Law & Society REVIEW

Scientizing Food Safety: Resistance, Acquiescence, and Localization in India

Jessica Epstein

Since the mid-1990s, formal scientific risk management has been codified at all levels of food safety governance in affluent states: firm-level standards, national regulation, and international law. Developing countries' access to affluent importers and power in international standard-setting fora now hinges on their scientific capacity. This article explores the consequences of these developments in India, which moved quickly from resistance to acquiescence, and then later to mobilization around narratives of scientific risk management's local benefits. The case suggests a two-stage model of scientization among developing countries: (1) coercive and competitive mechanisms drive adoption of science-based governance models, and (2) as local actors mobilize to meet foreign demands, they attach their own interests and agendas to science-based reforms. The outcome is a set of rational myths about the benefits of scientization. The article draws on content analysis of organizational, policy, and news documents and a small set of interviews with highly placed pubic officials and industry representatives.

> We cannot have totally different kind of laws which is not based on the scientific knowledge the world believes in. (Interview, public official, 2009)

> The demands of export have made us more aware of what's going on internationally . . . When others are placing demands on us, we become aware that "ok, this is also what to do." And then that leads to people demanding for internal market to do. (Interview, public official, 2009)

Many scholars have drawn attention to the escalation of food safety requirements in affluent markets since the 1990s, and to the difficulties this has posed for farmers, processors, and regulators in the developing world (e.g., Anders and Caswell 2009; Athukorala and Jayasuriya 2003; Henson and Jaffee 2006). In wholly separate

The author wishes to thank the three anonymous reviewers, Lane Kenworthy, Marc Schneiberg, and Christina Xydias, for helpful feedbacks on prior drafts. She also thanks the Indian Institute of Management Bangalore for its generous hosting in the fall of 2009.

Please direct all correspondence to Jessica Epstein, Sociology Department, Reed College, 3203 SE Woodstock Blvd., Portland, OR 97202; e-mail: jeepstein@reed.edu.

Law & Society Review, Volume 48, Number 4 (2014)

https://doi.org/10.1111/lasr.12106 Published online by Cambridge University Press

literatures, others have documented the increasing reliance of governance institutions on formal scientific procedures and expertise, a phenomenon known as *scientization* (Drori et al. 2003; Finnemore 1991; Schofer 2004). But few have documented the intersection of these two developments.

Scientific technologies of governance are now codified as requirements at all levels of food management: firm-level standards and quality management systems, national regulation, and international law. This has posed serious challenges to developing countries, whose access to affluent import markets and power in international standard-setting fora now hinges on scientific capacity in the form of advanced laboratories, institutionalized expertise, and national data collection.

This article examines the unfolding of incentives for science-based food safety governance, and their political and ideological consequences, in India. The country initially, and quite publicly, challenged pressures to adopt new regulatory models on the grounds that it lacked the scientific capacity to do so. But opposition quickly gave way to acquiescence. And as state and industry actors mobilized to build scientific capacity, they made expansive new claims about the domestic benefits of reform. These efforts integrated global norms into domestic political agendas and transformed the nature of scientization from imposition to localized ideology.

The case suggests a two-stage model of scientization among developing countries. In the first stage, coercive and competitive mechanisms drive adoption of science-based governance models and advanced technologies. In the second stage, as local actors mobilize to meet foreign demands, they attach their own interests and agendas to science-based reforms. The outcome is a set of rational myths about the benefits of scientization.

The article draws on content analysis of organizational, policy, and news documents and a small set of interviews with highly placed public officials and industry representatives.

Explaining Global Scientization

The Mechanisms

Many scholars have noted the worldwide spread of science-based governance, sometimes called scientization (Drori et al. 2003; Drori and Meyer 2006; Finnemore 1991; Quark 2012; Schofer 2004; Winickoff and Bushey 2009). The phenomenon includes expanding roles for scientists and their expertise in political life and the ascent of formal risk analysis as the only legitimate method of locating and articulating threats to the social order (Jasanoff 1999).

https://doi.org/10.1111/lasr.12106 Published online by Cambridge University Press

Most world polity accounts of global scientization have emphasized normative and associational mechanisms of diffusion (e.g., Drori et al. 2003; Drori and Meyer 2006; Schofer 2004). Science is appealing and highly valued: its own kind of authority, "a form of religion in a rationalistic modern world" (Drori and Meyer 2006: 46) and widely seen as an instrument for social progress (Schofer 2004: 223). It has become a taken-for-granted script for doing politics (Schofer 2004: 223), an object of unreflective imitation. Moreover, as science spreads, science-based governance becomes the new standard of appropriateness, and its adoption a precondition of membership in the club of rational actors (Drori and Meyer 2006: 34). And finally, international organizations and nongovernmental organizations drive scientization by offering governments science-based solutions to policy problems (Schofer 2004).

From this perspective, there are three primary explanations for why developing countries scientize. The first is reputation; adopting highly valued scripts for social progress legitimates local elites (Schofer 2004: 225) and entire governments (Polillo and Guillen 2005) in global policy circles. The second is thoughtless mimicry of what is now a taken-for-granted way to do governance. The third is that poorer countries accept science-based prescriptions from international organizations because they cannot afford to research plausible alternatives (Schofer 2004: 225).

But an emerging political sociology of science (Frickel and Moore 2006; Moore et al. 2011; Quark 2012) has begun making the case for competitive and coercive drivers of scientization among developing countries. Powerful states, notably the United States, have led the institutionalization of science-based decisionmaking at the global and transnational levels. Weaker states' power within those institutions is now contingent on playing the "scientific game": investing in expertise to legitimate their policy positions and challenge those of opponents (Quark 2012: 901–02). This argument differs substantially from the reputational competition assumed by world polity accounts. Here, power hinges on specific politico-scientific capacities that improve states' ability to advance their interests in negotiations. The mechanism is not reputation writ large but rather *material and epistemic support* for position taking.

