.
- “Support use for sustainable procurement - supplier selection”.
- “Having some sector specific filters. I think this tool is particularly useful for informing sustainability reporting frameworks, such as The European Sustainability Reporting Standards (ESRS) and the Corporate Sustainability Reporting Directive (CSRD) and other voluntary reporting frameworks like TNFD. There are some similarities with existing tools such as ENCORE, it would be interesting to explore differences in data sets used”.
- “Case-studies on how the indicator is/could be used to inform/change practices”.
- “Really interested in the emerging pieces!”
- “It would be good to have a similar dashboard for devolved administrations in the UK. Also, in the dashboard it would be good to see what commodity for what country (e.g. deforestation in the UK will be mostly for roundwood), I know that, but I cannot deduct it from the dashboard. This would help in monitoring whether there is an increase or decrease in imports and how that compares with within the UK trends on forestland and harvest”.

- “More commodities (e.g. sheep); dynamic (I understand this is a bit hurdle and don't expect it in the next year but if dynamic approaches are looked into (e.g. the impact of reducing production of a key commodity in the UK) we strongly support it); -future expansion to non-land commodities”.
- “Is it true that there are some limitations in the estimates which still need ironing out, or some measures which could be added to produce a more rounded picture of biodiversity impacts? I can imagine a use-case where the GEIC is combined with a trade model that gives net changes in regional production and consumption (including diversion and indirect effects) resulting from change in trade liberalisation. The integrated GEIC indicators could tell us the net environmental effects of the change and map the nature and magnitude of those changes according to where they occur”.
- “It would be great if the interactive dashboard was made easier to operate to extract the key drivers of the trends. It would also be useful if we could go deeper into the data(e.g. to have a demographic view of trends - by region, gender, ethnicity, disability status, etc)”.
- “Include a "world" line to enable quick comparison of a country/regions impacts relative to global total”.
- “Additional use-cases for the indicator. Areas to expand the scope into. Suggested platforms to promote the indicator”.

## Appendix 4: Usability testing session notes

Notes taken during the usability testing sessions are recorded, anonymised, in this appendix.

**Table 3.** Notes taking during usability testing sessions. The table is split into two parts, with the first three users presented first, and the other two users presented beneath.

Questions	User 1		User 2		User 3	
	Correct answer / method?	Notes	Correct answer / method?	Notes	Correct answer / method?	Notes
How familiar are you with the dashboard?	n/a	Never seen	n/a	Played with it a few times but not properly interpreted it.	n/a	Has used the indicator to answer questions/find data.
What do you think this dashboard is showing?	n/a	-	n/a	Looks at commodity impacts in different countries. Can get an idea of (e.g.) impact of UK on worldwide deforestation (also in reverse).	n/a	Environmental impacts in different measures (e.g. predicted species loss is a measure). Can switch between two models. Look at map, ranking of countries, top countries of origin, etc. Update data to see results. Uses trade data to feed into environmental impact of each commodity type, link with hotspots of biodiversity, calculates risk.

Questions	User 1		User 2		User 3	
	Correct answer / method?	Notes	Correct answer / method?	Notes	Correct answer / method?	Notes
What potential uses does this dashboard have?	n/a	-	n/a	DEFRA – including those looking at GBF Target 16, sustainable supply chain policies management, climate change people.	n/a	Interested in getting the data to calculate footprints for several parameters. Using mass of (e.g. rice) can give you methane emission calculations. This can then be compared with other databases or used to update existing data. Deforestation is key to European Commission at the moment with policies coming in next year, companies pushing for more time. Data for deforestation could be useful for this. Has more trust in it given its based on physical trade flows rather than just monetary. Could be used to correct monetary flow data?
What is the area of deforestation in Australia associated with UK consumption in 2021?	Yes	-	Yes	-	Yes	-

