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# Situated Ethics in Development: STS Insights for a Pragmatic Approach to Development Policy and Practice

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**Abstract**

Technology has played a central role in development programming since the inception of development assistance. Recent development organizations, like the Bill and Melinda Gates Foundation, believe technological innovation can improve development outcomes. Development ethics, a field of study focused on the ethical questions posed by development policies and practices, has yet to fully appreciate the ethical dimensions of the science and technology. Addressing this important research and policy gap, we contend that science and technology studies (STS) offers important

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insights that can be used in combination with development ethics to influence development policies and practices. Utilizing a case study of a private development program in Uganda, we illustrate how STS offers important insights for understanding how a sociotechnical ensemble placed pressure on already scarce water resources. Two dimensions of STS scholarship, the power asymmetries of technological development and the incomplete or partial nature of technoscientific knowledge, are examined and help us to understand how sociotechnical ensembles in development increase the likelihood of the emergence of publics who are negatively impacted by sociotechnical ensembles in development programs. Leveraging STS insights, we argue for the importance of situated ethics—a pragmatic approach to ensuring responsiveness to the emergence of these publics.

**Keywords**
situated ethics, development, Uganda, private development assistance, Africa

Jonathan is a Ugandan farmer participating in an internationally funded dairy development program in his community.[1] Based on the number and type of dairy cows he owns (five dairy cows—two crossbreeds, three local breeds), he is considered by the development program personnel to be an example of someone who has been reasonably successful. Yet, Jonathan tells us, "We should discuss more the effect of dairy cows on our relationships with our neighbors." Jonathan continues on to explain that he has experienced growing tensions with his community because he adopted the recommended technology, crossbreed dairy cows, encouraged by a development program. The crossbreed cows demand significantly more water than the local breeds, and therefore, to be a "successful" dairy farmer, Jonathan must take more water. Yet, water is a communal resource and often scarce in Jonathan's community. He says, "the fact that I fetch a lot of water from the community borehole, this has damaged my reputation with the neighboring community as the community claims that I am wasting their already scarce water on animals, yet some families go without this water." The development program Jonathan referenced was focused on reducing food insecurity and lifting smallholder farmers out of poverty. Yet, Jonathan's concerns reveal a development program that failed to innovate and identify solutions to a significant local problem, not enough water during the dry season to sustain the community and the development

program's technological innovation, crossbreed dairy cows. In this article, we argue that science and technology studies (STS) offers important insights that can be used, in combination with development ethics, to influence not only the policies but also the practices of development to reduce the likelihood of maldevelopment. In particular, STS insights make a case for the cultivation of situated ethics—a pragmatic approach to engaging critically with development in policy and practice in communities.

Science and technology has long been a point of emphasis in development assistance programs (Cherlet 2014). Indeed, in the speech that is often cited as the beginning of "development" President Harry S. Truman (1949) stated that the United States would "embark on a bold new program for making the benefits of our scientific advances and industrial progress available for the improvement and growth of underdeveloped areas." Despite the high aspirations expressed in Truman's speech about development assistance, the results of development programs have been uneven and at times inhumane for people, animals, and environments in countries disproportionately located in the Global South.[2] In response to so many failures, the field of development ethics emerged in the 1970s with the goal of trying to reduce maldevelopment, where development programs "sacrificed rather than benefited poor people" (Crocker 2008, 5). However, development ethicists have rarely considered the ethics of the science and technology deployed within development programs, instead focusing more broadly on the overall goals of development. By contrast, STS scholarship can provide important insights but to date has had limited engagement with development scholarship and practice (Khandekar et al. 2017). Specifically, we highlight two dimensions of STS scholarship—the power asymmetries of technological innovation and the ways in which technoscientific knowledge is always incomplete or partial—that can contribute to situated ethics in development policy and practice.

The following discussion builds our case for situated ethics in development by first describing new development actors, many of whom have a strong belief in the power of technology to provide solutions to intractable problems. We then briefly elaborate on the history of STS and ethics related to power asymmetries of technology and gaps in technoscientific knowledge. Our third section, focuses on our case study of a major internationally funded dairy development program in Uganda. We position this case study within the existing STS literature and elaborate on the role of situated ethics. Finally, we bring these works together to call for situated ethics in development programs by highlighting that technological interventions in development are embedded within a web of practices, actors, and

institutions, many of which must change for the technology to successfully operate.

This article draws on a three-year (2015-17), multimethod research project investigating the impact of a large, privately funded development program, the East African Dairy Development (EADD) program, on men and women smallholders in Uganda. The EADD was initiated and largely funded (approximately US$68 million over ten years) by the Bill and Melinda Gates Foundation (BMGF) as an effort to reduce poverty and food insecurity by integrating smallholder farmers into dairy value chains and increasing their incomes. The BMGF is the largest private development actor active in agriculture. Schurman (2018) estimates that BMFG has committed US$4.9 billion to date to agricultural development. The data for this article are thirty-four farmer interviews (both men and women) and four focus groups with a total of nineteen farmers divided by gender, and ten key informant interviews with EADD staff, hub leaders, and extension agents, along with field notes, as part of a larger, three-year, multimethod (surveys, GIS data, interviews, focus groups, and observation) study of four EADD sites in Central and Eastern Uganda. While our case study focuses on the BMGF, we argue that our conclusions can provide insights for a wide range of development programs, particularly private development programs.

