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# Innovation as if people mattered: the ethics of innovation for sustainable development

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## ABSTRACT

Innovation policies' normative foundations have been little discussed in the academic literature, despite these foundations' impact on the priorities and consequences of innovation. Especially, the aim of sustainable development calls for discussion about innovation's normative foundations. This article discusses ethical principles drawn from ideas about Triple Bottom Line (TBL) accounting, human rights, and the New Sussex Manifesto. It discusses implications that these ethical principles have for innovation systems design and for innovation policies. Based on that discussion, the authors outline a principle of a human rights-based TBL in innovation. This principle implies that innovation systems, especially those involving vital resources, should look beyond science, technology, and competitiveness, and consider the needs and rights of those whose livelihoods depend on the resources in question. The article concludes with a set of general principles for the design of innovation systems in natural resource-based economies.

## KEYWORDS

Innovation; ethics; human rights; Triple Bottom Line; sustainable development; inclusiveness

## 1. Innovation for what purpose?

The normative foundations of innovation and public innovation policies have been little discussed in the academic literature, despite the fact that public concern about 'sustainable development' calls for an explicit discussion about such foundations. Yet these often tacit normative foundations of public innovation policies profoundly impact the priorities and consequences of innovation. Therefore, the innovation discourse may benefit from a critical, explicit analysis of innovation's normative aspects. This article seeks to contribute to such analysis.

National economic welfare is arguably the predominant normative value driving national and multinational innovation policies. This value is typically operationalized into three main success criteria of innovation: competitiveness, economic growth (measured in gross national product (GNP)), and production of know-how protected by patenting and other intellectual property rights (IPRs). Fulfilling these success criteria thus becomes the main goal of innovation policies. In turn, this goal comes to govern

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science through research councils that are increasingly instructed by governments to establish programmes for these purposes. In innovation politics, the purpose of public goods production, for example, tends to be comparatively muted, often oriented towards public policy implementation or ‘green growth’, understood these days mainly as growth with smaller climate impacts.

This article addresses the question of how institutions for innovation would be designed if they were based on the ethics that underlie the goal of sustainable development. Thereby, we need to address what these ethics are and the implications that these ethics have for the design of innovation systems.

Our research question addresses innovation’s legitimate purposes. Our discussion is relevant to, although not restricted to, a discourse on inclusive innovation that is currently emerging in the fields of innovation and economic development. However, the article seeks to go beyond the current discussion about the nature of ‘inclusiveness’ in innovation (e.g. Guth 2005; George, McGahan, and Prabhu 2012; Foster and Heeks 2013; Heeks et al. 2013; Fressoli et al. 2014; Heeks, Foster, and Nugroho 2014). Instead of discussing the nature of inclusiveness, this article discusses the ethics that may justify or require inclusiveness. This approach then seeks to build on Cozzens and Sutz (2012) who argue that “‘Actor-centred” approaches to innovation can illuminate how people can be agents in innovation processes instead of patients, in a quite similar way as with respect to development processes’ (Cozzens and Sutz 2012, 11).

Although Weber ([1919] 1946) famously advised that social science should abstain from normative judgement, the past century has challenged the legitimacy of science’s detachment from ethics: economic depression, world wars, and the rise of totalitarian states strengthened the links between social science and political thinking (Polanyi [1944] 2001), forced science to acknowledge ethical responsibility when acting as a political instrument (see Mueller-Hill 1997), and highlighted science’s own dependence on political structure (Merton 1968, 604–615). German academics developed the notion of ‘critical theory’ in the 1930s to explicitly include in social science ethical thinking and the commitment to improving people’s conditions of life (Horkheimer [1937] 1975). After the Second World War, the discourse on economic development coupled academic and ethical questions: because economies are about people’s ability to sustain their livelihoods, and because these abilities depend on the rights to use scarce resources, it has been difficult to escape critical social theory in the development discourse. Growing public concerns about the environmental sustainability of economic growth have reinforced this difficulty. The question of how to promote sustainable development – that is, covering the basic needs of today’s generations without threatening life conditions for future generations (see WCED 1987) – has become a large research field. The idea of sustainable development, we argue, is based on ethics different from, and potentially conflicting with, the ethics implied by the predominant innovation discourse.

Social scientists have often, and not only in development studies, produced knowledge to promote outcomes that they assume are normatively desirable. In a few cases, social science has also undertaken an explicit and relatively disinterested discussion of what exactly a ‘desirable’ outcome is.<sup>1</sup> In this article, we aim to advance the innovation systems perspective based on contributions to the discussion about goal-justifiability in development and innovation. We begin by comparing the so-called Sussex manifestos with the idea of Triple Bottom Line (TBL) accounting, and we proceed to suggest the

‘Human Rights-Based Triple Bottom Line (HRB-TBL)’ as an ethical principle of innovation for sustainable development. Subsequently, we discuss obstacles and pathways, respectively, to realizing the HRB-TBL in the innovation process. We derive from our discussion principles for innovation system design in activities that directly concern coverage of people’s basic needs.