Moreover, when science-based governance models become formal requirements in affluent markets—and below I establish that they have in the food trade—dependent exporters have little choice but to follow suit. In the literatures on corporate and supply chain governance, this type of competitive isomorphism is well established in relationships between large corporations and their suppliers (e.g., Gereffi and Korzeniewicz 1994; Roy 1997). In the political science literature, a similar dynamic is associated with the "trading up" school (Braithwaite and Drahos 2000; Radaelli 2004;

https://doi.org/10.1111/lasr.12106 Published online by Cambridge University Press

Vogel 1995), which posits that as wealthy countries ratchet up their health and safety standards, trade partners must raise their own or lose access to high-value markets. While this work is about escalating stringency and not scientization, the connection is not hard to draw. As will become clear in the following sections, when regulatory precision escalates among wealthy importers, it does so in line with ever-more-sophisticated technologies of measurement and control, which are then effectively required among exporting country regulators and producers.

This article offers a two-stage model of the diffusion of science-based food safety regulation in developing countries. In the first step, rich states write scientific regulatory norms into global governance institutions and their own regulations, and institutionalize such high levels of stringency that sophisticated technology and expertise are required to meet them. This creates strong incentives for developing states to scientize their own food governance. The second step is elaborated below.

Localizing Science

Globalization researchers have long argued that "diffusion" is actually a kind of syncretism, a blending of external and domestic elements. Local agents act to sell domestic actors on the local benefits of global norms, generally in service of activist or professional agendas (Acharya 2004; Halliday and Carruthers 2009; Merry 2006). Once imported, those norms are filtered through local politics and institutions, becoming part of domestic political repertoires, agendas, and practices.

How might this process unfold under the conditions sketched above—that is, when local actors had little choice but to adopt global norms in the first place? If developing country producers, regulators, and growth promotion officials are aware of external pressures to scientize—and surely they must be—there is likely some early resistance, resentment, or sense of imposition. At the very least, new technologies of governance should initially be perceived as foreign. And yet meeting exogenous demands to scientize is in the interest of all of these parties. It is therefore also in their interest to persuade peers and constituencies that new scientific governance forms and investments are worthwhile.

Domestic sociolegal research suggests that this kind of scenario can transform imposed reforms into locally valued strategies. The logic is that because laws are incomplete contracts, firms must construct and define compliance. In doing so, they develop rational myths about the other payoffs of the approaches they have chosen (Edelman 1992, 1999). A classic example comes from research on equal employment opportunity law in the United States (Dobbin

https://doi.org/10.1111/lasr.12106 Published online by Cambridge University Press

and Sutton 1998; Dobbin 2011), where ambiguous mandates for nondiscrimination spawned, first, corporate efforts to diversify the workplace, and later, a whole ideology of diversity as an efficient form of corporate organization.

The second stage of the proposed causal model rests on this insight. Here, there is not a single law but rather a complex set of externally imposed rules and incentives for scientization. And in place of a set of firms with embedded professionals doing the interpretation and constitution of "compliance," here there are multiple actors that take on the projects of compliance and persuasion. The resulting rational myths thus ought to include multiple local benefits of reform.

The Model

Stage 1: Scientization among rich importers and in transnational governance institutions generates incentives for scientization among developing countries.

Stage 2: Local actors integrate new scientific technologies of governance into local political agendas, recasting imposed reforms as locally beneficial.

The Codification and Costs of Scientization

The early mid-1990s were a period of rapid escalation of food safety standards in affluent markets (Anders and Caswell 2009; Braithwaite and Drahos 2000; Vogel 2012). National regulators and large buyers like supermarkets increasingly demanded that suppliers formalize their hygienic practices, adopt expensive quality certifications, and reduce potentially harmful production inputs down to ever-lower levels. These new demands posed challenges for farmers, processors, and regulators in developing markets (Anders and Caswell 2009; Athukorala and Jayasuriya 2003; Berdegue et al. 2005; Bingen and Busch 2006; Henson and Jaffee 2006; Reardon et al. 1999; Swinnen 2007).

At the same time, western regulators and firms were institutionalizing a regulatory epistemology of risk management (see FAO 2005; Winickoff and Bushey 2009; Vogel 2012). Its foundational precept is that the relationship between food and health is one of risks posed to individual consumers by isolated, harmful food characteristics like pathogens, additives, and chemical residues. The term "food safety," in fact, reflects the risk orientation—the view that consumers must be protected from dangerous food. The risk management approach further defines risk as something that can

https://doi.org/10.1111/lasr.12106 Published online by Cambridge University Press

only be established with scientifically collected and analyzed evidence, and managed with highly technical systems of verification and control.

A crucial component of the risk management model is total quality management for food hygiene at the level of production: identifying production hazards (e.g., microbial contamination), setting thresholds for those hazards (e.g., microbial concentration), and then monitoring and evaluating procedures to control them (e.g., sampling and testing) (FAO 2005; International HACCP Alliance 2010). In the early mid-1990s, downstream firms—for example, supermarkets—and governments began to demand that processors adopt these production controls in the form of private quality certifications: market-based systems for processing and production enforced via third-party certification (Bingen and Busch 2006; Ponte and Gibbon 2005). Brand-name certifications proliferated, resulting in an alphabet soup of standards with names like HACCP (Hazard Analysis and Critical Control Point), BRC, the ISO series, and GlobalGAP. Public regulators, for their part, converged on HACCP. Between 1991 and 1994, the European Commission instituted HACCP requirements for all of its food suppliers, and the United States implemented similar rules for fish in 1995 and meat in 1996 (Huss et al. 2004).

