

Wicked Problems in Africa: A Systematic Literature Review

SAGE Open
July-September 2021: 1–19
© The Author(s) 2021
DOI: 10.1177/21582440211032163
journals.sagepub.com/home/sgo


Ville-Pekka Niskanen^{1,2} , Mikko Rask² , and Harri Raisio¹

Abstract

The theory of wicked problems, originating from Western academic discussion, has evolved since the 2000s toward a universal diagnostic of societal challenges. In this article, we employ a systematic literature review to investigate the application of the concept of wicked problems in studies focusing on the African context. Our aim is to understand the additional value and limitations of using the concept in a non-Western frame of reference. We conclude that the concept remains underutilized in studies concentrating on Africa; moreover, when it is used, it is mainly by academics of Western or Anglophone origin. Overall, the concept of wicked problems is mainly applied descriptively rather than theoretically. Based on the analysis of the themes and issues characterized as wicked, we elaborate toward a typology that takes account of the concrete “manifestations” (e.g., health issues such as AIDS/HIV and its treatment history) and “mechanisms” (e.g., historical path dependency) that condition the presence of wicked problems in the African context. The article contributes to the theory of wicked problems by developing a typology that distinguishes between interlinked and contextual problems (often characterized through the concept of “dual wickedness”), and proposes that problems can become exacerbated when the two dimensions are simultaneously present.

Keywords

wicked problems, Africa, dual wickedness, systematic literature review

Introduction

Wicked problems is a concept often used to describe complex social and socio-ecological issues that are characterized by the difficulty of problem formulation and the multiplicity of stakeholders involved in defining and addressing the problem. Wicked problems are contested, unique, complex, and unsolvable and involve emergent aspects, meaning that the effects of applied solutions cannot be known (Rittel & Webber, 1973; see also Danken et al., 2016). Since its introduction in the 1970s, the concept continued its quiet existence until the 2000s, when it was rediscovered by scholars (Conklin, 2005; Grint, 2005; King, 1993; van Bueren et al., 2003) as a means to describe and discuss contemporary challenges. Its usage has sharply increased in the 2010s (Danken et al., 2016; Xiang, 2013). On June 26, 2020, our search of articles in the academic journal database Scopus with “wicked problem(s)” in the title, abstract, or keywords returned a total of 1,839 articles since the concept’s introduction in Rittel and Webber’s seminal article in 1973. Of these, 1,634 (89%) were published in or after 2010. Interestingly, the concept seems to have spread to many different global contexts, with the *exception of Africa*. This discrepancy was first identified by Xiang (2013) and persists to the present day. Our filtering of the above-mentioned search results

resulted in 63 articles with a connection to Africa, a mere 3% of the total.

The concept’s limited usage in the literature on Africa does not, however, mean that the continent’s countries, societies, and peoples are free from serious challenges. According to the SDG Center for Africa & Sustainable Development Solutions Network (2019, p. 21), in Africa “the majority of countries are off-track on most of the 17 [Sustainable Development Goals],” with *good health and wellbeing, infrastructure, and peace, justice, and strong institutions* currently seeming to be furthest from reach. Other assessments draw similar conclusions. For example, the OECD characterizes most African countries as, to varying degrees, *fragile states* (OECD, 2018), which face various environmental, political, economic and societal issues (OECD, 2016). Based on World Bank data, Christiaensen and Hill (2019) report that the absolute number of Africans living under the

¹University of Vaasa, Finland

²University of Helsinki, Finland

Corresponding Author:

Mikko Rask, University of Helsinki, Helsinki Institute of Sustainability Science, and Centre for Consumer Society Research, Snellmaninkatu 10, Helsinki, 00014, Finland.
Email: mikko.rask@helsinki.fi



1. There is no definitive formulation of a wicked problem
2. Wicked problems have no stopping rule
3. Solutions to wicked problems are not true-or-false, but good-or-bad
4. There is no immediate and no ultimate test of a solution to a wicked problem
5. Every solution to a wicked problem is a “one-shot operation”; because there is no opportunity to learn by trial-and-error, every attempt counts significantly
6. Wicked problems do not have an enumerable (or an exhaustively de-scribable) set of potential solutions, nor is there a well-described set of permissible operations that may be incorporated into the plan
7. Every wicked problem is essentially unique
8. Every wicked problem can be considered to be a symptom of another problem
9. The existence of a discrepancy representing a wicked problem can be explained in numerous ways. The choice of explanation determines the nature of the problem’s resolution
10. The planner has no right to be wrong

Figure 1. Characteristics of wicked problems (Rittel & Webber, 1973).

international poverty line of 1.90 USD has risen between 1990 and 2015, even though the share of poor in Africa has decreased. Furthermore, simulations by The World Bank (2018, p. 25) estimate that 87 % of the world’s poor will live in Sub-Saharan Africa in 2030.

The problems faced by contemporary African societies are unquestionably different from the issues that gave rise to the concept of wicked problems 50 years ago in Western society (see Ritchey, 2013; Skaburskis, 2008). For example, infrastructure-related issues were presented as an example of *tame problems* by Rittel and Webber (1973, p. 156) but may in fact be wicked problems in an African context (Suleiman & Khakee, 2017). In this systematic review, we examine *the literature on wicked problems in Africa*. We frame our review within the context of the limited use of the concept of *wicked problems* in this literature, and recent critical discussion on the concept, addressed in Section “Wicked Problems” of this article. Here, our aim is to review the ways *wicked problems* have been described in the literature on Africa, thereby revealing how the concept is understood in this regional context, and to contribute to the vivid discussion around the concept. We approach this through our first research question: *What are the main themes and concrete manifestations of issues described as wicked in the African context?*

Second, we further explore the relative absence of the concept of *wicked problems* in the literature on Africa. It is clear that many African societies face persistent and complex challenges. However, as previously mentioned, the concept has not been broadly utilized in this context, especially compared with the number of articles focusing on *wicked problems* in other geographical areas. Possible reasons for this have been briefly discussed (Xiang, 2013) but have not been systematically investigated. We approach this issue from a critical stance, aware of the concept’s Western background, and aim to uncover possible reasons for its lack of use with our second and third research questions: *What are the geographic foci of articles that use the concept of “wicked problems” in the African context? Is the concept of wicked problems utilized and therefore seen as applicable by authors affiliated with African cultures?*

This article proceeds as follows. First, Section “Wicked Problems” explores the concept of *wicked problems* and its critique. Section “Researching African Societies With Western Concepts” then discusses the issue of applying the concept to non-Western contexts, utilizing the concept of *fragile states* as an example. Section “Methods and Materials” presents the systematic literature review process, methods of analysis and the research material. Next, Section “Results” illustrates the results of our three research questions. After that, the discussion in Section “Discussion” introduces a typology of *wicked problems in Africa* based on the literature reviewed and discusses the limitations of the study. Finally, Section “Conclusion” presents our conclusions and questions for further research.

Wicked Problems

The introduction of the wicked problems concept is commonly attributed to Horst W. J. Rittel and Melvin M. Webber’s *Dilemmas in a General Theory of Planning* published in 1973. However, it should be noted that the first publication on the concept was by Churchman (1967), who commented on a seminar presentation by Horst W. J. Rittel (on both the concept’s history and its publication history, see Skaburskis, 2008).

Rittel and Webber argued that the predominantly technical issues or *tame problems* faced by societies could be solved by professionals, who could both define and solve the issues they encountered. Ultimately, society would be left with problems “that are much more stubborn,” characterized by ambiguity, uncertainty and a multiplicity of stakeholders and values. Technical and scientific approaches of identifying and solving such “problems of open societal systems” would thus be ineffective (Rittel & Webber, 1973, pp. 156, 159–160). The original 10 characteristics of wicked problems as defined by Rittel and Webber (1973) are presented in Figure 1. These problems have been condensed and developed by later authors, including Conklin’s (2005) five characteristics and the *super wicked problems* introduced by Levin et al. (2012).

Rittel and Webber's eagerness to reject technical problem-solving approaches should be understood within the context of the events that unfolded in the United States in the 1960–1970s (Ritchey, 2013; Skaburskis, 2008). However, the 21st century rediscovery of the concept demonstrates that scholars have found that it resonates with the complex issues facing contemporary societies: poverty and economic issues, climate change, terrorism, and health care, to name but a few (see Danken et al., 2016).

Scholars have become increasingly aware of the utility of *wicked problems* for drawing attention to the complexity and interlinkedness of societal issues and the multiplicity of stakeholders involved. Following and building on Turnbull and Hoppe (2019), Termeer et al. (2019, p. 177) view the concept as a rhetorical tool for “critiquing other concepts or studies for not addressing major uncertainty, system complexity or political conflict, for proposing magic solutions or panaceas for societal problems, or, in interdisciplinary research, for overlooking the social side of technologies or natural processes.” Thus, the concept can remind academia of the real qualities of and issues faced by societies, because, as argued by Noordegraaf et al. (2019, p. 280, original emphasis), “[w]ickedness theory enables scholars to bring together academic *and* organizational *and* societal concerns.” In addition, the wicked problems literature often suggests possible “survival methods” for addressing such issues (Raisio, 2009, p. 482; Noordegraaf et al., 2019), and is useful for underlining the “complexity in social, natural and political processes” (Alford & Head, 2017, p. 399).

However, in parallel with rising interest in utilizing the concept of wicked problems, its perceived usefulness in describing the complexity of societal issues has also been increasingly questioned. For example, Peters (2017, p. 386; see also Ritchey, 2013) argues that the concept “has become a fad in the academic literature” and that it is used for describing “almost any problem that is difficult to solve and which has a variety of alternative causes.” In addition, Rittel and Webber's (1973) original list of 10 characteristics is long and rather obtuse. According to Danken et al. (2016, p. 17), “[this] lack of a clear-cut definition makes it difficult to advance and consolidate scholarly knowledge on wicked problems in public administration research.”

Critiquing and discussing the broader theory-like literature around the concept, Noordegraaf et al. (2019, p. 280) identify three “weaknesses of wickedness theory.” First, they consider that the concept and the related literature “ignores people and their practices” and fails to take account of how wicked challenges are actually perceived and addressed. Second, they argue that the collaborative, trust-building and learning-based approaches often suggested for addressing *wicked problems* are “too romantic” and may in reality may be obstructed by factors related to the problem, or may be additional benefits of common action rather than methods themselves. Finally, they consider that “wickedness theory has unclear managerial and

professional implications,” as it fails to provide practical tools for dealing with practical issues linked to wicked problems, such as resource allocation (Noordegraaf et al., 2019, pp. 280–283). Inspired by these three alleged drawbacks, a summary of the discussion in a *wicked problems* special issue by Termeer et al. (2019), and the recent literature, we identified five types of critique leveled against the concept of *wicked problems*: (1) conceptual ambiguity, (2) false dichotomy, (3) not grounded in reality, (4) solution normativity, and (5) unhelpfulness. These categories are presented in Table 1 with definitions and examples.

While the concept clearly has its own strengths and weaknesses, Termeer et al. (2019, p. 177) suggest, based on the literature published in the same special issue, that “conflict, complexity and uncertainty look like promising candidates for specifying wickedness.” This re-definition would also match Danken et al.'s (2016, p. 28) literature review synthesis of wicked problems as “chronic public policy challenges that are value-laden and contested and that defy a full understanding and definition of their nature and implications.” We view these proposals as a constructive approach to addressing some of the drawbacks of “wickedness theory” while acknowledging its contribution. However, we also accept Termeer's et al. (2019, p. 167) view that “developing dimensions of wicked problems (i.e., conflict, complexity and uncertainty) into more analytically precise research tools and linking them more closely with contemporary policy science developments” is required to further develop the concept. Earlier research on *wicked problems* has studied scholars' understanding of the concept (Danken et al., 2016; Peters & Tarpey, 2019), mapped the public policy issues that conform to the characteristics of *wicked problems* (Kirschke et al., 2019), and developed more granular typologies for identifying such problems (Alford & Head, 2017). However, *concrete issues* described as wicked have not been extensively investigated (for a list of issue groups described as wicked, see Danken et al., 2016). We address this by reviewing a subset of wicked problems in the literature on Africa.