Our focus on the environment and satisfaction of basic needs suggests paying special attention to innovation in natural resource-based economies: These economies use and/or produce goods – such as food, water, and energy – that are essential for the subsistence of human beings today and in the future. Therefore, parts of our discussion focus specifically on these economies.

## 2. The Sussex manifestos

In 1969, a UN committee commissioned from a group of academics an introductory statement to the UN’s *World Plan of Action on the Application of Science and Technology to Development*. The resulting document, which the UN committee declined to include in the world plan, outlined innovation principles that were radical for its time. The document, published as an annex to a UN report in 1970 and known as the ‘Sussex Manifesto’, highlighted the need to use science and technology for the purpose of qualitative social change rather than merely for GNP growth. The Manifesto’s authors argued that to achieve such a change, developing countries should be assisted in developing their own knowledge capacity instead of merely receiving technologies from industrialized countries (Ely and Bell 2009). This first Manifesto came at a time when the modern environmental movement was still in its infancy, and the document was shaped by the period’s science/technology-focused understanding of innovation. The Manifesto was thus little concerned with questions of environmental sustainability and with practices and knowledge besides science and technology.

Since 1970, the question of environmental sustainability has become central to the public discourse on innovation and development. The development discourse has also become much more sensitive to the importance of knowledge other than science and technology (Ely and Bell 2009). Therefore, the STEPS centre at the University of Sussex in 2010 published a New Manifesto (2010).

The New Manifesto opened by declaring that ‘[m]eeting the interlinked global challenges of poverty reduction, social justice and environmental sustainability is the great moral and political imperative of our age’ (STEPS 2010, 1). The New Manifesto argued that innovation has rarely benefited those who need it the most; record levels of R&D investments have failed to remove, and in some cases have increased, extreme poverty and environmental degradation. Therefore, the New Manifesto called for a new politics of innovation that addresses the question of who innovation is for. The New Manifesto argued that innovation should not only be about science and technology *per se*, but also about the related knowledge, institutions, practices, and social relations that shape the purposes, applications, and results of such science and technology. Innovation should be about ‘new ways of doing things’ in a broad sense (STEPS 2010, 1).

Similar to the original manifesto, the New Manifesto argued that development should no longer be regarded as a race up some predefined, one-dimensional slope. Instead, innovation policies should pursue socially just outcomes by considering in each context the

many alternative directions that scientific, technological, and associated institutional change may take. The New Manifesto argues that to achieve poverty reduction and social justice, the innovation process must address the so-called 3Ds. First, it must include affected people, especially the poor and underprivileged, so that these people can shape innovations' *direction* (meaning the type of innovation pursued). Second, such an inclusive approach aims towards promoting fair *distribution* as a direct outcome. Third, the context sensitivity that follows from this bottom-up and needs-oriented innovation process requires *diversity*, meaning that functional local solutions are prioritized over standardized, technocratic top-down solutions. The New Manifesto outlined a 'vision for innovation' where science and technology, based on the 3Ds, would work more directly for poverty alleviation, social justice, and the environment (STEPS 2010, 16).

### 3. The New Manifesto and the TBL

The three purposes of innovation outlined by the New Manifesto – social justice, poverty reduction, and environmental sustainability – bear some resemblance to the 'TBL' principle for business accounting that Elkington (1997) brought to public attention and that influences much recent thinking about business ethics (Pava 2007; Slaper and Hall 2011). The TBL principle prescribes that business accounting should include not only profit measures, but also social and environmental measures. This value triangle is often referred to as the 3Ps (profit, people, and planet) (Slaper and Hall 2011).

In order to clarify the ethical principles of innovation for sustainable development, some reflections on the relationship between TBL and the New Manifesto are appropriate.

The TBL idea emerged largely from a general discourse on business ethics and the environment, whereas the Sussex manifestos emerged mainly from the development discourse: the New Manifesto thus emphasizes poverty alleviation where the TBL prescribes more generally that profit seeking be combined with social concerns. The TBL might thus appear to be the more viable ethical reference point in modernized economies where absolute poverty has, for the most part, been abolished, whereas the New Manifesto may seem to offer a more precise and forceful imperative in settings where absolute poverty remains widespread.

