Journal of Rural Studies 52 (2017) 90–99

Contents lists available at ScienceDirect

Journal of Rural Studies

journal homepage: www.elsevier.com/locate/jrurstud

# Metrology and sustainability: Using sustainability audits in New Zealand to elaborate the complex politics of measuring

Christopher Rosin [a, *], Hugh Campbell [b], John Reid [c]

[a] Department of Tourism, Sport and Society, Lincoln University, Lincoln, New Zealand
[b] Department of Sociology, Gender and Social Work, University of Otago, Dunedin, New Zealand
[c] Ngai Tahu Research Centre, University of Canterbury, Christchurch, New Zealand

ARTICLE INFO

*Article history:*
Received 16 July 2016
Accepted 16 February 2017
Available online 27 February 2017

*Keywords:*
Agri-food systems
Auditing
Sustainability
Non-human agency

ABSTRACT

The study of metrology has emerged in the last couple of years as a useful new approach to understanding economic practices and networks. In this paper, we draw on research experience with the New Zealand kiwifruit and wine sectors as well as the development of an indigenous branding project to examine the role of metrics in promoting sustainable practice. We first identify two more commonly theorised aspects in which metrics operate: as measures (i.e., simple representations of uncontested values, and as tools (i.e., signifiers of the power of wider institutions or structures. We also argue, however, that metrics have operated in a third, potentially more controversial, manner in exerting their own power as 'material agents' within economic networks. In each case, there are elements of the development of new economic practices that suggest that metrics can work as material agents in reorganising economic activity and reordering social networks



## 1. Introduction

In this article, we engage with theorisations of metrology to gain insight to the complex dynamics associated with the adoption of indicator metrics to verify the sustainability of primary sector production systems. More specifically, we examine the emergence of sustainability—as a measurable and measured quality of food and primary production systems—as an extension of recent changes in the governance of these systems through which new technologies of audit have been enrolled to networks of producers, consumers, retailers, scientists and other actors. Such audit schemes create dense arrays of measures, standards, protocols, thresholds and sanctions that are increasingly influential in organising the practices of primary sector producers (and consumers) around the world (Busch and Bain, 2004; Giovannucci and Ponte, 2005; Hatanaka et al., 2005; Le Heron, 2003; Marsden, 2000; Mutersbaugh, 2008; Ransom et al., 2013). The result, as we suggest in a previous publication, is the consolidation of a 'metric-centric' approach to pursuing sustainability outcomes in agri-food systems (Campbell and Rosin, 2011).

This metric-centric moment poses interesting challenges to established social science explanation, especially in terms of non-human actors in socioecological networks. To date, metrics commonly appear in one of two analytical modes common to orthodox theorisations of socio-worlds, as either: 1) bystanders to more pertinent dynamics of change and control—no more relevant than the typeface used in the publication of Marx's *Capital*—or 2) inanimate pawns deployed by social and economic agents to enact power. In other words, metrics are either inert signifiers, or, to the extent that they appear to exert social power, tools wielded by institutions, groups or individuals to organise worlds. In this article we propose that, beyond mere passive participants, metrics should also be understood as agents when we theorise many agri-food dynamics. We purposefully refer to metrics as agents not to establish any equivalency to humans, but to highlight the potential for metrics to initiate change beyond the expectations, intent and control of humans[1]. Put differently, sustainability has become ordered around the enactment of sets of numbers that do much more work than has previously been acknowledged. To use the words of the editors of this special issue: '[t]he consumption of food is

* Corresponding author.
*E-mail address:* Christopher.Rosin@lincoln.ac.nz (C. Rosin).

[1] Our use of agency conforms to the diverse treatments of non-humans in ANT (Sayes, 2014) and invokes Mol's (2010: 255) characterization of the purpose of ANT to "… open(…) up the possibility of seeing, hearing, sensing and then analysing the social life of things—and thus of caring about, rather than neglecting them".

http://dx.doi.org/10.1016/j.jrurstud.2017.02.014
0743-0167/

simultaneously the consumption of numbers'.

The need for further theorisation of the purportedly neutral and inert world of measures (and the grades, standards, protocols, thresholds and sanctions they underpin) is evident in the recent discussion surrounding the potentially negative outcomes of pursuing sustainability via measurement. That metrics are being identified as a problem is obvious without reference to theorisations of metrologies. Bell and Morse (2008: xvii) exemplify a common understanding, arguing that any attempt to measure sustainability is a "futile exercise of measuring the immeasurable". They further claim that quantifying sustainability has not succeeded as an approach to achieving it, noting that quantification has merely resulted in "measuring things that can be measured and not things that should be measured" with the result that sustainability becomes "defined by the parameters that can be measured rather than the other way around". In their critique, metrics of sustainability are a problem because of inherent inaccuracies of the measures and their inappropriate use by other (human) agents. In this case, metrics merely signify the work of other agents exercising social and economic power.

