BID-REX
Interreg Europe

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Capacity building for decision makers and data providers

19-21 June, 2018, Norfolk

1 Introduction

This document summarises the main topics developed during site visits (19th -20th June 2018) and an international participatory workshop (21st June) hosted in Norfolk (UK) with the participation of over 50 people from 26 organisations covering the 7 regions represented in the project.

The site visits and workshop were organised by Norfolk County Council, in collaboration with University of East Anglia, to develop further the themes presented in the previous thematic workshops.

1.1 Focus of the site visits and workshop

Two days of site visits were organised to present talks and demonstrations from key stakeholders and actors from the biodiversity data community in the UK. Organisations and speakers were chosen to reflect requests by the project partners and through the identification of good practice. All presenters were chosen on the basis that they were able to illustrate a measure of capacity-building on themes that had been identified in previous workshops as being key to the delivery of successful action plans through the BID-REX project.

The workshop developed these themes further with project partners and stakeholders presenting and exchanging their experiences of building capacity across a variety of themes.

2 The themes

The previous workshops identified a number of key themes considered essential to ensuring that biodiversity data can be effectively used by decision makers. In order to bring together examples of good practice, and to direct discussion, the site visits and workshop were built around the following themes:

- How do we build capacity to gather the data we need?
- How do we increase our ability to verify these data and ensure accuracy?
- How do we build trust in our data?
- How can the engagement of data providers be ensured now and into the future?
- How do we ensure access to taxonomic expertise now and into the future?
- How do we increase our capacity to deliver data to decision makers?
- How do we build our capacity to interpret data to answer the questions we are asked?
- How do we ensure our data and tools can help decision makers to make the right choices now and in the future?

The UK partners used examples of good practice identified during Local Stakeholder Meetings and other events to identify participants. Project Partners from other regions also identified key stakeholders and organisations that were of particular relevance, and where possible, their participation was arranged.

The following document outlines the key points that were presented and discussed around these themes. They are shown as separate topics but it should be noted that many of the good practices and suggested solutions to the themes are cross-cutting, and if implemented effectively, have the potential to provide multiple benefits.

3 Building capacity

In order to build capacity for data providers and decision makers it is important for us to know where we are starting from. We need to understand:

The data we hold

Is it fit for purpose? Does it allow us to answer the questions asked of it? Is it accurate? Does it have any gaps?

The needs of our users

It is essential that we understand the needs of the actors and stakeholders involved. Are the questions they are asking clear? Have we understood the policy drivers of their questions? What is their ability to understand our answers? How do they want to receive the information?

The actors

We need to consider what capacity needs to be built for those involved in data collection, data management, and decision-making. There may be varying levels of understanding and skill involved. Some users may want high resolution "raw" data, others may want simple, interpreted, well-designed maps. Understanding the audience is key to effective information delivery.

4 Learning outputs

The site visits and workshops used the questions shown above to investigate the current situation, generate discussions on approaches to take, and demonstrate ways in which partners and stakeholders are already taking action. The responses to the questions are outlined below, alongside examples of good practice presented during the meeting.

4.1 How do we build capacity to gather the data we need?

The first step is to understand what we need. Previous workshops have examined the ways in which we need to engage with data users and decision makers to understand their needs. However, these are often framed around very specific questions. To effectively gather data and build our capacity to do that, there needs to be a wider consideration of the appropriate approach or approaches to take. This can vary from localised single-species recording by taxonomic experts, to large-scale citizen science participation recording multiple taxa across whole regions. Both can provide answers to questions, but it is likely that one will have many more uses than the other. The former being of use for limited purposes and the latter offering more potential for providing answers to a variety of questions.

Once we have decided on the data that is needed, careful consideration then needs to be given to the process for holding and managing the data. There needs to be clear data-flow pathways to ensure that data is moving from collection to validation and verification, and from there on to a platform where it can be easily accessed by users. This process has been explored in detail during the previous workshops.

Alongside this there needs to be a known accuracy in the data to ensure that it can be trusted. This will ensure that decision makers can be confident that they are making properly informed choices.

