

# **Situations, problems, and solutions: How varying conceptual systems conflict collaborative processes**

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## I

Our contemporary world can perhaps best be described as the epoch of wickedness, appealing to the ways in which wicked problems have risen and promulgated from modern social practices, are reinforced and made more complex by our institutions, and are increasingly driving both reflective and unreflective innovation. Many scholars have written on the concept of wicked problems from a variety of disciplinary lenses including sociocultural, regulatory and governance, and scientific and material analyses (see: Head 2008; Murakami et al. 2017; Rittel & Webber 1974) and although these literatures do well to describe components of these problems, the nature of wicked problems demands integrated analyses that recognize the relation between the components. By this, I mean to suggest that wicked problems are not merely material problems, i.e. problems that can be defined, described, understood, and evaluated without appeal to faculties of human minds and societal institutions nor are they merely extra-material problems without appeal to material realities. A multi-modal lens, however, explicitly recognizes that wicked problems are the product of the material conditions *and* the extra-material human and social capacities that serve to interpret and construct a problem as a wicked problem.

This essay explores the multi-modal nature of wicked problems, seeking to provide clarity to the ways in which a problem is characterized as wicked due to the relationship between its material and sociocultural conditions. The paper begins with a brief discussion of problems, in general, and the conditions upon which a problem becomes characterized as wicked. Following this, I offer a conceptual foundation for understanding this relation, based in the ways that our individual and community experiences serve to construct our conceptual understandings of the world. The following section explores the ways in which diverging conceptions of the environment underwrite the wicked problems that environmental governance seeks to address. The essay ends with brief recommendations for governance strategies that can better treat wickedness through the recognition of these differentiated conceptual understandings of a (wicked) problem. Ultimately, it is not my aim to suggest that previous analyses are misguided, only to highlight the ways in which the problems of our contemporary times can be understood through the recognition that wickedness is deeply rooted in our meaning making practices, our personal/social experiences, and the institutions that arise from them

## II

An analysis of the wickedness of problems requires at least a rudimentary understanding of what constitutes a problem, in general. For my purposes, I understand a problem as a situation that a person or group is unsatisfied with and therefore seeks a solution. Key to this understanding are the relations between *situations*, *problems*, and *solutions*. Situations, here, are statements of the world that do not yet cause dissatisfaction whereas problems are situations that have been filtered through a set of sociocultural considerations that render the situation as undesirable. Solutions are possibilities that, if enacted, would dissolve the dissatisfaction with the problem. These brief

descriptions are vague, yet gesture towards the multi-modal interpretations of (wicked) problems. Situations describe a current state of affairs, often employing empirical, factual, and descriptive language. For example, “my shirt is missing its top button” is a description of a situation. On common understandings of the individual components, the sentence describes a state of affairs as it currently is. Problems, however, describe a situation viewed through a value-sensitive lens (Rocheffort & Cobb 1993). My missing button is not a problem until I seek to wear the shirt to a professional event. Here, I value this shirt above others and I am respecting social values of modesty, minimally. The situation becomes a problem when my values give rise to dissatisfaction with the current state of affairs. The material and empirical conditions of the problem – namely, the missing button – are filtered through my sociocultural values rendering the situation as a problem. The material and extra-material considerations of the missing button, as such, are necessary components of it being considered a problem.

Given the problem as defined, solutions may vary between wearing a different shirt or replacing the missing button, each being strategies for the satisfaction of the problem. Zooming out, we can see analogies with larger-scale problems. A changing precipitation pattern due to climate change is a situation. When the changing precipitation causes dissatisfaction, perhaps due to irrigation shortages during growing seasons, it becomes a problem. Solutions may be to modify agricultural practices or to change the practices that lead to the changing climate – in either case, these can be seen as governance strategies that seek to satisfy the problem. Of course, the situation as described is going to be (de)valued differently by different communities, giving rise to different problems and different solutions. Furthermore, the situation resists determinate formulation – why are the rainfall patterns changing? The answer to this question will range across a variety of different formulations of the “why?” question, some recognizing the socioeconomic drivers (e.g. consumerist materialism driving greenhouse gas emissions) while others recognize meteorological processes (e.g. jet stream movement), among others. Indeterminate situations become increasingly complex as different communities – rife with their own value-systems – define the problems differentially. These problems can be characterized as complex, uncertain, and indeterminate, occurring in a social milieu requiring the recognition that diverse communities have legitimate interests in the problem formulation, and that the varying problems are interconnected and interdependent by virtue of being defined by common material realities (Buchanan 1992; Rittel & Webber 1974). The difference between the two examples can be understood as the difference between a problem and a *wicked* problem.