The New Manifesto prescribes inclusion of marginalized groups in innovation. It can be argued that the TBL, at least by implication, prescribes the same thing. However, the New Manifesto and TBL have quite different perspectives on how to pursue the social purposes of economic activity. TBL accounting implies reporting social effects that can to some degree be measured (Norman and MacDonald 2004; Slaper and Hall 2011). Although companies may have to use multiple, incomparable measures to calculate their social 'bottom line' (Pava 2007), the TBL implies consequentialism by focusing on definite outcomes. Although the TBL does not necessarily imply the kind of utilitarian ethics that (tacitly) underlies cost-benefit analyses, the TBL's flexible consequentialism implies that the TBL can very easily be combined with such ethics. The TBL's mode of measurement, it can be argued, favours utilitarian thinking.<sup>2</sup> A potential problem of utilitarian ethics is that total net utility constitutes the only criterion of the rightness of an act, as in the Kaldor-Hicks criterion for a Pareto improvement in welfare (de Scitovszky 1941). Thereby, utilitarian ethics may justify policies that ignore the needs of the poor if only the benefits to the rich are sufficiently large. By contrast, the New Manifesto's social

justice requirement rejects the utilitarian principle. As Norman and MacDonald (2003, 10–11) point out, fulfilling one's social obligations may not always entail doing what gives the highest net positive social impact. Social justice is less a measurable outcome, weighed against other outcomes, than it is an ethical standard against which outcomes can be assessed within a given social, institutional, and cultural context. The New Manifesto acknowledges this insight in a way that the TBL does not.

In our view, the social justice perspective of the New Manifesto implies acknowledging that people have absolute rights: Economic activity that deprives some people of their means of subsistence, for example, is not permissible, even if such activity may bring benefits to many others. Moreover, removing absolute poverty emerges as an absolute obligation, not an option whose consequences may be weighed against benefits to the affluent. A social justice perspective thus implies not only consequentialist ethics, but also duty ethics (often called *deontological* ethics).<sup>3</sup>

A call for duty ethics does not necessarily imply rejecting the TBL altogether. However, we think that the TBL should include a duty-ethical element to be fully functional as an ethical standard, especially in contexts where people's ability to satisfy their basic needs is at stake. We therefore propose that benefits, whether these are economic, social, or environmental, should add to the bottom lines if – and only if – they result from activities that pursue, and that do not violate, human rights.

The cluster of international agreements that constitute the International Bill of Human Rights is the dominant institution in terms of defining human rights.<sup>4</sup> Especially, the UN (1966) *International Covenant on Economic, Social, and Cultural Rights* (ICESCR) concerns matters of innovation and sustainable development. Among relevant requirements in this covenant, which builds on general principles outlined in the Universal Declaration of Human Rights, are that no people shall be deprived of their own means of subsistence (Article 1); everyone's right to an adequate standard of living (Article 11); everyone's right to work (Article 6); workers' right to fair wages, equal treatment, healthy working conditions, union activity, and the ability to make a decent living for themselves and their families (Articles 7, 10, and 12); right to social security (Article 9); right to education (Article 13); and states' obligation to prevent hunger by improved methods for producing and distributing food (Article 11).

Because the HRB-TBL combines consequentialist and duty-ethical reasoning, it is in the spirit of the HRB-TBL to pursue improvement of the lives of the relatively underprivileged: the HRB-TBL implies not only removing absolute poverty, but also counteracting social injustice more generally.

The inclusion of duty ethics affects the justification for pursuing TBL outcomes; preserving livelihood possibilities for others, for example, is not only an act to be taken into account, but also an obligation unreceptive to trade-offs. Combining the TBL with such a duty reconciles the New Manifesto's values with TBL principles. Our proposed result of such reconciliation is a globally applicable ethical principle – the HRB-TBL – that removes the objectionable differentiation between ethics for rich and poor countries. This principle entails an absolute obligation to provide basic livelihood possibilities for present and future generations, and it entails continued consideration for humans and the environment also once this obligation has been fulfilled.

It may seem obvious that the ethics of innovation have implications for the types of innovations pursued. Less obvious are implications in terms of institutional design:

How should innovation institutions be designed to promote HRB-TBL outcomes? As is well known, modern economies are designed in ways that do not always promote such outcomes: The strive for competitiveness, profits, and growth often takes priority over sustainability and social justice. Institutions for innovation that pursue the HRB-TBL must thus seek to overcome obstacles frequently found in modern economies. In what follows, we try to open a discussion about principles for innovation institutions for HRB-TBL outcomes. Our contribution in this regard can be only rudimentary and general. We hope, however, that our contribution encourages further discussion about the design of innovation systems.

We begin our discussion by addressing major obstacles to HRB-TBL outcomes of innovation, and we argue, very generally, that achieving such outcomes requires functional links between economic and non-economic institutions. Subsequently, we address the question of how to assess the desirability of innovations' outcomes, and we argue that standard tools of neo-classical economics are unsuited to a pursuit of HRB-TBL outcomes. Finally, we discuss principles for innovation systems design. Due to our focus on the environment and satisfaction of basic needs, we focus, especially, on natural resource-based economies.