These themes are developed further in the responses to the questions discussed below, but in summary, the key priorities around data gathering are as follows:

Clear data-flow pathways

It should be clear where data needs to go. This is often easier for specific projects than general biodiversity data collection. Processes should be well advertised to ensure that data providers know how, and where, to submit data. Equally important is that data providers and users know where it will end up and how to access it.

Good systems

We should provide easy-to-use ways of gathering data. These should work for both data providers and managers. The data should be easy to submit, with standardised formats and intuitive interfaces. It should also be easy to extract from the system for publication and sharing.

One stop shop

Ideally, data for a region should have a single end-point. This could be where all data is stored in its original state (full resolution, all attributes). It could also be a public facing portal with “blurred”, open data that acts as a way of signposting users to the information available from the data providers. Either way, there should be a clear mechanism for users to acknowledge the data provider and gain access to the underlying datasets and metadata.

Data licencing

Any potential restrictions on the use of data need to be considered at an early stage. Will the data be open and freely available for any user? Or will it be shared with restrictions on use, such as for non-commercial purposes only? These questions will often be answered by the original collectors of the data or the funders of that collection. Clear metadata and licences for data users are needed.

Demonstrating good practice

National Biodiversity Network (NBN) Atlas (UK) - https://nbnatlas.org/

- The NBN Atlas revolutionises the use of UK biodiversity data, enabling it to be shared, analysed and researched
- The NBN Atlas is an online tool that educates and informs people about the natural world
- The NBN Atlas holds data on marine and terrestrial species
- The NBN Atlas allows users to interrogate species records and download distribution maps
- The NBN Atlas makes UK biodiversity data compatible with other countries' biodiversity data, and allows users to compare and share data globally

Identifying the skills we need

To improve the quantity and quality of the data available, we need to assess where we have skills gaps. Regions may have existing groups to collect data and as a result have a base to build capacity from. In other areas, we may be starting from nothing. The resources needed will be very different, as will the time taken to reach the desired end point.

Identify the gaps that need filling

Are there data that we are missing? Do we have the spatial, temporal, and taxonomic coverage that we need? Have we recognised spatial biases based on the location of populations of recorders or favoured locations for recording? Are there taxon biases due to the popularity of certain groups (e.g. birds) or the difficulty of identification or need for specialist equipment and techniques (e.g. beetles). Policies around protected species can also create biases in the taxonomic coverage of our data. Are we only focussing on the rare species rather than building comprehensive datasets that can detect changes?

Find the lost data

Data is often collected and used for a limited purpose, such as Environmental Impact Assessments (EIA) during infrastructure developments. We need to develop mechanisms that ensure that this data is collected and made available through our systems. Likewise, data collected for academic purposes should be made more easily available. There should be a presumption of publication of all data, particularly that which is being funded by the public. We need to investigate if it is possible or appropriate to move towards a system of making data publication for certain purposes compulsory.

Move to open data approaches

Where possible, we should embrace open data systems. This does not mean that all data can or should be open but we should strive to make as much of it available for as wide a range of uses as possible. Often it may be appropriate to provide coarse resolution open data based on the full resolution data with access to the latter bringing a charge that supports its collection and maintenance.

National and local recording schemes and societies

The UK has a model of national and local recording groups that can offer an example for other regions. Mid- to long-term, we need to invest in groups starting from a well-supported, centralised baseline, and building to create groups that feel confident and able to support themselves.

Show the benefits of data sharing

In some regions, the common benefit of sharing data is better understood and embraced more widely. In others there is less altruistic approaches to data sharing. We need to communicate the benefits of making data more available to help to change this mentality and create change within the recording community. We need to publicise the benefits to get people to contribute to the collective.

Work with partners

A culture of working with partners from other organisations and the wider public can help to build a community and provide a support network. This needs to include empowering the people to see the value of what they can achieve. It also needs to work the other way and demonstrate to specialists, who are often reluctant to trust the quality of the data collected, the value and abilities of the volunteer network.