Although brief and surely oversimplified, this description of wicked problems highlights the integrated material and extra-material components of wicked problems. The world presents complex and indeterminate situations that are interpreted and filtered through diverse value-systems in order to define problems – and subsequent solutions – as such. The next section takes up in detail the character of this integration, focusing on the ways in which material situations can be understood through extra-material faculties of human minds and societal institutions.

### III

To understand a problem – wicked or not – we must first understand the situation that gave rise to the problem. What, then, is required to understand a situation? Answers to this will vary and

be directed at different conditions of what it means to understand. However, common to these is the need to have a system of relations in order to describe the ways in which different elements of the situation impact and are impacted by the other elements. In our contemporary society, we often appeal to the scientific institution to structure our systems of relations and provide meaning to the concepts that make up these structures (De Regt & Dieks 2005; Pielke Jr 2007). If scientific understandings were independent of the values that individual scientists bring to bear in doing science, then it may be sufficient to appeal to science for common understandings of situations. However, as widely recognized, science does not exist independent of the people doing science. Individual scientists bring with them their own experiences, values, and conceptual understandings which impress upon the products of science, rendering scientific systems of relations already an integration of material and extra-material realities (Elliott 2017; Intemann 2010; Rolin 2006; Sarewitz 2004; Smith 2013). Furthermore, many communities understand their situations through conceptual systems that are not directly derived from the scientific institution (Kimmerer 2013; Ottinger 2017; Deloria 2007). It is not difficult to recognize that different communities – scientific or otherwise – bring to bear different conceptual systems to understand their situations, but what does this amount to? Are we merely interpreting the same situation in different ways, or are our differentiated interpretations indicative of varying situations arising from the same set of material conditions?

I presume that regardless of which conceptual system that we understand a situation within, we do in fact employ some sort of conceptual system. If this is true, it is worth exploring how these systems are derived in order to better understand the situations that they are used to understand. It is plausible that a conceptual system requires minimally two elements: [1] A set of concepts and [2] A set of the relations between the concepts.<sup>1</sup> So, where do our concepts come from? One answer to this is that our concepts are reducible to external, mind-independent objects in the world (i.e. realist natural kinds). On this view, it may be true that we are not able to grasp the nature of these objects free from our own value-systems, but they nonetheless exist and through reliable and justifiable processes we can better align our conceptual systems with reality. It is becoming widely accepted, however, that the concepts we use are socially derived and do not reflect the objective truth that positivist science presupposed (Longino 1990). Mark Johnson (1987) offers an explanation for these socially derived concepts, arguing that our conceptual systems are imaginatively derived reflections of our embodied experiences in the world, the meanings of which are based in “our embodied, spatial, temporal, culturally formed, and value-laden understanding” (172). For Johnson, our concepts are not derived from “classical, set-theoretical views of categorization” (171), but instead our conceptual architecture consists of metaphorical categories grounded in the ways beings-as-we-experience the world. For example, the scientific concept of “high-energy particles” is based on the socially mediated view that “more is up” – a metaphor located in our embodied experiences of the level of a pile rising as more things are added to it, yet a metaphor all the same (Lakoff & Johnson 1980, 465). Similarly, the conceptual structure that provides meaning to the metaphor “I rose above my

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<sup>1</sup> The relationships between concepts could be concepts themselves. In this case, it may be that two concepts are related by a third concept. It is of no matter to this argument if this is the case.

emotions” is the socially experienced metaphor of “rational is up” rooted in the culturally experienced view that human’s rationality places them over the natural world (ibid, 16-7).