Researching African Societies With Western Concepts

How should challenges faced by African societies be researched, approached and described? Westerners may generalize Africa into a single unit in their research topics (see Briggs & Weathers, 2016), even though such an approach is problematic: the continent comprises 54 countries and many more cultural and ethnic groups (Booker, 2014). On one hand, since the 1960s it seems that (Western) research has embraced this plurality by focusing on “a clearly defined society, population, sector, geographically defined area, or topic” rather than on broader unifying aspects or geographical areas of Africa (Lassiter, 2000, p. 2). However, some African scholars see emphasizing the unique perspectives

Table 1. Critique of Wicked Problems in Recent Literature.

Category	Definition	Examples
Conceptual ambiguity	The concept is unclear; there is no agreement on its ultimate characteristics. The concept was not intended to be used in the way it is currently often utilized; it is used as a rhetorical tool.	<ul style="list-style-type: none"> • <i>Ambiguous definition</i> (Danken et al., 2016) • <i>Wicked problems were intended to describe “all societal problems”, not a specified set of problems</i> (Turnbull & Hoppe, 2019, p. 318) or to include “most policy problems” (Levin et al., 2012, p. 126). • <i>Issues described as wicked do not fulfill all the criteria of wicked problems</i> (Peters, 2017; Peters & Tarpey, 2019) • <i>Wicked problems are “a fad” or used for rhetorical purposes</i> (Peters, 2017; Peters & Tarpey, 2019; Turnbull & Hoppe, 2019). • <i>Rittel & Webber’s original publication primarily a contribution to a contemporary discussion in the US</i> (Turnbull & Hoppe, 2019).
False dichotomy	Wicked problems are not distinct from other societal issues.	<ul style="list-style-type: none"> • <i>Reality is not “wicked” or “tame”</i> (Alford & Head, 2017; Kirschke et al., 2019) and “many rather ordinary policy problems also have some of the attributes utilized to characterize wicked problems” (Peters, 2017, p. 386). • <i>The dichotomy between wicked and tame problems “is simply the old false distinction between social and natural sciences, rewritten in the language of policy and planning”</i> (Turnbull & Hoppe, 2019, p. 318).
Not grounded in reality	Wicked problems are not grounded in how problems are perceived in reality	<ul style="list-style-type: none"> • <i>Wicked problems do not take account of how problems are dealt with in practice</i> (Noordegraaf et al., 2019) • <i>Problems are subjective: “All problems are only problems for those involved in experiencing or treating them”</i> (Turnbull & Hoppe, 2019, p. 321).
Solution normativity	It is often claimed that wicked problems can and/or should be solved. A similar set of approaches for addressing them is often discussed.	<ul style="list-style-type: none"> • <i>Too much hope is placed on collaboration and learning as ways of addressing wicked problems</i> (Noordegraaf et al., 2019). • <i>A “totalising” approach to wicked problems sees them as impossible to solve, allowing problem-solvers to either do nothing or to make “a dramatic transformative intervention that settles things decisively”</i> (Alford & Head, 2017, p. 399). • <i>Wicked problems were not originally meant to be solvable problems</i> (Peters, 2017; see also Alford & Head, 2017).
Unhelpfulness	The concept offers limited practical help. Seeing problems as wicked may make it difficult to act on them.	<ul style="list-style-type: none"> • <i>The concept fails to provide practical tools for addressing and managing problems</i> (Noordegraaf et al., 2019). • <i>Wicked problems may present problems as impossible to solve and the concept “lacks a basis for breaking the problem down into smaller, more manageable parts”</i> (Alford & Head, 2017, p. 399; Termeer & Dewulf, 2019).

and cultural aspects of the continent as important (see Lassiter, 2000), especially as “[m]ost of that which is received as knowledge about Africa is produced in the West” (Mama, 2007, p. 4). Almost a decade later, Briggs and Weathers (2016), found that this assertion remained true. Africa-based authors may also possess insights that would otherwise be excluded from research (Yankah, 1995, as cited in Briggs & Weathers, 2016), and conducting research has not necessarily been possible for Africans in the colonialist past. Thus, the dominance of non-African researchers may present challenges for African scholars. For example, Irele (1991, p. 62) considers that “the Western academy remains the unique source of validation for the African scholars,” forcing them to use a foreign language and concepts in “a derived discourse.” An example of such a concept is *fragile states* or *state fragility*, used by governments and international organizations like the OECD, World Bank and EU (see Grimm et al., 2014) and often linked to African contexts (see OECD, 2018).

A *fragile state* is usually understood as “a distressed state that lacks the elements necessary to function effectively,” with issues such as conflicts, corruption, economic problems,

weak governance and the poor legitimacy of governing institutions (Osaghae, 2007, p. 692). However, the concept has also been heavily criticized. Boege et al. (2009, p. 14) argue that it imposes the “modern Western-style Weberian state” on non-Western contexts, while “we should focus more attention on models of governance that draw on the strengths of social order and resilience embedded in community life of the societies in question and work with the grain of actually existing institutions on the ground.” In their summary of a special issue, Grimm et al. (2014) argue that the concept of *fragile states* can be used by external actors to justify their policies and the concept may thus be defined opportunistically. Nonetheless, the OECD has continued to use the concept and has developed it in a more analytical direction, rather than merely employing it as a “label” (see Grimm et al., 2014), by increasing the detail of the criteria for determining between different levels of state fragility (OECD, 2016). Nevertheless, this discussion underlines the importance of concept choice. In relation to our research, it is pertinent to ask whether it would be possible to use and define *wicked problems* in a way that acknowledges the unique characteristics of non-Western societies.

Methods and Materials

Our study conducts what is known as a *systematic literature review* (see, e.g., Gjaltema et al., 2019; Voorberg et al., 2015). According to The Cochrane Collaboration (2015), a systematic review is a “review of a clearly formulated question that uses systematic and explicit methods to identify, select, and critically appraise relevant research, and to collect and analyse data from the studies that are included in the review.” While “traditional” literature reviews are used for argumentational purposes by selectively choosing the literature, systematic literature reviews are “methodical, comprehensive, transparent and replicable” and thus potentially less biased (Siddaway et al., 2019, p. 751). We combined this systematic approach with scoping review methodology. This was chosen as the review approach, as the focus of this research was the use of the concept of wicked problems throughout the literature published on Africa rather than only in the research results. In addition, scoping reviews are suited to answering research questions that are broader in nature than those usually addressed in systematic literature reviews. Scoping reviews require no formal assessment of the quality of the literature reviewed, and indeed no such assessment was performed, as it was not the focus of this study. When applicable, we followed the checklist of the PRISMA extension for scoping literature reviews (PRISMA-ScR) when reporting the review (Arksey & O’Malley, 2005; Munn et al., 2018; Tricco et al., 2018).

First, the following eligibility criteria were developed based on the research questions. All studies were required to fulfill the criteria to be included in the review.

Study Eligibility Criteria

- Conceptual focus—as the concept is established, wicked problems should be explicitly defined with references. This indicates that the study is using the concept as understood in the academic discourse.
- Geographical area—the study is conducted in or focuses on the continent of Africa or any African country.

Report Eligibility Criteria

- Reports should be published in peer-reviewed journals.
- Books, book chapters, book reviews, conference papers, discussion papers, commentaries, or letters to editorial boards are not eligible.
- The report should be written in English.
- Publication status—both published articles and articles in press are included.
- Publication date—the report should be published in or after 1973, the year in which Rittel & Webber’s (1973) article on wicked problems first appeared.

Search Strategy

Searches were conducted in four databases: Web of Science, Scopus, ScienceDirect, and African Journals Online (AJOL). Different sets of search queries were developed due to differences in the search tools of the databases. The countries used as search terms were based on the United Nations African Group (United Nations Department for General Assembly and Conference Management, n.d.). The first searches were conducted in July and August 2019, with additional searches in July 2020. The search strategy is presented in Table 2. The searches returned a total of 159 results. Removal of duplicates produced 110 unique results for the screening phase.

Screening

The screening process is described in the PRISMA flow chart presented in Figure 2 (Moher et al., 2009). When obtaining publications for this phase, it became evident that the majority of books and book chapters discovered in the search phase could not be obtained. Therefore, the report eligibility criteria were adjusted to exclude books and book chapters from this review. This change resulted in the removal of 11 publications. Two articles (Ramaswamy, 2015; Yawson et al., 2020) could not be obtained for this review, as the authors were unable to access them. Therefore, a total of 13 publications were removed, leaving 97 articles for the screening phase.

The titles, abstracts and keywords of 71 articles found in June–August 2019 were read and their eligibility assessed independently by three assessors. Next, the selected articles and the reasons for the omission of each excluded article were discussed at a meeting. Based on the discussion, the inclusion criteria were adjusted to reduce ambiguities, after which the adjusted and final set of criteria was applied to the whole body of 97 articles, including the articles found in the additional searches conducted in June 2020. The screening and eligibility assessment phases resulted in the exclusion of 52 articles, leaving a total of 45 articles for the review.

Description of Materials

The publication years presented in Figure 3 confirm the growing interest in the concept during the 2000s identified by other authors (see Danken et al., 2016; Xiang, 2013). The volume in which one article appeared (Westin et al., 2012–2013) was listed as spanning 2 years; the latter year was coded as the publication year.

Analysis

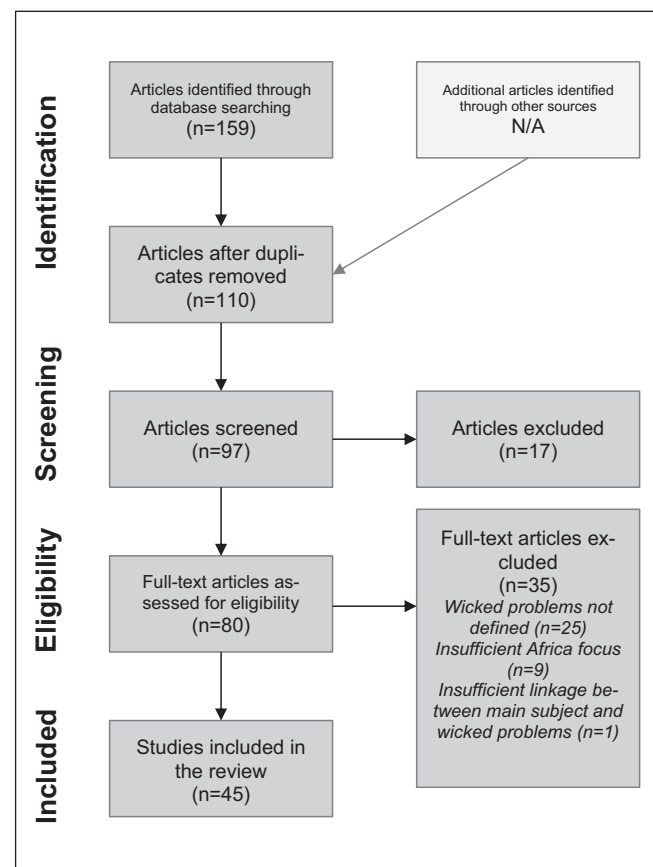
Articles included in the review were analyzed with inductive qualitative content analysis (Elo & Kyngäs, 2008) by the main author. To answer the first research question, we developed a two-phase content analysis process. In the first

Table 2. Search Strategy.

