

COMMENTARY

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Rethinking communication: integrating storytelling for increased stakeholder engagement in environmental evidence synthesis

Anneli Sundin^{*†}, Karolin Andersson[†] and Robert Watt

Abstract

Storytelling is a two-way interaction, written or oral, between someone telling a story and one or more listeners. It is a well-known and powerful means of communicating messages and engaging audiences. In this commentary paper, we present a framework for the integration of storytelling in systematic reviews and systematic maps at the stages where stakeholders are actively involved. Using storytelling to explain complex research has, in the past, not been considered a rigorous method of communicating science. But an increasing number of studies are showing how narratives can be useful for developing trust with an audience and increasing knowledge retention as well as the ability and willingness by audiences to learn and take action. Being easily digested by the human brain, stories help bridging between our *logos* and *pathos*; when an audience becomes emotionally receptive of facts, chances increase that they will respond and act on the knowledge. Here, we argue that storytelling holds potential as a tool in systematic reviews and systematic maps, serving mainly two purposes. First, collecting contextual narratives from stakeholders at the stages of question formulation and protocol writing can help to inform and generate relevant research questions and review designs. Here, we refer to contextual narratives as stories gathered from stakeholders to gain an understanding of their perspective. Second, creating a final story that faithfully presents the review results, while also relating to the contextual narratives, can contribute to effective communication of the results to stakeholders as well as to a broader audience. This approach can increase their engagement with the science and the implementation of evidence-based decisions. The paper concludes that storytelling holds untapped potential for communicating evidence from systematic reviews and maps for increased stakeholder engagement. It is time for researchers and research networks such as the Collaboration for Environmental Evidence to support and emphasize the importance of exploring new tools for effective science communication, such as storytelling.

Keywords: Environmental management, Narratives, Science communication, Stakeholder engagement, Storytelling

Background

The issues at stake in environmental management and conservation are often complex, while communication of systematic reviews and systematic maps needs to be clear and comprehensible (for definitions of and differences between systematic review and mapping methodologies, see e.g. [3, 15]). Traditionally, scientific knowledge has

been communicated as isolated logical ideas with limited context given to the target audience. This poses the risk that the audience, particularly the non-expert one, might make inaccurate assumptions when they try to make sense of new information [6]. Therefore, effective science communication is considered to be an important foundation for evidence-based decision-making [10]. The results from systematic reviews and systematic maps are commonly communicated to stakeholders through formats such as final reports, policy briefs and summaries [3]. In the case of evidence-based environmental management,

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stakeholders are defined as “all individuals and organisations that might have a stake in the findings of the review” (ibid., p. 16). The findings are, in similarity with primary research, most often written with a traditional logical-scientific structure (see examples [9]).

Communicating evidence in an understandable and practically relevant way for stakeholders, for instance by embedding knowledge in a narrative storyline, has shown to increase an audience’s engagement, willingness to act upon the knowledge and use the evidence as a basis for their decisions [6, 11, 18]. By placing knowledge into context, stories are easier to process and generate more attention and engagement than traditional logical-scientific communication [5]. Storytelling, the ancient tool of using stories to communicate knowledge [11, 19], has the potential to give evidence meaning, motivate and engage audiences and give relevance to their realities.

Although storytelling has grown as a tool for science communication in several research fields such as health care and science education [5, 6, 13], integrating it into systematic reviews and systematic maps in environmental management and conservation to communicate evidence to stakeholders and other target audiences is yet to be explored and used to its full potential.

This commentary paper argues for an increased and integrated use of storytelling in science communication for increased stakeholder engagement and evidence-based environmental management. The argument is valid for research in general but particularly so for systematic reviews and systematic maps, in environmental conservation as well as in other sectors. These reviews and maps are intended to provide stakeholders with an overview of existing, often complex, evidence on a particular topic and may thus have a greater influence over decisions made on an aggregate level than individual primary research studies [10]. Primary research, on the other hand, might be of higher significance for decision-making in certain contexts.

Telling stories and the introduction of storytelling in science communication

Telling stories has been a method for humanity to make sense of their environment, organise experience and ideas and communicate with their community to create shared understanding since ancient times [19]. It has been and still is an art form with a purpose to educate, inspire and communicate values and cultural traditions. Storytelling typically follows a structure that describes the cause-and-effect relationships between events that take place over a particular period of time and that impact a range of individuals [5]. It is often interactive and can help the listeners to cultivate their imagination. Storytelling has the potential to generate a shared understanding

among people about a situation, a topic or a problem, and through its engaging nature it has the potential to attract and sustain interest and enable audiences to make meaningful connections [8]. Another advantage of storytelling is that it is often easily accessible and does not require the audience to have expert knowledge to understand and associate with the knowledge that is being communicated. It is also in the narrative form in which most people receive their news and information [5].