If we take seriously the views that our conceptual systems are derived from our social and embodied experiences in the world – however mediated within our own communities – and there are sufficiently distinct conceptual systems that interpret a set of experiences differently, then we should be prompted to take seriously the possibility that differently conceptualized situations may derive from a common set of material conditions but are nonetheless not reducible to those material conditions.<sup>2</sup> As I’ve described problems and their wicked counterparts, this suggests minimally that the situations that give rise to problem definitions (themselves mediated through a diverse set of values) are themselves an integration of material and extra-material conditions, requiring both the imaginative human faculties of the mind and the empirical realities that structure and constrain our embodied experiences. This treatment has been brief and future work would do well to develop a more complete description of our conceptual structures and their impact to our situational understandings. However, if we find differentiated conceptual structures compelling, it is worth exploring how our concepts give rise to wicked problems in practice. The next section is aimed at this, illustrating how varying conceptions of the environment underwrite the wicked problems that environmental governance seeks to address.

#### IV

As embodied beings, humans necessarily experience our environments. I explicitly recognize – and do not wish to diminish – that the term “environment” is not relegated only to those spaces often described as natural or consisting of non-human life and its requisite ecosystems. However, both environmental philosophy and environmental governance disciplines have taken up as a subject this narrow understanding of the environment. Following from the previous discussion, it is worth understanding how different conceptualizations of the environment serve to construct varying situational definitions and the wicked problems they give rise to.

Although it is beyond the scope of this essay to provide a comprehensive taxonomy of environmental conceptions, there are four dominant themes in the literature that help to illustrate the conceptual underpinnings of environmental wicked problems. For simplicity, I label these *extractive*, *preservative*, *managed*, and *reciprocal* conceptions. The first two – extractive and preservative – are related in that they similarly operate (with vastly different consequences) on the presumption that human welfare is separate from environmental welfare. The second two – managed and reciprocal – are similarly related (again with different consequences) in that they presume that human welfare is inseparable from environmental welfare.

The view that human and environmental welfare are separate is common, paradoxically, in environmental conceptions that see our environments as existing for the subjugation and extraction by human societies as well as the view that the environment can only be preserved if

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<sup>2</sup> At this point, it is worth recognizing the specter of linguistic idealism in this view. I do not mean to suggest that our linguistic practices are themselves sufficient for exhaustive conceptual structure development, only that they are necessary in collaboration with our material realities and that this collaboration gives rise to distinct – and possibly incommensurable – situational understandings.

humans remove themselves from it. Robinson and Tout (2012) trace the conceptual separation of humans from their environments to “Enlightenment discourses of scientific exploration, universality, atomism, and progress” (160) buttressed, in part, by Lockean conceptions of property and Cartesian conceptions of dualism (see also: Lloyd 2000). Cartesian dualism, in combination with Christian dominion over nature, provided a foundation with which western cultures conceptualized the environment as wild and in opposition to civilized human society, prompting the mastery and control of nature. The western philosophies of the Enlightenment prompted those Eurocentric cultures to conceptualize the environment as something to be put in the service of human society, a conception that still underwrites many industries such as subsurface mining and commercial logging and agriculture.

Conversely, if one sought to protect the environment instead of enact extractive dominion over it, the dualistic conception developed by Eurocentric cultures required the removal of humans from the environment, setting aside preserves that would remain untouched by extractive society. John Muir’s efforts to set aside iconic environments as national parks and protected wilderness exemplifies this preservative conceptualization. Preservative conceptions are prone to universalizing moral theory, demanding a non-anthropocentric rationale for the moral considerability of nature (e.g. Birch 1993; Sagoff 1993). As recognized by Fabienne Bayet-Charlton (1994) and echoed by Ramachandra Guha (1989), the environment conceptualized as independent of human civilization has deep environmental justice implications as the “concept of wilderness as nature without any trace of human interaction dehumanizes the peoples living in that landscape” (176, as quoted in Robinson and Tout 2012). Although preservative conceptualizations of the environment may have good intentions for the welfare of the environment, the conceptual separation of people from their environments serves to construct both the environment as something to be objectified (either for our extractive needs or our voyeuristic pleasure) and the communities living in those environments as either less civilized by virtue of not taking advantage of extractive potential or immorally related to their environments as their use of them defile the purity of nature.