As their standards became more stringent, regulators in affluent markets began effectively requiring that developing country industries and regulators invest in advanced laboratories and testing equipment. The European Union, in particular, has developed a reputation of escalating the precision of its standards in line with new testing technologies, so that a residue previously limited at one part per million would move down to one part per billion as soon as there are means of testing at that level (Das 2008; Henson et al. 2004). Because export markets must be able to test at the same levels of precision as their importers, every European advance has imposed new investments on the production side (Das 2008; Henson et al. 2004; Winickoff and Bushey 2009: 364).

In 1995, the World Trade Organization (WTO) codified risk management as the core principle of its Sanitary and Phytosanitary (SPS) Agreement. The Agreement requires that all signatories base food safety rules on science, which it functionally, both in the agreement and subsequent jurisprudence, operationalizes as formal risk assessment[1] (*cf.* Foster 2008; Hoberg 2001; Roberts and Unnevehr 2005; Thornsbury 2000). In principle, this means that regulators base decisions on mountains of evidence, carefully

[1] The SPS technically allows for consideration of economic and environmental factors, but WTO jurisprudence has not yet established clear guidelines for when and to what degree.

https://doi.org/10.1111/lasr.12106 Published online by Cambridge University Press

analyzed, about the potential hazards any given product or practice poses to a given population (FAO 2005). In practice, it means that states must be able to justify their political preferences in the language of science—of evidence, analysis, and risk.

The provision has teeth. The WTO is empowered to resolve trade disputes and impose retaliatory tariffs on the losers. If Country A believes that Country B's food rules are unfairly—unscientifically—excluding its products, it can bring that complaint to the WTO. If the body's dispute settlement panels find that Country B did not use sufficient evidence or appropriate risk assessment procedures to develop its rules, it gives Country A dispensation to impose retaliatory tariffs on Country B. These tariffs will continue until Country B eliminates the rule in question, or until the two countries reach a diplomatic resolution.

The performance of science required by these rules, and by the risk management epistemology, has substantial material and institutional prerequisites. Evidence of human harm and risk assessment processes cannot simply be fabricated; this does not pass muster at the WTO (or anywhere else). According to the Food and Agriculture Organization of the United Nations, for instance, risk management requires not only "adequate food laws and regulations" and "a national food control strategy" but also "effective inspection and laboratory services, scientific and technical capacity, infrastructure, epidemiological data, and mechanisms for information, education and communication" (FAO 2005: 11).

The SPS Agreement also gives legal status to an ostensibly science-based standard-setting body called the Codex Alimentarius, encouraging member states to adopt its standards and treating its rules as presumptively legitimate in trade disputes. The Codex has 183 member states, whose delegates meet across a complex of specialized committees to set limits on potentially harmful additives and contaminants, outline acceptable sampling and testing procedures, and set guidelines for foodstuffs like pasteurized milk. Since 1995, Codex deliberations have demonstrably become higher stakes and higher profile; national delegations have become larger, their attendance more regular, and meetings more contentious (Livermore 2006; Veggeland and Borgen 2005). Codex is now widely recognized as the world's central food rule-making body.

Codex rule-making processes also favor rich states with strong politico-scientific infrastructures. Its meetings function on the logic of science,[2] such that any national position must be framed in terms of robust national datasets and risk assessment procedures (Horton 2000; Randell 2002). While this does not eliminate politics (Poli 2004; Winickoff and Bushey 2009), it does require that political

[2] On the formal introduction of risk analysis principles into the Codex, see FAO 2005.

https://doi.org/10.1111/lasr.12106 Published online by Cambridge University Press

interests be effectively framed in scientific terms. Because the cost of mustering persuasive data and risk analyses is high, developing countries have famously struggled to advance their national interests at Codex meetings relative to affluent counterparts (Henson and Jaffee 2006; Livermore 2006; Traill et al. 2002).

Methods

This article relies primarily on content analysis, both formal and informal. I analyzed every annual report (1993/1994–2007/2008) of the Ministry of Food Processing Industries, a growth promotion body, every Codex Commission Meeting report from 1998 to 2010, and all issues of the Ministry of Commerce's monthly newsletter *India and the WTO* from 1999 to 2002. I also employ informal content analysis of Europe's Rapid Alert System for Food and Feed annual reports (2002–2009), hundreds of Indian news articles (1997–2010), and the text of India's 2006 food safety reform bill, the Food Safety and Standards Act.

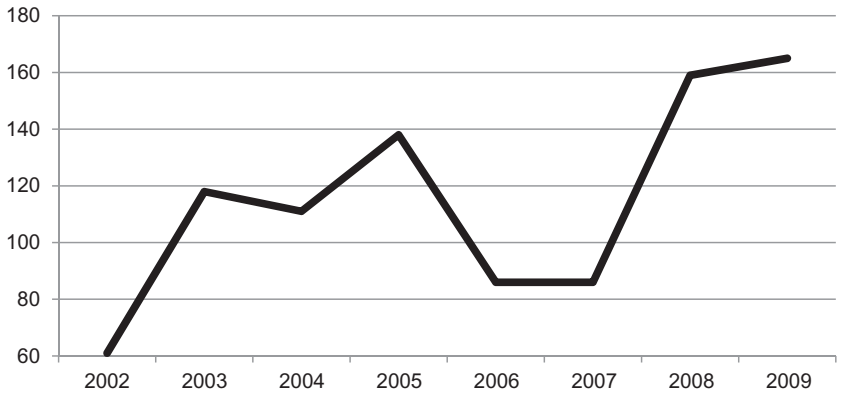
The article also draws on a small set (N = 11) of in-depth interviews with highly placed public officials and industry representatives, conducted in India in late 2009.