Database	Search terms and operators	Date
Scopus Web of Science ScienceDirect	Publications that include the terms <i>wicked</i> and <i>problem(s)</i> or <i>wicked</i> and <i>issue(s)</i> within two words of each other in their title, abstract or keywords AND include any of the following geographical areas in their title, abstract or keywords: Africa* OR Algeria OR Angola OR Benin OR Botswana OR “Burkina Faso” OR Burundi OR “Cabo Verde” OR “Cape Verde” OR Cameroon OR “Central African Republic” OR Chad OR Comoros OR “Democratic Republic of Congo” OR Congo OR “Republic of the Congo” OR “Cote d’Ivoire” OR “Ivory Coast” OR Djibouti OR Egypt OR “Equatorial Guinea” OR Eritrea OR Gabon OR Swaziland OR Ethiopia OR Gabon OR Gambia OR Ghana OR Guinea OR Guinea-Bissau OR Kenya OR Lesotho OR Liberia OR Libya OR Madagascar OR Malawi OR Mali OR Mauritania OR Mauritius OR Morocco OR Mozambique OR Namibia OR Niger OR Nigeria OR Rwanda OR “Sao Tome and Principe” OR “São Tomé and Príncipe” OR Senegal OR Seychelles OR “Sierra Leone” OR Somalia OR “South Africa” OR “South Sudan” OR Sudan OR Tanzania OR Togo OR Tunisia OR Uganda OR Zambia OR Zimbabwe	July 22–23, 2019 July 6, 2020
Scopus Web of Science	Articles in journals that include any of the geographical areas listed above in the name of the journal AND include the terms <i>wicked</i> and <i>problem(s)</i> or <i>wicked</i> and <i>issue(s)</i> within two words of each other in the title, abstract or keywords of the article.	August 27, 2019 July 6, 2020
AJOL	Similar searches to those conducted in the three databases were not possible in AJOL due to technical limitations. The database was searched on August 27, 2019, for articles with the query “ <i>wicked problem</i> ” OR “ <i>wicked problems</i> ” OR “ <i>wicked issue</i> ” OR “ <i>wicked issues</i> ”. The query was completed individually for each of the terms in July 25, 2020, as the database search engine had changed from the previous search.	August 27, 2019 July 25, 2020

phase, the main issues explicitly discussed as *wicked problems* in each article were coded. This was performed by identifying the issue explicitly referred to as a wicked problem, or, in case there was no explicit linkage between an issue and the concept of *wicked problems*, by closely reading the text. However, while solely focusing on identifying problems explicitly “labelled” (see Peters, 2017) as wicked produced a list of *wicked problems*, this failed to reveal why the issues were viewed or discussed as wicked; moreover, this method tended to identify issues discussed at a general level without a practical or concrete context. Consequently, a second phase was developed to analyze *manifestations*, in other words, the concrete ways in which the issues identified as *wicked* in the first phase were manifested according to the texts. The literature on both wicked problems and problem formulation suggests that a deeper understanding of problems is key, as “every wicked problem can be considered to be a symptom of another problem,” thus any issue can be attributed a *causal mechanism* (Rittel & Webber, 1973, p. 165; Rochefort & Cobb, 1993).

This two-stage process allows us to compare the wicked problems identified in this literature review with the earlier review (Danken et al., 2016), and to discern between the first phase, which we consider to be more descriptive in terms of the reviewed literature, and the interpretative second phase. Also, a deeper understanding of the *wicked problems* discussed in the articles is likely to reveal perspectives that otherwise would have remained hidden. To answer the second and third research questions, key information (the geographical

**Figure 2.** PRISMA flowchart (adapted from Moher et al., 2009).

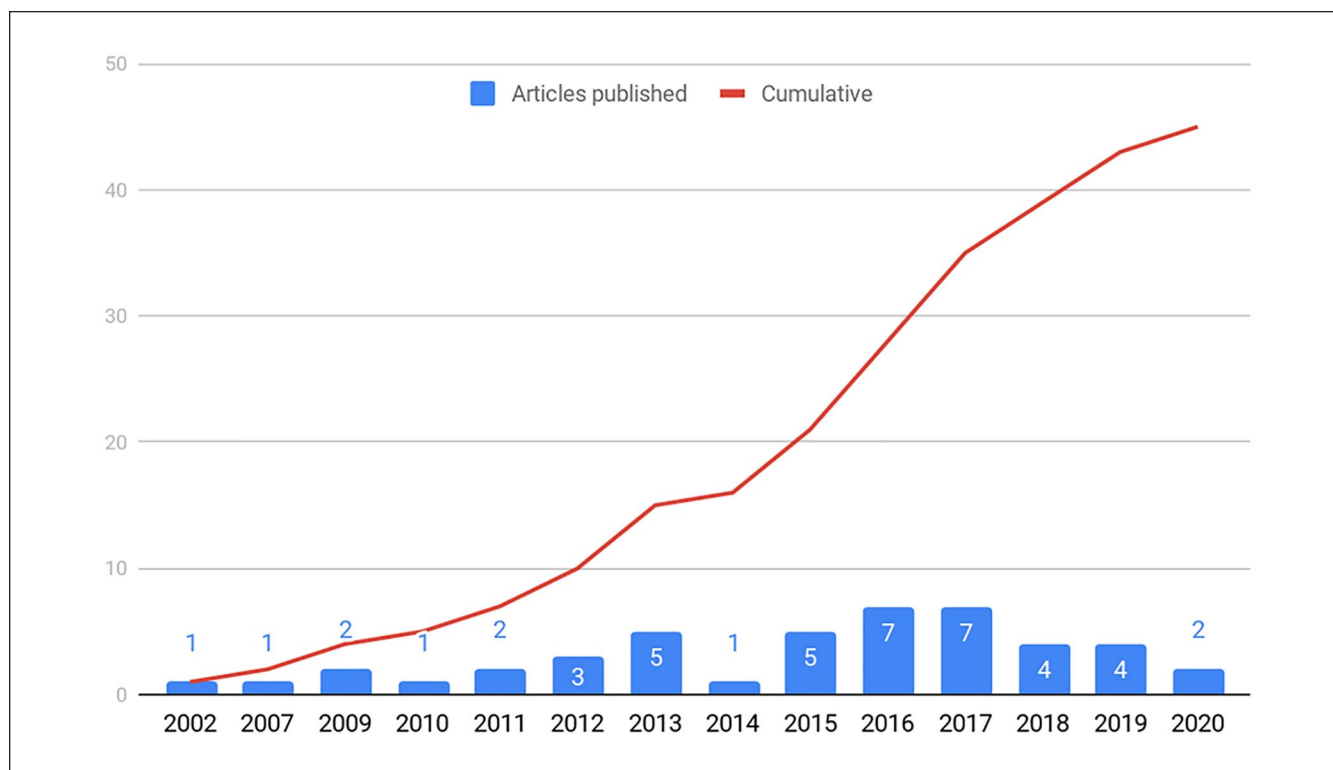


Figure 3. Publication years of articles included in the review.

foci of the articles, author affiliations, publication years, research material) was collected by reviewing and tabulating the relevant information from all the articles (for a similar approach, see, e.g., Isoaho & Karhunmaa, 2019).

Results

What are the Concrete Manifestations of Wicked Problems in the Reviewed Literature?

Themes explicitly named as wicked problems. In this section, we describe the results from the first coding phase, where issues explicitly referred to as *wicked problems* were identified from the reviewed articles. After identifying and coding these explicit issues, they were thematically grouped according to the “issue areas” identified in an earlier literature review of *wicked problems* by Danken et al. (2016). This allowed us to compare the themes we identified with the results of this earlier review. Danken et al. (2016) reviewed, with no geographical restrictions, a total of 105 articles in the fields of Public Administration, Business Economics, and Environmental Sciences published between 1991 and August 2014. It is thus possible that some of the studies included in our review had been reviewed earlier by the authors. For purposes of clarity and transparency, we limited identification of themes to one main theme per article. Danken et al. (2016) did not reveal the protocol for identifying the “issue areas” in their earlier review, requiring us to develop our own process.

For example, we based one such issue area on Bouma and McBratney (2013, p. 137), who discuss *wicked problems* in terms of “the six major global environmental sustainability issues” of *food and water security, energy sustainability, ecosystem service delivery, biodiversity protection and climate change* and their linkages with *soil security*. We coded all of these issues as a single issue belonging to the group *Environmental Resource Management*. The results of the first coding phase grouped according to the issue areas identified by Danken et al. (2016), with a comparison of their respective rankings, are presented in Table 3.

Similar to the earlier review, *Environmental Resource Management* was also the largest group in our sample, with 11/45 contributions. However, in Danken et al.’s review, *Climate Change* was included as a subcategory of *Environmental Resource Management* and involved a significant number of contributions. By contrast, we identified only one article with climate change as the primary issue of focus: FitzGibbon and Mensah (2012). Most of the articles that we included in the *Environmental Resource Management* group mainly concern issues related to natural resources and human–nature interaction, such as community wildlife management (Balint, 2007), natural resource conflicts (Bond, 2016), coral reef degradation (Bruggemann et al., 2012), views on environmental issues (Quigely et al., 2015), the captive lion industry (Williams & ‘t Sas-Rolfes, 2019), and invasive species (Woodford et al., 2016). The following group, *Health and Healthcare*, mostly consists of articles

Table 3. Main Issues in Reviewed Articles Grouped According to the Issue Areas of Wicked Problems by Danken et al. (2016).

Rank	Issue area	Number of contributions	Rank in Danken et al. (2016) review
1	Environmental Resource Management, including subgroup Climate Change	11 (Balint, 2007; Benjamin-Fink & Reilly, 2017; Bond, 2016; Bouma & McBratney, 2013; Bruggemann et al., 2012; FitzGibbon & Mensah, 2012; Quigely et al., 2015; Rendigs et al., 2015; Vogel et al., 2016; Williams & 't Sas-Rolfes, 2019; Woodford et al., 2016)	1
2	Health and Healthcare	8 (Burman, 2018, 2019; Burman & Aphane, 2017; Burman et al., 2015, 2017; Chasi, 2017; Khoo, 2013; Tsisis et al., 2015)	3
3	Sustainability	6 (Acey, 2016; Davison et al., 2016; van der Laan et al., 2017; McGibbon & Van Belle, 2015; Perry et al., 2018; Westin et al., 2012–2013).	5
4	Unemployment, Social Exclusion, and Social Assistance, including subgroup of Poverty	4 (Gold et al., 2018; Onyango, 2009; Onyango & Jentoft, 2010; Reinecke & Ansari, 2016)	4
5	Food Security	3 (Hamann et al., 2011; Haysom et al., 2019; *Ingram & Memon, 2019)	9
6	Education	2 (Bennett et al., 2017; Schoeman & Mabunda, 2012)	12
7	Diversity and Equality	2 (Home & Kabata, 2018; Mertens, 2016)	11
8	Management Issues	2 (Okeke-Ogbuafor et al., 2020; Suleiman & Khakee, 2017)	8
9	Spatial Planning	2 (Barry & Fourie, 2002; Mwangi, 2009)	10
10	Economic Issues	1 (Ricker-Gilbert et al., 2013.)	6
11	Ethical Issues	1 (Heimer, 2013)	13
12	Security and Defense	1 (Asamoah, 2020)	2
	Conceptual Papers	2 (Booker, 2014; Farrell, 2011)	N/A

*One article on water security (Ingram & Memon, 2019) was included in this group.

that view HIV/AIDS as a wicked problem from different perspectives or due to different reasons (Burman, 2018; Burman & Aphane, 2017; Burman et al., 2017; Chasi, 2017; Tsisis et al., 2015), although it also includes one article on health governance (Khoo, 2013). In turn, the *Sustainability* group (6/45) includes a variety of research papers focusing on sustainability or sustainable development and defining this as a wicked problem (Acey, 2016; Booker, 2014; Davison et al., 2016; McGibbon & Van Belle, 2015; Perry et al., 2018; van der Laan et al., 2017). These are followed by the group *Unemployment, Social Exclusion, and Social Assistance*, including the subgroup of *Poverty*, which contains four articles concerned with poverty (Gold et al., 2018; Onyango, 2009; Onyango & Jentoft, 2010) or conflicts and violence (Reinecke & Ansari, 2016), the *Food Security* group, with three articles on food and water security, and seven smaller groups with 1–2 articles each. Two articles were categorized as *Conceptual Papers*, where no clear main wicked problems could be identified. In one of these, Booker (2014) applied the framework developed in the article to an example case; however, no clear *wicked problems* could be identified. In the other, Farrell (2011) used a case located in Africa as an example in the discussion, but this was not the main focus of the article.