The western philosophies of Eurocentric thought structured institutions that provided the sociocultural experiences allowing extractive and preservative environmental conceptions to develop, promulgate, and persevere. The conceptual separation of human civilization from their environments can be seen in contemporary environmental conflicts reflected in the discourses of extractive industries and radical environmentalists that seek to protect nature by removing human use from it. For example, federal public land management in the American West is strife with environmental conflict, especially regarding the proper use of western landscapes. Involved in these conflicts are powerful extractive industries that are themselves supported by Eurocentric philosophies, economic power, and political legitimacy within the progress narratives of United States policy (Nieto & Durbin 1995).<sup>3</sup> In response to the environmental degradation that results from extractive conceptions, radical environmentalists demand that all human use of environments be de-coupled from human society for the preservation of pristine nature (see the

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<sup>3</sup> Progress narratives, here, refer to the idea that infinite economic growth is a desirable aim for a nation. Infinite economic growth, however, requires material inputs that further require environmental resources, thus motivating an extractive conceptualization.

Ecomodernist Manifesto, Asafu-Adjaye et al. 2015). Stakeholder groups that operate from either of these conceptualizations are in tension regarding the proper use of federal lands (i.e. environments), and this tension is complicated by the managed and reciprocal conceptualizations held by many communities living on these lands.

Managed and reciprocal conceptualizations are similar in that they both recognize that human and environmental welfare exist in a dependent relation that cannot be conceptually separated. However, unlike extractive and preservative conceptualizations, managed and reciprocal conceptualizations do not share a common genesis, demanding each be understood on its own terms. Although they do not share a common genesis with each other, managed conceptualizations of the environment do derive from the Eurocentric philosophies underwriting extraction and preservation. The spread of Euro-settlement through colonial initiatives also spread the sociocultural practice of agriculture, a practice by which an environment becomes private property and is cultivated for the production of food and fiber. Agriculture required the healthy productivity of an environment but also required the use of the environment. Preservative conceptualizations could not capture this as environments required use, yet the recognition that healthy environments were essential to productivity diverged from purely extractive practices.

Aldo Leopold's (1970) land ethic begins to formalize this, prescribing environmental management such that we "think like a mountain" (140). Leopold's land ethic led him to preservative conceptualizations (see 264-279), however he recognized that we should seek a "state of harmony between men and land" that required humans to responsibly manage their environmental practices (243). Wendell Berry (1977) and Paul Thompson (2017) echo this sentiment of responsible environmental management within agriculture practices, arguing that commercial agriculture's productionist ethic motivates irresponsible environmental practices and we should instead seek practices that better harmonize humans and their environments. Along varying degrees of environmental use by humans, these sentiments are reflected throughout the literature (Baviskar 1999; de Silva 1987; DeLind & Link 2004; Merchant 1981; Norton 2015). These conceptualizations do not demand the separation of humans from their environment, but instead demand that we recognize our inseparability and develop responsible environmental practices. Whether prompted by the pragmatic recognition that humans do in fact live in their environments and, by virtue of this, use their environments or the normative prescription that humans should use their environments, these conceptualizations diverge from the extractive and preservative conceptualizations in that they seek to responsibly integrate humans with environments. However, managed conceptualizations do not interrogate the environmental ontologies that allow the environment to be managed, scientifically studied, owned, controlled, and ultimately treated as an object.

Reciprocal conceptualizations share the inseparability of humans from their environments with managed conceptualizations, yet they do so by understanding this relationship as a mutual exchange. Although humans use their environment, these reciprocal relationships conceive of the environment as consisting of agential entities that provide resources for human societies and thus those societies have a responsibility to provide for the environment. These conceptualizations developed apart from the western philosophies that underwrite the other conceptualizations I've

described, instead manifesting through the place-based lived experiences of cultures that pre-date the rise of Eurocentric colonialism (Tuck et al. 2014). Without the dualistic and propertied conceptions provided by western philosophies, reciprocal relationships evolved in concert with local environments, developing social institutions that align with local environmental conditions. Describing a traditional environmental ethics of African peoples, Philomena A. Ojomo (2010) explicitly recognizes the divergence from western philosophies as the:

