

Consensus or Contestation: Reflections on Governance of Innovation in a Context of Heterogeneous Knowledges

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Governance of innovation needs to cater in a democratic way for heterogeneity of knowledges. Many initiatives in the democratisation of innovation aspire to some sort of consensus among relevant actors. However, consensus tends to silence dissenting voices, typically those of marginalised groups. In situations of high epistemic and epistemological diversity, this problem can be expected to aggravate. Against consensus-seeking theories of deliberative democracy, Chantal Mouffe has proposed the aspiration to grant the possibility of contestation. While one central principle in many theories of democracy is that it should never silence dissenting or minority positions, Mouffe elevates contestation, rather than the pursuit of consensus, to be the linchpin of democracy. I will explore what a contestation-oriented view of democratisation could mean in the case of governing innovation, specifically in the case of biogasification of rice straw. The latter is commonly presented as a potentially beneficial use of rice straw, which is currently considered waste and (illegally) burned by farmers on the Indian countryside. However, our research has shown that this view indeed unduly suppresses valuable yet marginalised knowledges. Lessons for frameworks such as Responsible Research and Innovation, and particularly an alternative to the dominant aim of democratising innovation through deliberation, will be drawn.

Keywords: Contestation, knowledge brokerage, Responsible Research and Innovation, epistemological diversity

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Introduction

Thinking through innovation has a long history, and moreover one that has long been concerned with issues of democratisation. Innovation is essentially about making new things or making things new, regardless whether we talk about products (both artefacts and services), processes, the ways things are positioned and the mental models we use to manage things (Tidd & Bessant, 2009). That innovation potentially has a democratic deficit is not hard to see. When innovations have consequences that pervade into the broader social world, people who are not directly involved in the innovation process may yet experience its consequences. Acquiring access to that process, and exerting influence, is easier for those who have formal expertise and socio-economic power than for those who lack these assets. Being forced to experience the consequences of innovations in which one has no say constitutes a democratic deficit that calls for democratisation.¹

Democratisation of innovation is not least about improving the inclusion of knowledges that are somehow relevant, while yet hitherto excluded from the innovation process. Most prominently, this is the case when they are not recognised as formal expertise. Presumably, inclusion of these knowledges is desirable either for reasons of democratic legitimacy or for reasons of prudence, when there is something valuable in the unheard knowledges. The working hypothesis underlying this article is that such democratisation of innovation by inclusion of knowledges is more difficult in situations of higher epistemic and epistemological diversity; that is, diversity in what people think about things and diversity in how people validate their knowledge. I assume this as a general structure: Some parties have a stronger hand than others in the innovation process, which means that they also have a stronger hand than others in determining what knowledge is deemed relevant. Knowledge that is closer to those dominant parties' criteria of validation thus has a greater chance of being included in the innovation process. In situations of higher epistemological diversity, where knowledge validation systems are more apart, this will play out as a bigger hurdle for knowledge to travel, especially for subaltern knowledge.

The incorporation of knowledges other than formal expertise into innovation has inspired a whole range of inclusion initiatives. These range from consensus conferences, stakeholder meetings and technology assessment (Van Est & Brom, 2012) as a specific form of expertise that informs parliaments to organised nation-wide debates such as the *broad societal discussion*² on nuclear energy in the Netherlands in the 1980s (Hagendijk & Terpstra, 2004). The recent discourse on *Responsible Research and Innovation* (RRI) is to be reckoned a novel branch to this tradition. It specifies a number of concrete aspirations for this democratisation: innovation should be anticipatory, inclusive, reflexive and responsive (Owen, Macnaghten, & Stilgoe, 2012; Schomberg, 2011; Stilgoe, Owen, & Macnaghten, 2013).

Ultimately, much of this strategy is aimed at reaching consensus and the straightforward, uncritical incorporation of knowledge (Van Oudheusden, 2014). This is not surprising, as a univocal position offers a much more productive action perspective than a controversial one does. This means that innovators are likely to

value unambivalent more than ambivalent knowledge. In a classical political theory such as John Rawls's (1993), consensus is not so much the opinion that all members of a community hold, but rather a conclusion that the vast majority of a community can accept, because it has been achieved after due, democratic process undisturbed by power relations (even if they, as individuals, may disagree to its content). Yet it is worth noting that any consensus is relative to the circumstances in which it came about (Harding, 2009). This entails that the content of the consensus will be subject to dominant epistemologies, even if it is pretendedly neutral: knowledge positions will be easier to justify if they comply with dominant ideas of such justification.