Using the local to understand the global

Local recording can inform global decisions. Often, volunteer recorders are involved because they have an interest in their local area rather than a desire to record wildlife for the greater good. They often feel a geographic identity and a sense of pride and interest in “their” nature. We need to use this to understand motivations and to help bring together these individuals into a network that can provide the data we need.

4.2 How do we increase our ability to verify these data and ensure accuracy?

The accuracy of the data that we use to inform decisions is key. If we are to make properly informed decisions and ensure trust in our data, then it needs to be of a recognisable quality. The way in which this quality can be assured is largely dependent on the type of data, so it is important to understand its origin. If the data has come from citizen science with a wide range of unknown and potentially unskilled recorders, then this poses a different challenge to structured, systematic recording by experts. The size of the dataset being gathered is also of relevance to our ability to verify the information. For instance, large and varied datasets may need a range of taxonomic experts to undertake the verification.

With robust systems in place to validate and verify the quality of data it is more likely that decision makers will trust the data and its providers.

A number of methods for effectively verifying data prior to use were identified during the site visits and workshops. Key actions stemming from these methods were identified for successful capacity building, and can be summarised as follows:

Use standardised data formats

These ensure that all required fields are captured and can be transferred easily between systems.

Demonstrating good practice

In the UK, the NBN Atlas uses a data format based on 'Darwin Core' to ensure that data is compatible

https://docs.nbnatlas.org/guide-to-the-nbn-atlas-occurrence-record-upload-template-for-species-datasets/

Demonstrating good practice

Darwin Core - https://dwc.tdwg.org/

- Darwin Core is a standard that includes a glossary of terms intended to facilitate the sharing of information about biological diversity by providing identifiers, labels, and definitions
- Darwin Core is primarily based on taxa, and their occurrence in nature is documented by observations, specimens, samples, and related information

Use well-designed data capture methods

Ensure that recorders know what information is needed to make sure records are valid and verifiable. Apps and online recording systems can ensure that all necessary information is provided before data can be submitted. Digital recording can also allow images, sound recordings, and other useful information to be provided.

Demonstrating good practice

Indicia - http://www.indicia.org.uk/

Indicia provides a solution for developing online biological recording. It comprises a toolkit that simplifies the construction of websites, Indicia supports wildlife observation recording forms that are as simple or advanced as you need, allow photo upload, reporting, mapping, and verification of the records. By providing these facilities via a comprehensive set of highly configurable components, Indicia can be used to build diverse and unique recording solutions, which avoid reinventing the wheel and minimise the cost of development.

In the UK Indicia currently provides solutions for.*5 million records covering 500 datasets across 70 websites.*

Use clear verification processes

It is important that users are able to see the process that has been followed to ensure the accuracy of the data. This should be a key part of any metadata statement.

Train and support data providers

It is particularly relevant to beginners, but important for all recorders, to understand how to capture data effectively and accurately. This should include support with identification.

Build a network of verifiers

Access to taxonomic experts who can confirm the accuracy of data is essential. However, there is a need to build tools to help them to process large volumes of data. They need to focus on the difficult to identify, rather than widespread, species that can be easily recognised.

Use the data to check itself

Large datasets can "check" themselves. If distributions of species can be determined from existing data, then species' records falling outside of the known range can be flagged for verification. Likewise temporal data can be used to flag incorrect identifications based on the time of year.

Provide feedback and show the value of providing good quality data

Thank those who gather the data. Engage with recorders to show the value and uses of the data that is collected. Demonstrate the use of data and how its application has a direct impact on decisions. Give a sense of meaning and connection to data.

Publish good practice

Devise and publish guides (e.g. for 'Bioblitzes') to ensure that all data collected can be used. These should give clear guidance on how to gather information, how to verify it, and where it should go.

4.3 How do we build trust in our data?

As discussed above, the trust that decision makers have in our data is largely dependent on its accuracy. Verification provides us a means to ensure that accuracy, but that is only part of the process in building trust with our users. Alongside this there is a key role for data managers in explaining and communicating the ways in which data can be used. This should include clear messages on the quality, quantity and coverage of any datasets. It should also provide information on why and how the data was collected.