“indispensability of African metaphysics in the construction of a meaningful African environmental ethic...the absence of the dichotomy between plants, animals and inanimate things, between the sacred and the profane, matter and spirit, the communal and the individual in the African worldview...[informed] the traditional African attitude of ‘*live and let live*’” (60)

In reciprocal conceptualizations, humans and the environment are alike in that they have needs of each other and responsibilities to each other. In describing research on traditional sweetgrass harvesting methods in Potawatomi communities, Robin Wall Kimmerer (2013) describes how the sweetgrass itself tells us how to show respect to it: “sustainable harvesting can be the way treat a plant with respect, by respectfully receiving it as a gift” (165), suggesting that the environment can (and should) be used, yet in a way that treats the environment as kin with which we hold relationships of responsibility to. Although the language of management may be applicable to these conceptualizations (Anderson 2005), the ontological distinctions between management and reciprocal conceptualizations diverge in ways that render tenets of dualism and property untenable for reciprocity.

Each of these conceptualizations are present in environmental discourse in the proper use of public lands in the American West. Many of the agricultural communities closely align with Leopoldian or Berryian management conceptions, whereas the indigenous communities whom lived on land before colonial settlement and maintain traditional practices operate on reciprocal conceptions. As these stakeholders come together with those from extractive and preservative conceptions, the question of the proper use of western lands becomes undeniably complex. The sociocultural, embodied experiences of each of these stakeholders underwrites their concepts of the environment and these concepts serve to define the situations that the stakeholders face. For example, when faced with the material reality of environmental degradation due to overgrazing livestock, each conception will understand the situation differently. Extraction may understand it as a no longer-useful plot of ground; preservation may recognize it as a deteriorated natural landscape; managers may recognize it as an indication of failed practice; reciprocal relationships may recognize it as ignorance of community relationships. In either case, the way that the material conditions are conceived of can lead to similar, yet importantly divergent, problem definitions and tenable solutions. The extractivist may see it as a problem only insofar as livestock aren't getting fed, demanding a different local lot with available feed. The preservationist may see it as a problem of human use of environments, demanding that livestock is removed from the environment. The manager may see it as a faulty grazing strategy, demanding that the livestock be managed differently for better results. The reciprocal relationship holder may see it as an lack of personal responsibility to the land, demanding that

we foster a relationship with the local environment allowing us to better understand what it needs.

This example may fall short of sheer wickedness, but it does highlight how wicked problems are integrations of material realities and extra-material faculties. That the material conditions are conceptualized through our sociocultural and embodied experiences differentially, further interpreted through our individual and community values, and solutions track these differences throughout should prompt us to consider the roles of meaning-making, varying conceptual systems, interpretive resources, and social values when describing conflict in wicked problems. If, on the other hand, merely understanding the material reality was possible and sufficient for understanding the problem then it would not likely be wicked.

## V

This essay has argued that the ways individuals and communities develop the conceptual systems they use to understand their worlds with are reflective of their sociocultural realities operating in concert with their material realities. These sometimes divergent conceptual systems serve to understand our situations and the value-derived problems arising from them differently, providing considerable complexity to problem solving. Among other conditions, these complexities underwrite wicked problems and stymie satisfactory progress to resolution. How, then, can recognition of these varying conceptual systems help us govern in light of wicked or otherwise complex problems?

This question is large and is due much more consideration than I can give here. The previous discussion served to highlight how divergent conceptual systems can lead to tension in situational definition, prompting divergent problem identification and subsequent diversity and tension in tenable solutions. This picture requires a governance process that seeks the input of multiple communities. How, then, can governance structures better manage for diverse conceptual systems when collaborating across multiple communities? Diverse conceptual systems can conflict in many places in the governance structure, yet they are especially relevant to collaborations designed to illuminate value conflicts and seek consensus for decision making. Collaborations can come together for many different reasons, however they presumably do so in order to solve a problem of some sort. Recognition of the difference between a situation, a problem, and a solution can help align participants in the process, regardless of the conceptual system or values they are employing.