## New Development Actors and a Need for Development Ethics

Critical insights from STS are all the more important today, as the landscape of development assistance has shifted, with new organizations that have a belief in the predominant power of technology to advance development (Gore 2013; Hay and Muller 2013; McGoey 2014; R. Rogers 2015). Traditionally, development assistance primarily came from official development assistance (ODA) delivered as bilateral (country to country) or multilateral (international governing body, such as, the World Bank, to a country or region) aid. Today, there is a proliferation of new actors in development assistance, including countries that historically were the target of development assistance (e.g., China, India), private foundations, and nongovernmental organizations (NGOs; Gore 2013). New sources of aid are estimated to have grown to approximately half of the estimated total ODA (World Bank 2012), with specific sectors targeted by the new actors. For example, the Bill and Melinda Gates Foundation (BMGF) has focused heavily on health and agriculture, while China, a non-DAC country,[3] has focused extensively on infrastructure projects, their so-called belt and road initiative (J.P. 2017).

The increase in private development actors, especially the BMGF, has led to a growing literature focused on these organizations, which have been dubbed philanthrocapitalists because of their abiding belief in the effectiveness of capitalist markets and the positive role of technology in creating solutions (Fejerskov 2017; R. Rogers 2015). As Fejerskav (2017, 948) explains, "their philanthropic endeavors are, like their companies, shaped by logics of the individual, the market, and of societal progress through technological innovation." In other words, many of these private donors bring their business philosophy to the development sector. These organizations are seen as dictating what should be considered the most reasonable solutions, with an oversized commitment to technology and markets as being a part of the solution (N. Banks and Hulme 2014; Jenkins 2011; Fejerskov 2017). It is within this new context that we argue for a more robust use of development ethics in development policies and practices, informed by STS.

Historically, development ethicists have called attention to the ways in which development institutions and their policies have ethical dimensions that are rarely acknowledged or are framed in such a way that the ethical issues are ignored (St. Clair 2010). Development ethics was created to address "the ethical and value questions posed by development theory, planning and practice" (Goulet 1989, 5). The motivation of scholars in the field was and continues to be a desire to create worthwhile development (Drydyk 2016).

Perhaps one of the best known development ethics frameworks focused on worthwhile development is the capabilities approach (Nussbaum 2002; Sen 1999). The capabilities approach, which was integrated into the Human Development Index, sought to create human-centered development in contrast to a narrow economic focus. The goal of the capabilities approach was to create an "enabling environment for people to enjoy long, healthy, and creative lives" (Ul Haq 1995, 14). While the capabilities approach is the best known, there are other development ethics approaches that offer yardsticks for trying to prevent maldevelopment. For example, building on the contributions of the capabilities approach, Drydyk and colleagues identify seven generally agreed values that contribute to worthwhile development (Drydyk 2016; Penz, Drydyk, and Bose 2011). These seven include (1) enhancing well-being, ensuring development is (2) equitable and (3) environmentally sustainable; (4) involves people's free participation; (5) enhances human rights, cultural freedom and (6) social inclusion; and finally development is done with (7) integrity as opposed to corruptly (Drydyk 2016).

However, with few exceptions (see St. Clair 2010; Goulet 1989), the development ethics literature has not appreciated the ethical dimensions of the science and technology woven into development programing. Keulartz et al. (2004) have argued that applied ethics as a field suffers from technological blindness. We argue this also applies to development ethics. Moreover, while ethical yardsticks are laudable, such approaches fail to appreciate the dynamic and not fully knowable impact that technologies in development programming may have on specific communities. In other words, development programs may at the outset align with the generally agreed ethics of worthwhile development, but what mechanisms exist to ensure development in practice does not veer into maldevelopment? STS scholarship offers key insights that have largely been overlooked by development ethicists and practitioners and can contribute to situated ethics that informs development in policy and practice.

## STS and Ethics

Historically, STS scholarship has not focused extensively on the role of ethics and justice (Mamo and Fishman 2013; Ottinger 2013; Winner 1993). Keulartz et al. (2004, 8) argues the constructivist tendencies in STS, where studies have "opened the 'black box' of technological development," have at best been agnostic in their engagement with ethics (also see Winner 1993). STS can benefit from development ethics, as development ethicists offer a framework for thinking about ethical and just approaches to development. However, as a field that has deepened our understanding of the social processes and practices of science and technology, STS provides important insights for advancing the goals of worthwhile development. As noted at the outset of this article, we focus on two dimensions of STS scholarship—the power asymmetries of science and technology innovation and scientific knowledge as partial and dynamic—that are an important contribution to, and make the case for, situated ethics in development policy and practice.

### *Power and Politics of Science and Technology*

Many STS scholars have drawn on John Dewey's ([1927] 1991) idea that public engagement in politics emerges when there are issues to be debated (Busch 2009; Driessen and Korthals 2012; Marres 2007). This idea is relevant to technological interventions in development programming. New technologies can open up issues for societal debate and according to Driessen and Korthals (2012, 797) "generate fresh moral engagements." When

technological interventions and innovations occur, affected publics often emerge because technological change "in many ways is political, but lacks in transparency (Jasanoff 2003)—something that is deeply problematic" (Dreissen and Korthals 2012, 799). In part, what contributes to the politics of science and technology are the extreme power imbalances between those who design new technologies and those whose livelihoods are most vulnerable to technological change (Jasanoff 2016; also see STEPS 2010). Even across different types of technological transitions, where various actors are driving technology transitions for global development, politics that give rise to power asymmetries are ever present (Scoones 2016). Resources and subsequent resource distribution leveraged for sustainable development remains a source of unequal power in sociotechnical transitions (Smith, Stirling, and Berkhout 2005). Similarly, development projects, the mechanism through which many new technologies are introduced to communities, are often political but lack transparency. To be clear, we are not speaking metaphorically, comparing technological innovation to development programs, rather we are arguing that most development programs contain technological innovation(s), and both tend to be political but lacking in transparency. Such situations increase the likelihood of the emergence of publics impacted by these changes. If there are no opportunities for the concerns of these publics to be addressed in the midst of a development project, even a project that began within the sphere of worthwhile development may veer into maldevelopment.