In consequence, consensus is potentially hostile to deviant opinions, especially if those opinions are backed by epistemologies that are not acceptable across the community, or at least the dominant part of that community. While it is at the basis of democratic theories that dissenting opinions should not be silenced (Mill, 1991 [1859]), such a thing is easier said than done. Voices speaking from minority epistemologies, by definition, run the risk of appearing as nonsensical or irrational at worst, and uneducated and uninformed at best. Hence, even if they are granted the right to speak, there is still no guarantee that their input will sort any effect.

In this article, I will therefore develop ideas on how such emancipation of minority voices can be shaped further. I build on the work of, amongst others, Chantal Mouffe, who proposes *contestation* as a better principle for organising politics than *consensus*. Chiefly, the idea is that people should be enabled to publicly contest the validations of other knowledges, notably those knowledges of which the validations have come to be accepted as natural to the community. Of course, in practice, discourse is not this black and white. There are higher and lower degrees of agreement, higher and lower degrees of similarity in validation and justification, and higher and lower degrees of social inclusion in decision-making processes. In practice, consensus and contestation will both have some legitimacy at specific points. What matters here is that the contestation part requires further development.

This article engages with such difficulties specifically in the context of innovation. To complex innovation projects, many different sorts of knowledge are (potentially) relevant. Yet their inclusion is non-trivial if particular epistemologies are dominant. In times where the call for *RRI* (Owen et al., 2012; Schomberg, 2011; Stilgoe et al., 2013) with further pleas for knowledge inclusion are well heard, this problem merits due attention. How can we build a knowledge-inclusive way of governing innovation?

This article builds on 1.5 year of research into the problem of rice straw burning on Indian farmlands, notably in the states of Punjab, Haryana and Uttar Pradesh, and biogasification as a potential solution. Initially, shaped as an *RRI* study to help shape an innovative technology in an inclusive way, the project gradually shifted to a study into the intricacies and ramifications of the problem of rice straw burning. In a nutshell, the case is that farmers alternately grow wheat and rice on the same land. They need to vacate the land off rice residues quickly so as to be able to sow the wheat. Burning the residues on-site is often felt to be the only solution. Our initial engagement with the problem came from the innovative idea of using

the rice straw for the production of biogas, an innovation project in which chemical industrial corporates would have to collaborate with farmers.

On the one hand, we noticed that a lot of relevant and valuable knowledge was available among the different players. This knowledge was in all its diversity highly relevant to understanding the problem of rice straw burning and any inventive solution to it. On the other hand, we noticed that knowledge failed to flow easily between the different players: They had radically different understandings of the problem, and even more so of the solutions that would be desirable. Below a seemingly defeatist stance among many with respect to the feasibility of cooperation, we found different, incompatible narratives, knowledge validations and value prioritisations.

The central claim developed in this essay is that if innovation in such situations with high knowledge heterogeneity wants to achieve technologies that are adapted to the contexts in which they are to operate, it had better build arrangements for *contestation* in addition to arrangements for *consensus building*. If left uncorrected, consensus building runs the risk of silencing knowledges from subordinate groups. Cultivating contestation, on the contrary, permanently allows all voices to speak, and to speak moreover from a position with more legitimated epistemic authority.

This article will continue along three lines. First, I will seek to make sense of such radically different knowledges and their epistemologies, and give each their due in a comparative³ perspective. Second, I will explore how the aforementioned contestation can be achieved and productively sustained over time, in a way that makes sense to all involved actor groups. And third, I will propose arrangements for this contestation process such that it specifically caters towards innovation processes, where knowledge is not only heterogeneous but also tied to epistemic authorities that differ both in (perceived) level and kind of justification.

The Consequences of Consensus

Initiatives in stakeholder engagement, understood broadly, have sought many ways to broaden the knowledge base that innovation projects can tap into. This has been pursued for various reasons. As Reed (2008) reviews, participatory initiatives are variably justified by an appeal to the potential reduction of marginalisation, the breeding of trust in decisions and civil society, the empowerment of stakeholders to join in the co-production of knowledge, the facilitation of social learning and the presentation of decisions as being taken in a fair way and inclusive of a diversity of values and needs. Also, it is claimed that participation will help produce better decisions and decisions better adapted to local situations. Within *science and technology studies* (STS), one classical insight is that different groups will have different definitions of an innovation problem (Bijker, 1995). It is through their particular definition of a problem that groups are connected to the problem (Callon, 1986), and participatory methods should thus cater to a multiplicity of such definitions.