Furthermore, in our reviewed literature, we failed to find the issues of two groups identified in the Danken et al. (2016) review: *Energy* and *Global Terrorism*, which was named as a

subgroup of the *Security and Defense* issue area. Moreover, most notably, we identified only one article whose main focus concerned the *Security and Defense* issue area (Asamoah, 2020), though this was the second largest group in the Danken et al. (2016) review.

Concrete manifestations of wicked problems. In the second coding phase, we analyzed the concrete manifestations of the issues identified in the first phase. For example, after discussing sustainability issues framed as wicked problems, Bouma and McBratney (2013) continue by presenting the case of *green water credits*, which are designed to improve the quality of water in Kenya. In this context, the authors describe a variety of complex social-environmental issues: soil degradation and its effects on, for instance, groundwater, farming, and a reservoir used for electricity production, and the difficulties in choosing the appropriate soil protection measures for all farmers due to differences in both soils and crops (Bouma & McBratney, 2013). These issues were coded and finally grouped under the theme *Environmental and Natural Resource Management*. As another example, Bruggemann et al. (2012) discuss the reasons for coral reef degradation in Madagascar and present multiple reasons for this problem based on the previous literature. Each of these reasons was coded as a concrete manifestation in its respective group.

This approach allowed us to identify seven distinctive *main wickedness themes* in the reviewed literature, which are

Table 4. Wickedness Issues and Related Problem Mechanisms and Manifestations.

Wickedness themes	Concrete manifestations and mechanisms	Articles
Ambiguity	Multiplicity of stakeholders and values Complexity, unknowns, and a lack of clarity	30/45
Institutional weakness and plurality	Pressure from external (development) actors Poor governance Top-down governance, short-term governance, weakness of governance and institutions lack of services, political will, knowledge (of policy effects), skills, trust Poor representation Corruption, clientelism “Unofficial” institutions: different ways, traditions, beliefs	24/45
Environmental and natural resource management	Climate change and its effects Wildlife and fisheries management Complexity of managing social-ecological systems Ecological issues Pollution Environmental change Ecological vs. economic values	23/45
Health	HIV/AIDS Continuing effects of previous interventions Ethical issues in healthcare and health research Food and water security Other	18/45
Socio-economic issues	Poverty Economic unfairness Unemployment	17/45
Human rights issues	Conflicts and violence Discrimination Indigenous peoples, minorities, gender-based discrimination	12/45
Historical path dependencies	Colonial history Apartheid history	6/45

presented in Table 4. Each theme contains lower-level categories, which we termed *Manifestations and Mechanisms*, as it includes both the ways the issues described as wicked problems are *manifested* in the literature (e.g., *Wildlife and Fisheries Management* issues, *HIV/AIDS*, *Food and Water Security*, *Poor Governance*), and the *mechanisms* that can be seen as the mediators, carriers or causations of these issues (e.g., *Stakeholder and Value Multiplicity*, *Colonial History*). One of the conceptual articles (Booker, 2014) was excluded from this phase, as no concrete issues could be found.

While this categorization partially overlaps with the thematic list, it nevertheless provides a more detailed description of the issues scholars consider are linked to wicked problems in Africa. Moreover, the ordering of the groups by prevalence in the literature we reviewed also provides a first glimpse of the central aspects of wicked problems discussed in the African context. Based on an in-depth reading and analysis, three observations can be made.

First, the article frequencies reveal a significant overlap between all main themes and especially between *Ambiguity* (30/45 articles), *Institutional weakness* (24/45), and *Environmental and natural resource management* (23/45). As such, the articles we reviewed seem to have described

complex issues with multiple causation mechanisms and manifestations. This is supported by the high prevalence of the Ambiguities group, which covers the majority of articles reviewed and whose manifestations and mechanisms are *multiplicity of stakeholders and values*, *complexity, unknowns, and a lack of clarity*. Quigely et al. (2015) is an example of an article including all three most prevalent wickedness themes and their interlinkedness, as it discusses, for example, the simultaneous existence of differing cultures and worldviews in Kenyan society, the failure of the government to take into account indigenous ways of life in environmental governance, and the degradation of the environment by different actors through the exploitation of natural resources.

Our second finding is the presence of the *Historical path dependencies* group. Here, we understand *path dependency* as the history of a process determining its future development (Kay, 2005, pp. 553–554). Especially relevant to this group is the concept of *dual wickedness* introduced by Suleiman and Khakee (2017). In our view, this concept could potentially advance the discussion on wicked problems by providing a perspective rooted in the African context. Suleiman and Khakee (2017) describe how water tariff

policies inherited from the colonial era have hampered the ability of a water utility company in the Ghanaian city of Accra to charge for water and how “appropriate institutions do not exist to produce optimal socio-economic outcomes and improve water services” (p. 333). The authors discuss and portray this urban water reform as a wicked problem and on this basis develop the novel concept of *dual wickedness*. Here, the concept describes the socio-cultural atmosphere in Ghana, which has been influenced by the continuing effects of its colonial history, dependence on external development actors, endemic corruption, the general sentiment among Ghanaians that “the state is not theirs,” and the consequent lack of a “sense of collective ‘ownership’ of public property.” Dual wickedness means “wickedness within wickedness,” and delineates how “political and social malaise in Ghana requires a thorough understanding of history, politics and power dynamics,” which is further complicated by external donors being “regarded as an extension of colonialism.” The authors consider that because the memory of the colonial era is “shared by the society as a whole, the implementation of a reform of a public policy is likely to be difficult, if not impossible since the experience resides in the collective memory of the society” (Suleiman & Khakee, 2017, pp. 329–330).

Overall, articles in the *historical path dependencies* group discuss the continuing impact of *colonial* or *apartheid history* on people or broader cultural contexts. For example, Acey (2016) discusses the entrenchment of the top-down governance introduced during Nigeria’s colonial era and its unsuitability for solving the issues prevalent in the country. In turn, Bennett et al. (2017, p. 59) argue that “[s]ocio-economic inequalities such as poverty still remain a challenge in post-apartheid South Africa and continue to impact the country by contributing to the burden of disease and social health faced by the population,” with the poorest potentially being the worst affected. Furthermore, Chasi (2017, p. 497) discusses Nelson Mandela’s efforts to communicate the HIV/AIDS problem and claims that the president was forced to work in a post-apartheid situation where leadership was difficult and “in societal arrangements that quite intractably constrain what they [leaders] can do to secure a more just social order.” Other problems in this group include the long-term effects of colonial (and post-colonial) rule on indigenous peoples and ethnic groups (Home & Kabata, 2018), and more general social and ecological issues in South African post-apartheid society (Mertens, 2016).

Though most clearly related to the theme of *historical path dependencies*, *dual wickedness* and its emphasis on the centrality of contextual understanding could arguably characterize many of the issues and literature reviewed here. For example, while discussing economic deprivation, Onyango (2009, p. 43) observes that wicked problems such as poverty are “quite unique to a particular area” and thus “solutions . . . cannot be the same in two different places.” Therefore, even defining poverty requires contextual

understanding (Onyango, 2009). In turn, Bruggemann et al. (2012) discusses how local belief systems may be one of the causes of coral reef degradation. Heimer (2013) again describes the ethical decisions made on a case-by-case basis by researchers working with patients in HIV/AIDS clinics. Burman (2018), Burman and Aphan (2017), and Burman et al. (2017) highlight the continuing negative effect of the old ABC HIV/AIDS prevention campaign on contemporary medical practitioners’ work, which requires a departure from the established ABC way of thinking. Moreover, problems intertwined with histories of colonialism, authoritarian regimes, the multiplicity of value systems, external influence, and overall contextual differences are discussed by multiple authors (e.g., Balint, 2007; Burman, 2018; Gold et al., 2018; Khoo, 2013; Onyango & Jentoft, 2010; Reinecke & Ansari, 2016; Ricker-Gilbert et al., 2013; Vogel et al., 2016).

Third, the close-up reading in this second coding phase produced the finding that the concept of wicked problems is integrated into the problems identified in the literature at two distinct levels—*descriptive* and *theoretical*. Most of the articles (32/45) use the concept in a merely *descriptive* way, and this descriptive usage in most cases seems to have three phases: first, a problem is presented; next, it is labeled as a wicked problem; last, different descriptions of wicked problems or suggested means of addressing the wicked problem are discussed based on the literature and in relation to the issue at hand. For example, while Ricker-Gilbert et al. (2013) underline that the issues addressed in agricultural input subsidy programs share some of the characteristics of wicked problems, they fail to integrate the concept or the characteristics of wicked problems otherwise into their review. This is congruent with Peters’ (2017) argument that *wicked problems* have become a “fad” in the academic literature and are used to describe a wide set of issues without deeper adherence to wicked problems theory. In such cases, the concept functions as a rhetorical device that links the issue discussed to the wicked problems discourse and potentially emphasizes an aspect compatible with the theory (see Peters, 2017; Peters & Tarpey, 2019; Termeer et al., 2019; Turnbull & Hoppe, 2019). In line with Peters, we too argue that such descriptive usage of wicked problems has low potential for contributing to the development of the wicked problems literature or the concept, as such research fails to provide new perspectives on wicked problems; rather, it simply subsumes the issues in question within the concept.

The other way of using the concept is *theoretical*. Here, the characteristics of wicked problems as derived from the literature are considered as a theory or a framework against which it is possible to analyze an issue or build new theories. Of the 13 articles utilizing the concept theoretically (Asamoah, 2020; Balint, 2007; Barry & Fourie, 2002; Booker, 2014; Davison et al., 2016; FitzGibbon & Mensah, 2012; Heimer, 2013; Ingram & Memon, 2019; Okeke-Ogbuafor et al., 2020; Onyango, 2009; Quigely et al., 2015;

Woodford et al., 2016), we found that the article by Suleiman and Khakee (2017), discussed above, contributed most to the discussion on wicked problems by providing a strong perspective rooted in the African context.

What Are the Geographic Foci of Articles That Use the Concept of “Wicked Problems” in the African Context?

The geographical focus of the articles was identified by gathering information on the location of the research or its geographical context. More than one focal area was allowed for each article. The results are presented in Figure 4. A clear majority (24/45) of the articles included in this review focused on South Africa, followed by articles written in the context of or focusing on the whole continent or larger areas of the continent (Africa overall, 8/45), and Kenya (7/45).

Is the Concept of Wicked Problems Utilized and Therefore Seen as Applicable by Authors Affiliated With African Cultures?

For this research question, information on the geographical location of the institutional affiliation of each author was collected. Affiliation was identified from all included articles based on the affiliation mentioned on the first page of each article. Here, to allow for a more detailed analysis, we distinguished between lead authors and other authors. Lead authors were identified as authors who were either (1) mentioned first in the author list or (2) were marked as corresponding authors. Authors of single-author articles were grouped as lead authors. If more than one affiliation was mentioned for a single author, only the first affiliation was coded. The affiliations of two lead authors were not disclosed, and these were grouped as *Unavailable*.

It should be noted, however, that this is very basic information on the connection between the concept of *wicked problems* and research and institutions in certain cultural contexts, and as such provides no information on the cultural or ethnic background or nationality of the authors. The geographical locations of the affiliated institutions of lead authors and authors employing the concept of wicked problems in the African context are presented in Figure 5.