While technological interventions in development programs may not seem novel to development staff, a failure to appreciate that "technological artifacts embody particular options and restrictions: they invite certain kinds of action or behavior and discourage other ones, and thus reinforce or alter existing role divisions and power structures" (Keulartz et al. 2004, 10) can contribute to the failure of a program and/or maldevelopment. In other words, technological interventions are usually situated or embedded within a web of practices, actors, and institutions that are necessary for the successful operation of the technology. This embeddedness has also been referred to as the coherence of sociotechnical ensembles or networks (Bijker 1997; Callon and Law 1989). The web within which technologies in development programs are embedded is woven with power asymmetries.

## *Scientific Knowledge Gaps*

The power asymmetries within sociotechnical ensembles influence whose knowledge is considered legitimate throughout the course of a development

program. Feminist philosophers of science were the first to identify that science tends to privilege certain types of knowledge and is often delimited to a very narrow set of research questions (Haraway 1988; Harding 1991). Drawing on the works of feminist scholars in a wide range of disciplines who emphasized that a person's understanding of the world—their standpoint—was shaped by the person's particular location in the social structure (Ferguson 1998; Smith 1990), Harding (1991) argued that science should be grounded in women's lives (and other marginalized perspectives), as these perspectives will generate different questions for research. Arguing against too narrow a focus on identity politics and knowledge production, Haraway articulated the idea of situated knowledge in science studies (Haraway 1988, 1991; Prins 1995). Specifically, she argued that "all forms of knowledge reflect the particular conditions in which they are produced, and at some level reflect the social identities and social locations of knowledge producers" (A. Rogers, Castree, and Kitchin 2013, n.p.).

Subsequent STS scholars have written extensively about the limits of scientific knowledge, with an emphasis on who defines research questions and what types of information are considered legitimate. For instance, Jasanoff (2016) has highlighted that formal risk assessments of new technologies tends to exclude pragmatic knowledge, choosing to rely on narrowly crafted expert knowledge. In the case of chemicals, risk assessments tend to focus on product-by-product risk assessments and does not attend to "synergistic effects" of exposure to multiple chemicals (Jasanoff 2016, 55). These effects often disproportionately impact poorer and marginalized communities that are home to hazardous industries—creating a toxic brew of environmental injustice.

Specific to development, the types of knowledge that are valued in development programming often ignore other forms of knowledge, particularly traditional knowledge. In the context of a developing country focused on water infrastructure, Bauchspies (2012) argues there is a tendency to assume "modern" water infrastructure is better by global policy makers. By contrast in her case study in Guinea, she found that community members utilize a combination of traditional and "modern" technologies to manage household water access (Bauchspies 2012). Moreover, communities' and individuals' innovative solutions were necessary for meeting the water needs of community members that went unmet by modern water infrastructure. Bauchspies (2012, 402) concludes that if these local innovations had the same "recognition and resources" as "modern" water infrastructure, they "might just be able to do what 'modern' piped water infrastructure failed to do."

Beyond privileging specific types of knowledge, STS scholars have called attention to the dynamic nature of technoscientific knowledge. What is considered a good technological solution today, will likely appear anachronistic within less than a few decades, if not sooner (Ottinger 2013). There are a few reasons that the dynamism of knowledge production surrounding science and technology is particularly relevant to development programs. First, who defines the problems, and therefore the solutions, matters within development schemes. The scope of a program is often defined by people who are removed from the day-to-day lives of the communities that the program seeks to engage (N. Banks and Hulme 2014; Jenkins 2011; Williamson 2010). Even within more participatory development programs, so-called bottom-up approaches, who participates in the targeted communities is not random. In their review of over 500 studies on participatory development, Mansuri and Rao (2013, 5) found participants were disproportionately wealthier, more educated, higher social status, more politically connected, and male. To summarize, whether top-down or bottom-up, who defines the problems to be solved in development programs shapes the types of scientific and technological solutions brought to bear on the program. As Hess (2007, 22) has argued, the "resources to water and weed the garden of knowledge" tend to be provided by political and economic elites, which means science and technology development is often "consistent with the goals of political and economic elites." Overtime, this contributes to "the systematic non-production of knowledge," whereby other issues or areas of inquiry are completely ignored (Frickel et al. 2010, 446).

Second, recognizing the dynamism of technoscientific knowledge in development suggests that neither development program staff nor participants involved in the program can fully know the impact or outcomes of adopting new technologies. Although focused on environmental justice, Ottinger's (2013) insights are equally relevant to thinking about development programming and the participants who are enrolled. She writes, "the changing landscape of knowledge calls into question the idea that consent or participation during one decision-making process can by itself constitute procedural justice" (Ottinger 2013, 251). Rather we argue development projects must provide opportunities for "proactive knowledge production to fill in knowledge gaps" and ongoing opportunities for communities or publics to emerge and enter into debate (Ottinger 2013, 251).