## **4. Obstacles that systems for HRB-TBL innovation may need to overcome**

### **4.1. Commodification and disembeddedness**

Reflecting on social and political crises that followed world market collapse in the early twentieth century, Polanyi ([1944] 2001) argued that functional economies could not operate in isolation from affected social systems. Polanyi argued that pre-industrial economies had served people's needs by being embedded in lasting social ties and by operating according to established social institutions. He argued that modernizing economies had subjected livelihoods' bases – land and labour – to the forces of unregulated markets, thereby disconnecting economic life from its social foundations. Leaving livelihoods' bases to the forces of the market entailed fundamental insecurity for many: Satisfaction of basic needs, such as material welfare and social belonging, became market-dependent and, thereby, lost the guarantee provided by traditional social institutions. The result, Polanyi argued, was social crisis. Only by reintroducing political regulation of markets and, thereby, reconnecting economies and societies could humanity reverse this social crisis. Since Polanyi's day, scholars concerned with the effects of social networks on modern economic life have further developed ideas about embedded economies (Granovetter 1985; Smelser and Swedberg 2005), and interconnections between markets and other institutions have been widely acknowledged outside neo-classical economics.

Natural resource-based economies typically use and/or produce subsistence resources such as food, water, shelter, and energy. Such economies, whether based on fishing, farming, forestry, energy production, or related activities, are also characterized by their attachment to physical territories traditionally governed by communities – large or small – located in those territories. Natural resource-based economies thus tend to be deeply embedded in communities, making access to subsistence resources a question of social structure. The form of embeddedness may vary, but it includes social relations and institutions that regulate, for example, resource use rights and local supply chains.



The question of embeddedness is thus important in relation to innovation in natural resource-based economies because such innovation often spurs commodification of subsistence resources.

Polanyi argued that the social disembodiedness of unregulated markets arose from the commodification of labour, land, and money. He argued that labour, land, and money are ‘fictitious’ commodities because they have not been produced for sale. He pointed out that land is not a product, but the nature-given basis for human existence and for societies; subordinating it to market laws will disrupt its vital social functions (Polanyi [1944] 2001, 71–72).

Many innovation-created problems, such as pollution of the environment, unsustainable natural resource harvesting, and exploitation of workers, relate to the fictitious commodities that Polanyi described. However, in recent decades, livelihood conditions have also been commodified in ways that Polanyi did not, and could not, foresee. Innovation and requirements for innovation in modern economies have spurred a form of commodification that is qualitatively new and different from commodification of land *per se*, namely commodification of *rights to use natural resources*. We argue that such use rights, typically established through public policies, constitute a fourth fictitious commodity. Similar to land and labour, these use rights have not been produced for sale; they have been integral parts of societies and fundamental conditions of life.

Commodification of rights to use natural resources pertains to common pool resources such as fish stocks and forests, and to public goods such as land, oceans, and the atmosphere. Such commodification entails that rights to use subsistence resources have changed from being customary, shared, and non-transferable to becoming law-protected, private, and tradable. Individual catch quotas in fisheries are a well-established example (e.g. Palsson and Petursdottir 1997): Although the fishery resource *per se* remains a common pool, the right to use it has gained private-property-like characteristics. Systems for international trade of emission quotas are another example of politically driven use right commodification (e.g. Carton 2014).

Development towards exclusive, law-protected use rights of natural resources has often not been driven by commodification goals, but by concerns about the unintended, unsustainable side effects of economic growth. However, commodification has resulted because use right exclusivity requires mechanisms for distributing the rights efficiently and with minimum political conflict; therefore, states have sometimes established markets for exclusive use rights, often with controversial social consequences (see, e.g. Palsson and Petursdottir 1997). These consequences may become even more problematic in a globalizing economy where financialization of environmental conservation schemes moves control over subsistence resources from local institutions to the world market (Sullivan 2011). Growing economies may in some cases have required that rights to use common natural resources came under the regulatory domain of states, but these rights have no inherent characteristics placing them naturally under the regulatory domain of markets. The role of markets emerged largely as a convenient solution to the political problem of distribution.

Unlike exclusive rights to use physical natural resources, exclusive rights to commercial use of knowledge have been developed for the purpose of commodification. Policy-makers have believed that biotechnological innovation is spurred by increasing possibilities for



profitable utilization of such innovation. Consequently, states' obligations to protect IPRs were included in the WTO agreement through the Trade-Related Aspects of Intellectual Property Rights Agreement (TRIPs) in 1994. The TRIPs agreement sought to enhance the commercial utilization of IPRs on a global scale by, among other things, globalizing patent regimes regarding the use of genetic material. This world-wide commodification of rights to use genetic material spurred controversy regarding human rights and social and distributional effects (Helfer 2004). As a result of current IPR regimes, a handful of big companies control most of the world's patents to plant genetic material; these companies have thus gained control over, created a scarcity of, and, thereby, successfully commodified fundamental means of food production (Kloppenborg 2004).