As mentioned in the previous section, articles focusing on South Africa accounted for over half the reviewed articles (24/45). Similarly, South African research institutions were the most represented single group for both lead authors (17/45) and other authors (28/78). The authors (lead and other) were affiliated with five different African countries in total: Ghana, South Africa, Kenya, Madagascar, and Tanzania. Each of these countries was also represented as a focal area. Roughly half of both the lead authors (23/45: South Africa, Ghana, Tanzania, and Madagascar) and secondary authors (38/78: South Africa, Kenya, and Madagascar)

were affiliated with African countries. Of course, this also means that roughly a half of both the lead authors (22/45) and other authors had published in affiliation with research institutions in countries outside Africa. Nearly as many lead authors were affiliated with research institutions in the United States, the United Kingdom, and Canada together (14/45) as with South African institutions (17/45). The high prevalence of Swedish authors seems to be linked to two articles.

The results can be compared with information on the division of scholarly output between the continent's countries. A query made with the online tool SciVal (www.scival.com) of publications released in 2009–2018 and listed in the online database Scopus revealed that the 10 countries with the most academic publications in Africa (South Africa, Egypt, Tunisia, Nigeria, Algeria, Morocco, Kenya, Ethiopia, Ghana, and Uganda, respectively) accounted for 85% of all articles published in African countries. Of these 10 countries, authors from research institutions in only three countries (South Africa, Kenya, and Ghana) are represented in our sample. For example, no articles from Egypt were included in our review, even though it is the country with the second-most publications after South Africa.

An explanation for this difference might be language. All the lead authors of the articles included in this review were either affiliated with research institutions from countries with English as one of their official languages (leads from Canada, Ghana, Ireland, South Africa, Tanzania, South Africa, the United Kingdom, and the United States accounted for 33/45 lead authors) or some other language linked to a Western culture (altogether 22/45 lead authors were affiliated with European and North American research institutions). Ghana, South Africa and Tanzania were the only African countries with which lead authors were affiliated. Similarly, except for the Democratic Republic of Congo and Madagascar, *all the geographical focal areas included in our review* had English as one of their official or widely used languages. Six of the top 10 of African countries with the most academic publications (Egypt, Algeria, Morocco, Tunisia, Ethiopia, Uganda) were not represented in our sample either as focal areas or as the locations of research institutions. Of these, only Uganda has English as an official or widely used language (Central Intelligence Agency, 2021).

Our key finding is that *the usage of the concept of “wicked problems” in research focused on Africa is strongly linked to South African and Western research institutions*. Furthermore, the research itself is mainly focused on African countries with English as one of the predominant languages. Even though the majority of academic literature, especially that found in journals, is published in English (see Amano et al., 2016; Hamel, 2007), language differences may account for the lack of research literature utilizing this concept in the African context. Scholars from non-Western cultures, non-native English speakers, or scholars primarily using other-than-English languages in their work may not use, be aware

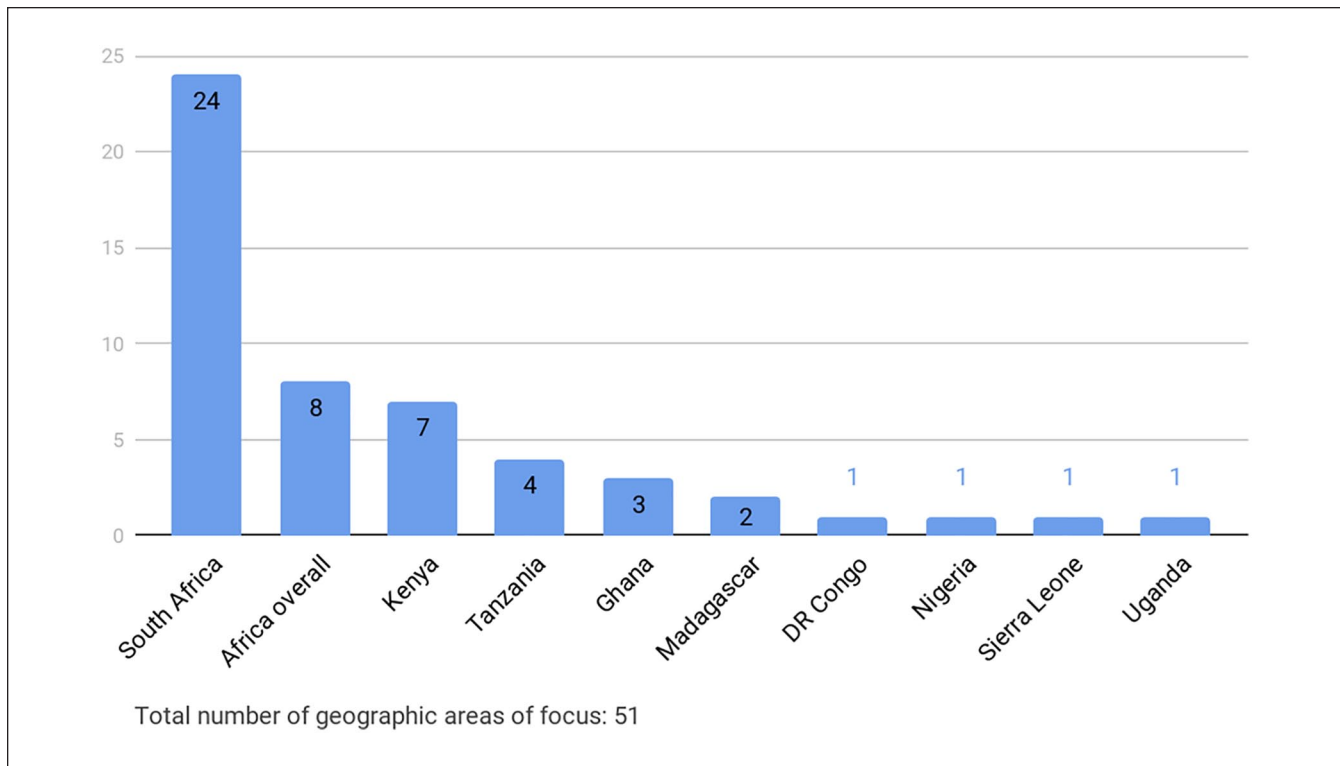


Figure 4. Geographical foci of the articles.

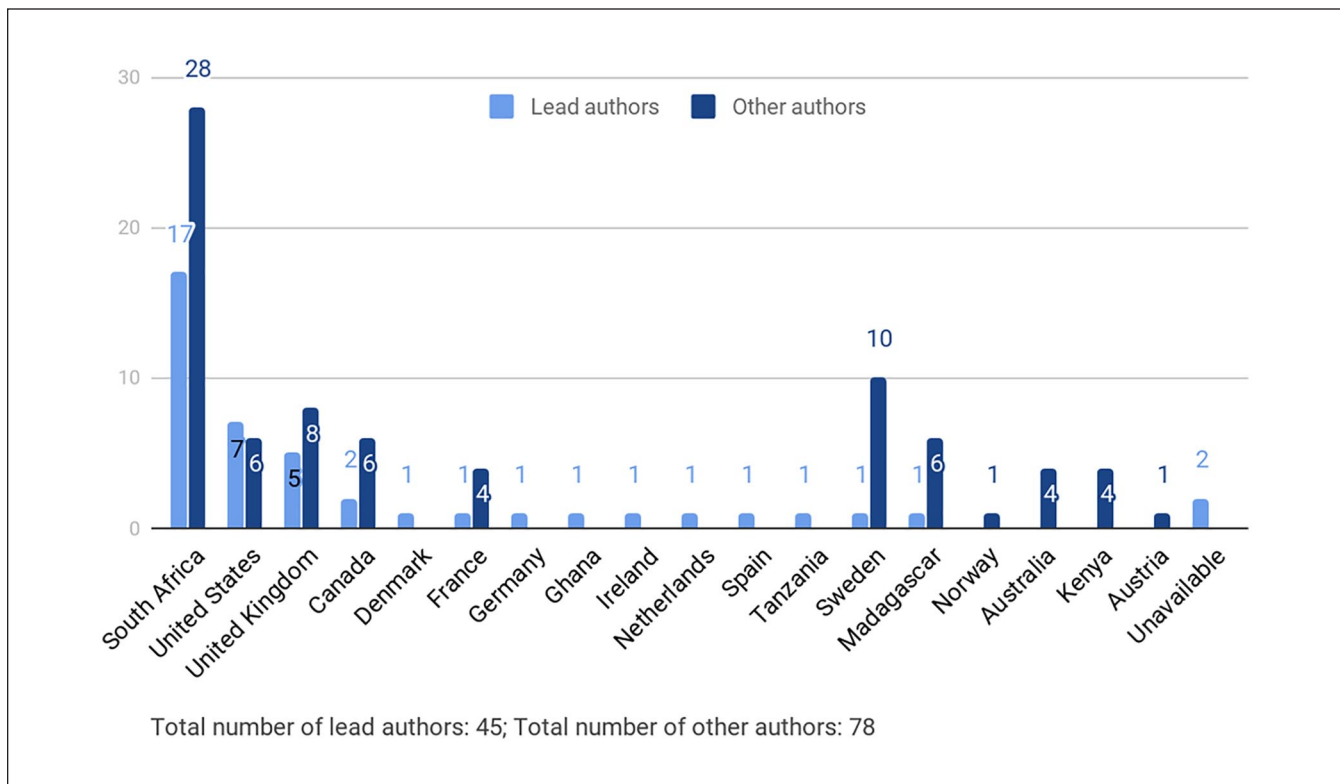


Figure 5. Geographical distribution of the affiliated institutions of lead authors and other authors.

of, or see *wicked problems* as a suitable concept for their cases (for a discussion on non-native English speakers and academic publishing, see Salager-Meyer, 2008). For example, in their analysis of articles published in Africa-focused journals, Briggs and Weathers (2016, p. 486–487) suggested that “academics based outside Africa write on topics different from those chosen by academics based inside Africa” and that “Africa-based authors are writing on topics that do not map neatly onto the broader Anglophone political science literature.” Likewise, it would seem that *wicked problems* is a concept predominantly used by researchers linked to Western institutions—to researchers who know and use English in their work and who are familiar with this Western research strand. As discussed by Briggs and Weathers (2016), such differences in topics between African and Western researchers may also be one explanation for the low citation numbers of articles published by African-based authors.

Discussion

As mentioned earlier, much of the literature on *wicked problems* has thus far focused primarily on the characteristics of wicked problems, and many authors have contributed to this theme. As our analysis confirmed, these characteristics, such as *conflict*, *complexity*, and *uncertainty* (Termeer et al., 2019), are nonetheless compatible with many different understandings of *wicked problems* (see also Danken et al., 2016). However, less research has focused on the specific issues referred to as wicked, a gap we have attempted to address through the research question “*What are the concrete manifestations of issues described as wicked in the African context?*” Based on the results reported in the section on the concrete manifestations of wicked problems, we developed a *typology of wicked problems in Africa*, presented in Figure 6.

The typology is formed on the basis of the main themes and the manifestations and mechanisms identified in the literature included in this review. It consists of the three groups of *interlinked*, *exacerbated*, and *contextual problems*. *Interlinked problems* are broad, ambiguous issues characterized by multiple causes linked to other problems and other groups in the typology. Such issues include input subsidies (Ricker-Gilbert et al., 2013), highly complex socio-economic-ecological issues (Gold et al., 2018), conflicts between groups of people or people and animals (Bond, 2016), the management of invasive species that cause environmental harm but provide economic and social benefits (Woodford et al., 2016), and poverty (e.g., Okeke-Ogbuafor et al., 2020; Onyango, 2009; Onyango & Jentoft, 2010). Exacerbated problems are also somewhat complex in terms of their linkages, but at the same time they also display some context-specific characteristics. Such issues may include HIV/AIDS-related problems connected to previous attempts to control the epidemic (Burman & Aphane, 2017), issues that require contextual consideration due to a conflict between “official ethics” and “ethics on the ground” (Heimer, 2013),

and institutional weakness epitomized by overall poor governance, corruption, and dependence on external actors (e.g., Mwangi, 2009; Okeke-Ogbuafor et al., 2020; Suleiman & Khakee, 2017). Institutional weakness may also fall into the *contextual problems* category, as the issues associated with institutional weakness may vary greatly between states and are strongly contextual (see, e.g., Asamoah, 2020).