Even though thinking through participation has gone a long way in STS (see e.g., Chilvers & Kearnes [2015] for a recent overview), not all these promises are

delivered. It is observed that many current attempts at participation are limited to straightforwardly including actors and their opinions, without a clear idea of how the concurring politics should be facilitated and how mechanisms of inclusion and exclusion can be laid bare and repaired (Van Oudheusden, 2014). In some cases, the development of such initiatives comes down to mere window dressing, and in other cases it leads to an ever larger, uncritical inclusion of parties, without a clear justification or strategy and hence with unclear benefit for the innovation process (Gregory, 2016). But most important for the current argument are the hazards that majority knowledges remain hegemonic (Callon, Lascoumes, & Barthe, 2009; Fuller, 2012), and more specifically that techno-scientific expertise remains dominant (Guston, 2013).

Along these lines, the call for more reflexive approaches to participation has been increasing recently. For example, Wynne (2007) observes that participation processes are usually kept firmly in the hands of experts who thus impose their specific perspectives. Carrying this a step further, Voss and Amelung (2016) argue that participation methods have in fact themselves become objects of technocratic management, and thus ironically reproduce the very democratic deficit that they were intended to resolve. In response to this issue, Krzywoszynska et al. (2018) show how letting stakeholders co-determine the very *format* of participation (as opposed to surveying their perspectives in pre-set formats) leads to the articulation of entire novel rationalities. And Lezaun, Marres, and Tironi (2016) review that participation is today often shaped as experiments, so as to allow (amongst other benefits) new problem definitions to emerge.

It seems crucial that inclusion not only takes place at the level of knowledge, needs and values but also at the more reflexive level of questions such as where critique can be levelled, what format the participation should have and which problem exactly is to be solved by the inclusion. Exclusion is not only a *de facto* phenomenon of deviant opinions being harder to voice once a majority opinion has stabilised. According to Chantal Mouffe (2000), it is rather *in the very act of achieving consensus* that exclusion happens. As she discusses in the context of political philosophy, both John Rawls and Jürgen Habermas devise procedures (be it very different ones) to arrive at consensus. For both, consensus depends on specific norms and substantive content. This makes the consensus and even the procedures of consensus building inaccessible for those who cannot recognise these norms as their own. This would be no problem if the norms were truly universal, but the very possibility of universal norms should be approached with the deepest scepticism—if not from a normative perspective, then at least from the empirical observation of their failure to achieve general acceptance.

With Mouffe (2013), democratisation is about rendering dissenting voices in their own right. In contrast, both Rawlsian and Habermasian forms of deliberative democracy tend to see dissenting voices as something that needs to be accommodated and primarily protected against the tyranny of majority. They seek the legitimacy of the majority in neutral procedures (Rawls) or in power-free deliberation (Habermas), but do not problematise the epistemologies of majorities that themselves depend on power. It is key to Mouffe's ideas that this problematisation itself is democratised.

This cannot be enshrined into a single institution, as that would de facto become the new epistemological hegemon. Therefore, she proposes pursuing a multitude or ‘ecology’ of institutions that together cultivate this.

Thus, according to Mouffe (2005, p. 3), any pursuit of impartial institutions should be abandoned. Instead, we should seek arrangements that stimulate a vibrant public sphere, and more specifically, arrangements that explicitly facilitate agonistic debate: debates that are open to contestation, not only of achieved consensus but also the foundations and justifications on which such consensus rests. This entails that discourse should not be framed in terms of right or wrong, let alone the today obsolete categories of left or right. These categories are far too restrictive to conduct an agonistic debate.

