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TECHNICAL REPORT ON

Financially quantifying the benefits of the Agricultural Census

by

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Introduction

This technical paper is part of a series of resource papers prepared in the framework of the development of the World Programme for Census of Agriculture 2020 Volume 2 on operational guidelines. The resource papers will be accessible on the web and linked to the main publication of volume 2 of WCA 2020.

The paper addresses an important challenge for Census Managers in many countries for justifying the benefit of the census of agriculture and making a convincing case for decision makers to allocate required funds to this operation. The paper elaborates on the importance of financially quantifying the benefits of the census of agriculture and main steps and technical approaches that can be considered. It provides an illustration with the application of the techniques in various scenarios and closes with other considerations and some conclusions.

This paper was developed by the ONS UK under an FAO service agreement and was reviewed and revised by the Census Team of FAO Statistics Division. A short summary of the paper is available in Chapter 2 of volume 2 of WCA 2020.

1. Importance of financially quantifying the benefits

Across the world, producers of statistics are coming under increasing pressure to justify the cost of producing statistics. Robust business cases are required, setting out the benefits of producing statistics. The benefits case is often logically or qualitatively clear: numerous critical uses can be cited, often underpinned by legislative requirements. However statistics producers often need to go further than this and financially quantifying the benefits delivered.

This is a challenging area because statistics in themselves do not deliver benefits; it is the use of statistics that delivers benefit - through better and/or more timely decisions by governments, companies and individuals. However, this does not mean statistics producers can avoid estimating benefits – governments and other funding organizations need to decide spending priorities and statistics producers need to provide them with evidence to justify expenditure on statistics (as opposed to other priorities).

Given that financially quantifying the benefits of statistics is not an easy task, before starting, it is important to establish precisely what question needs to be answered and what decision(s) the work will inform.

In most cases, benefit quantification is conducted to inform a cost-benefit analysis. This involves comparing the benefits of a (proposed) course of action to the costs - to either establish the net present value (NPV) or the benefit to cost ratio. The higher the NPV, the better; and the greater the \$ benefit to \$ cost ratio the better. A negative NPV, or a benefit to cost ratio of less than one would indicate that a project is not worth pursuing on economic grounds (it may make sense on other grounds - for example – official statistics may be needed to meet legislative requirements). This financial quantification of benefits (and cost benefit analysis) may be needed to:

- Justify continuing with the census of agriculture
- Evaluate a previous census of agriculture

- Appraise options for delivery (full census versus more frequent sample surveys)
- Justify a new/expanded census of agriculture

The decision being made will influence the work needed. If the work is to justify an existing course of action, there will usually be a good understanding of the statistical outputs and their uses – by both producers and users of the statistics. If the work is to justify a new or changed course of action, there will be less understanding of the potential statistical outputs and uses. Consequently, the latter exercise is more difficult.

It is important to note that the guidance in this section is generic and individual countries may have their own guidance for such exercises – issued by their Ministry of Finance (or similar). The advice in this document should not supersede any guidance issued by individual countries; one of the most important things is to ensure that any cost-benefit analysis or benefit quantification is conducted in a manner that first of all meets the needs of the decision maker responsible for its approval. This paper is based on information from work done on financially quantifying the benefits of the population census by the Office for National Statistics - responsible for statistics in England and Wales, UK.

The differing size of different countries' economies and price variations mean the costs and benefits of running an agricultural Census greatly differ between countries. As such all numbers quoted are indicative and it is the patterns/profiles that are important; the reader should read it with an awareness that this is a generic guidance.

2. Main steps to financially quantify the benefits of the Agricultural Census

This section sets out the main steps to enable financial quantification of benefits, namely:

- Identifying users and uses
- Resourcing, prioritisation and planning the work
- Initial data collection
- Compiling, aggregating and analysing data
- Overcoming reluctance to participate

Identifying users and uses

The first stage in financially quantifying the benefits of statistics is to generate a list of the main groups/categories of users of the statistics. There is no need to identify every user, just significant ones and groups of users. In most cases, this should be fairly straightforward based on regular engagement about issues such as content requirements, structure and format of outputs. There may be user groups or similar; any past consultations may well give a good indication of groups of users.