The key actions identified for effective capacity building can be summarised as follows:

Produce metadata statements

Clear information should be available on the coverage – taxonomic, spatial, and temporal – of the dataset. This should be regularly updated for long-term datasets. The reasons for data collection and the type of survey should also be included (e.g. Bioblitz, citizen science, academic).

Provide clear messages on what the data can do

It should be clear that the data is fit for purpose. It is also important to be clear what the data does not do. For instance, a blank spot on a map means 'no data', not necessarily 'no species'.

Show that all data is valuable

Experts and academics sometimes query the role of citizen science data. Communications about the vital role of different providers in producing quality data are important in building an efficient recording network.

4.4 How can the engagement of data providers be ensured now and into the future?

Regardless of the systems in place to gather and verify data, the long-term supply of high quality information is, at present, largely dependent on citizen science and volunteer recorders. Whilst funded recording does take place, this is often restricted to key protected species, habitats or sites. In order to ensure large-scale, widespread, multi-taxa recording we need to engage with these volunteer networks in an effective way that supports and nurtures their efforts.

The key ways in which the resource can be built were identified during the site visits and workshops and can be summarised as follows:

Recruitment

Encouraging people to get involved is key to building the resource available. Volunteer capacity can be increased or improved by involving people in specific projects. Often volunteers are involved because of an interest in their local area. Supporting and investing in them can develop their interest in the wider network.

Keeping people motivated

This is the most important factor. In order to keep people actively recording it is often necessary to offer them opportunities to take part in new projects. However, if the aim is to develop a long-term recording network, then there needs to be ways of maintaining their interest and offering something that keeps their involvement.

Offer a "career" path

Offering volunteers a way to develop their skills with support from data managers and taxonomic experts can help to maintain their interest and also help to develop the experts of the future. Provide volunteers with mentors who can support and encourage them as they build their abilities.

Demonstrating good practice

Field Studies Council BioLinks - https://www.fscbiodiversity.uk/

Field Studies Council (FSC) BioLinks is an exciting new biodiversity project for FSC, funded by the Heritage Lottery Fund, which will run from 2018 to 2022 inclusive. BioLinks is all about invertebrate identification. It will bring together new volunteers with existing volunteers who have skills in invertebrate identification and recording. The aim is to build and strengthen the biological recording community by providing training, learning opportunities and digital tools for people involved in biological recording and those that wish to become involved. Training opportunities will be given at all levels from beginner to expert, allowing people to progress and consolidate their skills and experience.

Give them ownership of recording

Data providers should feel that it is their project. We are reliant on their ongoing support and they should not be taken for granted. If they can see the benefits to them and the environment then they are likely to be more engaged. They should also feel that they are equally important to, and in control of, the project.

Provide ongoing feedback

People need to know that what they are doing is worthwhile. Is their data being used? What difference has it made? This feedback should occur at all stages, not just during the collection phase. Citizens and volunteers can be encouraged to share if they get rapid feedback.

Demonstrate benefits

To encourage data sharing or increase capacity to pool data, you need to identify benefits to data providers. For example, professionals tend to share their data if they can become co-authors on scientific journal articles.

Promote the need for support from key data users

Data users, such as governments and planning authorities, need to understand the costs involved in supporting a network of volunteer recorders. There is a major role for data managers to communicate this to decision makers and data users.

Demonstrating good practice

Norfolk Bat Survey - http://www.batsurvey.org/

The project aims to improve our understanding of bat distribution and activity. It provides an opportunity for anyone to take advantage of recent advances in technology for automating the capture and analysis of acoustic data for bats.

Volunteers sign up to monitor a 1km square over 3 nights and borrow equipment from a network of monitoring centres. Sound recordings are analysed by computer and a report detailing the findings is returned to the volunteer within a few days.

Since 2013 the project has analysed 1.9 million bat records across the county.

Data is passed to Norfolk Biodiversity Information Service - http://www.nbis.org.uk/ - where it is made available to users.

4.5 How do we ensure access to taxonomic expertise now and into the future?

An increasing lack of taxonomic expertise has been identified by the project partners as a key factor in ensuring that the right sort of data is available to answer the questions we are posed. Many taxonomic experts are elderly and there is a lack of younger experts to take their place. This is, in part, due to a lack of formal study opportunities in schools and universities for younger people, but also because often there is no informal network of support for those wishing to develop their skills.