The issues that are most clearly *contextual problems* are those included within the *historical path dependencies* theme. Suleiman and Khakee’s (2017, p. 329) concept of *dual wickedness* describes this end of the continuum well: to understand issues in their contexts “a thorough understanding of history, politics and power dynamics” is required. This notion is also compatible with the original description of wicked problems by Rittel and Webber (1973, p. 173): though two problems may seem similar, “there always might be an additional distinguishing property that is of overriding importance.” This context-specificity has not been included in the contemporary characterizations of wicked problems as issues with *conflict*, *complexity*, and *uncertainty* (Danken et al., 2016; Termeer et al., 2019), but, interestingly, the emphasis on context-specific solutions is reflected in the *adaptive*, *participatory*, and *transdisciplinary* methods often suggested for addressing wicked problems (Xiang, 2013; Head & Xiang, 2016). The *wicked problems* in Africa reviewed in the present study are, for their part, highly context-specific and politically, culturally, and historically intertwined. For example, Home and Kabata (2018, p. 3) describe the case of “descendants of Nubian soldiery that served the British colonial power” living in Kenya. Nubian soldiers were recruited by the British at the beginning of the 20th century and remained in Kenya after their service. The British colonial administration did not, however, consider them citizens. This denial of citizenship, and thus any land rights, was inherited by their descendants and continued until 2017, when the situation was to some extent settled (Home & Kabata, 2018). Thus, while the issue at hand is certainly conflict-ridden, complex and uncertain, it is also highly contextual. Understanding history is crucial for understanding and dealing with such wicked problems. Such contextually and culturally aware “decolonizing” approaches have also been advocated by several scholars (Mama, 2007; see also Asante, 1998; Khupe & Keane, 2017; Mkabela, 2005; Ndimande, 2012).

Why then is the overall popularity of the concept not replicated in the African context? Xiang (2013, p. 2) asked if this discrepancy could “be a reflection of the difference in developmental stages between developed and developing countries?” In the light of the body of literature reviewed in the present study, this seems unlikely. Rather, the underuse of the concept of wicked problems is probably attributable to cultural or language backgrounds. Indeed, earlier research has revealed that the topics selected by Africa-based authors differ from those of their non-African counterparts (Briggs & Weathers, 2016).

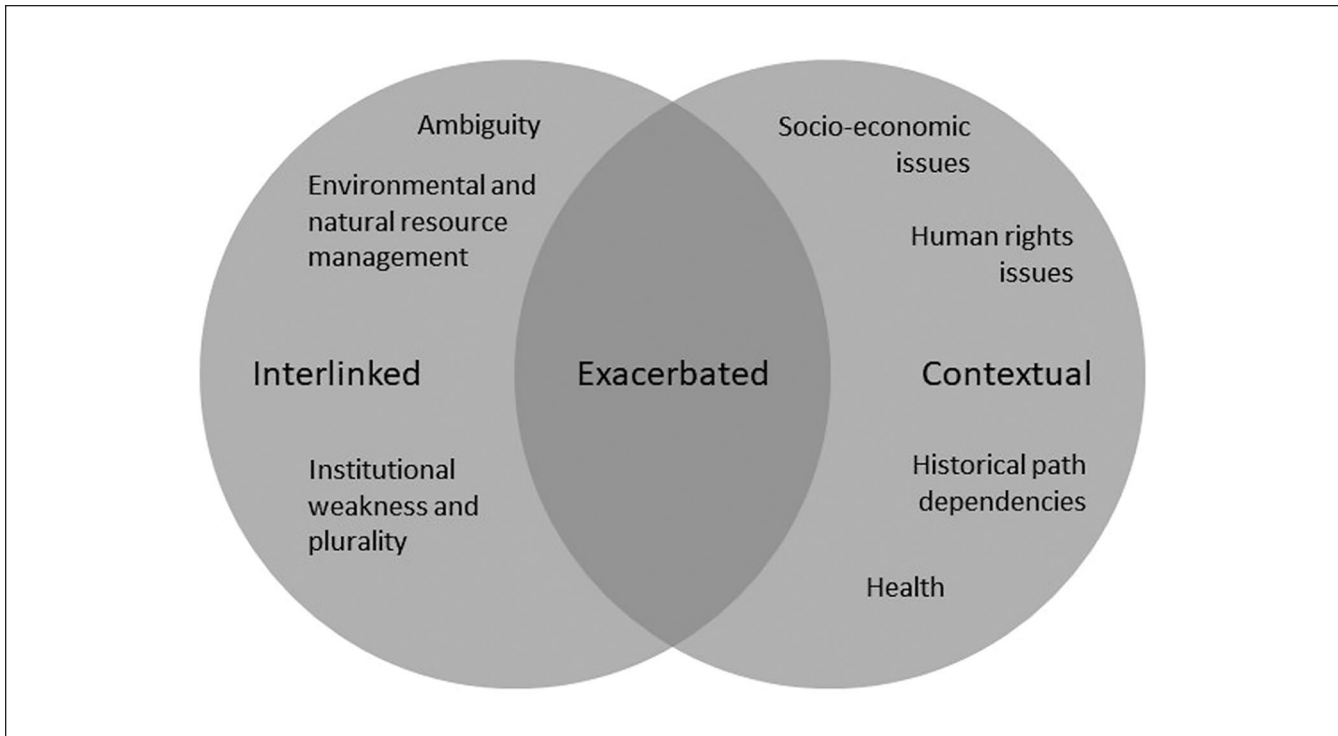


Figure 6. A typology of wicked problems in Africa.

Finally, we are aware of the limitations of this review. The articles we analyzed are from a broad range of disciplines, employ multiple different methodologies, include both conceptual and empirical research and cover a variety of topics. To ensure the inclusion of a significant portion of the *wicked problems* literature published in the African context, we placed no restrictions on the type of research (empirical or conceptual) in the inclusion and exclusion criteria, which have been presented in the section on methods and materials. However, this choice also presented challenges. The number, plurality and diversity of the articles reviewed complicated the consolidation of information on them and lowered the level of detail. However, this drawback was addressed through clear reporting and by answering the first research question in two phases, the latter of which was more interpretative and grounded. In addition, we are aware of the “Anglophone” (Briggs & Weathers, 2016) background of the concept we are researching and the potential issues concerning Western scholars contributing to research on Africa.

Conclusion

In this systematic literature review, we analyzed 45 peer-reviewed academic articles on *wicked problems* in the African context and consequently answered three research questions. First, we studied the main themes and issues characterized as wicked. As in a similar study of wicked problems by Danken et al. (2016) (without geographic limitation),

we found *Environmental Resource Management* to be the most frequent theme, but with one striking difference: climate change played a key role in just one article, while Danken et al. (2016) found a significant number of such articles. The second most frequent theme in our sample was *Health and Healthcare* (ranked no. 3 by Danken et al., 2016), which mostly consisted of articles that viewed HIV/AIDS as a wicked problem from different perspectives or for different reasons. Interestingly, in contrast to Danken et al. (2016), where it was the second largest group, only one article fell under theme of *Security and Defense* in our study.

To better understand—and articulate—the contextual characteristics of wicked problems in our sample, we conducted a more grounded qualitative content analysis of the wicked problems most repeatedly discussed. We classified these, on one hand, as concrete manifestations (environmental and resource management, health, economic issues, and human rights issues), and on the other hand, as mechanisms (ambiguity, institutional weaknesses, and historical path dependencies). Even though some of these manifestations and mechanisms overlapped with the previous thematic analysis, conducting a parallel analysis of both substantive (i.e. concrete manifestations) and process (i.e. mechanisms) issues allowed us to progress toward a typology of wicked problems in Africa. As illustrated in Figure 6, wickedness can be constituted either by the interlinkedness of several simultaneous problems, which result in ambiguities in defining the problems and their root causes, or by contextual complexities,

often derived from historical path dependencies, that undermine effective governance interventions. When these factors coexist, problems tend to become exacerbated, as, for example, in the case of finding viable treatments for AIDS/HIV, where the poor historical track record of disease treatment has contributed to a low level of trust and agency in managing the problem.

Answers to the second and third research questions on the geographical division of authors and research subjects indicated that the concept of *wicked problems* is still mainly utilized by authors affiliated to English-speaking African countries or non-African countries. We suggested that this was probably due to a lack of knowledge or acceptance of this Western or U.S. concept among African academics.

The theory of wicked problems is an important tool in the effort to characterize the most severe challenges facing societies, and we consider that this concept can also contribute to problem diagnostics, critical reflection, and policy learning in the African context. In line with the views of Alford and Head (2017) and Noordegraaf et al. (2019), we consider the concept relevant for both academics and practitioners around the globe when drawing attention to complex social realities. The concept serves as a means for academia to assess different societal challenges and problem types and can empower practitioners faced with seemingly intractable problems. In addition, it can provide them with an established toolkit for tackling the issue at hand (Raisio, 2009). However, as this review and the vivid discussion around the concept has demonstrated, it remains a work-in-progress. *Wicked problems* can and should be developed from the foundation established by Rittel and Webber in 1973 to accommodate contemporary global contexts, Africa included.

Of the wickedness themes identified in the present study, we found that the notion of *dual wickedness* (Suleiman & Khakee, 2017)—the importance of contextuality—resonated with both the literature we reviewed and approaches advocated by other scholars focusing on Africa. Moreover, it also highlighted an important aspect of *wicked problems*. Based on the contextual issues in the literature reviewed in the present study, we argue that context-sensitivity should be incorporated into characterizations of wicked problems. This may also address some of the criticisms of the concept presented in Table 1 and could be compatible with the notion of context-aware, practice-based, on-the-ground-oriented *wickedness* suggested by Noordegraaf et al. (2019) as a response to the “weaknesses of wickedness theory.”

This article focused on the “problematique” or analysis and comparison of the most salient and frequent wicked problem themes and issues that characterize African societies in the literature. Future research should alter the perspective and begin exploring the “resolutique” or appropriate means to address such challenges; this could potentially allow further elaboration of the theory of wicked problems to better take into account the huge contextual differences

that prevail between Western and non-Western societies. The results and discussion presented in this article will also inform future research questions, such as the way complex issues should be approached at *street-level*. Based on this review, it would seem that the wicked problems literature on Africa has thus far failed to address the way citizens and practitioners experience and respond to wicked problems. Thus, it remains unclear whether the notion of *wicked problems* resonates with the day-to-day challenges confronted by African citizens and practitioners alike. Moreover, in a broader context, the wicked problems literature has focused strongly on *Defense and Security* (Danken et al., 2016)—why is this not reflected in the context of Africa? Finally, it would be important to map African complexity-related research and practical approaches to these multifaceted problems, as many of the issues reviewed and discussed by the scholars in this review could be characterized as complex.

Acknowledgments

The authors would like to thank the participants of the 2019–2020 University of Helsinki ECGS Consumer Citizens and Sustainable Transitions Master’s Thesis Seminar for their invaluable comments and discussion on earlier drafts.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research and/or authorship of this article.