These sources offer a window into the public politics of food safety: how power players articulated importers' demands to the Indian public, the educational and political mobilization that followed, and the formal content of various reform efforts. The analysis below is therefore largely about the discursive, rather than material, elements of food safety reform, though it also employs interview data for insight into insider politics, particularly on questions of motivation.

Teaching with an Iron Fist

The mid-1990's escalation of safety standards was immediately visible in a broad range of Indian food products. Thousands of Indian shipments were rejected across a product range that included seafood, meat, rice, cashews, spices, peanuts, mangoes, grapes, tea, eggs, and dairy (*Business Line*, 17 June 2002; *Hindustan Times*, 1 May 2006; Das 2008), and an equally wide range of complaints, including high pesticide residues, unapproved additives, microbiological contamination, and filthy or decomposed product (Bakhshi 1995; Das 2008). Failure to employ HACCP systems was added to this list of complaints in the mid-1990s. In 2002, the European Commission began issuing "rapid alerts"—notices of regulatory noncompliance, with consequences ranging from strict

https://doi.org/10.1111/lasr.12106 Published online by Cambridge University Press



Source: European Commission 2013.

Figure 1. EU Rejections of Indian Shipments.

scrutiny to product bans—to its importers. Indian rejections are depicted in Figure 1 and demonstrate substantial and rapid escalation in the country's alerts from 61 in 2002 to a high of 165 in 2009.

Rejections were not merely economic hits, but also lessons in how to do scientific risk management in the style preferred by western regulators—lessons backed by an iron fist of threatened market closure. All European Commission alerts trigger more frequent testing of an exporter's products and an immediate audit by European inspectors, who both report on deficits and detail suggested reforms. To be taken off the alert list, producers must address auditors' complaints and then submit to another (ten-day) audit. When an import seems particularly troublesome, it can trigger a sectoral audit of not only production but also of regulatory practices. There were 14 of these in India in 1999–2008 period. Each recommended an action plan which Indian regulators were required to address within 25 days.

Sectoral audits are incredibly detailed, generating fine-grained information exchange about how to do European-style risk management. They address perceived deficiencies not only in production, but also storage, testing, and regulation. Take, for example, the discussion of conditions on fishing vessels in the 2005 audit of that sector. There were, say the report, dirty ice and poor procedures to prevent contamination of fish. Authorities failed to carry out "official organoleptic checks on every landed batch" of fish products "at the time of landing or before first sale to the consumer" as required by European Commission directives (European Commission Food and Veterinary Office 2005: 8). There appeared to be "no legal requirements concerning hygiene

https://doi.org/10.1111/lasr.12106 Published online by Cambridge University Press

conditions of the landing sites/auction markets" (European Commission Food and Veterinary Office 2005: 8). Furthermore, sampling procedures to detect microbiological and antibiotic contamination were inadequate and lacked official controls as required by European Commission directives. The report included similarly detailed findings on fish processing, laboratory services, and official procedures for regulatory approval and inspection.

Europe's scrutiny of the fisheries sector arguably had lessons that resonated well beyond fish producers. Seafood is India's biggest agro-food export, and threats to its economic viability generated extensive coverage in the Indian press. Public–private partnerships also mobilized to meet European demands with a nearly $4 million package of investments between 1996 and 2003 (Henson et al. 2004: 32) and continuing initiatives thereafter (Mathew 2004). This generated increased public attention in the form of news stories about new food parks, technological investments, and regulatory initiatives.

Moreover, the "teaching" process was iterative. The European Commission banned all Indian fishery exports in 1997, and audited the sector five times over the 1998–2011 period. Each period of scrutiny resulted in reforms, investments, or both on the Indian side, but then European rejections would escalate due to some new complaint (Henson et al. 2004). Exporters reported in 2005 that they felt "caught up in a seemingly continuous process of equipment upgrade and staff training to keep on top of emerging issues" (Henson et al. 2004: 33).

Supermarkets and other buyers also began sending a clear message to Indian producers in the mid-1990s: adopt private quality certifications, or lose access to high-value markets. Thus, by 2006, a survey of Indian exporters found that a handful of certifications—EurepGAP (now GlobalGAP), BRC, HACCP, the Codex, and ISO 9001—had become de facto requirements of export to Europe (*The Statesman*, 20 March 2006).

Mobilizing the Export Sector

State and industry actors mobilized to meet these new requirements. HACCP became mandatory for the major exports certified by India's primary export regulatory body, the Export Inspection Council, including seafood, dairy, eggs, and honey (FAO & WHO 2006). Furthermore, during the early 2000s, public–private partnerships organized or subsidized certifications for many areas of production: GlobalGAP (then EurepGAP) in grapes (Padmapriya 2004) and onions (Kumar 2003), and ISO and HACCP certification of tea gardens (*Hindustan Times*, 22 December 2005), milk

https://doi.org/10.1111/lasr.12106 Published online by Cambridge University Press

(*Hindustan Times*, 1 May 2006), oil mills, pesticide plants (*Hindustan Times*, 5 May 2005), spices, and cashews (*Business Line*, 17 June 2002).

They also worked to build and diffuse an ideological consensus on the importance of new standards. This is reflected in the reported content or purposes of many meetings, conferences, and research centers. The conclusion of a 2001 industry meeting, for instance, was that "Indian industries, in order to realise their full potential, will have to implement the Hazard Analysis and Critical Control Point . . . For export markets, it has become inescapable" (*Business Line*, 6 September 2001). Similarly, at the opening of a new laboratory in Hyderabad, the country's Director of Animal Husbandry argued that trade globalization offered increased opportunities for meat and egg products, but "unless we match the sanitary and phytosanitary standards or Codex Alimentary standards, it will not be possible for us to capitalise" on this potential (Chandrashekar 2008). An industry representative framed this message as a warning at a 2003 seminar on fruit processing. India was losing mango trade to producers in Latin America, Africa, and Australia, and accounted for only $75 million of the $3.9 billion fruit juice concentrate market despite being the world's second largest fruit producer. "We can't keep patting our own backs," he warned, adding "our quality standards does not match global industry standards" (*Business Line*, 5 February 2003).