Depending on data release policies, there may be a register of users or subscribers. If statistics are published on the internet and are available free of charge, there may not be such a register or it may be incomplete. One should be careful not to assume that the only users are those that regularly engage. There may be more users, some just do not (regularly) engage. Also, it should be remembered that those who engage regularly may be personally more interested in the statistics as opposed to organisations that derive the greatest value.

Typically, the user groups that statistics producers will have the greatest engagement with are from the public sector (central and local bodies). It is important not to overlook commercial organisations though. A challenge is that this sector can be disparate with numerous companies

operating in different ways. It is therefore often best to start with representative bodies or trade associations.

It should be reasonably easy to come up with a list of uses from information already held from previous engagement with users. In many countries, user satisfaction surveys are conducted among the users of official statistics; in other countries user satisfaction surveys have a wide scope and may cover all government/public authorities. If there is little information about the uses of statistics, there may be a need for a survey of users or workshops with users to identify uses. However, if this is the case, any collection of additional uses can probably be done at a later stage.

Resourcing, prioritisation and planning the work

It is very likely that there are more uses and users than resources (time, staff and money) available for the work. Judgement will be needed to prioritise the users and uses that are likely to derive the greatest financial benefit from census data.

In all cases, the work requires input and/or data from users. This inevitably involves arranging meetings and sending documents to users and chasing up responses, (the time this can take up should not be under-estimated). This work is much better done over a longer time frame than in an intense burst: a day a week for five months is likely to yield better results than five weeks continuous effort.

Initial data collection

Data from users will be needed. Ideally, this will be data that directly gives financial values but, more likely, it will be data that enables calculations or informs next steps. There are three main routes for this data collection:

- Desk based research
- Surveys
- Meetings/workshops

In any of these, the questions to answer are:

- What are the significant uses of Census of Agriculture data?
- To what extent does data usage affect outcomes/decisions?
- What is the estimated financial value of those decisions/outcomes?
- What is the contribution of census of agriculture data to those decisions; hence what is its estimated financial value?

Desk based research may help identify uses and users but it is unlikely to help with the financial quantification of benefits.

Information from previous user satisfaction surveys should be used if available – either directly (if appropriate questions have been asked) or indirectly (identifying users that may be able to provide assistance). It may be possible to use future user satisfaction surveys to ask questions about the financial value of use of the statistics – it could be a module or questions asked to a subset of users. If information is not available from user satisfaction surveys, specific surveys may be worth conducting. This is appropriate where:

- There is a large user base (and information on it).

- Individual users in themselves are unlikely to derive material financial benefit.
- Cost and time makes meeting numerous users not possible.

However, the response rate may be poor and, given the topic can be hard for users to relate to, there may be some poor quality responses.

Face-to-face meetings and workshops are always the most effective method to get the attention of users and enable discussion of the topic in more detail. This approach is definitely recommended for significant users of the statistics (for example – government departments).

Surveys and face-to-face sessions can be combined:

- Use a survey initially as a low-cost way to gather data. Follow up the survey with face to face meetings with respondents that have provided the most detailed/useful responses
- Use face-to-face meetings or workshops to get initial value estimates then survey others to get agreement/corroboration of the estimates

Compiling, aggregating and analysing data

The above will result in potentially a large quantity of information which needs to be collated and prioritised. Some form of database or spreadsheet is essential; suggested fields for each record are:

- Use
- Estimated value of sector/decision¹ (note – not benefit value)
- User (organisation, contact, contact details)
- Estimated contribution of user to sector/decision (%)
- Basis for benefit calculation (probably not known at this initial stage, details follow in section three)
- Estimated benefit (probably not calculated at this initial stage, details follow in section three)
- Link/reference to source information (survey return, meeting notes, website references)

It is recommended that analysis is conducted on an ongoing basis, and not to wait until all data is collected especially if conducting meetings or workshops - analysis can be used to re-design future meetings.