ORCID iDs

Ville-Pekka Niskanen  <https://orcid.org/0000-0002-5109-6183>

Mikko Rask  <https://orcid.org/0000-0002-1065-0192>

References

- References marked with an asterisk indicate studies included in the systematic literature review.
- *Acey, C. (2016). Managing wickedness in the Niger Delta: Can a new approach to multi-stakeholder governance increase voice and sustainability? *Landscape and Urban Planning*, *154*, 102–114. <https://doi.org/10.1016/j.landurbplan.2016.03.014>
 - Alford, J., & Head, B. W. (2017). Wicked and less wicked problems: A typology and a contingency framework. *Policy and Society*, *36*(3), 397–413. <https://doi.org/10.1080/14494035.2017.1361634>
 - Amano, T., González-Varo, J. P., & Sutherland, W. J. (2016). Languages are still a major barrier to global science. *PLOS Biology*, *14*(12), Article e2000933. <https://doi.org/10.1371/journal.pbio.2000933>
 - Arksey, H., & O’Malley, L. (2005). Scoping studies: Towards a methodological framework. *International Journal of Social*

- Research Methodology*, 8, 119–132. <https://doi.org/10.1080/1364557032000119616>
- *Asamoah, K. (2020). Addressing the problem of political vigilantism in Ghana through the conceptual lens of wicked problems. *Journal of Asian and African Studies*, 55(3), 457–471. <https://doi.org/10.1177/0021909619887608>
- Asante, M. K. (1998). *The Afrocentric idea: Revised and expanded edition*. Temple University Press.
- *Balint, P. J. (2007). A proposed general model for Southern African community-based wildlife management. *Human Dimensions of Wildlife*, 12(3), 169–179. <https://doi.org/10.1080/10871200701322829>
- *Barry, M., & Fourie, C. (2002). Wicked problems, soft systems and cadastral systems in periods of uncertainty: South African experience. *Survey Review*, 36(285), 483–496. <https://doi.org/10.1179/sre.2002.36.285.483>
- *Benjamin-Fink, N., & Reilly, B. K. (2017). A road map for developing and applying object-oriented Bayesian networks to “WICKED” problems. *Ecological Modelling*, 360, 27–44. <https://doi.org/10.1016/j.ecolmodel.2017.06.028>
- *Bennett, A. G., Cassim, F., & van der Merwe, M. (2017). How design education can use generative play to innovate for social change: A case study on the design of South African children’s health education toolkits. *International Journal of Design*, 11(2), 57–72.
- Boege, V., Brown, M. A., & Clements, K. P. (2009). Hybrid political orders, not fragile states. *Peace Review*, 21(1), 13–21. <https://doi.org/10.1080/10402650802689997>
- *Bond, J. (2016). Extension agents and conflict narratives: A case of Laikipia County, Kenya. *The Journal of Agricultural Education and Extension*, 22(1), 81–96. <https://doi.org/10.1080/1389224X.2014.997256>
- *Booker, D. S. (2014). Wiki approaches to wicked problems: Considering African traditions in innovative collaborative approaches. *Development in Practice*, 24(5–6), 672–685. <http://doi.org/10.1080/09614524.2014.934786>
- *Bouma, J., & McBratney, A. (2013). Framing soils as an actor when dealing with wicked environmental problems. *Geoderma*, 200–201, 130–139. <https://doi.org/10.1016/j.geoderma.2013.02.011>
- Briggs, R. C., & Weathers, S. (2016). Gender and location in African politics scholarship: The other white man’s burden? *African Affairs*, 115(460), 466–489. <https://doi.org/10.1093/afraf/adw009>
- *Bruggemann, J. H., Rodier, M., Guillaume, M. M., Andréfouët, S., Arfi, R., Cinner, J. E., Pichon, M., Ramahatratra, F., Rasoamanendrika, F., Zinke, J., & McClanahan, T. R. (2012). Wicked social–ecological problems forcing unprecedented change on the latitudinal margins of coral reefs: The case of southwest Madagascar. *Ecology and Society*, 17(4), 47. <https://doi.org/10.5751/ES-05300-170447>
- *Burman, C. J. (2018). The Taming Wicked Problems Framework: A plausible biosocial contribution to “ending AIDS by 2030.” *The Journal for Transdisciplinary Research in Southern Africa*, 14(1), 1–12. <https://doi.org/10.4102/td.v14i1.401>
- *Burman, C. J. (2019). Re-contextualizing medical pluralism in South Africa: A research schema for indigenous decision making. *Systemic Practice and Action Research*, 32(4), 379–402. <https://doi.org/10.1007/s11213-018-9460-0>
- *Burman, C. J., & Aphane, M. (2017). Complex HIV/AIDS landscapes: Reflections on how “path creation” influenced an action-oriented intervention. *Systemic Practice and Action Research*, 30(1), 45–66. <https://doi.org/10.1007/s11213-016-9385-4>
- *Burman, C. J., Aphane, M., Mtapuri, O., & Delobelle, P. (2015). Expanding the prevention armamentarium portfolio: A framework for promoting HIV-Conversant Communities within a complex, adaptive epidemiological landscape. *SAHARA-J: Journal of Social Aspects of HIV/AIDS*, 12(1), 18–29. <https://doi.org/10.1080%2F17290376.2015.1034292>
- *Burman, C. J., Aphane, M. A., & Mollé, N. M. (2017). The taming wicked problems framework: Reflections in the making. *Journal for New Generation Sciences*, 15(1), 51–73.
- Central Intelligence Agency. (2021, July 7). The World Factbook. <https://www.cia.gov/the-world-factbook/>
- *Chasi, C. (2017). What we should have learnt from Mandela. *African Studies*, 76(4), 491–507. <https://doi.org/10.1080/00020184.2017.1346347>
- Christiaensen, L., & Hill, R. (2019). Poverty in Africa. In K. Beegle & L. Christiaensen (Eds.), *Accelerating poverty reduction in Africa* (pp. 33–50). International Bank for Reconstruction and Development / The World Bank.
- Churchman, C. W. (1967). Guest editorial: Wicked problems. *Management Science*, 14(4), B141–B142.
- The Cochrane Collaboration. (2015, February 3). Glossary. *Cochrane Community*. <https://community.cochrane.org/glossary>
- Conklin, J. (2005). *Dialogue mapping. Building shared understanding of wicked problems*. John Wiley.
- Danken, T., Dribbisch, K., & Lange, A. (2016). Studying wicked problems forty years on: Towards a synthesis of a fragmented debate. *Der Moderne Staat—Dms: Zeitschrift für Public Policy, Recht und Management*, 9(1), 15–33. <https://doi.org/10.3224/dms.v9i1.23638>
- *Davison, A., Patel, Z., & Greyling, S. (2016). Tackling wicked problems and tricky transitions: Change and continuity in Cape Town’s environmental policy landscape. *Local Environment*, 21(9), 1063–1081. <https://doi.org/10.1080/13549839.2015.1066321>
- Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing*, 62(1), 107–115. <https://doi.org/10.1111/j.1365-2648.2007.04569.x>
- *Farrell, K. N. (2011). Snow white and the wicked problems of the west: A look at the lines between empirical description and normative prescription. *Science, Technology, & Human Values*, 36(3), 334–361. <https://doi.org/10.1177%2F0162243910385796>
- *FitzGibbon, J., & Mensah, K. O. (2012). Climate change as a wicked problem: An evaluation of the institutional context for rural water management in Ghana. *SAGE Open*, 2(2), 1–14. <https://doi.org/10.1177/2158244012448487>
- Gjaltema, J., Biesbroek, R., & Termeer, K. (2019). From government to governance. . . to meta-governance: A systematic literature review. *Public Management Review*, 22, 1760–1780. <https://doi.org/10.1080/14719037.2019.1648697>
- *Gold, S., Muthuri, J. N., & Reiner, G. (2018). Collective action for tackling “wicked” social problems: A system dynamics model for corporate community involvement. *Journal of Cleaner Production*, 179, 662–673. <https://doi.org/10.1016/j.jclepro.2017.11.197>

- Grimm, S., Lemay-Hébert, N., & Nay, O. (2014). 'Fragile States': Introducing a political concept. *Third World Quarterly*, 35(2), 197–209. <https://doi.org/10.1080/01436597.2013.878127>
- Grint, K. (2005). Problems, problems, problems: The social construction of leadership. *Human Relations*, 58(11), 1467–1493. <https://doi.org/10.1177/0018726705061314>
- *Hamann, R., Giamporcaro, S., Johnston, D., & Yachkaschi, S. (2011). The role of business and cross-sector collaboration in addressing the “wicked problem” of food insecurity. *Development Southern Africa*, 28(4), 579–594. <http://doi.org/10.1080/0376835X.2011.605581>
- Hamel, R. E. (2007). The dominance of English in the international scientific periodical literature and the future of language use in science. *Aila Review*, 20(1), 53–71. <https://doi.org/10.1075/aila.20.06ham>
- *Haysom, G., Olsson, E., Dymitrow, M., Opiyo, P., Taylor Buck, N., Oloko, M., Spring, C., Fermskog, K., Ingelhart, K., Kotze, S., & Agong, S. G. (2019). Food systems sustainability: An examination of different viewpoints on food system change. *Sustainability*, 11(12), 3337. <https://doi.org/10.3390/su11123337>
- *Heimer, C. A. (2013). “Wicked” ethics: Compliance work and the practice of ethics in HIV research. *Social Science & Medicine*, 98, 371–378. <https://doi.org/10.1016/j.socscimed.2012.10.030>
- Head, B. W., & Xiang, W. N. (2016). Why is an APT approach to wicked problems important? *Landsc Urban Plan*, 154, 4–7. <https://doi.org/10.1016/j.landurbplan.2016.03.018>
- *Home, R., & Kabata, F. (2018). Turning fish soup back into fish: The wicked problem of African Community land rights. *Journal of Sustainable Development Law and Policy*, 9, 21–22. <https://doi.org/10.4314/jsdlp.v9i2.2>
- *Ingram, W., & Memon, F. A. (2019). Internet of Things innovation in rural water supply in sub-Saharan Africa: A critical assessment of emerging ICT. *Waterlines*, 38(2), 71–93. <https://doi.org/10.3362/1756-3488.18-00028>
- Irele, A. (1991). The African scholar. *Transition*, 51, 56–69. <https://doi.org/10.2307/2935078>
- Isoaho, K., & Karhunmaa, K. (2019). A critical review of discursive approaches in energy transitions. *Energy Policy*, 128, 930–942. <https://doi.org/10.1016/j.enpol.2019.01.043>
- Kay, A. (2005). A critique of the use of path dependency in policy studies. *Public Administration*, 83(3), 553–571. <https://doi.org/10.1111/j.0033-3298.2005.00462.x>
- *Khoo, S. M. (2013). Health governance and ‘wicked problems’: Facing complex developmental transitions using a rights-based approach. *Irish Studies in International Affairs*, 24, 259–273. <https://doi.org/10.3318/ISIA.2013.24.8>
- Khupe, C., & Keane, M. (2017). Towards an African education research methodology: Decolonising new knowledge. *Educational Research for Social Change*, 6(1), 25–37. <https://doi.org/10.17159/2221-4070/2017/v6i1a3>
- King, J. B. (1993). Learning to solve the right problems: The case of nuclear power in America. *Journal of Business Ethics*, 12(2), 105–116. <https://doi.org/10.1007/BF00871930>
- Kirschke, S., Franke, C., Newig, J., & Borchardt, D. (2019). Clusters of water governance problems and their effects on policy delivery. *Policy and Society*, 38(2), 255–277. <https://doi.org/10.1080/14494035.2019.1586081>
- Lassiter, J. E. (2000). African culture and personality: Bad social science, effective social activism, or a call to reinvent ethnology. *African Studies Quarterly*, 3(3), 1–21. <http://asq.africa.ufl.edu/files/Lassiter-Vol-3-Issue-3.pdf>
- Levin, K., Cashore, B., Bernstein, S., & Auld, G. (2012). Overcoming the tragedy of super wicked problems: Constraining our future selves to ameliorate global climate change. *Policy Sciences*, 45(2), 123–152. <https://doi.org/10.1007/s11077-012-9151-0>
- Mama, A. (2007). Is it ethical to study Africa? Preliminary thoughts on scholarship and freedom. *African Studies Review*, 50(1), 1–26. <https://doi.org/10.1353/arw.2005.0122>
- *McGibbon, C., & Van Belle, J. P. (2015). Integrating environmental sustainability issues into the curriculum through problem-based and project-based learning: A case study at the University of Cape Town. *Current Opinion in Environmental Sustainability*, 16, 81–88. <http://doi.org/10.1016/j.cosust.2015.07.013>
- *Mertens, D. M. (2016). Advancing social change in South Africa through transformative research. *South African Review of Sociology*, 47(1), 5–17. <https://doi.org/10.1080/21528586.2015.1131622>
- Mkabela, Q. (2005). Using the Afrocentric method in researching indigenous African culture. *The Qualitative Report*, 10(1), 178–189. <http://www.nova.edu/ssss/QR/QR10-1/mkabela.pdf>
- Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G., & The PRISMA Group. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLOS Medicine*, 6(7), Article e1000097. <https://doi.org/10.1371/journal.pmed.1000097>
- Munn, Z., Peters, M. D., Stern, C., Tufanaru, C., McArthur, A., & Aromataris, E. (2018). Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Medical Research Methodology*, 18(1), 1–7. <https://doi.org/10.1186/s12874-018-0611-x>
- *Mwangi, E. (2009). Property rights and governance of Africa’s rangelands: A policy overview. *Natural Resources Forum*, 33(2), 160–170. <https://doi.org/10.1111/j.1477-8947.2009.01219.x>
- Ndimande, B. S. (2012). Decolonizing research in postapartheid South Africa: The politics of methodology. *Qualitative Inquiry*, 18(3), 215–226. <https://doi.org/10.1177/1077800411431557>
- Noordegraaf, M., Douglas, S., Geuijen, K., & van der Steen, M. (2019). Weaknesses of wickedness: A critical perspective on wickedness theory. *Policy and Society*, 38(2), 278–297. <https://doi.org/10.1080/14494035.2019.1617970>
- OECD. (2016). *States of fragility 2016: Understanding violence*. <https://doi.org/10.1787/9789264267213-en>
- OECD. (2018). *States of Fragility 2018*. <https://doi.org/10.1787/9789264302075-en>
- *Okeke-Ogbuafor, N., Gray, T., & Stead, S. M. (2020). Is there a “wicked problem” of small-scale coastal fisheries in Sierra Leone? *Marine Policy*, 118, 103471. <https://doi.org/10.1016/j.marpol.2019.02.043>
- *Onyango, P. (2009). Re-configuring poverty: The wickedness perspective. *African Journal of Tropical Hydrobiology and Fisheries*, 12(1), 37–46. <https://doi.org/10.4314/ajthf.v12i1.58032>
- *Onyango, P., & Jentoft, S. (2010). Assessing poverty in small-scale fisheries in Lake Victoria, Tanzania. *Fish and Fisheries*,