I try to answer to this call specifically with respect to innovation in a context of heterogeneous knowledges. Some knowledges, chiefly those of policymakers and formal experts, are likely to be paid due attention in the innovation process. Others, such as craft knowledge and farmers’ knowledge, are not. This is despite the fact that they have a certain pertinence to the innovation problem—the knowledge itself concerns the important context of application, and the owners of this knowledge have a clear stake in the innovation because of their rootedness in the context of application. It is also despite the fact that the knowledges are grounded in full knowledge systems; they just lack grounding in dominant knowledge systems. How can we make sure that these knowledges, while legitimate and relevant, yet not founded along the lines of dominant epistemologies, somehow remain able to stand their position in the innovation process? How can we make sure that voices that are not couched in the technocratic idioms of technoscientists and policymakers can somehow remain relevant and even recognised on an equal footing to technoscience?

Knowledges do not circulate independently, but are connected to specific social groups. Thus, the issue is not only about the inclusion of mere knowledge but also about how group identities are defined, and about which identities are found to be legitimated to speak. In our study, we have sought to understand knowledge identities as something achieved by a social group, rather than as something connected to some overarching, decontextualised standard of valid knowledge. Also, knowledge identities are thus not something readily available for political accommodation but something of which the legitimacy and ‘right to speak’ are achieved through work. In the context of RRI, and governance of innovation more broadly, this raises the question whether and how specific knowledge identities can and must be enrolled to contribute to the innovation process, and whether and how they can be enabled to provide a perspective on the legitimacy of competing—and potentially dominant—knowledge identities.

One final question is how this can be institutionalised, or otherwise perpetuated over time. Looking at the specific case of rice stubble burning, how could such agonistic knowledge exchange be installed more permanently? And how can knowledge identities be enabled over a longer period of time to conduct this

contestation in a public, political way? What this means for innovation and stakeholder engagement in the specific case of rice stubble burning and biogasification in India is what I will explore in the remainder of this article.

The Case of Rice Stubble Burning and Biogasification

As mentioned above, we⁴ initially set out to conduct an RRI-inspired investigation into the possibilities to produce biogas from rice straw. In theory, this innovation would kill multiple birds with one stone. It would offer a more economical alternative of using the rice straw than the burning that farmers see themselves currently compelled to do as a consequence of intensive, industrial-style farming and quick crop rotation. It would also avail a great amount of energy from a renewable source to the national energy balance. It would, if remunerated, offer the farmers an additional source of income—what is now thought of as waste would become a commodity. And it would relieve vast parts of India, including the Delhi metropolitan area, of a major source of smog and air pollution.

The innovation was envisioned by an international corporate player, and they contributed in kind to our research. This innovation, as originally conceived of, entailed the challenge of making a connection between corporate players and farmers in question, many of whom are smallholders. In addition, the innovation had the interest of policymakers at many levels, of activist groups and researchers both in academia and in commercial research. Each of these groups has a different, preferred understanding of the problem. Of course, the groups are internally not as homogeneous as might thus be suggested, but the current small research project did not offer the opportunity to differentiate extensively here. Bringing together the various definitions of the problem and its potential solutions is a complex affair, when such a diversity of perspectives is in place.

In the course of one and a half year, we conducted interviews with over twenty experts, from corporate innovation, policymaking at various levels, academic research, social action groups and farming. The interviews were semi-structured and primarily aimed at elucidating the respondents' perspectives on rice straw, gasification and the problem of rice straw burning. In particular, we were interested to learn how they define the problem of rice straw (if any), and what solution they deem realistic. In addition, we also (co-) organised a number of events with various actor groups, some more heterogeneous and others less so. For example, we co-organised a meeting with about 100 farmers, which was comparably homogenous, even though farmers represented various farming paradigms, from organic to industrial farming (see also Mamidipudi & Frahm, 2020; Pandey, 2020). In contrast, we also organised a workshop where academics and policymakers attended, which was comparably heterogeneous. We provided a workshop to corporate scientists and engineers. And the final event welcomed representatives from all sorts of stakeholders.

Stakes were different for different groups, and we as researchers had stakes of our own as well. Initially, our commitment was to the gasification of rice straw

and the question how this can be implemented in a societally responsible way. In a way, we very much committed the sin of having our agenda determined by the innovation expert perspective, but it was all we had at that first moment. During the process, our engagement broadened, and we sought ways to also incorporate other definitions of the problem. For this article, I will allow myself to discuss only one cross section through the case as it emerged: the challenge of finding a way to treat different knowledges in a fair way, thus implicitly emancipating those problem definitions that would otherwise have difficulty getting heard and making a substantial contribution to the innovation process. In particular, how can it be that respondents from all groups succeed in explaining their particular definitions of the problem fairly clearly to us as researchers, while it is recognised across the board that communication between the groups is so hard? The explanation of India being a stratified and segregated society where groups simply do not talk to one another would be overly simplistic here, as it would dismiss the many structures and communications that run across different strata.