The main initial piece of analysis to conduct is an assessment of which uses have good quality data and which ones may have potentially large benefits but little information is available (and a different data collection approach may be needed). It is also worth identifying uses where there is considerable data but benefit values are likely to be low.

Overcoming reluctance to participate or assist

Sometimes users need to be told assertively upfront that the benefits of the agricultural census need to be financially quantified in order to secure its ongoing existence and, that without their assistance this is going to be difficult. Users may need to be told that their evidence is needed to

¹ This can often be obtained from government accounts for the public sector and official statistics on businesses and industries for the private sector.

make the case and that if they cannot provide evidence that the Census of Agriculture delivers tangible financial benefits Census managers will be unable to convince senior government officials/ministers that they should fund this projects.

3. Techniques to financially quantify the benefits of the Agricultural Census

This section sets out a number of techniques that can be used to financially quantify the benefits of the census of agriculture. Which ones are best to use will depend on the use of the statistics, the data available and the ease of engagement with users.

The approaches are:

- Direct estimate by users
- Willingness to pay
- Costs avoidance
- Estimating value added
- Deriving total benefits

Direct estimate by users

The simplest approach is to get a direct estimate of the value of census of agriculture data from users. Some users may be able to financially quantify the benefits from the Census of Agriculture without assistance. However it is more likely that users find it hard to value the data to their organisation; how to value data is not a question they will have considered. In some cases the data is free to the user. This can either be because it is released to users free of charge (or for a nominal fee) as is the policy for the release of statistics in many countries or because it is free to them (as their organisation or company pays for all data by subscription etc).

Users find it much easier to react to a value than to propose one themselves. So, rather than asking an open question, ask about a value or a range; rather than asking “how much is this dataset worth to you?”, ask “is this dataset worth \$1000 to your organisation?”. In response to this question, there may be a clear consensus amongst users that it is worth more or less than this amount. In these cases, try another value and iteratively arrive at an answer (“if worth more than \$100, how about \$200? ... if less than \$200, is it worth \$150?”) and so on.

This approach is worth trying as it is the most straightforward, however it is rare that users can give a valuation and it is more likely that other approaches will be more successful.

Willingness to pay

A standard economic technique for estimating the value of a good or service is to establish how much the recipient would be ‘willing to pay’ for it. This may be different to the actual amount they currently pay which may be a nominal charge or free. For example, a dataset may currently cost a user \$100. If however, that dataset enables them to increase income by \$1000, in theory they should be willing to pay up to \$1,000 for that dataset. In reality, they will normally need the income generated by a good or service to exceed the costs of producing that good or service so the value they may be ‘willing to pay’ could be more like \$500.

One use that this approach is particularly suited to, is valuing expenditure on research. Statistics are often used in research. Research, like statistics, is very hard to value. An approach is to look at research commissioned solely using Census of Agriculture statistics and look at the cost of this research. In this way benefits of the statistics can be valued indirectly on the presumption

that the output of the research is worth, to whoever commissions it, at least the expenditure on it.

Information on research conducted can be gathered through either contacting the major sponsors of policy research (usually government departments or other public bodies) or by surveying universities (usually the major conductors of research).

Establishing willingness to pay is straightforward in theory but somewhat harder to apply in practice for a number of reasons. Potential barriers to getting assistance from users and mitigations to take are set out below:

Table 1 – Barriers to using willingness to pay approach and mitigations

Barrier	Mitigation
The question arouses suspicion. Although the question may well be posed to users as a result of a genuine attempt to financially quantify the financial value, it may be perceived as a precursor to an introduction of, or increase in, charges for data. Given this, users will be liable to understate the value of the data to them.	Get a clear written statement from someone senior and credible in the organisation to clearly stipulate the purpose of the survey, emphasising that data is being collected to assess the cost-efficiency of the census and to provide the government/funding authority with the evidence of the usefulness of agricultural census data for the society. The statement should then confirm that there is no intention to use this work to increase or introduce charges.
Commercial confidentiality. Commercial organisations will be using census of agriculture data to make business decisions. They may not want to disclose how they use the data or how much value they attach to it due to concerns about giving advantage to their competitors.	<p>Offer to make inputs anonymous “a buyer from a large food producer” rather than naming the firm.</p> <p>Rather than speaking to individual companies, speak to representatives from trade bodies – they can generalise across an industry.</p> <p>Speak to people who have recently retired from an industry – they may well be much more willing to discuss use than those currently in the market. If doing this, establish whether information can be attributed to a particular company or whether it should be unattributed. If the latter, explain that this is for commercial confidentiality reasons,</p> <p>Depending on the work’s audience, confidentiality may be ensured (if this work is only being used for internal justification rather than published).</p>