Priorities for building capacity to address the issue were identified as follows:

Encourage identification

The easiest way to develop a new cohort of taxonomists is to encourage people to try to identify things. From here they can move to the development of identification skills and understanding of the process. There are many ways to do this, including easy to use but reliable and comprehensive identification resources, training frameworks, or mentoring schemes. For the future it is essential to train beginners by working with universities and schools, and by promoting certain taxa.

Promote the importance of taxonomy

In particular, schools and universities should be encouraged to emphasise the importance of taxonomy and the important role it plays for government and decision makers, and that it creates employment opportunities. Explain the essential nature of taxonomy within ecology and conservation. Show that it is the basis of everything.

Look to citizen scientists

Developing the skills of volunteers and citizen scientists could be used to offset the loss of taxonomic experts from academia.

Work with recording groups

Linking up with national schemes and societies, such as Butterfly Conservation UK, can provide a way to develop the skills of recorders. It can also foster vital links between data providers and decision makers.

4.6 How do we increase our capacity to deliver data to decision makers?

Effectively meeting the needs of decision makers is key to the outcomes of BID-REX. Previous workshops have developed and presented thinking around the need for interpreted and well-presented data. In most cases, finding ways and means to successfully engage decision makers is contingent on the ways data is presented, using technology to deliver a clear message.

During the presentations and discussions the following priorities were identified:

Have a clear objective

When building capacity we need to be clear whether we are focussed on a single question or building something bigger. Do we need a website for a single local project or an online system to hold a national species dataset? The limitations of any system need to be considered. Resources will dictate what is possible, so we need to be clear what our users want and how we are able to meet their needs.

Customise products to the objective and user

The final product should be adapted to the decision makers' needs and also their abilities to understand the outputs. It is important to communicate and explore this in order to understand what level of data they need but also to give them better awareness of the type of data that are available.

Same data, many products

The same data should be packaged in multiple ways. Different users will have different needs that can all be served on the same platform, using the same data, but presented in different ways. For example, commercial users may have higher resolution access to data that they pay for than a member of the public viewing for free.

Develop new skills and technology jointly with users

This can help to facilitate data understanding and use. Working closely with decision makers to build skills and develop technology together ensures that realistic approaches are taken and that both parties are invested in the outcomes.

4.7 How do we build our capacity to interpret data to answer the questions we are asked?

Throughout this and the previous workshops it has been clear that, in most cases, the decision makers we work with are actually more interested in our interpretations than the raw data itself. For example, ecological network maps, habitat opportunity maps, or predictive species models. In order to build our capacity to meet this need, we need to ensure that we are developing our data products and staff skills appropriately.

In order to do this we need to give priority to the following:

Understand the question

The first step is to understand what the decision maker needs. In many cases it is not the data itself, but an answer to a very specific question. It is often the case that the data exists to answer the question and it just needs the right interpretation. It is important to elicit feedback from the decision makers to ensure that we understand what they are asking and their expectations.

Understand the context to the question

The questions we are asked are often the result of drivers such as policy. For instance, the need to protect significant species from development, or the development of ecological network maps for use in strategic planning documents. An understanding of the underlying policies and legislation can help us to understand the research or policy questions and design products to provide answers. An understanding of these policy drivers can also help us to understand the data needs and to design our data collection appropriately. It can also help us to ensure that the decision maker has asked the right question, or that it is framed in the right context.

Answer clearly

Even when we are providing answers based on interpreted data we need to remain factual. It is important to be mindful of the questions that are being answered. Any caveats need to be clearly stated and all answers should be clear and transparent.

Be clear on terminology

There is often a problem of translation between data holders and decision makers. Be sure that all parties understand what the product will be and what it can and can't do.

Provide a matchmaking service

The possibility of providing a single point of contact for decision makers who need data products was raised. If this provided a catalogue of available services or existing tools this could serve to facilitate efficient product development by preventing the need to "reinvent the wheel". It would also offer the opportunity to build relationships, understanding, and trust between parties. The work can then be directed to those with skills most suited to delivery.