The wider literature on agricultural 'grades and standards' also implies that metrics are of interest as the tools of powerful institutional actors. For example, it is often argued that: the measures at the core of organic certification have been co-opted to serve the interests of corporate capital (Pollan, 2006); or the measures in farm production systems have driven unsustainable intensification of farming practices by male farmers (Jay, 2007). This ability of metrics to translate the power of other actors and institutions is further, and amply, demonstrated by the example of nutritional measures through which companies, development agencies and governments, have legitimised the transition to unsustainable diets in the Developing (and Developed) World (Dixon, 2009; Dixon et al., 2004; Scrinis, 2008).

While such work draws attention to important aspects of the social dynamics associated with the introduction of measures into the production of food, the representation of quality or the disciplining of diets, the world of numbers in agri-food scholarship nevertheless remains under-examined. At the very least, the concerns raised by Bell and Morse (2008) indicate contexts in which the question of representation are highly relevant; and, in the metric-centric worlds of sustainability audits, it is imperative to question whether a measure accurately represents an agro-ecological reality. Furthermore, and on closer inspection, the seemingly inefficacious metrics of food quality and nutrition are potential tools of other agents of social power or coordination. That is, they do social-economic work to which other important actors conform. In the sense of Barthes' mythologies (Barthes, 1972), they are the visible representatives and vectors of other sociologically understood powers and it is important to recognise their roles in the enactment of such powers.

In this article, however, we use the theoretical work of metrology to extend more common approaches in social scientific studies of the processes, institutions and dynamics around sustainability; that is, we intend to focus on the different pathways and outcomes that are enacted *between* state regulation, industry actions, voluntary protocols and codes of conduct, formal market-audit mechanisms, individual voluntarism or community governance through the agency of metrics. Following the work of Barry (2002), Callon et al. (2007) and Mitchell (2002, 2008), a metrology approach re-centres analysis of networks of economic activity towards understanding the ways that metrics order or structure behaviours and practices, in effect, creating a framework to which people and things adhere. This effectively unsettles the usual causality that implicitly informs social scientific analysis and places the human or institutional actor as the essential locus of agency in agri-food systems or networks. Such an approach recognizes that, within the process of establishing measures of sustainability, metrics assume authority by setting the parameters for appropriate practice. It shows that, rather than mere representatives or tools of other powers, metrics (as non-humans) also do work at the intersection of social, economic and ecological worlds as argued by Bennett (2010) and Mol (2010).

In effect, our work in this article is to elaborate a rapprochement between established critical work on metrics such as Bell and Morse, Dixon and Scrinis and the new metrological approaches by acknowledging three (of many) aspects of metrics. To achieve this, we first introduce a metrology framework for understanding sustainability and audits. We then apply this framework to broaden our understanding of three case studies of the application of sustainability audits from New Zealand. Through these case studies, we propose that the entrance of metrics can be: 1) as pure measures, 2) as tools to promote practice and to order production chains and 3) as agents that compel their use. No matter the initial engagement with metrics, however, all three aspects become evident in each case study in a manner that points to the value of dialogue between the different critical approaches to sustainability metrics identified in the introduction.

## 2. Understanding sustainability and market audits in NZ through the lens of metrology

Over the preceding ten years, we have been active participants in the critical examination of audit systems in food production. Throughout this time our focus has largely been oriented to the emergent dynamics of social and society-environment relationships driven by audit criteria. Based on this work, we have argued that the measures involved in audits are negotiated on the basis of their public legitimacy (Rosin and Campbell, 2009) and their practicality and acceptance amongst those implementing and being subjected to them (Campbell and Rosin, 2011). These contributions positioned us as a critical voice in debates regarding the development and meaning of metrics as well as the political implications of their implementation. Despite these insights, we were increasingly frustrated in our efforts to elaborate the dynamics of social change that could not be adequately explained in terms of power structures and human agency. In other words, it was increasingly apparent to us that the metrics themselves were impelling many of these changes.

Our emerging engagement with theorisations of metrology and growing awareness of the significance of the third aspect of metrics (their vitality) in food systems has been strongly influenced by the wider context of New Zealand-based scholarship that points towards such dynamics. A prime example of the insights to be gained in using a metrology approach is Henry and Roche (2013) examination of the recent history of the New Zealand meat industry. They argue that the creation of meat standards, genetic measures of stock 'quality', as well as the creation of a global standard for Wagyu beef production all became central features in re-organising the production, processing and ownership of elements of the meat industry. Another example is that provided by Cooper (2015) in his analysis of the metrologies of carbon emissions trading (or failure thereof) in New Zealand.

For the purposes of this paper, we will re-narrate existing engagements with metrics of best practice (mostly addressing sustainability issues) in three economic settings in New Zealand:

1) the evolution of the KiwiGreen and GlobalG.A.P. audits and subsequent revisions to their metrics within the kiwifruit export industry,