Cost avoidance

An alternative approach is to establish what resources are saved because an agricultural census supplies the information users need. If the census of agriculture did not exist, what resources would be spent on alternatives – would (local) government agencies commission their own census or survey and how much would this cost? Would they commission research or commit staff time to research on trends or updating previous Censuses or surveys using modelled data? This may get data of equivalent quality to a census, but more likely would be a less suitable (so lower benefit) data source. One of the advantages of this technique is that estimating costs is usually easier than estimating benefits directly. Estimates can be built up from known costs of staff time or purchased data.

The financial benefit is the costs avoided through the provision of statistics from a Census of Agriculture. They will inevitably be an underestimate of the real value because:

- They are unlikely to be the full benefit; it is doubtful an agency would spend, say, \$10,000 on a survey if it only delivered \$10,000 of benefit, they would probably want a return on investment of at least two to one to justify the expense (given other competing priorities).
- Estimates will only relate to the value to the one user who commissions the work rather than the wider user base.
- Any surveys or work relating to a subset of the scope of a full census of agriculture do not bring the benefit of comparability that a national consistent exercise has – thereby reducing overall benefit.

This approach is likely to be most appropriate to government agencies – central or local. This is because they are often interested in a particular sub-set of the statistics. For central government agencies, this may be particular variables, for local government; this may be the entire output set for the geographic area for which they have responsibility.²

Estimating value added

For many uses, particularly those involving decision-making or investment appraisal, statistics are used alongside other data and expert knowledge. The financial value of the decisions influenced by the statistics may be considerable but this whole value of the decision cannot be attributed to the Census of Agriculture. The question is “how much more efficient do the statistics make decisions?” or “what proportion of the expenditure is directly attributable to the census data?”

These questions can only be answered by engaging with users; this can be done with individual users or groups. An effective way can be to derive proportions in a workshop setting when the issue can be extensively discussed, come up with a consensus amongst those present then ask others to endorse or disagree with the findings. The last step can then be done remotely/electronically – saving time and cost.

The steps to follow to financially quantify the benefits are:

- Estimate the turnover of the user group (for example, Ministries, academia, think-tanks, input suppliers, agro-industry) or value of the decisions
- With sector experts, estimate the role that data as a whole contributes to the sector/industry/decisions. Bear in mind that even if the work is based on use of data, a substantial proportion of the value is attributable to the intellectual capital and added value of those who interpret and apply the data.
- Of the proportion of the sector or decision’s value attributable to data, estimate the proportion attributable to census of agriculture statistics.³
- Use these estimates to derive an estimated value for the contribution of censuses of agriculture statistics.

² *In establishing the benefits of the England and Wales population Census, this approach was used to value some local authority services. It was also used to estimate the benefit to the retail sector in planning store location – without population data, they would need to do their own (expensive) field work to profile an area rather than a desk-based profiling based on statistics.*

³ *The second and third bullet points could of course be combined, but is it easier to work through these type of calculations step-by-step as it leads to more accurate assumptions and enables challenge and discussion of each contributory step.*

Broadly speaking, there will be two types of use/decision

- Uses/decisions/businesses founded on Census statistics – they could not happen without them. For example businesses conducting data interpretation and presentation - specialist data analytics companies or consultancies.
- Uses/decisions that are informed by Census statistics to make them better but could happen without the Census.