Foreign quality norms also forced Indian regulators and industry to keep up with and invest in cutting edge regulatory technology. Take, for example, the 2003 rejection of Indian chili powder on the grounds of trace amounts of banned colorant Sudan Red. The Indian Spices Board retested their shipments but could find no Sudan Red. The discrepancy turned out to be technological; Europe was testing at parts per billion, the Indians at parts per million (Nair 2004; see also Das 2008). The Spices Board then purchased the more sensitive equipment—for roughly $300,000 (Das 2008: 14; exchange rate by author's calculation). This incident was not isolated. In an interview, one public official complained:

> What . . . we observed that the maximum residue levels which were being prescribed by the European Union, particularly the European Union, they were going down, becoming more and more strict in direct proportion to technology development. So if they developed an equipment which could test at 0.01 parts per billion that became the MRL, and if they go further down, they will go further down if they have a much better equipment. So now they are talking about parts per trillion.

The country's response to a 2003 grape controversy is illustrative. After finding pesticide residues on shipments of Indian grapes, the

https://doi.org/10.1111/lasr.12106 Published online by Cambridge University Press

European Commission issued 17 rapid order notifications—notices of warning or rejection—and ignited a panic in European markets (*Rediff*, 22 June 2007). The European Commission demanded that India take and report on safeguard measures. At the time, the grape export market was worth 150 crore rupees, a little over US$30 million at 2003 exchange rates (Padmapriya 2004; exchange rates by author's calculation). And though this would not pose a major economic blow, it was perceived—according to one informant—to be a serious problem for the country's food exporters more generally because of its reputational effects.

After the controversy, an export promotion official reports that reforming the sector became a "front seat" issue, the subject of at least 50–60 meetings between that July and February of the next year. What followed was a massive redesign and investment in the sector: laboratories for testing, increased certification in scientific management systems, and even a complex traceability system called GrapeNet that gives inspectors one-click access to "reports to laboratory analysis, certificate of residue analysis and the pack house details, which are available in detail instantly" (*Rediff*, 22 June 2007; see also Padmapriya 2004).

From Resistance to Acceptance

Content analysis of Codex Commission Meeting Reports from 1997 to 2010 and Ministry of Commerce newsletter *India and the WTO* from its inauguration in 1999 to 2002 suggest that India's strategic response to the new global risk regime evolved quickly from active resistance to acceptance (Figure 2).

RESISTANCE	ACQUIESCENCE / SEAT AT THE TEABLE	ACCEPTANCE / ADVOCACY
Claim: "risk assessment methodology" is difficult for developing countries to apply	Request: technical assistance, and that data from developing countries be included in Codex risk assessments	Tone: no challenges of a fundamental nature at Codex meetings
Claim: developed country standards are "beyond the technical competence of developing countries"	Claim: regulatory stringency increases with each uptick in limits of detection	Reference: alludes to other states' complaints about India's increased application of standards-based barriers to food imports
Claim: international bodies have not ensured a role for developing countries in standard setting	Tone: in *India and the WTO*, post 1999-references to the SPS become more rare and routinized.	Reference: defends Australia's SPS barriers, which had been critiqued by other member states
1997- SPRING/SUMMER 1999	SUMMER 1999 – 2002/2003	2002/2003 – PRESENT

Sources: *India and the WTO* Newsletter (1999–2002); Codex Commission Meeting Reports (1997–2010).

Figure 2. Indian Strategic Responses: Global Risk Management Regime.

https://doi.org/10.1111/lasr.12106 Published online by Cambridge University Press

Initially, India treated the risk management approach as an unambiguous challenge. In 1997, for instance, the Indian delegation to the Codex Commission complained that developing countries had difficulties "applying low maximum limits for residues and contaminants" (Codex Alimentarius Commission 1997: 2). They also noted "the difficulties of developing countries in the application of risk assessment methodology" (5), and asked that some of the discussed quality criteria be made voluntary rather than mandatory. *India and the WTO* made similar complaints in several of that year's issues: developed country standards were "beyond the technical competence of developing countries" (April 1999: 5), costly, "impractical, and unrealistic" (May 1999: 7). Affluent countries were unwilling to transfer technologies that might enable compliance with their standards, and international bodies had taken insufficient measures to "ensure effective participation of developing countries in setting of standards" (April 1999: 5). India submitted these concerns in the form of a position paper to the WTO's SPS Committee in the same year (July 1999: 6–10).

But India's publicized positions soon shifted to demands for a larger role in the risk management regime. In 1999, India's delegation to the Codex Commission argued that developing countries should be given technical assistance in risk analysis and "Codex-related activities" (Codex Alimentarius Commission 1999: 5), and that data from these countries be considered in Codex risk assessment processes. The second request was again made in 2001 (Codex Alimentarius Commission 2001a, 2001b). In 2003, the delegation complained about "continuous changes in methods of analysis resulting in lowered limits of detection" (Codex Alimentarius Commission 2003: 36)—a shift in the rules of the science game, but not science itself.

The next shift was to virtual silence—what we might understand as acquiescence. After 2003, there were no challenges to the prevailing risk regime in any Codex Commission reports. A similar pattern emerged in *India and the WTO*, where after 1999 references to the SPS Agreement became more rare and routinized; there was not a single serious complaint or critique in any of the newsletters from 2000 to 2002, despite continued, incisive criticism of the WTO on other policies, particularly agricultural subsidies.