Commodification of rights to use natural resources entails that access rights to subsistence goods are becoming distributed according to market rules. Such commodification is paradoxical from a Polanyian viewpoint because these use rights have been commodified by political design: States have replaced customary use rights with law-protected use rights that enable markets to further displace traditional institutions as foundations for economic life. The functioning of these new markets requires that customary and/or non-exclusive use rights are replaced with law-protected and exclusive ones. Commodification of rights to use natural resources is, in our age, a product of political economy.

The economy's ensuing detachment from surrounding societies becomes manifest in, for example, problems of ensuring citizens' compliance. The problem of protecting IPRs to cultural products in the Internet age is but one example of business laws classifying as crime acts that are widely regarded as morally acceptable among citizens. Such problems of legitimacy are reinforced considerably when IPRs affect people's ability to satisfy their basic needs (Gezelius 2004). Innovation systems for HRB-TBL outcomes should be designed so that those whose subsistence depends on a resource retain their necessary access to that resource.

The legitimacy problems of IPRs to biological resources extend into institutionalized conflicts between different types of legislation. Helfer (2004) has pointed out that potential social justice problems have resulted in 'regime shifting': actors' resorting to non-trade and (originally) non-IPR regimes, such as the human rights regime, to counteract potential social damages resulting from the TRIPs agreement. Such regime shifting is illustrative of the potential conflict between institutions aimed at facilitating efficient markets and institutions aimed at securing people's basic needs.

Although neo-classical economics may assert that markets distribute use rights 'optimally', neo-classical economics has not been designed to take human rights, social legitimacy, and future generations into consideration. The significance of this fact increases because market-based distribution systems provide for speculative investments: allocating surplus wealth to the acquisition of diminishing natural resources may be profitable because the scarcity of many natural resources cannot be reduced by increasing human production of them; thereby, prices of subsistence resources may increase to the point where people who depend on those resources are excluded.

In summary, we think that institutions for the HRB-TBL must seek to avoid, especially, commodification of rights to use subsistence resources. Rather than markets, it is institutions designed to protect the interests of the most needy that should distribute such use rights. Natural resource-based economies thus need innovation systems that protect and build non-market institutions to govern economic life.

#### **4.2. HRB-TBL, economic theory, and the problem of assessing the desirability of outcomes**

In this section, we address the question of how to assess the desirability of innovations' outcomes. We argue that standard tools of neo-classical economics are poorly suited to assess outcomes of innovation for HRB-TBL outcomes.

Neo-classical economics is often applied to public policies under the assumption that desirable outcomes can be compared in standardized quantities and, thereby, rationally optimized. When applied to public policies, therefore, neo-classical economics is driven by tacit utilitarian ethics. Unlike ideas about human rights, utilitarian ethics are purely consequentialistic. Neo-classical economics leaves no room for ethical values that cannot be reduced to preferences; anything that cannot be traded off against something else, that is, treated as a commodity, thus becomes irrelevant to public choice. Therefore, questions regarding human rights tend to be muted once policy-makers define a problem as an economic one.

Neo-classical economics' ideological implications are evident in its reliance on the externality concept when dealing with environmental and natural resource problems. The externality concept signifies costs or benefits that are fully or partly received by others than those who create these costs or benefits. The neo-classical environmental economics' solution is to place market values on these externalities by way of surrogate markets or other measurement methods (such as contingent valuation or hedonic pricing) to motivate actors to take externalities into account when making choices. The idea is to build systems that reward positive externalities and penalize negative externalities so that these are internalized in the actors' 'bottom lines'. Thereby, neo-classical economics purports to take social and environmental consequences into account by turning these into quasi-commodities, such as tradable pollution rights; in the process, economics takes any question about absolute rights off the agenda. Attractive as such quasi-commodification may seem, it potentially turns human rights questions into matters of cost-benefit calculation.

In contrast to neo-classical economics, the New Manifesto forms part of a legacy of economic thinking, represented by, for example, Harsanyi (1955), Sen (1977), and Polanyi (1944 [2001]), that includes moral reasoning other than utilitarianism. The duty-ethical perspective taken by the New Manifesto implies that one cannot make the issue of whether or not to deprive others (including future generations) of their livelihoods into a question about willingness to pay; one can only legitimately regard it as a question of rights. Consequently, the tools of neo-classical economics are inadequate for measuring HRB-TBL outcomes.