For decisions founded on data (e.g. analysis of data to inform export policies), discussions should be straight-forward. The data users are likely to be very aware of how they use Census statistics because it forms an integral part of their work. Collectively the value of data to the decision, as opposed to interpretation needs to be agreed then the contribution of Census data relative to other data sources.⁴

Sectors where data use is not the core business but Census of Agriculture data is used to inform business decisions (for example by farm machinery suppliers) may be harder; the challenges being that the data interpretation is often done by parts of the organisations to support others so assessing its importance to decision making is difficult. In these cases, there should be more success from engaging with sector experts and representative or trade bodies rather than staff from individual bodies / companies⁵. The proportions derived in these situations are likely to be low, but these are potentially in relation to large amounts of expenditure. The efficiency improvement from improved agricultural policy due to use of statistics from a census of agriculture may only be small (<1%) but if it is a small proportion of a large amount, there will still be a considerable benefit value.

It can be expected that the values attributed to capital investment decisions to promote agricultural production are much higher (maybe 10 times) than those attributed to revenue expenditure. This is because capital investments have discrete options (the benefit of making the right decision compared to an alternative can be great) and cannot be quickly changed. For example, once an irrigation system is built, it cannot be moved whereas spending on staff advising farmers can be switched from one topic to another or from one geographic area to another.

The following table show indicative benefits for uses that are reliant on Census of Agriculture data and where it is used to increase value/efficiency. It shows indicative values and demonstrates the point that the value of the benefit is a product of both the value of the decision/sector and the importance of the statistics. The value of statistics can be high if they have a small impact on large financial decisions.

Table 2 – Example of benefit calculation

Sector	Value of sector (A)	Contribution of data to sector (B)	Contribution of census of agriculture data - out of total data (C)	Benefit attributable to census of agriculture data (A x B x C)
High usage – export policy making	\$10m	40%	20%	\$0.8m
Low usage – agro-machinery supply	\$20m	2%	20%	\$0.8m

⁴ In ONS work to quantify the benefits of the population Census, this worked well with sellers of geo-demographic profiling products. They combine data from the Census with other data (e.g. credit referencing) to profile areas. The Census is an essential component, as is other data and, as is, their intellectual capital in combining and interpreting the datasets.

⁵ ONS engaged with trade bodies or industry experts to estimate the financial value of benefits to the retail, market research and, advertising sector

For each sector/usage discuss the final values and underlying assumptions with sector experts or the wider sector for corroboration, and adjust estimates as necessary. It is always easier to get feedback on figures than to get estimates in the first place.

Deriving total benefits

It is very difficult to individually estimate the benefits to all users or to all sectors. More probable is some estimates for some uses. The database/spreadsheet suggested above under point 3 (compiling, aggregating). will contain this information. It can be used to calculate global benefits. Given that it is easier to get users to react to estimates than make estimates, apply an iterative approach across similar sectors and similar uses. The following table suggests approaches for different situations:

Table 3 - Approach to deriving total benefits

Situation	Approach
Around 50% of sector quantified	Ask users where benefit values have been calculated if they are typical of the sector. If they are, apply benefit as a proportion of the sector quantified to the value of the whole sector. If not, apply an adjustment to reflect greater/lesser use to estimate the value to the rest of the sector.
5% of sector quantified	This is a low proportion to make assumptions about the whole sector without corroboration. Contact other users in the sector, using this value and invite challenge. Use this to make a more informed estimate.
0% of sector quantified	Consider other estimates and determine which sectors are most similar and use values estimated for them. For example, with an estimate that the census of agriculture increases efficiency of a use by 0.5%, look at similar sectors, analyse and discuss the differences and similarities in usage with users and use this to derive further estimates. If there is no comparable sector and no further data collection possible, do not guess a value.

Techniques not to use

- Secondary (indirect supply chain or induced / multiplier) effects should not be included in the benefit calculations. If a company uses census of agriculture data to increase its revenue, a proportion of that revenue can be attributed to the data. However, secondary effects such as the company employing more staff, those staff spending money and paying taxes and thereby boosting the overall economy should not be counted. These are excluded because although the economy is being positively impacted by the use of census of agriculture data, it is impossible to estimate the extent to which this is additional economic activity or displacement of other activity.
- Estimates based on assumptions not supported by empirical evidence should be avoided, it is vital that all assumptions have some degree of underpinning evidence. Judgement calls and assumptions have to be made but they must have some underpinning evidence. Including unsupported assumptions risks undermining confidence, not just in those particular calculations but the wider work. Where evidence is limited, sensitivity analysis should be used to examine the impact of changing assumption values.