In summary, STS allows us to better understand that sometimes the people most affected by a new technology only emerge as publics once the technology is put in place. This is because technological interventions may

negatively impact people or their communities, who rarely have had input into the development of these technologies. Moreover, the knowledge surrounding technological interventions is inevitably partial. Much like publics who come into existence when there are issues to be debated, technoscientific knowledge is dynamic and open to revision. Relevant knowledge may not yet be known or recognized at the outset of a development program. Yet, the ability to respond to the emergence of publics and integrate new knowledge can be the difference between a development program that is ethical and just or one that veers into maldevelopment.

## Technological Interventions in a Development Program

The goal of EADD was to incorporate smallholder farmers into dairy value chains and cooperatives as a means for reducing poverty by increasing farmer incomes (EADD 2008). A key mechanism to achieve this transformation was the technological intervention of crossbreed dairy cows that can produce more milk than local breeds. For example, local breeds may only provide a household one to two liters per day of milk, whereas a Jersey crossbreed can provide ten to twelve liters per day but requires that the crossbreed is given significantly more water. The crossbreed cows were embedded in a web of changes to practices, actors, and institutions, that is, a sociotechnical ensemble that must cohere for the technology—and by implication the smallholders—to be successful.

With Heifer International as the lead agency, the project was implemented in two phases: Phase I (2008-13) included Uganda, Kenya, and Rwanda and Phase II (2014-18) included Uganda, Kenya, and Tanzania. The BMGF funded Phase I through a US$42.8 million grant and Phase II through a US$25.5 million grant, of which Uganda received US$10.9 million in Phase II (World Agroforestry 2014). This project had many dimensions, including advocating smallholders to adopt crossbreed dairy cows, accompanied by support structures such as veterinary services for artificial insemination (AI) and the treatment of sick animals, and institutional change. In Uganda, the institutional change involved targeting 43,000 dairy farmers, who were then organized into thirty-three dairy producer organizations or "hubs."

The multidimensional transformations required of smallholders participating in this program is demonstrated in a newsletter from a project staff member early on in the program, when he explained:

> The farmers' attitude is very important in implementation of EADD. This is in the sense that if the farmers are not ready to play their roles religiously, EADD cannot do everything for them. In the pastoral areas, farmers are slow to change the way they are doing things, including slow adoption of AI and rearing more beneficial breeds in terms of milk production. (EADD 2009, 11)

In this passage, it is made clear that farmers not only must change their attitude, but the types of technologies they adopt (AI to produce beneficial breeds) to be successful. Not stated explicitly, but very much a part of the program is that smallholders must also change how they farm. Smallholders were asked to no longer put their dairy cow in the field but instead move the animal to a confined stall where feed and water are brought to the animal. This creates more work for smallholders and their household members but is intended to increase the amount of milk produced.

## *Emergence of Publics—Water Scarcity*

The embeddedness of the technological intervention of improved dairy breeds—requiring a series of changes to practices, actors, and institutions—invited "certain kinds of action or behavior" and discouraged others (Keulartz et al. 2004, 10). This contributed to the emergence of impacted publics surrounding the changes brought about by this project. A salient issue of contestation that arose repeatedly in interviews, and we argue represents an "emergence of publics" in this development project, was the issue of water scarcity. There was a lack of response by project staff to the issue of water scarcity, as it did not fall directly within the development program's official scope. Although the issue is clearly directly relevant to the project, water scarcity did not receive subsequent attention or action. The lack of engagement on what was clearly an important, potentially life-altering issue reveals there is a need for situated ethics to consider how such an important concern can be addressed.

All but one of the interviewed smallholders spoke about the problem of water scarcity in their villages. They spoke about the distance to water sources and lack of adequate access to enough water during the dry season. Paul, one of the Ugandan smallholder farmers we interviewed, typifies the sentiment among many of the smallholders. He states, "finding adequate water for the dairy cows is my biggest challenge; water is very far from my household (3 kms) and we spend a lot of time fetching water for the dairy cows" (Paul, 414, unpublished interview). For the majority of rural Ugandans, community boreholes (also called hand-pump wells or tube wells) are

the most common source of clean drinking water (approximately 44 percent coverage), but access varies widely and demand for additional boreholes remains high (DWD 2017; Sloots 2010).

As the dry season progresses the lines of people at the boreholes get longer, and some boreholes run dry as the groundwater table falls below the depth of the well. Lack of water leads to competition and sometimes violence. In a women-only smallholder focus group (FG) discussion, Dembe (FG1) stated, "In this zone we have many people and many animals, but we have only one borehole. Here water is for fighting. If you want water free [from conflict], you have to go at night [1-3 a.m.]." The tension over insufficient water increased among community members when some people were collecting water to give to their cows. In another focus group, Susan (FG2), observed that "when the people know you are collecting a lot of water for animals, they start complaining and so you never get enough." In the same focus group, Ruth (FG2) said "some people think animals don't deserve water before humans."

In talking with project staff, they were aware of the problem of the dry season, but they did not directly engage with concerns of smallholders or community members about a lack of enough water in the community. Neither did they reconsider the technology itself, crossbreed dairy cows, which require more water than local breeds. Indirectly, project staff recognized the challenges of the dry season for raising dairy cows, but they never directly questioned the sustainability or ethics of intensifying milk production in water insecure communities. Sarah (2017, unpublished interview), a staff member from a partner NGO providing support to EADD, explained that EADD encouraged farmers to grow better livestock feed in the form of higher protein grasses, legumes, fodder shrubs, "most of which are *drought tolerant* [emphasis added]," as opposed to simply having the cows graze on whatever grasses are available. She continued on to say though, that "water is the most essential feed. I don't know why the project didn't consider this. The amount of water affects production [of milk] and reproduction" (Sarah 2017). Sarah also pointed out that EADD's efforts to encourage farmers to grow more pasture for silage to feed cows during the dry season means that cows actually need to drink more water, as they are getting less moisture from the food. In other words, encouraging a silage system to offset drought actually increases the need for water for the cow. Sarah repeated again in our interview, "The project did not consider water, but it's the biggest issue."