Indeed, references to the SPS in late 2002 *India and the WTO* issues suggest an embrace of the standards regime India had once opposed. Twice, the newsletter cited complaints by other WTO member states about India's increased application of standards-based barriers to food imports (June 2002: 9; July–August 2002: 19). In the summer of 2002, India reported that developing countries had expressed concern about Europe's standards on the grounds they were not sufficiently based on science, and even then

https://doi.org/10.1111/lasr.12106 Published online by Cambridge University Press

offered little support for the view (July–August 2002: 16). The only other meaningful reference was a defense of Australia's food safety standards, which had been criticized by other member states as unfair barriers to trade (September 2002: 18).

Norm Localization Unfolds

How did global, and largely imposed, systems of food risk and risk management become integrated into domestic agendas and politics? This section presents a content analysis of annual reports of the Ministry of Food Processing Industries, a body started in 1988 to promote the food processing sector, from the period 1993/1994 to 2007/2008.[3] The reports suggest a fairly clear progression. The Ministry made few references to food as a safety risk until 1997, began making superficial gestures toward global models of risk management in that year, and thereafter began expanding and deepening its discursive commitments to the risk management approach (see Figure 3 for operationalization). Over time, it made risk management central to its proposed strategies and subsequently defended it as locally beneficial.

Between 1994 and 1997, reports (see Figure 4) displayed few gestures toward risk management ideology. They made only glancing references to laboratories, quality control, quality standards, and food safety—usually in reference to the name of an institute, or embedded superficially in discussion of other matters. While there was much discussion of modernization and growth, it was largely framed in terms of improvements in productivity and expanding the use of modern processing equipment.

Over the following few years, they made superficial gestures toward the ideology—referencing elements of risk management

	SHALLOW GESTURES	DEEPENED COMMITMENTS
SCIENCE	Microbiological contamination or contaminants Laboratories	Explanation of food risks in terms of microbiological contaminants Networked system of laboratories Scientific advisory committees
RISK SYSTEMS	HACCP, ISO, or total quality management (TQM)	Claims that HACCP, ISO, or total quality management improve food safety
FOOD SAFETY	Food safety Safety and standards in service of trade	Explanation of threats food poses to Indian consumers Defense of safety initiatives for domestically consumed foods Making "safe, hygienic" food a central goal for the sector
HARMONIZATION	Meeting international standards	Treatment of safety and international standards as synonymous Linkage of harmonization and other domestic goals

Figure 3. Operationalizing Discursive Commitment to the Risk Management Approach.

[3] Reports are hereafter referred to by their latter dates, for example, the report for 2006–2007 is the "2007 report."

https://doi.org/10.1111/lasr.12106 Published online by Cambridge University Press

THE OLD REGIME	INTRODUCING RISK MANAGEMENT	INTRODUCING A "QUALITY REGIME"	FINDING A COMPETITIVE EDGE
No references to TQM, HACCP, Codex Glancing references to laboratories, quality control, quality standards, food safety	HACCP introduced as a system desirable given "the scenario in international trade" Codex introduced as a standards body with status under the WTO Ministry adds HACCP and ISO adoption to modernization goals, along with "achieving international standards and evolving effective quality assurance system"	TQM "are vital today, if one has to reach the world market or avoid being swamped by imported food items...MFPI aims at setting up a network of laboratories to help implement quality regime for processed food. A number of prestigious laboratories have been assisted in upgrading facilities for finding the quality revolution in the country."	"Quality and food safety have become competitive edges...the installation of ISO 9000...and HACCP...is extremely desirable in view of changing scenario in international trade." Cites goal of "enabling pro-active participation in Codex deliberations and adequate projection of the Indian view point in Codex system"
1993/1994.....1996/1997	1997/1998.....2000/2001	2001/2002	2002/2003

MAKING THE CASE FOR A QUALITY REGIME	LINKING THE NEW QUALITY REGIME AND GLOBAL STANDARDS
Announces draft of reform bill to set up body whose tasks will include "data generation for risk assessment and risk management" of domestically consumed foods "Indian food processing industry needs to build up quality and ensure error-free safety to match up to acceptable global standards. R&D facilities and food quality lab network services need to be improved and upgraded as per requirement of GMP, ISO, HACCP and EU standards." Cites enforcement of quality standards as a necessary condition of promoting agricultural development, and their dearth as a fundamental problem in the sector	Introduces new food safety agency tasked with laying down "science based standards" and promoting harmonization with international policy measures Repeatedly discusses plans to upgrade and set up laboratories and standards, and proposes merging these plans with work on strengthening the country's Codex office Explains main objectives of sectoral research and development as upgrading technology to meet national and international standards Proposes new meat and wine boards to develop hygiene standards, provide testing, and meet global standards Introduces plan to improve safety of street food
2003/2004 .....2005/2006	2006/2007

EXPANDING THE LOGICS OF REFORM
Setting up and upgrading laboratories "would benefit all stakeholders including domestic industry, exporters, entrepreneurs, small and medium enterprises, existing academic & research institutions...Implementation of Good Manufacturing Practices, HACCP, ISO standards will help in improving the overall quality of food safety and hygiene in the country and to increase on share in global food trade."
Indian consumers' "improved...perception towards food safety" and globalization of trade require a "focused approach" toward research and development. Proposes to set up a scientific advisory committee to set research priorities.
Vision statement for the sector begins with the goal of providing "safe, hygienic and quality food products to the people."
Claims increased vigilance about the sanitary qualities of meat resulting from "emerging health threats of the diseases communicable to humans through meat." Explains that "meat is a highly perishable commodity and acts as an excellent medium for the rapid multiplication of micro-organisms many of which render meat poisonous for human consumption. Microorganisms invade and start multiplying immediately after an animal is slaughtered. In a hot country like India the speed with which such organisms develop is considerable with the result that the meat deteriorates faster in India than in cold countries. Consequently, the need for proper care in production, maintenance of hygienic conditions at all stages from production to consumption and conditions of storage aimed at preventing decomposition due to micro-organisms play a very vital role in the meat industry in India. "
2007/2008