4. Application in various scenarios

Using statistical quality assessment to determine value

Decision makers may want to use benefit quantification to inform a decision about what option to take with regard to production of agricultural census data, for example whether to conduct a full ten yearly agricultural census or a (possibly more frequent) sample survey. This is more complicated than a straight quantification of benefits as the benefits to users will be different between different options (and different uses and users may derive differing benefit).

In such cases, it is best to first financially quantify the benefits of the current method (as that is what is best understood). Having derived values for the current method, adjustments can be made to reflect differences in quality that will result from a change to the delivery model. This can be structured using the UNECE Dimensions of Statistical Quality⁶:

- Relevance – the degree to which statistics meet the needs of current and potential users.
- Accuracy – the closeness of statistical estimates to true values.
- Timeliness – the length of time between data being made available and the event they describe
- Punctuality – the time lag between the release date of data and the target date when they should have been released.
- Accessibility – the physical conditions in which users can obtain data: where to go, how to order, delivery time, clear pricing policy, availability of micro or macro data, availability of data in a variety formats.
- Clarity – whether data are accompanied by sufficient and appropriate metadata, whether illustrations such as graphs and maps add value to the presentation of the data, and whether information on data quality is available;
- Comparability (over time and across geographies) - the extent to which differences between statistics are attributed to differences between the true values of the characteristic, or to methodological differences.

When comparing different options for meeting a need, it is unlikely that the punctuality, accessibility or clarity will differ – they are all in the producer’s control and should not differ between delivery options (unless for example, there is a greater lag between release of a Census than a survey due to greater data processing). Comparability may be reduced through a change in method if it affects outputs making comparisons across time less robust or if it entails changes to output geographies.

Alternative options

So, the critical dimensions to consider are relevance, accuracy and timeliness. To estimate the benefits, an understanding of the relative importance that users attach to these dimensions is needed. In an ideal world, users will want statistics to cover all the data they need, that data to be totally accurate and to be issued very shortly after the reference date. This is neither feasible nor affordable; trade-offs have to be met. Broadly speaking there are three options to compare:

- A ten yearly full unit level Census
- Annual sample surveys (with no Census)
- A ten yearly full unit level Census and an annual survey

⁶ <http://unstats.un.org/unsd/dnss/docs-nqaf/UNECE-Quality%20Improvement%20Programme%202010.pdf>

The following table shows their characteristics:

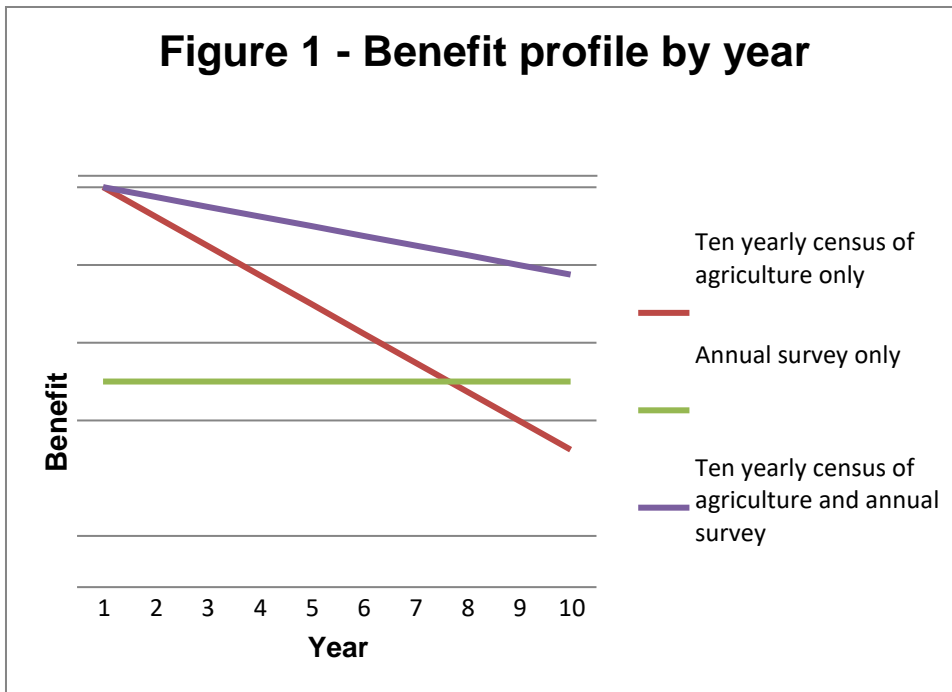
Table 4 – Options for delivery of statistics