In terms of solutions, when smallholders were asked during our interviews what they thought should be done, most of the respondents said the

project or the government should provide more water through drilling more boreholes or building dams. In contrast, when we asked project staff, most thought the farmers should be responsible for securing water. Charles, the regional project staff member said, "We encourage farmers to have water tanks, even a small one, whatever they can afford." But not all staff agreed. Sarah observed that most additional water sources (e.g., drilling another borehole, building dams) are too expensive for farmers, including water tanks. Moreover, she noted that, "you can find farmers with water tanks who no longer have enough water in the tank for the cows and they are only two months into the dry season."

This development program was in the final two years of a ten-year time line. As such, we observed publics that emerged in response to changes brought about by the insertion of more water intensive dairy cows. Specifically, smallholders with crossbreed cows and community members not enrolled in the program, but in need of water during the dry season emerged as publics impacted by the project. Interestingly, Sarah, who can see the tension and conflict of these emergent publics, began working on this project later and she was employed by another partner NGO, not EADD, the implementing NGO. Aside from clearly being an astute observer, Sarah likely benefited from her outsider/insider status (Adu-Ampong and Adams 2020; Giwa 2015) in recognizing these emergent publics.

## A Role for Situated Ethics

An issue of contestation around which publics emerged during the course of this development program were community disputes when there was not enough water for both community members and animals during the dry season. While project staff were aware of the problem, the staff did not respond or adapt the project to engage with the issue of water scarcity. Technically, the issue of water was outside the scope of this large development project, even though it could impact its success. This issue is also ethically problematic, as technically smallholders could be successful in the program, but at the expense of other household or community members well-being. Simultaneously, project staff, even when they were aware of the problem, did not respond. The lack of response may have been due to limited resources, lack of political influence, a need to assure funders that the program was "successful," or a combination of all three. The cause of the lack of a response misses the broader point. Rather we argue, situated ethics informed by STS offers an opportunity for a more robust response to development in policy and practice, ideally reducing the likelihood of

maldevelopment. Through increasing opportunities for community dialogue, there is also the possibility that these communities can find common ground and agitate for change from people and agencies that generally have more power, that is, government personnel or development funders.

The concept of situated ethics dates back to Aristotle (phronêsis; Kraut 2018) and has been applied to a wide range of topics, including research methods (Ebrahim 2010; Estalella and Ardèvol 2007; Perez 2019), ethical decision-making in occupations, like home healthcare nurses and social work (S. Banks 2016; Gremmen 1999), and by feminists' scholars (Ferguson 1998; Ong 2011). S. Banks (2016, 35) in her study of social work offers the definition that situated ethics "places dilemmas and decisions in a broader social, political and cultural context and sees responsibility in a wider, more relational sense, beyond the isolated individual decision-maker." Banks definition is a starting point, but like development ethics, suffers from technological blindness. In STS, scholars have referenced the "situatedness of local knowledge" (Ottinger 2013, 260), a "situated, speculative justice" (Reardon 2013, 188), and "situated communities" (McHugh 2011), all of which are building on earlier feminist STS scholars admonishment of traditional scientific epistemological approaches that take a view-from-nowhere (Haraway 1988). While the concepts in STS do vary, we propose a core idea relevant to situated ethics—it is a pragmatic approach to ensuring responsiveness to the emergence of publics who are impacted by sociotechnical ensembles.

Concepts across situated ethics literature share some complementary lenses with concepts from sustainable development theory, particularly sociotechnical transitions and socio-ecological system resilience. Socio-ecological systems can utilize a place-based structure to bound the system and coordinate governance though insufficient attention to power relations and stakeholder interests complicate the practical implementation of pragmatic place-based frameworks (Smith and Stirling 2010). Multilevel perspective on sociotechnical transitions can help organize analyses into a sociotechnical system with nested hierarchical components including niches, regimes, and landscapes to help uncover the power and political aspects of technology transition (Smith, Voß, and Grin 2010). While these concepts are theoretically informative to the research community evaluating complexities of power and technology across development, implementing these frameworks in the case of a program such as EADD would be impossible without more pragmatic solutions.

There are many potential avenues for developing situated ethics informed by STS, but for our purpose, the works of Keulartz and colleagues

(Keulartz and Schermer 2014; Keulartz et al. 2004) help us to envision situated ethics in development. Utilizing pragmatism, particularly American pragmatism (i.e., Dewey, Rorty), Keulartz and Schermer (2014, 288) emphasize that pragmatism's primary concern is "to facilitate the solving of problems and the settlement of conflicts" that emerge out of activities and practices in order to improve cooperation and peaceful cohabitation even while living in pluralistic societies.

Sociotechnical ensembles in development can bring to light "deep-seated and fundamental value conflicts," which in our case study is best captured by the tension over who or what should be prioritized when water is scarce, people with limited resources for accessing water or cows (Keulartz et al. 2004, 22). With the introduction of new technologies in development programming, pragmatism encourages a recognition that constant social and moral learning is required (Keulartz and Schermer 2014). In our case study, the lack of enough water for the community was exacerbated by the development project. From a pragmatist perspective "dealing with emerging problems can benefit from a multitude of visions and perspectives" in order to increase the chances of finding an effective and rational solution (Keulartz and Schermer 2014, 288). However, a multitude of perspectives can also be unproductive, which is why there is a focus on particular methods within pragmatism for working toward cooperation and consensus building, specifically gradualization and common-ground dialogue. In both instances, the EADD development program needed to allow opportunities for local communities to participate prior to the commencement of the project, at the point of implementation, and throughout the duration of the project to discuss emergent issues.