Figure 4. Discursive Landmarks: Ministry of Food Processing Industries Annual Reports, 1993/1994–2007/2008.

regimes, but framing them as beneficial and legitimate largely in the context of global trade. HACCP was first mentioned in 1998 as a system that "ensures that the products are safe and of good quality" and is desirable "given the scenario in international trade" (n.p.[4]). Codex was introduced in the same year as a body whose standards "are more and more being used in international trade negotiations for settling disputes" (n.p.), and in the next year as a standards body with status under the WTO. Harmonizing with international standards was added to the Ministry's list of goals in 1998, and the 1999 report added achieving HACCP and ISO adoption and developing a "quality assurance system."

[4] Until 2003, reports did not include page numbers.

https://doi.org/10.1111/lasr.12106 Published online by Cambridge University Press

In subsequent years, reports deepened their defense of and commitments to the western model of risk management. In 2002, it explained that total quality management systems were vital both for the global market *and* to "avoid being swamped by imported food items" (n.p.). It went on to claim that India was having a "quality revolution," and had set up "a number of prestigious laboratories" in its service (n.p.). The 2003 report mirrors the attitude reflected in earlier Codex Commission Meeting Reports—considering how to achieve a seat at global risk management table, or "enabling pro-active participation in Codex deliberations and adequate projection of the Indian view point in the Codex system" (51).

In the following years, reports began (1) treating the risk management approach as a taken-for-granted improvement for *all* Indian food regulation, (2) putting the model at the center of national policy proposals, and (3) linking the model to the goal of harmonizing with international standards. The 2004 report announced a draft reform bill to establish a new food regulator responsible for "data generation for risk assessment and risk management" of domestically consumed foods (6). The bill, which passed in 2005, resulted in a new food safety agency—the Food Safety and Standards Authority of India—which the 2007 report described as responsible for producing "science based standards" and promoting harmonization with international policy measures (9). The Ministry's goals now included ensuring "error-free safety to match up to acceptable global standards," along with "R&D facilities and food quality lab network services" upgraded to the requirements of ISO, HACCP, and other standards (2004: 37).

The 2007 report went further still. It proposed an initiative to improve the safety of street food, applying risk management language, for the first time, to an issue wholly unrelated to external trade. It also proposed new meat and wine boards to develop hygiene standards, provide testing, and meet global standards. Finally, it proposed merging existing plans to upgrade and invest in new laboratories with those to strengthen the country's Codex office—linking, again, India's scientific investments with its attempts to build influence in the Codex system.

In 2008, reports began articulating some wholly domestic logics for adoption of a risk management approach. The report explained that, in addition to improving the country's export prospects, implementing total quality management systems like HACCP and ISO would "help in improving the overall quality of food safety and hygiene in the country" (19). The report's vision statement for the sector now began with the goal of providing "safety, hygienic and quality food products to the people" (n.p.). And, for the first time, it offered an extensive explanation of food risks and the resulting need for vigilance, explaining in detail the potential for

https://doi.org/10.1111/lasr.12106 Published online by Cambridge University Press

microbiological contamination in meat and for its prevention via farm to fork controls (Figure 4).

On the Question of Timing

What explains the timing of the shifts described above? The most likely explanation is a combination of external coercion, market competition, and domestic political agendas.

Food processing had been a priority "sunrise" or "push" sector in India since the early 1990s (FICCI 2010; Palthur et al. 2009; *Press Trust of India*, 14 March 2009; Rao 2008). Sectoral growth was seen as an answer to the "single most important problem facing the country"—increasing farmers' incomes (MFPI 2003: 1). Processed foods are still a tiny portion of the Indian food basket, but are projected to be worth 318 billion by 2020 (from 181 billion in 2009), driven by a growing middle class with shifting tastes (FICCI & Ernst and Young 2009: 8). The agency responsible for promoting sectoral growth—the Ministry of Food Processing Industries—has also actively sought for years to increase Indian consumption of processed foods through promotional campaigns (see, e.g., MFPI 2007). The potential for export market growth is also enormous. As of 2008, India was the world's second largest producer of agricultural products but accounted for only 1.4 percent of the world food trade (FICCI & Ernst and Young 2009: 40).

This is perhaps why there was such a strong reaction to the perceived threat of imported foods to domestic producers. Until 1997, India effectively banned agricultural imports with a combination of tariffs and licensing requirements (Goldar 2005; Ronald 2006). These restrictions were technically outlawed by the WTO in 1995, but did not come under real political scrutiny until 1997, when the United States brought and won a formal complaint under the auspices of WTO dispute settlement. While some tariff barriers remain, most were dropped by 2001 (Goldar 2005; Ronald 2006). There was no subsequent surge of imports, but the potential for one remained widely feared largely on the grounds of its threat to the Indian market (Goldar 2005). Industry group Federation of Indian Chambers of Commerce and Industry (FICCI), for instance, co-organized a conference on "The Challenges of Globalization" whose explicit purpose was "to deliberate on the steps that need to be taken to protect the domestic markets from imported foods" (*Business Line*, 15 June 1998).