Feature	Dimension of statistical quality	Option		
		A - Full unit level Census	B – Annual sample survey	C – Census and annual sample survey
Frequency of data collection	Relevance	Ten-yearly	Annual	Annual
Frequency of outputs	Relevance	Ten-yearly	Annual	Annual
Ability to respond to changing user demand	Relevance	Low	High	High
Geographic details of outputs	Relevance and comparability	Full range of variables at low geographic area	Full range of variables at a high level of geography	Full range of variables at low geographic area, some updated annually ⁷
Accuracy at point of release*	Accuracy	High	Low	Medium
Accuracy shortly before next release ⁸	Accuracy	Medium	Medium	Medium/high

The ten yearly Census gives accurate detailed statistics but that accuracy will decay over time between releases. An annual survey can be usually less accurate and detailed but has the advantage of regular outputs. Some countries have an annual survey programme supplemented by a complete enumeration through a Census of Agriculture every ten years. This model addresses the inherent weakness of the ten yearly model; namely that the data becomes out of date. In such an instance, the benefit values would hold constant or only suffer a slight decline over the decade. The following figure gives an illustration of the typical benefit profile over time:

⁷ *This will depend on the precise design. It could be to provide frequent updates to the Census statistics or used for a different purpose (for example: the Census variables are structural/essential while survey variables are usually non-structural/current.*

⁸ *A feature of any ten-yearly system is that even if the data is accurate at the point of release, after ten years it is likely to be less accurate.*



The challenge is to establish the extent of the decline in value over time (the gradient of the lines in the figure). Assuming, the current system is a ten yearly census of agriculture (A) but an assessment of the merits of either moving to an annual sample survey with no Census (B) or an annual survey to supplement the Census (C) are being considered. Having first established the value of a use of the data (best done as an annual value in the peak year), work with users will be needed to establish, for alternative B:

- The extent to which value currently decays across the decade – are users still using the outputs after 8 or 9 years or are they using an alternative data source?.
- What level of accuracy and geographic detail drives the value?. If users are only using aggregated data, then producing outputs at lower levels of geography is not adding any benefit

And for Alternative C:

- Whether usage reduces over a decade or stays the same?
- Whether users make greater use of other data/information toward the end of the decade or not?
- Whether confidence in decisions diminishes or not over the decade?

Taking the three options above and assuming the benefit in year one of a ten yearly system is \$1m, there might be simulated benefit profiles along the lines set out below.

⁹ Year 1 in this table is the year of dissemination, this may be some years after the data collection. Benefits are not realised until the statistics are released. Given the value of statistics typically declines over time, benefit can be increased by disseminating earlier.

Table 5 – simulated benefit profiles over time – census compared to surveys

Benefit value (\$000)											
Option	Year 1 ⁹	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Total
Use one – detailed low level data drives value and usage reduces slowly over a decade. Higher level data would not be nearly so useful to users											
A	1,000	950	900	850	800	750	700	650	600	550	7,750
B	250	250	250	250	250	250	250	250	250	250	2,500
C	1,000	975	950	925	900	875	850	825	800	775	8,875
Use two – data is used at an aggregate level but after five years is too dated so not used. The loss in accuracy from a sample survey does not greatly reduce year one benefit											
A	1,000	800	600	400	200	0	0	0	0	0	3,000
B	750	750	750	750	750	750	750	750	750	750	7,500
C	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	10,000
Use three – currently the benefit from data decays to zero over the decade, an annual survey would only yield half the peak benefit due to lower detail and accuracy											
A	1,000	900	800	700	600	500	400	300	200	100	5,500
B	500	500	500	500	500	500	500	500	500	500	5,000
C	1,000	950	900	850	800	750	700	650	600	550	7,750