As a mode of inquiry, we sought to remain open to a multiplicity of problem definitions. To a large degree, this is a commonplace for researchers in STS. However, moving beyond straightforward perspectivism and carrying the multiplicity of problem definitions to all its consequences is a challenge of its own. For example, in discussions with stakeholders, we did not straightforwardly invite them to discuss their view on ‘the problem of rice straw burning’, but rather inquired carefully into what kind of challenges they perceived, what possible solutions they could think of and what was preventing them from realising those solutions. This led to them coming up with different primary problems: ranging from the problem of smog because of the burning to visions of the whole industrial approach to agriculture being bad, to logistical and supply-chain problems and to problems of poor education.

We could proceed with these multiple problem definitions because we addressed each of the groups separately. This provided a safe space where knowledge could be shared, and first corroborated within its own validation systems before we would take it out and confront it with other knowledges. We explicitly probed these validation systems by asking how people know things. We also provided explanatory examples ourselves of how we conceived of knowledge as being situated and dependent on local epistemologies. To holders of dominant (and often pretendedly universalist) knowledges, this offered a reflexive moment leading to some modesty and openness. To holders of subaltern knowledges, this offered a moment of validation and emancipation, and contributed further to the safe space for them to stage and own their knowledge. Also, it allowed for people to be critical of ideas on modernisation and progress, which are otherwise perceived as self-evident and beyond critique.

At the end of the project, we did not arrive at a clear-cut solution for dealing with rice straw, whether the burning part or the biogasification part. But we did achieve that voices could be heard that would otherwise have remained more silent. One important merit of our engagement was that this highlighted the complexity

and multiplicity of the rice straw problem, and helped make novel connections between knowledges and contexts. This point seemed to be well received by all parties, although we had no method to corroborate this.

The point made earlier, that democratisation of innovation (and more broadly democratisation of a knowledge society) needs to include a democratisation of the critiquing of knowledge, has been realised, though it needs our articulation to see it. Our intervention of bracketing knowledge and connecting it explicitly to its contextualised validation, implicitly opens it up for such contestation. At the same time, this contestation ran via us; not as a debate in which the contestants themselves actually engage in critiquing each other's epistemologies. This loads unto us the suspicion of taking an external position, a 'view from nowhere' or a 'God's eye perspective' if you like. I will seek a speculative answer to the question of how to resolve this in the next section.

While I stressed earlier that consensus is not to be pursued, it is vital for any strategy for innovation to somehow arrive at a form of closure: a sufficiently endorsed position on how to proceed. While we ended the project with substantive recommendations, these were at the same strategic metalevel as the current analysis: They concerned how to go about knowledge emancipation and problem articulation, etc. We did not achieve closure with respect to what to do with rice straw, what to think of biogasification, and what to do about the stubble burning and ensuing smog problems. We could not do that within the extremely short project duration, we did not pursue it and we felt this not to be our task. But it is something that knowledge brokerage, as proposed in the next section, will need a solution for—a solution that is at once worthy of the name closure and open enough to keep allowing for contestation.

Agonistic Pluralism in Governing Rice Straw Innovation

This special issue is organised around the theme of RRI in the Global South. Before I move on to speculating about how the above agonistic take on development could be developed specifically for a Global South perspective, it is crucial to take away some prejudices that might seep into the frame. For one thing, while smallholding farmers are vulnerable in important senses, we cannot treat them as a vulnerable group per se. It needs to be recognised that they have valuable coping strategies vis-à-vis the threats to which they are vulnerable. Also, treating them as categorically vulnerable would deny their innovative capacity and knowledgeability, which is in fact a crucial premise to the agonistic take on innovation. This is what I call the first principle: assume resilience and inventiveness, not misery (cf. Hommels, Mesman, & Bijker, 2014).