There are several methods to pursue what Dewey (1948) called reconstructive thinking, whereby the goal is to build shared ideas and communities. One proposed method for reconstructive thinking is the use of gradualization, whereby you encourage affected parties to think in terms of degrees rather than boundaries (Keulartz and Schermer 2014; Keulartz et al. 2004). Instead of viewing something as good or bad, participants are encouraged to consider solutions that are situated between the extremes. In this case, as tensions grew among community members over whether animals deserved access to the limited water supply, gradualization allows for a discussion among community members, smallholder farmers and project staff about the types (e.g., species and breeds), and total number of animals' community members think is reasonable given the amount of water available to the community. Or how community members, or even government officials, might work together to increase access to other water sources.

Such an approach also allows for the possibility that a development program can adapt to problems that were not previously anticipated. This means development program planners must plan for ongoing opportunities for engagement, as opposed to only planning for the preliminary meetings that occur at the outset of a project.

Another method is referred to as common-ground groups or dialogue (Keulartz et al. 2004, 24). The idea is that groups leave their core commitments off the table and search for areas and issues where they find some kind of agreement. For example, community members might come to an agreement that there is an increased availability of milk, yogurt, and ghee in the community due to the development project and this has benefited all households, not only households that own crossbreed dairy cows. It is beyond the scope of our discussion and our imagination to hypothesize what would be the outcomes of situated ethics in a development project. Rather we offer a vision of why situated ethics might work within development programming.

## Conclusions

A call for situated ethics in development programs emerges out of a recognition that technological interventions in development are embedded within a web of practices, actors, and institutions, many of which must change for the technology to successfully operate. As our case study illustrated, power asymmetries, incomplete technoscientific knowledge in the program planning, and inequitable impacts of technological interventions mean that the emergence of impacted publics are likely. As such, situated ethics is necessary to understand areas of contestation between and among publics and for development organizations to more intentionally engage with avenues of resolution. While our discussion has focused on one specific development project, science and technology have long been a point of emphasis in development assistance and this trend is continuing with the entrance of new development actors. There is a role for STS insights in shaping development policy and practice.

The field of development is littered with stories of development programs that have failed. Therefore, scholars, policy makers, and organizations should be open to considering situated ethics in development practice. Situated ethics can be a mechanism of dealing with the complexity of development in practice. Malavisi (2014, 298) observes that "development needs an ethics that is both critical and practical." Situated ethics with insights from STS scholars can help in providing an ethics that is both

critical and practical, while advancing the values of worthwhile development. The critical reflexivity of situated ethics provides an important tool for development practitioners to engage with publics and identify areas for reenactment.

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## Notes

1. All names have been changed to protect the identities of individuals.
2. Global South refers to countries that have lower levels of per capita income, investment in healthcare and education, investments in infrastructure, and governance capabilities.
3. The Organization for Economic Cooperation and Development (OECD) Development Assistance Committee (DAC) is an international forum of thirty countries that regularly reports development assistance activities, thereby creating more transparency than other sources of aid.

## References

Adu-Ampong, E. A., and E. A. Adams. 2020. "'But You Are also Ghanaian, You Should Know': Negotiating the Insider–Outsider Research Positionality in the Fieldwork Encounter." *Qualitative Inquiry* 26 (2020): 583-92.

Banks, Nicola, and David Hulme. 2014. "New Development Alternatives or Business as Usual with a New Face? The Transformative Potential of New Actors and Alliances in Development AU." *Third World Quarterly* 35 (1): 181-95.

Banks, Sarah. 2016. "Everyday Ethics in Professional Life: Social Work as Ethics Work." *Ethics and Social Welfare* 10 (1): 35-52.

Bauchspies, Wenda K. 2012. "The Community Water Jar: Gender and Technology in Guinea." *Journal of Asian and African Studies* 47 (4): 392-403.

Bijker, Wiebe E. 1997. *Of Bicycles, Bakelites, and Bulbs: Toward a Theory of Sociotechnical Change*. Cambridge, MA: MIT press.

Busch, Lawrence. 2009. "What Kind of Agriculture? What Might Science Deliver?" *Natures Sciences Sociétés* 17 (3): 241-47.

Callon, Michel, and John Law. 1989. "On the Construction of Sociotechnical Networks: Content and Context Revisited." *Knowledge and Society: Studies in the Sociology of Science Past and Present* 8 (1989): 57-83.

Cherlet, Jan. 2014. "Epistemic and Technological in Determinism in Development Aid." *Science, Technology, & Human Values* 39 (6): 773-94.

Crocker, David A. 2008. *Ethics of Global Development: Agency, Capability, and Deliberative Democracy*. Cambridge, UK: Cambridge University Press.

Dewey, John. 1948. *Reconstruction in Philosophy*. Boston, MA: Beacon Press.

Dewey, John. (1927) 1991. *The Public and its Problems*. Athens: Swallo Press/Ohio University Press.

Driessen, Clemens, and Michiel Korthals. 2012. "Pig Towers and In Vitro Meat: Disclosing Moral Worlds by Design." *Social Studies of Science* 42 (6): 797-820.

Drydyk, Jay. 2016. "Ethical Issues in Development." In *The Palgrave Handbook of International Development*, edited by J. Grugel and D. Hammett, 55-76. London, UK: Palgrave Macmillan.