Given the benefit values differ over time, it is very important to assess benefits consistently between options. This means estimating the benefits over, at least, the lifetime of option that delivers the least frequent statistics (probably ten yearly). In conducting a cost-benefit analysis, future benefits (and costs) may need to be discounted¹⁰ to give a current value that takes into account the preference for immediate as opposed to future benefits.

5. Other considerations

Engagement with decision makers

In most cases, the financial quantification of the benefits of the census of agriculture will be used to justify the expenditure to a decision maker either within the statistics office or in a central finance department at ministerial or upper/governmental level. It is therefore vital that they are brought in to the approach.

Benefit quantification is not a precise science; assumptions need to be made. Be upfront with decision makers about assumptions. It is entirely appropriate to make assumptions; the question is “are the assumptions reasonable and credible?” To ensure they are, wherever possible get third party buy-in to input values used. Perform sensitivity analysis on assumptions to establish how changes in assumptions impact conclusions. Decision makers may challenge the value of assumptions but they will be more content if it can demonstrated that conclusions hold even if assumptions are, say, 20% out.

It is best to discuss the proposed approach with decision makers before commencing significant amounts of work. This can bring several benefits:

- Incorporate their views from the start
- They may have extensive experience of this type of exercise and so can give genuine advice on how to conduct analysis
- They know how they want the analysis presented and may have templates or examples of previous good practice that can be utilised (saving work).

It is important if possible to keep them updated as the work progresses. This will enable early identification of any issues, saving time later. It also makes it harder for them to challenge findings later on, as they have seen and endorsed earlier versions of the work. The objective is to justify the census of agriculture but avoiding making over-ambitious estimates or estimates not supported by empirical evidence. If a reviewer challenges a particular number or estimate and it cannot be justified satisfactorily, it will undermine confidence in all the numbers – irrespective of whether they are more robustly justified or not.

Benefits that will be difficult to financially quantify

Financially quantifying benefits is difficult for all uses but some are particularly difficult:

- Good quality data influences scientific, national and informed general political debate. It is not possible to put a justifiable financial value on this debate, public debate may also lead to changes in government policy and decision-making.
- Statistics are highly valued by journalists and academics. Putting a financial value on this interest is impossible.
- Credibility is hard to financially quantify, data produced independently and objectively is valued by users.

One particular aspect that is hard to financially quantify is the social and distributional impacts of better policy making and the role data plays in that. The consequences of poor decision-making will differ across the World; in some countries – it will impact prices and overall efficiency, in other countries it may be a matter of life or death. The impact of poor decisions may be especially felt by vulnerable groups including children, women, older people, disabled people and those in poverty. These issues need to be clearly set out in any ‘business case’ but attempting to put financial values to them is challenging technically and ethically/morally.

Benefits of statistics are realised by users. The more users and the more they use the data, the greater the benefit. Greater benefit can therefore be achieved by expanding the dissemination of and facilitating the access to census results.

6. Conclusions

Financially quantifying the benefits of statistics is difficult but increasingly necessary to robustly justify the cost of producing statistics. Given that this is a difficult exercise, it is important to be clear about what question needs answering before starting work and to agree the approach with the commissioner of the work or decision maker upfront. Engaging with users is essential for getting data, corroboration and ensuring the work is objective.

Various techniques can be used and different techniques are needed for different uses and users. Assumptions have to be made and these should be clearly stated. Ensure all assumptions have some underpinning evidence. Where there is no evidence, do not attempt to guess a financial value for benefits – this will undermine the work.

¹⁰ The discount rate applied can heavily impact the values. Ensure that the rate used is a standard one approved by the Finance Department / Ministry (for example, in the United Kingdom, 3.5% is mandate