The second principle is of non-universal modernisation. We cannot treat the Global South (at any level, from individual citizens to entire states) as being on the same trajectory of progress as the West, just at a less-advanced point (Furlong, 2014; Hess et al., 2016, pp. 322–323; Robinson, 2005). Instead, we should somehow facilitate that owners of a particular future are themselves in charge of

setting the criteria for that future and the terms in which it should be discussed (cf. Krzywoszynska et al., 2018). This offers a methodological restraint to me as a (Western) researcher,⁵ who will by definition remain susceptible to the pitfall of *orientalism* (Said, 1979). But it is also a core ingredient to the agonistic approach to innovation itself: emancipating owners of a future to let their own criteria speak to that future allows for hegemonic criteria, and naively universalised ideas of modernity, to be replaced by local, alternatives that are felt to be more appropriate.

Let me use this point, of allowing actors to set the criteria for their own futures, as a first entry into developing agonistic innovation. Sandra Harding (2001) warns against uncritically emancipating oppressed knowledges or distinctively non-Western ways of knowing innovation. All knowledges, including oppressed ones, inherit specific limitations as a consequence of their situatedness. Yet one tenet in *standpoint theory* (Harding, 2004) is that knowing from an oppressed position requires more work because it needs to achieve liberation from taken-for-granted epistemologies. This exactly enables oppressed positions to know the mechanisms of oppression better. An exemplifying problem is when crafts knowledge is dismissed because it has not been corroborated in the same ways as have scientific and engineering knowledges. This needs to be repaired, not only by simply staging the knowledge but also by staging the way it understands itself *as knowledge*, and the way it understands the other knowledges that dismiss it. This is the third principle: connect knowledges to their own epistemologies and emancipate knowledges and epistemologies in tandem.

The fourth principle then holds that for a fair and symmetrical treatment, it is not only vital that all knowledges can defend their legitimacy by appealing to their own epistemology; they should also be allowed and enabled to critique the epistemologies of others (cf. Visvanathan, 2009); or put in terms borrowed from *standpoint theory*, it is not only about including the excluded and their ways of understanding themselves but also about including their ways of understanding the excluding parties with their particular knowledge and particular social relations (Harding, 2009). For example, when straw-burning farmers are confronted with the idea to convert their rice straw into biogas, they must somehow be enabled, and actively facilitated, to speak about the fact that the whole way of thinking of scientists and policymakers evidently overlooks the injustice they feel is done to them: The onus of collecting the straw and availing it to industry is uncritically shifted to them, whereas in their own perspective, the straw is itself already something 'done to them' by the system of intensive farming they are locked into. To them, it is not something they are responsible for in the way envisioned by scientists and policymakers. The disagreement is not only about the facts and the question who owns the rice straw (or, for that matter, who is responsible for solving the problem of burning). It is also about the decontextualising (Feenberg, 2002) and universalising way of knowing of policymakers and scientists that supports the specific diagnosis, and that would be critiqued by the farmers.

In this specific case, of an innovation that is to meet a highly heterogeneous social reality, some arrangements could be put in place in order to secure that these

principles can be delivered. Some conditions are vital to such institutionalisation. The arrangements must be acceptable to all, which poses an additional challenge if power relations are also internalised by the subaltern, and their critical perspective might be hidden from their own view. The arrangements must be able to survive more or less independently of particular individuals and remain in place over a longer period of time. While the research we conducted cannot produce a fully corroborated recipe for such institutionalisation, at least it provides important lessons learned.

The arrangements needed are best captured under the notion of *knowledge brokerage* (Malinovskyte, Mothe, & Rüling, 2014; Martinuzzi & Sedlačko, 2016). In its most general sense, knowledge brokerage is the activity of translating knowledge from one knowledge system to another, so as to make it useful in other contexts. In a narrower sense, it is also understood as the particular translation of academic and scientific knowledge towards practices of politics and policymaking, with the aim of making an ‘impact’ on behalf of science. In view of this specific case of incompatible epistemologies, I connect the four principles mentioned above to three concrete recommendations for knowledge brokerage. The recommendations are variably connected to the four principles, not one-to-one.

First, it seems vital to differentiate and segment between different knowledge groups, so that each knowledge group can stake their claims to knowledge in a somehow protected space. While this whole endeavour is essentially about collectivising knowledge processes, it is also clear that bringing them all together in one single site of knowledge exchange would render the situation subject to existing power relations. This segmentation creates sites in which social relations will be less asymmetrical and hence less influential on the exchange of knowledge. This is thus connected to delivering the third principle of preventing unfair treatment of knowledges by assessing them against alien epistemologies. It is also connected to the first principle of not presuming vulnerability, for the assumption of vulnerability exactly enacts a correlated assumption of non-knowledgeability. Dealing with this segmentation is the first requirement (and *raison d’être*) of knowledge brokerage here: one that is not only aimed at transporting and translating knowledge between different groups and making an impact from one to the other but also at dealing with epistemological diversity. The latter is not only about translating knowledge but also about emancipating epistemologies between groups.