Storytelling exists in many different forms and there are many different techniques. It can be applied to visually describe a narrative using different mediums such as video, photography or graphics/illustrations, in what is usually called visual storytelling. Something relatively new is to go digital in storytelling, i.e. using our modern digital means that makes it possible for essentially anyone to share their stories [16]. Of course, storytelling often exists in traditional forms as well, such as in theatrical performances.

Storytelling has been explored as one of many tools for communication in different scientific contexts and it has, as a debated concept within science, grown rapidly over the recent decades. Sectors such as health care are increasingly confident in using narratives as a communication tool for diagnostics, therapeutics, and the education of patients, students, and practitioners [13]. In a study by Greenhalgh [12] on health-related behaviour change in the UK, it was found that storytelling led to positive results.

“Although health professionals were frequently cited (and greatly valued) as sources of information, there was not a single instance in our interviews [of British Bangladeshi diabetes patients] when information from health professionals was associated with a reported change in behavior. In contrast, reports of changes in behavior were very frequently linked to a story told by another Bangladeshi.” ([12], p. 595)

Storytelling is now being explored as a tool for communicating research in other fields, such as in science education ([5, 6], see Table 1 for examples of how storytelling has been used in different fields). Introducing storytelling in the research community has, however, not been unproblematic. Some scientists have met it with scepticism, alluding to its inherently manipulative risks and that narratives are not as valid as scientific data due to its lack of systemisation, its inability to be reproduced and controlled, and to capture the complexity of science [5].

Nevertheless, storytelling can indeed fill a function as a communication tool for scientists and science communicators. Introducing new knowledge through a narrative that an audience can relate to provides a context in which complex information can be easier to understand

Table 1 Uses of storytelling in different fields

Example	Fields	How storytelling is applied	Target group/stakeholders
<i>Using evidence for better practice: a success story</i> [2]	International development/ public health	Tool to highlight the benefits of using systematic reviews in the sector	Development and health workers
<i>The story behind the science</i> [22]	Science education	A website creating stories that can be used by science educators to help illustrate specific concepts	University students
<i>Influence of evidence type and narrative type on HPV risk perception and intention to obtain the HPV vaccine</i> [17]	Healthcare	Method to increase risk perception about a virus and behavioral intention to get a virus vaccination	General public
<i>How people with motor neurone disease talk about living with their illness: a narrative study</i> [1]	Medicine	Data collection method (narrative case studies)	General public
<i>Drought risk and you</i> [7]	Climate change	Storytelling is used as one of several methods for gathering narratives to build local, historical knowledge about drought impacts, experiences and adaptation	Decision-makers for water management in the UK

and analyse. The human brain seems to better absorb and retain scientific knowledge and messages when it is introduced through a coherent narrative [11, 14, 20]. In fact, as Dahlstrom [5] describes it "...narratives seem to offer intrinsic benefits in each of the four main steps of processing information; motivation and interest, allocating cognitive resources, elaboration and transfer into long-term memory" (p. 13615). Some studies even claim that using narratives is the one most powerful way of planting new ideas in the human brain [8, 21]. Narratives are likely to bring about more engagement with an audience than traditional scientific communication since it aids the bridging between *logos* and *pathos*, terms deriving from "Aristotle's Rhetoric", the ancient Greek text about the art of persuasion. *Logos* refers to the logic behind the argument itself and *pathos* refers to the inherent emotions of the listener [18]. Bridging these two can result in an increased willingness by the audience to respond and act upon the information given [14].

Untapped potential for the use of storytelling in evidence synthesis

In spite of its increased popularity in science communication in general, the particular use of storytelling to communicate results from systematic reviews and systematic maps in environmental management and conservation has been rare, if used at all. Indeed, we have not been able to find any documented examples. Given the complexity of the issues and interests at stake in environmental management, we argue that exploring innovative tools to transfer evidence and communicate it to multiple audiences (decision-makers, environmental managers, the public, etc.) is highly relevant.