DWD (Directorate of Water Development). 2017. *Uganda Water Supply Atlas: Uganda National Report*. Edited by Ministry of Water & Environment (MWE) and Directorate of Water Development (DWD). Kampala, Uganda: DWD.

EADD (East African Dairy Development). 2008. "EADD Uganda Newsletter No. 1." *In East Africa Dairy Development Project*. Nairobi, Kenya: EADD. https://cgspace.cgiar.org/bitstream/handle/10568/2447/EADD%20Uganda%20Newsletter%20Issue1.pdf?sequence=1

EADD (East African Dairy Development). 2009. "EADD Uganda Newsletter No. 2." *In East Africa Dairy Development Project*. Nairobi, Kenya: EADD. https://cgspace.cgiar.org/bitstream/handle/10568/2448/Newsletter%20%20March09.pdf?sequence=1&isAllowed=y

Ebrahim, Hasina Banu. 2010. "Situated Ethics: Possibilities for Young Children as Research Participants in the South African Context." *Early Child Development and Care* 180 (3): 289-98.

Estalella, Adolfo, and Elisenda Ardèvol. 2007. "Field Ethics: Towards Situated Ethics for Ethnographic Research on the Internet." *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research* 8 (3): Article 2.

Fejerskov, Adam Moe. 2017. "The New Technopolitics of Development and the Global South as a Laboratory of Technological Experimentation." *Science, Technology, & Human Values* 42 (5): 947-68.

Ferguson, Ann. 1998. "Resisting the Veil of Privilege: Building Bridge Identities as an Ethico-politics of Global Feminisms." *Hypatia* 13 (3): 95-113.

Frickel, Scott, Sahra Gibbon, Jeff Howard, Joanna Kempner, Gwen Ottinger, and David J. Hess. 2010. "Undone Science: Charting Social Movement and Civil Society Challenges to Research Agenda Setting." *Science, Technology, & Human Values* 35 (4): 444-73.

Giwa, A. 2015. "Insider/Outsider Issues for Development Researchers from the Global South." *Geography Compass* 9 (6): 316-26.

Gore, Charles. 2013. "The New Development Cooperation Landscape: Actors, Approaches, Architecture." *Journal of International Development* 25 (6): 769-86.

Goulet, Denis. 1989. *The Uncertain Promise: Value Conflicts in Technology Transfer*. New York: New Horizons Press.

Gremmen, Ine. 1999. "Visiting Nurses' Situated Ethics: Beyond 'Care Versus Justice'." *Nursing Ethics* 6 (6): 515-27.

Haraway, Donna. 1988. "Situated Knowledges: The Science Question in Feminism and the Privilege of Partial Perspective." *Feminist Studies* 14 (3): 575-99.

Haraway, Donna. 1991. *Simians, Cyborgs, and Women: The Reinvention of Nature*. New York: Routledge.

Harding, Sandra. 1991. *Whose Science? Whose Knowledge? Thinking from Women's Lives*. Ithaca, NY: Cornell University Press.

Hay, Iain, and Samantha Muller. 2013. "Questioning Generosity in the Golden Age of Philanthropy." *Progress in Human Geography* 38 (5): 635-53.

Hess, David J. 2007. *Alternative Pathways in Science and Industry*. Cambridge, MA: MIT Press.

J.P. 2017. "What is China's Belt and Road Initiative? The Many Motivations Behind Xi Jinping's Key Foreign Policy." *The Economist*. https://www.economist.com/the-economist-explains/2017/05/14/what-is-chinas-belt-and-road-initiative

Jasanoff, Sheila. 2003. "Technologies of Humility: Citizen Participation in Governing Science." *Minerva* 41 (3): 223-44.

Jasanoff, Sheila. 2016. *The Ethics of Invention: Technology and the Human Future*. New York: W. W. Norton & Company.

Jenkins, Garry W. 2011. "Who's Afraid of Philanthrocapitalism." *Case Western Reserve Law Review* 61 (3): 753-822.

Keulartz, Jozef, and Maartje Schermer. 2014. "A Pragmatist Approach to the Governance of Vulnerability." In *Vulnerability in Technological Cultures: New Directions in Research and Governance*, edited by Anique Hommels, Jessica Mesman, and Wiebe E. Bijker, 285-304. Cambridge, MA: MIT Press.

Keulartz, Jozef, Maartje Schermer, Michiel Korthals, and Tsjalling Swierstra. 2004. "Ethics in Technological Culture: A Programmatic Proposal for a Pragmatist Approach." *Science, Technology, & Human Values* 29 (1): 3-29.

Khandekar, Aalok, Koen Beumer, Annapurna Mamidipudi, Pankaj Sekhsaria, and Wiebe E. Bijker. 2017. "STS for Development." In *The Handbook of Science and Technology Studies*, edited by Ulrike Felt, Rayvon Fouché, Clark A. Miller, and Laurel Smith-Doerr, 665-93. Cambridge, MA: MIT Press.

Kraut, Richard. 2018. "Aristotle's Ethics." In *The Stanford Encyclopedia of Philosophy* (Summer 2018 edition), edited by Edward N. Zalta. Accessed August 15, 2021. https://plato.stanford.edu/archives/sum2018/entries/aristotle-ethics/

Malavisi, Anna. 2014. "The Need for an Effective Development Ethics." *Journal of Global Ethics* 10 (3): 297-303.