Second, it is vital for knowledge brokerage that multiple definitions of the innovation problem should be enabled to circulate. In an abstract sense, this connects to the second principle of multiple future worlds (or modernities, if you like). But it also connects to the third principle of not unduly dismissing knowledge: The value of knowledge in general depends on how well it answers to the innovation problem. This means that strategically choosing one problem definition could serve the exclusion of particular knowledges as irrelevant. Demanding instead that different problem definitions are allowed, including at least one and possibly more per knowledge group, enables that such dismissal is pre-empted. This demand of multiple problem definitions adds to the tasks of the aforementioned knowledge brokerage.

The first and second recommendations for knowledge brokerage require that we be aware that knowledge relations are inextricably connected to social relations. That is to say, specific epistemic and epistemological positions are not simply occupied by persons who could select another at wish. Rather, they are connected to one's social position and are granted and validated by the community of which one happens to be a member. What is more, we must assume that these social relations are deep-rooted and internalised by all actors, including subaltern groups. This means that if we want to prevent particular epistemologies from becoming dominant, we must also abate the concurring social dominance. There is a need to enable knowledges to operate irrespective of their connected social position.

To achieve this, different modes of operation are needed, much like the front stage and back stage that Bijker, Bal, and Hendriks (2009) describe in the context of expertise in democracy. In front-stage situations, expert knowledge is confronted with alternative accounts of reality (ontologies) and alternative ways of knowing (epistemologies), and called to account publicly. Insofar as expertise has a privileged position, it will have to work hard (or depend on external power) to maintain epistemic authority. In back-stage situations, in contrast, knowledge is only held accountable to its native epistemologies. Expert knowledge is assessed primarily by the experts themselves within the confines of a profession or discipline. And in our case study, farmers' knowledge is only validated against the criteria that farmers themselves hold of good farming knowledge.

The backstage is comparably unproblematic, as indeed we managed to have talks with all parties involved in ways that allowed for their knowledge validations to be discussed. The frontstage is more complicated, though: How can we emancipate epistemologies such that they become capable of critiquing one another, thus answering to the fourth principle? That is in fact to ask: How can we install agonism in the sense meant by Mouffe in the practice of knowledge brokerage for innovation?

A fair critique of knowledges is thus to be pursued, which is only possible if the supporting legitimation and validation is supplied together with the knowledge it supports. For specific actors, especially subaltern ones, social hierarchies will make it impossible to level such criticism. This means that there is a task for knowledge brokers to do it on their behalf. This is comparably radical vis-à-vis existing notions of knowledge brokerage. The core task is usually understood as translating knowledge and adapting it to the recipients' epistemology; not to put that very epistemology in a critical perspective. In the current case study, we had no time to make this additional critical step. We did present the idea that epistemologies are limited, and it found a willing ear—also among policymakers and academics. Trying to actually challenge those epistemologies is a step further, which would be an interesting topic for further exploration and research. It is also the third recommendation for knowledge brokerage: start seeing the role of knowledge broker not only as translator and facilitator, but also as an active participant in the critiquing of knowledges.

Ultimately, the innovation process will need some form of closure: a conclusion about what the next steps should be. As exemplified here, consensus is unlikely to be

attained, and it can also be undesirable because of its potentially suppressive nature. It is therefore up to knowledge brokers, in concert with other parties involved, to draw up a best compromise. At the same time, they should be *explicit about the contingency and situatedness* of the content of the compromise. In other words, to keep explicit how it is not an eternal truth in the style modernist science would have it, but rather something constructed, social and temporal, and with a progeny in a context of power relations. Two challenges loom here. First, it will require a substantial diplomatic effort to keep the dominant parties on board, as they typically have the power to have it their way anyway. Second, it is not self-evident that the knowledge broker has the ironic privilege, as was ascribed by standpoint theorists to subordinate parties, of being able to recognise and articulate the conditions of power under which respective knowledges and their suppression come about. Worst case, it could amount to a vulgar travesty, if knowledge brokers start critiquing on behalf of subordinate parties—recall the first principle of not assuming vulnerability. But ideally, after proper preparation and training, the knowledge broker may be able to do exactly that in a way that enjoys endorsement from all parties.