Questions	User 1		User 2		User 3	
	Correct answer / method?	Notes	Correct answer / method?	Notes	Correct answer / method?	Notes
What is the area of deforestation in Australia associated with France's consumption in 2021?	Yes	-	Yes	-	Yes	-
What is the UK's total blue water use in 2021?	No	First instinct was to hover over the UK to bring up domestic blue water use, thinking that that referred to the total BWU.	Yes	-	Yes	-
What are the top three commodities responsible for this blue water use?	Yes	-	Yes	-	Yes	-
Which country has the 3rd greatest predicted species loss due to USA consumption in 2021?	Maybe	Was unsure whether this referred to the rank globally or the countries affected by US consumption.	Yes	-	Yes	-

Questions	User 1		User 2		User 3	
	Correct answer / method?	Notes	Correct answer / method?	Notes	Correct answer / method?	Notes
Where does the USA rank in consumption-related predicted species loss in 2021?	Yes	-	Yes	-	Yes	-
Has this changed between 2021 and 2005?	Yes	-	Yes	Was not immediately obvious.	Yes	Took a while to find more settings. Didn't fully understand.
Imagine the UK is looking to reduce its environmental impact in Scandinavia (Denmark, Sweden, Norway):	n/a	-	n/a	-	n/a	Did not think it was possible to add multiple countries to the producing countries but became obvious after adding one.
Which of the three countries experiences the greatest predicted species loss due to UK consumption?	Maybe	Got the answer but initial reaction was to hover over each country in turn, instead of changing the producing countries. Did do this eventually for the questions below.	Yes	-	Yes	-

Questions	User 1		User 2		User 3	
	Correct answer / method?	Notes	Correct answer / method?	Notes	Correct answer / method?	Notes
Was predicted species loss lower in Denmark due to UK consumption lower in 2007 than in 2021?	Yes	Took a while but got there	Yes	-	Yes	-
Which 5 commodities are most responsible for predicted species loss across Scandinavia in 2021?	Yes	-	Yes	-	Yes	-
What year did predicted species loss associated with UK consumption peak in Scandinavia?	Yes	-	Yes	-	Yes	Not at first.
Imagine the UK is looking to reduce its environmental impact of berry consumption (strawberry, blueberry and raspberry):	n/a	Immediately went into further settings for this scenario - learnt from the previous one.	n/a	-	n/a	-

Questions	User 1		User 2		User 3	
	Correct answer / method?	Notes	Correct answer / method?	Notes	Correct answer / method?	Notes
Which of the three has the highest scarcity-weighted water usage?	Yes	-	Yes	-	Yes	-
What is the general trend of scarcity-weighted water usage associated with the UK's berry consumption?	Yes	-	Yes	Understood. Highlight why to use scarcity-weighted water usage.	Yes	-
Which country experiences the highest scarcity-weighted water usage due to UK berry consumption?	Yes	-	Yes	-	Yes	-
Attempts to conserve the Amazon will focus on environmental impacts of consumption in Brazil:	n/a	-	-	-	-	Went straight to switch production and consumption.

Questions	User 1		User 2		User 3	
	Correct answer / method?	Notes	Correct answer / method?	Notes	Correct answer / method?	Notes
Which country's consumption is most responsible for deforestation in Brazil in 2021?	Yes	Took a while to realise consumption needed to be changed to production - initial reaction was to hover over Brazil on a map of Brazilian consumption related deforestation. Realised without any prompt.	Yes	-	Yes	Decided to exclude domestic flows after seeing Brazil was mostly responsible - more of a misunderstanding about the question than the dashboard.
What are the top 3 commodities responsible for deforestation in Brazil?	Yes	-	Yes	-	Yes	-
When did deforestation in Brazil peak?	Yes	-	Yes	-	Yes	Did not look at the full graph
Can you find the total area of deforestation associated with Ecuador's consumption?	No	Did not understand why Ecuador didn't appear in the drop-down menu. Did understand once directed to read the info button next to the box.	No	Some pop up that says, "you may want to switch data models". Needs to make it clear that you are using data from a different model.	Maybe	Did not realise to switch model at first. Did so unprompted eventually after playing around with the dashboard for a while.