Mamo, Laura, and Jennifer R. Fishman. 2013. "Why Justice? Introduction to the Special Issue on Entanglements of Science, Ethics, and Justice." *Science, Technology, & Human Values* 38 (2): 159-75.

Mansuri, Ghazala, and Vijayendra Rao. 2013. *Localizing Development: Does Participation Work?* Washington, DC: World Bank.

Marres, Noortje. 2007. "The Issues Deserve More Credit: Pragmatist Contributions to the Study of Public Involvement in Controversy." *Social Studies of Science* 37 (5): 759-80.

McGoey, Linsey. 2014. "The Philanthropic State: Market–State Hybrids in the Philanthrocapitalist Turn." *Third World Quarterly* 35 (9): 109-25.

McHugh, Nancy Arden. 2011. "More than Skin Deep: Situated Communities and Agent Orange in the Aluoi Valley, Vietnam." In *Feminist Epistemology and Philosophy of Science*, edited by Heidi Grasswick, 183-203. New York: Springer.

Nussbaum, Martha. 2002. "Capabilities and Social Justice." *International Studies Review* 4 (2): 123-35.

Ong, Aihwa. 2011. "Translating Gender Justice in Southeast Asia: Situated Ethics, NGOs, and Bio-welfare." *Hawwa* 9 (1): 26-48.

Ottinger, Gwen. 2013. "Changing Knowledge, Local Knowledge, and Knowledge Gaps." *Science, Technology, & Human Values* 38 (2): 250-70.

Penz, Peter, Jay Drydyk, and Pablo S. Bose. 2011. *Displacement by Development: Ethics, Rights and Responsibilities*. Cambridge, MA: Cambridge University Press.

Perez, Teresa Sandra. 2019. "In Support of Situated Ethics: Ways of Building Trust with Stigmatised 'Waste Pickers' in Cape Town." *Qualitative Research* 19 (2): 148-63.

Prins, Baukje. 1995. "The Ethics of Hybrid Subjects: Feminist Constructivism According to Donna Haraway." *Science, Technology, & Human Values* 20 (3): 352-67.

Reardon, Jenny. 2013. "On the Emergence of Science and Justice." *Science, Technology, & Human Values* 38 (2): 176-200.

Rogers, Alisdair, Noel Castree, and Rob Kitchin. 2013. "Situated Knowledge." *A Dictionary of Human Geography*. Oxford, UK: Oxford University Press. https://www.oxfordreference.com/view/10.1093/acref/9780199599868.001.0001/acref-9780199599868

Rogers, Robin. 2015. "Why the Social Sciences Should Take Philanthropy Seriously." *Society* 52 (6): 533-40.

Schurman, Rachel. 2018. "Micro(soft) Managing a 'Green Revolution' for Africa: The New Donor Culture and International Agricultural Development." *World Development* 112 (12): 180-92.

Scoones, Ian. 2016. "The Politics of Sustainability and Development." *Annual Review of Environment and Resources* 41 (1): 293-319.

Sen, Amartya K. 1999. *Development as Freedom*. Oxford, UK: Oxford University Press.

Sloots, Ron. 2010. *Assessment of Groundwater Investigations and Borehole Drilling Capacity in Uganda*. In The Republic of Uganda Ministry of Water and Environment (MWE) & UNICEF. Kampala, Uganda: UNICEF.

Smith, Adrian, and Andy Stirling. 2010. "The Politics of Social-ecological Resilience and Sustainable Socio-technical Transitions." *Ecology and Society* 15 (1): 1-11.

Smith, Adrian, Andy Stirling, and Frans Berkhout. 2005. "The Governance of Sustainable Socio-technical Transitions." *Research Policy* 34 (10): 1491-510.

Smith, Adrian, Jan-Peter Voß, and John Grin. 2010. "Innovation Studies and Sustainability Transitions: The Allure of the Multi-level Perspective and Its Challenges." *Research Policy* 39 (4): 435-48.

Smith, Dorothy E. 1990. *The Conceptual Practices of Power: A Feminist Sociology of Knowledge*. Toronto, Canada: University of Toronto Press.

St. Clair, Asunción Lera. 2010. "A Methodologically Pragmatist Approach to Development Ethics." In *Capabilities, Power, and Institutions*, edited by Stephen L. Esquith and Fred Gifford, 359-380. University Park: The Pennsylvania State University Press.

STEPS. 2010. "Innovation, Sustainability, Development: A New Manifesto." Accessed August 15, 2021. https://steps-centre.org/anewmanifesto/manifesto_2010/.

Truman, Harry S. 1949. "Inaugural Address." In *The Avalon Project*. New Haven, CT: Yale Law School. https://avalon.law.yale.edu/20th_century/truman.asp

Ul Haq, Mahbub. 1995. *Reflections on Human Development*. Oxford, UK: Oxford University Press.

Williamson, Claudia R. 2010. "Exploring the Failure of Foreign Aid: The Role of Incentives and Information." *The Review of Austrian Economics* 23 (1): 17-33.

Winner, Langdon. 1993. "Upon Opening the Black Box and Finding It Empty: Social Constructivism and the Philosophy of Technology." *Science, Technology, & Human Values* 18 (3): 362-78.

World Agroforestry. 2014. "The East Africa Dairy Development Project (EADD) Phase II Launch in Uganda." *World Agroforestry*. Accessed August 25, 2020. http://www.worldagroforestry.org/news/east-africa-dairy-development-project-eadd-phase-ii-launch-uganda.

World Bank. 2012. *Global Monitoring Report 2012: Food Prices, Nutrition, and the Millennium Development Goals*. Washington, DC: World Bank, International Monetary Fund.

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