Discussions about green growth and green innovation have largely focused on the double bottom line of economic and environmental consequences. These discussions have also gravitated towards quasi-commodity perspectives, often focusing on the costs and benefits of providing ecosystem services (Giles 2005; Millennium Ecosystem Assessment 2007; TEEB 2008). Pursuing the HRB-TBL implies moving away from such an approach to green innovation. It implies focusing, to a much greater extent than previously, on how to create institutions that are capable of securing the basic needs of the people who depend on the resources in question.

## **5. Institutional pathways to innovation for HRB-TBL outcomes**

### **5.1. Combining innovation systems theory and business ethics**

In this section, we suggest some implications of the HRB-TBL perspective for innovation systems' design.

TBL thinking emphasizes stakeholder involvement (Slaper and Hall 2011). The Sussex manifestos have highlighted stakeholder involvement to an even stronger degree, arguing that the marginalized groups that have the strongest need for the benefits that innovation brings should play a greater role in innovation than previously (STEPS 2010, 11). At this point, TBL ideas and especially the New Manifesto intersect with the innovation systems literature by addressing principles regarding the design of institutions for innovation.

Innovation systems theory, represented by Lundvall (1985, 1988, 1992), Freeman (1987, 2009), and others, is significant to our discussion because innovation systems theory takes social processes and institutions into account and thus stretches beyond Schumpeterian ideas about the individual entrepreneur. From an innovation systems perspective, innovation ethics are a question of who should be empowered in the innovation process. The innovation systems perspective may be especially relevant to natural resource-based economies because using or changing such resources often entails interacting or interfering with entire social systems dependent on the land. Changing land-based economies also tend to raise questions regarding livelihoods and subsistence for present and future generations. In short, the ethics of land-based innovation systems imply questions of social embeddedness.

What, then, would a national, regional, or local innovation system look like if it was designed to pursue HRB-TBL outcomes? Our discussion of this question begins with an outline of basic innovation system types and proceeds to address how these types may contribute to innovation for HRB-TBL outcomes. Finally, we suggest more specific guidelines for how innovation systems for sustainable development should be designed.

### **5.2. Innovation systems as collective learning systems**

Innovation is learning and, therefore, typically implies acquiring stimulus from others. Most innovation research acknowledges that innovation usually involves joint and mutually supporting activities by producers, consumers, authorities, and academics (Freeman 1987; Lundvall 1992; Foray, David, and Hall 2009).

In natural resource-based economies, innovation systems' social boundaries are often linked to territory. Whereas early contributions to innovation systems theory regarded innovation systems as national (Freeman 1987; Lundvall 1992), later studies have shown that such systems may also be primarily regional or local (Bryden and Refsgaard 2008; Heanue and Jacobson 2008; Stolarick et al. 2010; OECD 2012), although regional/local systems may still be connected to wider networks (Cooke 2005; Midttun and Koefoed 2005). According to Edquist (2004), a regional innovation system is characterized by a coherent structure that ties organizations and institutions, within a common territory, together for a common purpose. Closely connected to concepts of local innovation systems is the idea of smart specialization: innovation based on local collective learning about adaptation to local conditions and resources.

Jensen et al. (2007) outline two ideal types of innovation processes: (a) the ‘Science, Technology, and Innovation (STI)’ mode which relies on formalized R&D processes and explicit and codified knowledge and (b) the ‘Doing, Using, and Interacting (DUI)’ mode that is characterized by the development of practical, often non-codified, knowledge through informal interaction within and between businesses, and between these businesses and their customers or suppliers (see also Arrow 1962; Rosenberg 1982; Lundvall 1985, 1988; Foray [2000] 2004; Kamp, Smits, and Andriessse 2004; Boon 2008; Foray, David, and Hall 2009).

Similar to the Sussex manifestos, Jensen et al. (2007) argue that scholars and policy-makers remain biased in favour of the STI mode of innovation. This bias is unfortunate, they argue, because codified knowledge cannot change the world unless it is combined with prior, practical skills: scientific knowledge must be combined with know-how to be effective. Based on Danish data, Jensen et al. show that both the STI and the DUI mode promote product innovation, but that combining the two modes is by far the most effective. Comparative case studies of green innovation in Finland, Denmark, and the Netherlands also illustrate the power of combining the STI mode with the DUI mode. These studies show that the most successful systems included a comparatively broad range of stakeholders besides R&D and that these systems were supported by public policies that deliberately encouraged the inclusion of such stakeholders (Kamp, Smits, and Andriessse 2004; Midttun and Koefoed 2005; Buen 2006; Boon 2008; OECD 2012). Evidence suggests, then, that the transfer or development of scientific knowledge promotes innovation more effectively once combined with local, practical, and informally taught knowledge. As outlined in detail in the Introduction to this volume, STI and DUI in fact correspond to two of the forms of knowledge discussed by Aristotle in *Nichomachean Ethics* – *Episteme* and *Techne*.