4.8 How do we ensure our data and tools can help decision makers to make the right choices now and in the future?

In order to foster effective decision-making and ensure that our tools are fit for purpose, we need ensure that we can meet the needs of our users, both today and in the future. We cannot be sure that decision makers will make the "right" choice, as that is a subjective concept and in many cases politics will have an influence. We can however, work to ensure that enough data and information is available for informed decisions to be made.

The following priorities were identified from the presentations and discussions:

We need enough data to make interpretations

Access to robust and appropriate data is needed long-term. Measures outlined above provide methods for developing the means to ensure this, but strategies should be developed by data providers to ensure that they can meet the needs of their decision makers.

We need to know how much data is enough

Those providing services to decision makers need to be realistic about what they are able to do when it comes to data gathering. We may not always have the comprehensive dataset that we need, so it is important to have an understanding of the limitations of what can be done with the resources available. This could mean compromising on the detail that can be produced in interpretive maps or modelled predicted species distributions.

Adapt to new questions

We need to be smart about developing technologies and tools to answer new questions with our "old" data. We should be aiming to 'collect once, and use many times' when it comes biodiversity data.

Policy

Policy can and will change, and we should be prepared to answer new questions based on these changes. We should also be prepared to use the power of data to inform policy when we can.

Information, management, evaluation cycle

It can sometimes be useful to observe and assess the outcomes of the decisions that have been made based on our data. Did the tools we made influence a decision, and if so what was the outcome? Was it negative or positive? Was the decision maker properly informed by our information? What could have been done better? Do projects that use the same information but produce different products have different impacts on users? This evaluation will help to ensure that we can adapt and improve our tools and help to build positive relationships with decision makers.

5 Summary

Based on the learning outcomes from the site visits and workshops, a number of key themes were identified as forming the basis of successful capacity building. These should be considered when developing new approaches, building tools, and answering questions from decision makers.

Gathering data

It is important that that there is a clear understanding of:

- The data we have
- The data we need
- The way we will capture and manage data
- Who will be collecting the data
- Who will be using the data
- The questions being asked
- The context for the questions

Accuracy

To ensure effective decision-making good quality data should be delivered by using:

- Recognised and standardised formats
- Clear and understandable processes
- Good training and support
- Clear verification processes and qualified verifiers
- Feedback processes to enable ongoing improvements
- Promotion of good practices

Trust

To foster confidence in data and interpretation methods there needs to be:

- Clear and honest metadata – including any gaps of deficiencies with the data
- Clear messages about the potential use of the data
- Clear value to the data

Engagement of data gatherers

To provide an evidence base now and in the future we needs to ensure that those who gather data are effectively supported and nurtured. We can do this by:

- Recruiting effectively
- Motivating
- Providing a “career path” for continuous progression and development
- Giving a sense of ownership of the data and any resulting products
- Offer feedback
- Demonstrate the benefits of the data – illustrate the decisions made

Access to expertise

To ensure that we have access to the skills and knowledge that we need to provide and evidence base we can:

- Encourage an interest in species identification at all skill levels
- Promote the importance of taxonomy
- Develop a network of citizen scientists
- Foster a network of recording groups – focussed on taxon, geographical area, habitat

Delivering information to decision makers

To provide data and information in ways that can aid decision makers we need to:

- Have clear objectives
- Produce customised products
- Use the same data to provide many answers and products
- Develop new skills and technologies with our users

Answering questions

To give decision makers the tools they need and to answer the questions they have we should:

- Understand the question
- Understand the context of any questions – policy, politics, audience
- Answer clearly and understandably – avoid a communication gap
- Use clear terminology – avoid jargon

Supporting choices

To ensure that we can provide evidence to decision makers to base their choices on now and in the future we need to:

- Have enough data
- Know how much data we need
- Adapt to new questions, policies, audiences
- Collect once, use many times
- Be aware of policy

Based on the presentations and discussions undertaken at the site visits and workshop Figure 1 below shows a process that can be used when developing new approaches, building tools, and answering questions from decision makers.