- 11(3), 250–263. <https://doi.org/10.1111/j.1467-2979.2010.00378.x>
- Osaghae, E. E. (2007). Fragile states. *Development in Practice*, 17(4–5), 691–699. <https://doi.org/10.1080/09614520701470060>
- *Perry, B. G., Patel, Z., Norén Bretzer, Y., & Polk, M. (2018). Organising for co-production: Local interaction platforms for urban sustainability. *Politics and Governance*, 6(1), 189–198. <https://doi.org/10.17645/pag.v6i1.1228>
- Peters, B. G. (2017). What is so wicked about wicked problems? A conceptual analysis and a research program. *Policy and Society*, 36(3), 385–396. <https://doi.org/10.1080/14494035.2017.1361633>
- Peters, B. G., & Tarpey, M. (2019). Are wicked problems really so wicked? Perceptions of policy problems. *Policy and Society*, 38(2), 218–236. <https://doi.org/10.1080/14494035.2019.1626595>
- *Quigely, C. F., Dogbey, J., Che, S. M., & Hallo, J. (2015). Shared understandings: Environmental perspectives of Kenyan community members and teachers. *Environmental Education Research*, 21(7), 1079–1104. <https://doi.org/10.1080/13504622.2014.966660>
- Raisio, H. (2009). Health care reform planners and wicked problems. *Journal of Health Organization and Management*, 23(5), 477–493. <https://doi.org/10.1108/14777260910983989>
- Ramaswamy, S. B. (2015). Setting the table for a hotter, flatter, more crowded earth: Insects on the menu? *Journal of Insects as Food and Feed*, 1(3), 171–178. <https://doi.org/10.3920/JIFF2015.0032>
- *Reinecke, J., & Ansari, S. (2016). Taming wicked problems: The role of framing in the construction of corporate social responsibility. *Journal of Management Studies*, 53(3), 299–329. <https://doi.org/10.1111/joms.12137>
- *Rendigs, A., Reibelt, L. M., Ralainasolo, F. B., Ratsimbazafy, J. H., & Waeber, P. O. (2015). Ten years into the marshes—Hapalemur alaotrensis conservation, one step forward and two steps back? *Madagascar Conservation & Development*, 10(1), 13–20. <https://doi.org/10.4314/mcd.v10i1.S3>
- *Ricker-Gilbert, J., Jayne, T., & Shively, G. (2013). Addressing the “wicked problem” of input subsidy programs in Africa. *Applied Economic Perspectives and Policy*, 35(2), 322–340. <https://doi.org/10.1093/aep/ppt001>
- Ritchey, T. (2013). Wicked problems: Modelling social messes with morphological analysis. *Acta Morphologica Generalis*, 2(1), 1–8.
- Rittel, H. W., & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy Sciences*, 4(2), 155–169. <https://doi.org/10.1007/BF01405730>
- Rocheffort, D. A., & Cobb, R. W. (1993). Problem definition, agenda access, and policy choice. *Policy Studies Journal*, 21(1), 56–71. <https://doi.org/10.1111/j.1541-0072.1993.tb01453.x>
- Salager-Meyer, F. (2008). Scientific publishing in developing countries: Challenges for the future. *Journal of English for Academic Purposes*, 7(2), 121–132. <https://doi.org/10.1016/j.jeap.2008.03.009>
- *Schoeman, S., & Mabunda, P. L. (2012). Teaching practice and the personal and socio-professional development of prospective teachers. *South African Journal of Education*, 32(3), 240–254.
- Siddaway, A. P., Wood, A. M., & Hedges, L. V. (2019). How to do a systematic review: A best practice guide for conducting and reporting narrative reviews, meta-analyses, and meta-syntheses. *Annual Review of Psychology*, 70, 747–770. <https://doi.org/10.1146/annurev-psych-010418-102803>
- Skaburskis, A. (2008). The origin of “wicked problems.” *Planning Theory & Practice*, 9(2), 277–280. <https://doi.org/10.1080/14649350802041654>
- *Suleiman, L., & Khakee, A. (2017). Rethinking water reform policies as a “wicked problem” the case of urban water supply in Ghana. *International Planning Studies*, 22(4), 320–332. <https://doi.org/10.1080/13563475.2017.1291333>
- The Sustainable Development Goals Center for Africa, & Sustainable Development Solutions Network. (2019). *Africa SDG index and dashboards report 2019*.
- Termeer, C. J., & Dewulf, A. (2019). A small wins framework to overcome the evaluation paradox of governing wicked problems. *Policy and Society*, 38(2), 298–314. <https://doi.org/10.1080/14494035.2018.1497933>
- Termeer, C. J., Dewulf, A., & Biesbroek, R. (2019). A critical assessment of the wicked problem concept: Relevance and usefulness for policy science and practice. *Policy and Society*, 38(2), 167–179. <https://doi.org/10.1080/14494035.2019.1617971>
- Tricco, A. C., Lillie, E., Zarin, W., O’Brien, K. K., Colquhoun, H., Levac, D., Moher, D., Peters, M., Horsley, T., Weeks, L., Hempel, S., Akl, E. A., Chang, C., McGowan, J., Stewart, L., Hartling, L., Aldcroft, A., Wilson, M. G., Garrity, C., . . . Straus, S. E. (2018). PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. *Annals of Internal Medicine*, 169(7), 467–473. <https://doi.org/10.7326/M18-0850>
- *Tsisis, P., Cooke-Lauder, J., & Evans, J. M. (2015). Working together in a complex environment: Collaborative behaviors and social capital. *International Journal of Public Administration*, 38(8), 544–552. <https://doi.org/10.1080/01900692.2014.949749>
- Turnbull, N., & Hoppe, R. (2019). Problematizing ‘wickedness’: A critique of the wicked problems concept, from philosophy to practice. *Policy and Society*, 38(2), 315–337. <https://doi.org/10.1080/14494035.2018.1488796>
- United Nations Department for General Assembly and Conference Management. (n.d.). *United Nations regional groups of member states*. <https://www.un.org/depts/DGACM/RegionalGroups.shtml>
- van Bueren, E. M., Klijn, E.-H., & Koppenjan, J. F. M. (2003). Dealing with wicked problems in networks: Analyzing an environmental debate from a network perspective. *Journal of Public Administration Research and Theory*, 13(2), 193–212. <https://doi.org/10.1093/jpart/mug017>
- *van der Laan, M., Bristow, K. L., Stirzaker, R. J., & Annandale, J. G. (2017). Towards ecologically sustainable crop production: A South African perspective. *Agriculture, Ecosystems & Environment*, 236, 108–119. <https://doi.org/10.1016/j.agee.2016.11.014>
- *Vogel, C., Scott, D., Culwick, C. E., & Sutherland, C. (2016). Environmental problem-solving in South Africa: Harnessing creative imaginaries to address “wicked” challenges and opportunities. *South African Geographical Journal*, 98(3), 515–530. <https://doi.org/10.1080/03736245.2016.1217256>
- Voorberg, W. H., Bekkers, V. J., & Tummers, L. G. (2015). A systematic review of co-creation and co-production: Embarking

- on the social innovation journey. *Public Management Review*, 17(9), 1333–1357. <https://doi.org/10.1080/14719037.2014.930505>
- *Westin, M., Kronlid, D., Hellquist, A., & Colvin, J. (2012–2013). Towards urban sustainability: Learning from the design of a programme for multi-stakeholder collaboration. *Southern African Journal of Environmental Education*, 29, 39–57.
- *Williams, V. L., & ‘t Sas-Rolfes, M. J. (2019). Born captive: A survey of the lion breeding, keeping and hunting industries in South Africa. *PLOS ONE*, 14(5), e0217409. <https://doi.org/10.1371/journal.pone.0217409>
- *Woodford, D. J., Richardson, D. M., MacIsaac, H. J., Mandrak, N. E., Van Wilgen, B. W., Wilson, J. R., & Weyl, O. L. (2016). Confronting the wicked problem of managing biological invasions. *NeoBiota*, 31, 63–86. <https://doi.org/10.3897/neo-biota.31.10038>
- The World Bank. (2018). *Poverty and shared prosperity 2018: Piecing together the poverty puzzle*. International Bank for Reconstruction and Development.
- Xiang, W.-N. (2013). Working with wicked problems in socio-ecological systems: Awareness, acceptance, and adaptation. *Landscape and Urban Planning*, 110, 1–4. <https://doi.org/10.1016/j.landurbplan.2012.11.006>
- Yawson, R. M., Peterson, G., & Johnson-Kanda, I. (2020). Collective impact: Dialogue at the interface of the colliding systems of philanthropy. *World Review of Entrepreneurship, Management and Sustainable Development*, 16(1), 1–21. <https://doi.org/10.1504/WREMSD.2020.105528>