Innovation research and the Sussex manifestos thus appear to agree on the need to construct innovation systems in such a way that the STI mode is combined with a DUI mode of learning. However, the HRB-TBL principle suggests taking innovation systems theory a step further. Whereas innovation systems theory is primarily concerned with the questions of innovation’s causes and of how to promote it, the HRB-TBL principle addresses the questions of innovation’s normative justification and of how to ensure that innovation benefits those who need it the most. Innovation systems theory and normative innovation theory may thus have different implications regarding the innovation systems’ social boundaries. Unlike traditional innovation systems theory, criteria derived from the HRB-TBL concern not only actors’ knowledge and roles in the value chain, but also equally their needs and rights regarding the effects of innovation. Clearly, innovation systems for HRB-TBL outcomes emphasize empowerment of the most needy more than other innovation systems do (see Heeks, Foster, and Nugroho 2014, 177–178). Less obvious is that such innovation systems may grant public policy-makers a special role. We address this role in the next section.

### **5.3. Innovation systems, HRB-TBL, and the role of public policies**

It follows from our discussion above that public policies may have a significant role to play in terms of promoting innovation with HRB-TBL outcomes. The above-mentioned cases of renewable energy innovation in Denmark and Finland illustrate public authorities’

potential role; these innovation systems emerged in countries with strong traditions for state/industry interaction and public regulation of markets.

We argue that public innovation policies may have three significant functions. The first two functions can be broadly classified as ‘solving collective action problems’, and these have been widely acknowledged in the innovation discourse. The first collective action function is to compensate for first mover disadvantages. Foray, David, and Hall (2009) argue that to counteract market failure for first movers, public authorities can provide incentives for actors to take part in the innovation system; monitor and evaluate processes and outcomes; and invest in relevant education and R&D. The second collective action function is to counteract the negative externalities, such as environmental degradation, that innovation may generate. This function has received much attention already and is integral to TBL thinking.

Public policies’ third function has received comparatively little attention in the innovation discourse. This function is to ensure that innovation does not undermine the human rights of present and future people, including their right to viable livelihoods, and to promote innovation that improves the fulfilment of these rights. This third function has distinct consequences for innovation systems’ institutional design: public authorities should be active players in the innovation system to ensure, in particular, that poor and marginalized groups are given voice, that environmental organizations and other representatives of unempowered generations are given voice, and that their voices carry appropriate weight in the innovation process. Thereby, the involvement of public authorities would mean something different from authoritarian top-down rule; it would mean *bona fide* empowerment of underprivileged and unempowered stakeholders and, thereby, facilitation of bottom-up-driven innovation. As a result, the DUI mode of learning would be built into the innovation systems’ institutional design to a greater extent than is usually reflected in the public innovation discourse.

This third function also has implications for the public governance of the resources that innovation depends on. The third function demands that policy-makers be cautious about commodifying resources that are essential to people’s livelihoods. This includes caution regarding privatization of natural resources that are subjected to shared and customary use rights, be it land, living resources, or genetic material. It also entails being cautious about using markets or quasi-markets (such as cost-benefit analyses) to allocate such resources. Rather, resources that are essential to people’s livelihoods should be managed either by those who most strongly depend on them, including representatives of those who will depend on them in the future, or by decision-makers that are obliged by human and related customary rights and that can be held legally and democratically accountable.

Regarding so-called intellectual property, public authorities could fund R&D on the condition that innovations regarding life-sustaining resources are kept in the public domain by, for example, public ownership to patents. Such public ownership, whether held by a state or/and intergovernmental agency, should ensure free and unrestricted use of knowledge required to satisfy people’s basic needs. Such a policy implies that rights to use knowledge for the satisfaction of people’s basic needs should be a public good: innovation for the satisfaction of basic needs – for example, development of seeds or medicine – should thus be a public responsibility and should not be driven mainly by private interests that pursue exclusive use rights (see Kloppenburg 2004).

This third function – to protect people’s rights – would be central to the ‘new politics of innovation’ that the New Manifesto calls for. Although the cases above illustrate that public policy-supported bottom-up innovation can be found locally, it is fair to say that the top-down STI paradigm is predominant in broad national or multinational policies (Jensen et al. 2007). These top-down STI-oriented policies are usually little concerned with poverty and social justice; the poor and socially excluded are, if considered at all, assumed to benefit either through an unspecified ‘trickle down’ effect or indirectly by, for example, greater consumer choice. Equally important is that public innovation policies are usually void of strategies for empowering underprivileged groups and, thereby, of credible strategies for protecting the rights and interests of those groups.