Questions	User 1		User 2		User 3	
	Correct answer / method?	Notes	Correct answer / method?	Notes	Correct answer / method?	Notes
Imagine you wanted to know what types of deforestation are covered, could you find this information on the website?	Yes	Took a while to get to the FAQs	No	Suggested moving this information to the methodology and scope section and adding an FAQ on "if you wanted to look at this commodity...this is the best way to do this". Factsheet on crucial commodities provides more info on environmental impacts.	Maybe	Changed my question slightly, but understood where to find technical doc, etc.
Download a graph showing...	Yes	Did not realise the buttons were clickable at first	Yes	Queried why we offer SVG	Yes	-
What bits of the dashboard did you find most useful/easy to understand?	n/a	Thought that the dashboard was very clean with an attractive colour scheme. Reminded them of the GOV website. Found it easy to navigate and thought that the drop-down menus and heading titles were self-explanatory. FAQs were easy to understand. Really liked how interactive the map was - thought it gave a good overview very quickly and provides a nice foundation before scrolling down for further detail in the graphs.	n/a	It is great and user-friendly. There are a couple of things that are not clear, but these could be fixed with factsheets. Noted the importance of ensuring people are interpreting the results correctly. Suggested sending out a survey asking people to find facts and say what they are understanding from those results. If they are getting it wrong, then it would need work. Need to help with interpretation as much as possible.	n/a	All on one page, can see everything you need. Discovered that you can select multiple producing countries in this session, thinks that would be useful for their work. Likes the fact that it uses a combination of trade and physical data. Easy to use.

Questions	User 1		User 2		User 3	
	Correct answer / method?	Notes	Correct answer / method?	Notes	Correct answer / method?	Notes
What could be changed to make this dashboard more user friendly?	n/a	Adding explanations for some of the less-obvious commodities (e.g. industrial roundwood). Buttons for downloading graphs/data could be made more obviously clickable by changing the colour or shape of the border (specifically making it more rounded was mentioned). FAQs good but not immediately obvious where they are, could do with adding option at the top.	n/a	Independent data assessor - like the OEDC - to provide unbiased confirmation of data accuracy. Re: organising 1-on-1 teach-ins with countries: Can go directly to national focal points, could get secretariat to open regional and national dialogues, send webinar and then offer one-on-one teach in. UN Women have organised webinars for their gender indicator, not as impressive as the GEIC but there is a precedent of promoting a component indicator in this way. Could also send it through to the Defra focal point. Webinars would be regional - could have a recorded aspect with live Q&A. However, should do it all live to capture most people. Would need to be regional for time differences and translated into the official languages - cost?	n/a	Full dataset is too big to work with. If it was possible to extract just Belgium, that would be good. It would be much better to be able to download the data for a country for all environmental impacts rather than the individual graphs for each impact that you get now. There is a problem with decimals and downloading data. In French commas mean decimals - although he seemed to work this out but could not previously with the larger databases. It would be good to have the source for the data along with the data (e.g. a sheet on the spreadsheet with a pre-written acknowledgement/citation and a link to the dashboard), might forget where it came from otherwise (e.g. Eurostat comes with metadata that explains where it comes from, answers queries and requests to be cited/what to cite).

Questions	User 4		User 5	
	Correct answer / method?	Notes	Correct answer / method?	Notes
How familiar are you with the dashboard?	n/a	Have seen it and played with for 15 minutes.		Not at all
What do you think this dashboard is showing?	-	It shows the environmental impacts of different types of trade between countries. Lots of categories within this (e.g. water use, deforestation). Can also filter by year.	-	Per country looking at variety of metrics that you can filter by (e.g. sustainability metrics), dashboard gives overview and download of results. Temporal (i.e. you look at a specific year) and can change this can use this to look at change over time. No target value - just metric - not clear whether this is good or bad.
What potential uses does this dashboard have?	-	High up in chain of consumption policy (e.g. in government or food retailers). Scientists for analysis, media personnel for informing public, etc.	-	Policy makers, core civil service, setting country targets, checking progress against targets, tracking how country is doing inter-nationally, using data politically (i.e. shouting about areas where you are doing well), using in negotiations. NGOs could use for lobbying - good from an open data perspective. Enables media to use data in a transparent way. Would be less useful for the public to use directly – you are more likely to see it via comms channels (e.g. NGOs/ papers). It should be tailored more to specialists.