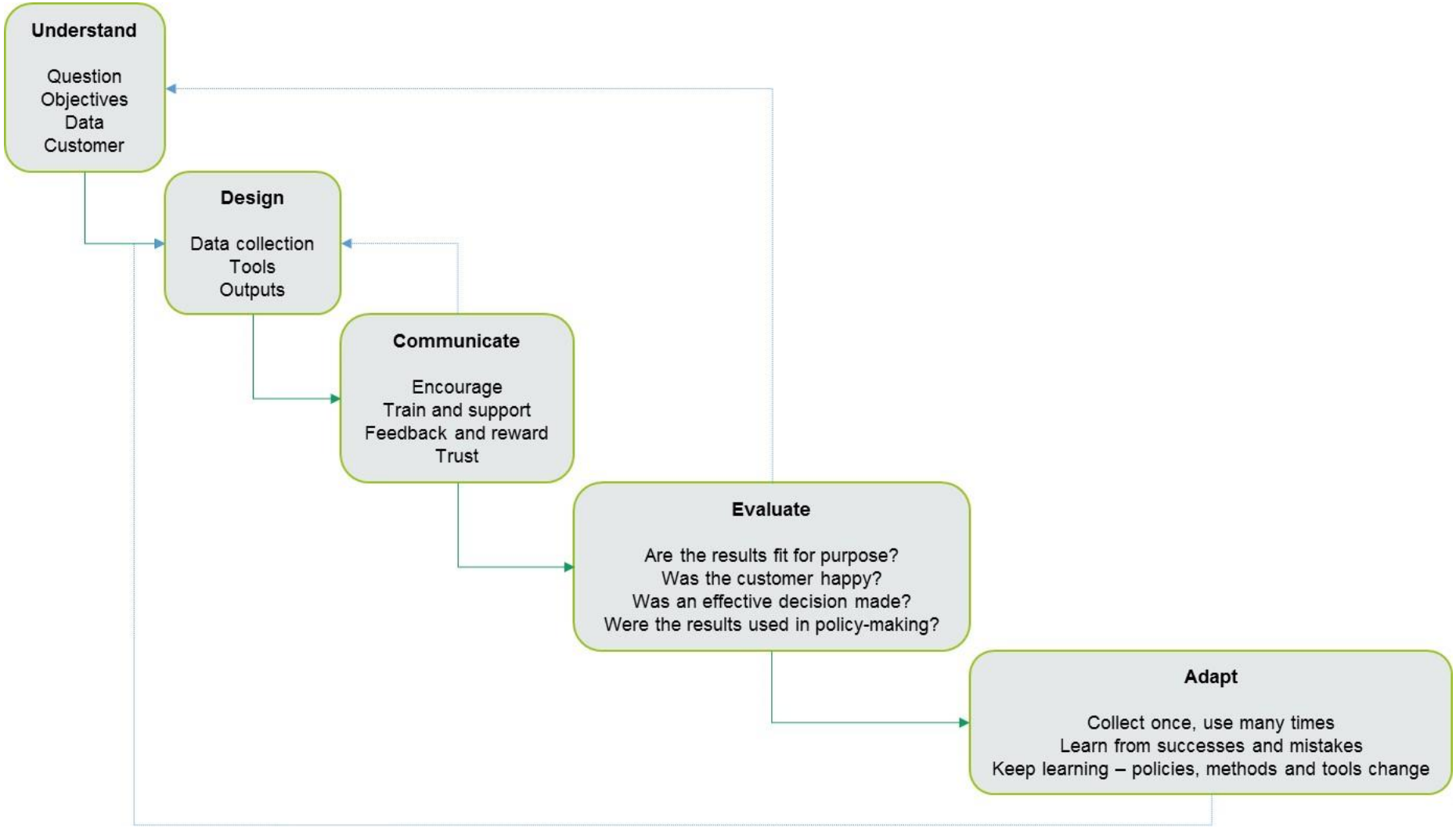

Figure 1: The process for developing new data and information approaches, building tools, and answering questions from decision makers