The widespread neglect of the underprivileged follows not only from public policy-makers’ STI bias, which generally downplays the role of non-scientists, but also from the idea that innovation’s primary purpose is to promote competitiveness, economic growth, and private-goods production rather than poverty alleviation, environmental sustainability, and social justice. Public innovation policies for HRB-TBL outcomes, by contrast, would prioritize public goods production and empowerment of underprivileged and unempowered groups; thereby, it would promote innovation systems that pursue these as primary goals. In our concluding section, we propose some institutional characteristics of such innovation systems.

#### **5.4. Characteristics of innovation systems for HRB-TBL outcomes**

Arguably, innovation systems for HRB-TBL outcomes will include a significant element of the DUI mode and empower underprivileged stakeholders. Consequently, such innovation systems will involve a variety of actors, including scientific/technical expertise, public authorities, producers, users, and NGOs with different agendas and knowledge. There can be several ways to design innovation institutions for HRB-TBL outcomes (e.g. Bryden, Gezelius, and Refsgaard 2013), but we argue that such institutions should be designed so that:

- they are representative of relevant stakeholder groups, including those groups that have the greatest need for, and that are most affected by, innovation;
- special care is taken to empower underprivileged and unempowered stakeholders, including children and the unborn;
- they are open to both scientific expertise and stakeholders with local, uncodified knowledge;
- they give the stakeholders voice regarding their needs, ideas, and knowledge;
- they are supported by public policies;
- public policy-makers attend, especially, to goals related to poverty reduction and sustainability;
- the innovation process is transparent to the public; and
- inclusiveness does not result in ineffectively large or complex organizations.

Such a design explicitly gives space for the inclusion of at least one further form of knowledge, outlined in the Introduction to this volume. This knowledge form is defined by Aristotle as ‘*Phronesis*’ or practical reasoning about right, sensible, or appropriate



action, and involving applied ‘value-rationality’ (Weber 1921[1978]). It is this form of knowledge that considers the ethical issues involved in ‘right action’, and it is mainly carried by actors who would not normally be included in the DUI–STI frame.

Innovation institutions for HRB–TBL outcomes can be constructed at different scales and levels. Electronic media, including social media, can be effective and cheap in terms of ensuring transparency and some degree of inclusiveness while keeping an organization manageably sized. Since such institutions seek to answer to stakeholders’ needs and, thereby, provide incentives for these stakeholders to participate, they may not be expensive to build and to run. For example, innovation ‘platforms’, as described in the soft systems literature (Checkland 1981; Checkland and Scholes 1990; Roling and Jiggins 1998), may be designed cheaply at local levels, while still promoting inclusivity, common purpose, and manageable size (e.g. Bryden, Gezelius, and Refsgaard 2013; Refsgaard et al. 2014).

## 6. Concluding remarks

We have sought to advance a discourse that has so far been marginal in academia: the ethics of innovation and innovation politics. We have attempted to outline ethical and theoretical foundations for innovation system design in sustainable economies. Thereby, we have tried to strengthen links between the discourses on innovation, sustainable development, and business ethics. We believe that many of those ethical considerations that frequently arise when innovation concerns developing countries – such as economic, social, and cultural rights, and the legitimacy of power – belong also in the discourse on innovation in rich countries. We believe that the principle of TBL accounting should be supplemented with the duty ethics of human rights to prove robust in, especially, developing world settings.

Finally, we hold that explicit analysis and critical discussion about innovation’s normative premises enhance the rationality of an innovation discourse that is often littered by tacit normative premises. Therefore, we call for a more elaborate academic discussion about the ethics of innovation policies and innovation research. The question of how institutions for innovation should be designed can be answered rationally only if normative premises are made explicit and justified properly. We have suggested some general characteristics that we think innovation systems would possess. Our suggestions are rudimentary and preliminary only. For example, we have not addressed the question of how to empower the most needy without hampering the utilization of expert knowledge. Neither have we addressed the problem of capture by powerful groups (e.g. Fressoli et al. 2014). These and many other questions may be crucial to institution design, and they can be answered only by further study and discussion. We hope, at the very least, that this article may encourage such discussion.

## Notes

1. Schumacher (1973) raised such a discourse within economics in a classic book that inspired this article’s title.
2. For a detailed outline of utilitarianism and consequentialist ethics, see Sinnott-Armstrong (2015).
3. For a detailed outline of deontological ethics, see Alexander and Moore (2015).



4. The International Bill of Human Rights consists of the Universal Declaration of Human Rights of 1948; International Covenant on Economic, Social, and Cultural Rights of 1966, and the International Covenant on Civil and Political Rights of 1966 (OHCHR 2016).

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