The guidelines for conducting systematic reviews in environmental management, developed by the research

network Collaboration for Environmental Evidence (CEE), do not include communication of results as a separate step in the review process ([3], p. 10). Nevertheless, in the brief section on further dissemination of findings ([3], p. 11), the guidelines do mention the need to communicate results not only in a full report, but also through other more easily digestible formats such as policy briefs, executive summaries and guidance notes. These summarised and condensed documents are, however, likely to be structured in the same way as the full report, i.e. a traditional logical-scientific structure, but in a condensed way and with less technical detail (Sif Johansson, personal communication). Thus, these products may still need to be further processed to build shared understanding and drive the engagement of stakeholders to take evidence-based action.

Embedding knowledge from reports, briefs and notes in a coherent story that connects with the interests and concerns of stakeholders is one tool to build shared understanding. A final story can provide relevant context to review results and helps stakeholders identify when and where they can engage and take action. To situate review results in a coherent and relevant final story, we propose gathering contextual narratives at the initial stages of a systematic review and map. These contextual narratives describe stakeholders' understanding of the issues under investigation in the systematic review or map, based on their experiences and previous knowledge. We believe the process of gathering contextual narratives can also increase stakeholder engagement. In the following section, we describe how these two ways of using storytelling can be integrated into systematic reviews and systematic maps. It should, however, be clear that storytelling for communication of evidence should not be understood as the sole way to reach and engage a target

audience, but rather as a complementary tool to the battery of traditional communication products.

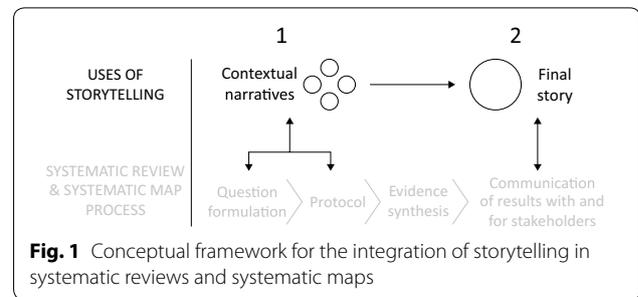
Integrating storytelling in systematic reviews and systematic maps

Stakeholder engagement is of key importance in systematic review processes [10]. Often, stakeholders contribute to the formulation of the research questions for the systematic reviews and maps to which they are also end-users. We argue that storytelling can be beneficial when it is integrated at the stages of the review process where stakeholders are involved. Moreover, storytelling can work as a means to effectively communicate the end results or key messages of the review. Here, we present two instances where storytelling can be integrated with the purpose of engaging stakeholders in the process or making use of the final results (see Fig. 1):

1. Assemble contextual narratives from stakeholders at the early stages of the review process, facilitating question formulation, protocol writing and review design.
2. Formulate a final story at the end of the systematic review or map and aligned with the contextual narratives earlier assembled. The final story can be used for communicating the results and make it digestible for stakeholders.

According to Gough et al. [10] there are mainly two different options for stakeholder involvement: stakeholders become either consultants or collaborators to the review team. As collaborators, the stakeholders are engaged to a larger extent than as consultants. During the initial stage, the reviewers formulate research questions together with stakeholders, who also contribute to the scope of the review or map as well as key concepts and definitions. In this paper, we explore the integration of narratives in systematic reviews and maps where stakeholders play a collaborative role. While this is one way to incorporate storytelling in evidence synthesis processes, there may be other means for its operationalisation.

At the initial stage of the review process, i.e. question formulation, stakeholders bring their various experiences, knowledge, priorities and values to the table. In the area of healthcare research, narrative inquiry is being commonly used as a technique to comprehend individual experiences [20]. If narratives were explored and used at an early stage in systematic reviews and maps in environmental management and conservation, they could contribute not only to increased stakeholder engagement, but also to a more informed process where diverse perspectives and needs of stakeholders effectively can be



gathered. These ‘contextual narratives’ (see Fig. 1) can be assembled using different types of storytelling techniques, for example, the “Message Box” exercise pioneered by COMPASS, and can be collaborative between stakeholders. The Message Box can help stakeholders to identify and formulate their relevant problem in need of investigation (see [4]). Gathering the contextual narratives will (i) help to identify the most pertinent review questions and take into account the needs of stakeholders for review design and protocol writing and (ii) provide context to the research issue that can be used when communicating the final results.