Questions	User 4		User 5	
	Correct answer / method?	Notes	Correct answer / method?	Notes
What is the area of deforestation in Australia associated with UK consumption in 2021?	Yes	-	Yes	Used dropdown for producing country.
What is the area of deforestation in Australia associated with France's consumption in 2021?	Yes	-	Yes	-
What is the UK's total blue water use in 2021?	Yes	-	Yes	Tried to search initially in the environmental metric dropdown.
What are the top three commodities responsible for this blue water use?	Yes	Was not initially clear but explored the dashboard.	Yes	-
Which country has the 3rd greatest predicted species loss due to USA consumption in 2021?	-	-	Yes	Looked at compared to other countries initially.
Where does the USA rank in consumption-related predicted species loss in 2021?	Yes	-	Yes	-

Questions	User 4		User 5	
	Correct answer / method?	Notes	Correct answer / method?	Notes
Has this changed between 2021 and 2005?	-	-	Yes	-
Imagine the UK is looking to reduce its environmental impact in Scandinavia (Denmark, Sweden, Norway):	-	Worked it out immediately.	--	-
Which of the three countries experiences the greatest predicted species loss due to UK consumption?	Yes	-	Yes	-
Was predicted species loss lower in Denmark due to UK consumption lower in 2007 than in 2021?	Yes	Switched year instead of looking at graph.	Yes	Switched year.
Which 5 commodities are most responsible for predicted species loss across Scandinavia in 2021?	Yes	-	Yes	-
What year did predicted species loss associated with UK consumption peak in Scandinavia?	Yes	-	Yes	-

Questions	User 4		User 5	
	Correct answer / method?	Notes	Correct answer / method?	Notes
Imagine the UK is looking to reduce its environmental impact of berry consumption (strawberry, blueberry and raspberry):	-	Understood.	-	-
Which of the three has the highest scarcity-weighted water usage?	Yes	-	Yes	-
What is the general trend of scarcity-weighted water usage associated with the UK's berry consumption?	Yes	-	Yes	Reason - out of season berry usage - increased demand - increased scarcity of water.
Which country experiences the highest scarcity-weighted water usage due to UK berry consumption?	Yes	-	Yes	-
Attempts to conserve the Amazon will focus on environmental impacts of consumption in Brazil:	-	Initially added Brazil as a producing country for UK consumption - no help needed to switch to production.	-	-

Questions	User 4		User 5	
	Correct answer / method?	Notes	Correct answer / method?	Notes
Which country's consumption is most responsible for deforestation in Brazil in 2021?	Yes	-	-	-
What are the top 3 commodities responsible for deforestation in Brazil?	Yes	-	-	-
When did deforestation in Brazil peak?	Yes	-	-	-
Can you find the total area of deforestation associated with Ecuador's consumption?	No	Kept looking for Ecuador in consumption list. Decided to do by RoW America.	No	Used the RoW America as a proxy couldn't work out how to get to Ecuador.
Imagine you wanted to know what types of deforestation are covered, could you find this information on the website?	No	Did not understand question initially but then went to about.	-	-
Download a graph showing...	Yes	-	-	-

Questions	User 4		User 5	
	Correct answer / method?	Notes	Correct answer / method?	Notes
What bits of the dashboard did you find most useful/easy to understand?	n/a	Descriptions are clearly laid out; order of the graphs is correct - getting more detailed as you go down.	-	-
What could be changed to make this dashboard more user friendly?	n/a	Note somewhere to indicate you need to switch models. Was not clear initially that you needed to scroll down - some kind of indication to do that (e.g. an arrow)?	-	-