Lessons for RRI in a Global South Perspective

This article has so far presented tentative lessons to be learned for knowledge brokerage in a specific case study. From various literatures and most centrally the political philosophy of Chantal Mouffe, I took the central idea that contestation is vital to emancipate oppressed voices, that this is not only about knowledges but also about their epistemologies. This amounted to four principles—assumption of resilience, non-universal modernisation, emancipate knowledges and their epistemologies in tandem, and allow all epistemologies and knowledges to critique others—and three recommendations for knowledge brokerage in practice—segment knowledges and grant each their backstage, let multiple problem definitions circulate and make critiquing part of the practice of knowledge brokerage. What remains to be discussed now is a broader perspective on what can be learned here for RRI in distinctively Global South situations, and possibly what political theory can learn from the strategic research site of innovation.

While it always runs the risk of erecting a caricature, it is vital to specify here some things that seem, from this case study, different from the West. One thing is that in India, the very thought that innovation is something heterogeneous and requires connections across the boundaries between professional and social groups is much less of an accepted fact than in Western frameworks of innovation. Rather, people tend to be concerned with their own distinct task or problem. This entails a central role for knowledge brokerage as described above. First, it needs to be broader than only making an impact from science on policy. Second, it needs to facilitate specifically the forms of contestation and critique developed here.

Another issue is that subordinate groups in the Global South are even more deprived than in the West of means to get their voice heard. This means that more

than in the West, social hierarchies and inequalities will exacerbate epistemological gaps. Also, this may in practice appear as a knowledge deficit (cf. Wynne, 1982), which may invite approaching it as such, against the lessons learned in STS. This again renders knowledge brokerage with contestation even more vital.

How does all this relate to the discourse of *RRI*? While there are many agendas going under that very name, they share an aim of making the innovation process more democratic, in many different senses: broadening the ownership of problems as well as solutions, broadening the knowledge base informing the innovation process, the expression and prioritisation of values and interests, to mention the most regularly occurring ones. Strategies are usually aimed at upstream intervention, and concepts such as responsiveness (Owen et al., 2012) and anticipation and reflexivity (Stilgoe et al., 2013) are mobilised to capture this.

To the very idea of *RRI* as a move of democratisation, the warning of consensus and its ensuing oppression of marginalised voices seems pertinent anyway, and even more so in a Global South context where epistemological gaps seem to play out more. Contestation-oriented knowledge brokerage seems a step in the right direction. As a corollary, this helps to open up taken-for-granted notions of modernity and progress; which is always a theme if Western concepts are translated to the Global South. This specific implementation of the ‘reflexivity’ that *RRI* calls for is thus a vital step to make.

For political theory in general, innovation is worth of attention particularly because it is a knowledge-intensive practice. This means that any emancipation achieved in innovation is likely to have a strong knowledge component, which will be very relevant for broader ideas of political emancipation: If we accept the diagnosis that unfair distribution of power correlates to unequal rights to speak for different knowledges, then emancipation may as well run through emancipation of those knowledges. The proposed practice of knowledge brokerage may play a path-breaking role there.

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NOTES

1. Democratisation means here: either opening up ways to exert influence or providing a convincing and acceptable justification why such influence should not be given. The latter is, for example, the case with police forces. Ordinary citizens have no direct say in how the police is organised and

operates. Yet a police force has a very clear and legitimate place in democratic systems. This realm beyond direct civic influence is not discussed in this article.

2. Dutch: brede maatschappelijke discussie.
3. ‘Comparative’ is not meant here as an attempt at ranking the knowledges and singling out the best ones, but in the same meaning as in ‘comparative philosophy’, where knowledge systems are presented vis-à-vis each other, without recourse to any overarching criterion for truth or validity.
4. The research team consisted of Wiebe E. Bijker, Annapurna Mamidipudi, Poonam Pandey, Amelie Riedesel and the author.
5. Two members of our team were native Indians (whatever that means in view of the huge cultural and political diversity within India). This helped me greatly to add nuances to my view beyond all stereotypes, but my mental model of India as ‘other’ was never fully eliminated.

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