By requesting the stakeholders to prepare their narratives in advance of the first workshop or stakeholder meeting, the reviewers can ensure to capture experiences and concerns from all stakeholders, including marginalised or vulnerable ones. At the same time, misperceptions are better avoided and diverging opinions easier to handle. The individual narratives will be rather ‘raw’ in nature, and stakeholders can be encouraged to step forward and reflect freely without necessarily being constrained by facts and data. Gathering contextual narratives at this stage of a systematic review or map is likely to increase the engagement and curiosity among stakeholders concerned, as well as creating a sense of ownership. Moreover, by giving this space to stakeholders, the review team can identify the agency of marginalised groups and individuals. The team also gets the possibility to identify variables important to stakeholders that can be integrated into stages of data extraction and synthesis. Recording and clustering the narratives are important as well, in order to facilitate accurate and traceable use when they are to be aligned with the final results for communication and outreach. It may be beneficial to consult a professional communicator prior to the meeting and assembly of narratives.

While the stakeholders have limited to no active participation during the intermediate stages of the systematic review (i.e. search, article screening, critical appraisal and data extraction, data synthesis and report writing) (Neal

Haddaway, personal communication), they are again critical when the results are to be communicated, now as end-users. Here, storytelling can be used as an effective tool to communicate the logical-scientific structured findings by formulating a final story that aligns and connects with the contextual narratives initially assembled (see Fig. 1). In contrast to the format of the final reports of systematic reviews and maps, where information is plainly presented, an experience is generated among stakeholders by embedding and grounding the findings into a contextually relevant story [8]. When the review team is preparing the communication and outreach material and activities, the narratives of perspectives and needs of stakeholders can be included to provide a context and to feed into the final story. This is important in making the final story resonate with the target audiences; the story will, in part, be based on the contextual narratives, thus the reviewers can adapt the material in terms of language, tone, place, and the use of jargon. The final stakeholder meetings are also an opportunity to test the story, and collaboratively adjust it. It could be equally beneficial, if not even more so at this stage, to consult a professional communicator when developing the final story, for an increased outreach and stakeholder engagement potential.

As a final point, a major advantage with both assembling contextual narratives and developing a final story is that they can be used and adapted for a large range of communication formats. This includes not only those suggested by CEE (policy briefs, executive summaries and guidance notes) ([3], p. 11), but they can also serve as a basis to develop and inform other communication products, e.g. by providing the synopsis for a video or underpinning the basic structure for an op-ed (an opinion piece in a newspaper or magazine) or an oral presentation.

Conclusion

The guidelines for conducting systematic reviews within environmental management recognise that review results should be communicated in a range of formats beyond the final report itself [3]. In addition, this paper suggests that new innovative communication tools should be encouraged by researchers and research networks, such as CEE. One such tool to complement the traditional battery of communications products is narrative storytelling. We encourage the guidelines for systematic reviews to be more informative and detailed regarding communication and stakeholder engagement. This could contribute to systematic reviews and maps being better designed for evidence-based decision-making in environmental management and conservation.

Storytelling can be an essential tool to effectively reach a target audience with scientific results. Through a story or a narrative, context is provided to the audience and complex scientific data can be easier to understand and analyse. In this commentary paper, the authors have argued for a more systematic and integrated use of the innovative communications tool storytelling to increase stakeholder engagement from early stages of systematic reviews and maps in environmental management and to communicate results to a wider audience. Assembling contextual narratives early in the review process can enhance stakeholder engagement and facilitate the development of research questions. In addition, the contextual narratives can feed into a final story collaboratively created with the stakeholders to be used for an array of different communication purposes.

We acknowledge that the effectiveness of using storytelling as a tool to engage and communicate with stakeholders, as well as the type of storytelling methods to be used, are determined by the type of review undertaken, the stakeholders involved and is context-specific. We also recognize that further research is needed to understand storytelling as an effective means of science communication and how to best integrate and carry out storytelling activities into systematic reviews and systematic maps in environmental management and conservation. To conclude, it is crucial that space and possibilities are available to researchers, reviewers and review teams who are motivated to explore novel methods for translating knowledge and communicate it to multiple audiences.

Abbreviation

CEE: Collaboration for Environmental Evidence.

Authors' contributions

RW conceived the idea for the manuscript and assembled the team of co-authors. AS and KA drafted and revised the manuscript. RW, KA and AS commented on and improved the draft manuscript. All authors read and approved the final manuscript.

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Competing interests

The authors declare that they have no competing interests.

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Consent for publication

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Ethics approval and consent to participate

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