Ideally, participants will all enter a collaboration with situational understandings and nothing else. Collaborations of these sorts may be formed in order to foster relationships and garner political power for future conflicts, but they are not exempt from differential situation understandings. Reflective discussion on the situation/problem/solution relationship can allow participants to understand the conceptual systems that they use to understand the situation that brought the group together. Facilitators must develop methods and activities that elicit conceptual differences in order to develop common understanding of other's constructs. Special attention should be paid to the introduction of problem-language in discussions of situations. As discussed previously, problems are situations that have been filtered through a set of personal



values and although this is a necessary discussion, it should not be had in parallel with situation discussions. It is not that a person's conceptual system will not impact their problem definitions (it most certainly will), but conceptual differences offer a different set of tensions that should be discussed apart from values. There are many ways that extra-material considerations are integrated into understanding problems, and related conceptual and value discussions can be clarified by reflectively discussing the roles that each play in the situation/problem/solution relationship.

Once people have discussed their respective situations, then problem definition can begin. Often problem-definition will already be started because the objective of the collaboration will have instilled a set of values at the outset. For instance, if a group forms a collaboration to learn how to better manage for riparian health, problem-definitions will be taking for granted that healthy riparian zones should be prioritized. This is not bad, but it is worth understanding that the engagement will be founded within a preset collection of values. Discussing the values that underwrite which problems are actually seen as problems to all participants can help to reduce the conflict that often appears in collaborations. Sometimes, it is worth reflecting on the preset collection of values. For instance, if someone had the situation of a low-precipitation year and the objective of riparian health was assumed, a problem-definition may look like "how do we keep our livestock herd from grouping around riparian zones?". The set of solutions for this problem may be untenable for the participants, and frustration may ensue. In this case, a facilitator may help the group re-define the problem. Perhaps the initial values of riparian health are ignored and a discussion of the low-precip year comes up with a new problem-definition of "how do we ensure that willows are able to proliferate during the next growing season?". This does not exactly speak to riparian health, but may render a new set of solutions that can be acted on. One way to reformulate problems in ways that don't take certain values for granted is to include members in the collaboration that have different conceptual and value systems. High value participants to include are boundary-spanners, or those people that are familiar with common conceptions of the situation but not so close to it to be tied up in common problem-definitions. These are people who operate across different communities and are generally adept at double-speak, indicating proficiency with multiple conceptual systems.

A solution is a specific governance response to a problem. When a group has agreement on the problem definition, solutions can be easy to agree on although they may be difficult to find. However, people may enter a collaboration with a solution and no problem. In these cases, they have a behavioral response that they would like to see, but they need a problem to address with the response. Using the livestock example above, some participants would like to see livestock removed from federal public lands. This is not a situation or a problem, it is a solution. Therefore, when these participants enter a collaboration they will be looking for a problem that their solution is an answer to. Every situation that is expressed will be framed as a problem that their solution can fix. If there is a collaboration with one participant with a situation, one with a problem, and one with a solution, it will be very difficult to align any sort of engagement or collaborative solutions unless they are all coincidentally aligned.

Collaborative processes are difficult and made even more so with the recognition that each participant brings different conceptual and value systems to the process. The situation/problem/solution relationship discussed here is a simple heuristic that helps to clarify the relationships that material and extra-material considerations play at different stages of governance processes. This discussion is by no means complete or entirely coherent. It is meant only to help organize collaborative processes and guide theoretic work to understand the genesis of conflicts in complex and wicked problems, and offer preliminary strategies to navigate these conflicts.

## VI

I have outlined a crude distinction between situations, problems, and solutions in order to motivate an evaluation of the development of varying conceptual systems that underwrite conflicts in wicked problems. Although not exhaustive, the discussion of extractive, preservative, managing, and reciprocal environmental conceptualizations was offered as examples of the ways that different sociocultural and embodied experiences give rise to distinct conceptual systems, themselves used to differentially understand the situations we find ourselves in. The essay concluded with a brief discussion of how the argument can be used to help facilitate conflicted collaborations with the recognition that values are but one type of extra-material faculty that causes tension in collaboration.

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