The potential health threats posed by imports also challenged the country's existing regulations for domestically consumed processed food. Since the 1950s, the sector had been overseen by a patchwork of over seven laws and agencies with overlapping and

often inconsistent rules and authority. The system had long been seen as politically capricious, rigid, inconsistent, and punitive—that is, as inhibiting growth and innovation (*cf. Financial Express*, 12 June 2002; *The Hindu*, 18 January 2002; *Hindustan Times*, 18 July 2006; Palthur et al. 2009; FICCI 2010). But the reform movement only gained steam in the early 2000s, and a reform bill was passed in 2005: one which, on paper, made scientific risk management a core regulatory strategy. When asked to explain the timing, a highly placed public official first responded that it was because industry wanted a common law. But when pressed about *why*, he elaborated:

> It is definitely because the WTO, India has become part of the WTO, and increasingly every product is now going to come into the country. . . . but the regulatory system has not aligned to that particular situation. We have a situation where things have started coming in, but we do not know how to check it, or how to verify it, only good things are coming in, or only safe things are coming in.

The SPS Agreement also effectively obligated India to introduce the risk management framework into reform efforts. The Agreement requires member states to (1) apply the same standards to foreign and domestic goods, and (2) regulate foreign goods with formal scientific risk analysis. The only viable option for domestic regulation then was a risk management approach. This logic is echoed by India's Codex Manual, which attributes the country's reform to the need to regulate domestic goods and imports uniformly (Codex India 2010). The same logic was repeated by the above-cited regulator:

> . . . we have to align the regulatory mechanism to this inflow of things coming in, so that we are, number one, we are aligned in terms of standards. . . . The law says that any item coming into the country should have the same safety standard as those for the domestic market.

Making Rational Myths

Industry leaders and political officials made highly public claims about the local benefits and purposes of a risk management approach, often in service of other domestic agendas. Industry leaders framed risk management as a cure for the ills of India's old regulatory regime, and lobbied the state for science-based reforms. They also worked together with state actors to spread awareness of and buy-in to models like HACCP across a broad array of public fora, including conferences and trainings. In doing so, they claimed

https://doi.org/10.1111/lasr.12106 Published online by Cambridge University Press

that India faced two risks: a flood of imports that threatened its food industry, and food-borne illness that threatened its consumers. In both cases, they framed science-based food governance as a form of protection.

Food industry groups treated science-based standard setting as normative, the Indian government's failure to employ it as a self-evident problem, and global norms as the appropriate way of doing so. See, for instance, this industry statement to an Indian news outlet: "the existing system of standard-setting is not scientific. It is not just a question of pesticides; there are other issues regarding microbes, metals, etc., and norms for these need to be set in synchronisation with global guidelines" (Datta 2003). During the lead up to a 2006 reform bill, industry group Confederation of Indian Industry (CII) recommended a council of food standards based on science-based risk analysis (*Business Line*, 28 March 2005). In at least some fora, global norms were more specifically defined as the Codex, as when CII met with top public officials in 2005 and recommended Codex alignment (*Business Line*, 14 November 2005).

The country's largest industry association, FICCI, went farther—explicitly tying science to freedom from political roadblocks and capriciousness. The group helped write India's 2006 reform legislation, the Food Safety and Standards Act, which established a formal commitment to base new standards on scientific risk analysis and risk management (Ministry of Law, Justice and Government 2006: 22). After the passage, FICCI publicly lauded the new law for being "effectively empowered to bring in a science-based standard setting procedure" which, it claimed, "will go a long way in releasing this industry from the shackles of multiple laws and punitive attitudes" (*Hindustan Times*, 28 July 2006).

FICCI and CII also worked to build broad sectoral interest and investment in the risk management model, sponsoring conferences and trainings, and producing reports and press releases that framed science-based regulation as a crucial (and widely preferred) strategy for the food sector. Of all food and trade conferences, seminars, and trainings listed in Indian news sources from the period 1997 to 2010, and whose publicized materials and content connected food and trade or scientific risk management (N = 31), 19 were co-sponsored or organized by FICCI (6) or CII (13)[5]

At these events—in speeches or presentations by conference presenters and press releases by conference organizers—the risk management model was tied to the threat of imported foods and

[5] Found either (1) through the course of my research or (2) via Lexis-Nexis searches in select Indian news sources utilizing multiple search terms like "food AND conference," "WTO AND food safety," and "HACCP and meeting."

domestic consumer interests. In his inauguration of the 1999 (CII-sponsored) FoodPro conference, for instance, a cabinet minister remarked that:

> With the Indian food processing companies facing a major threat from imported food products, there is a need to harmonise rules in the country with those in the new world trade order . . . Not only would such a move do away with the need to modify exports to suit many different standards, it would also offer Indian consumers greater choice at more competitive prices . . . Harmonising standards would help reduce costs and also to improve India's competitiveness in the global trade, apart from ensuring consumer confidence in the domestic market. (*Business Line*, 8 December 1999)

A government official made similar connections at the opening of FICCI's new Food Research and Action Center. He began by discussing how India must meet the high demands of importers, and how research centers like this one would be valuable in that effort. And, without explanation, he linked this to industry's potential growth within the domestic market: "despite the fact that 80 per cent of our food is unprocessed and 95 per cent un-packaged, 50 per cent of Indian money is spent on food. That tells us opportunities ahead and that also tells us about the challenges ahead" (*Press Trust of India*, 22 September 2006).

The many logics of risk management were also tied together by their discursive proximity at public events. Take, for instance, the programs for two consecutive International Food Regulatory Summits (co-organized by CII). In a 2007 presentation, an American regulator advocated for "science-based decision making" on the basis of WTO rules, its positive effects on consumer confidence, and consumer safety (Horton 2007). An Indian government representative bemoaned the "misconception" that international standards are only for exports, a "lack of scientific data," and the absence of "designated scientific institutions" to support standard setting, and recommended more widespread certification in ISO 22000 and national categorization and coordination of private food testing labs (Jauhri 2007). And an Indian consumer advocacy group promoted "science and evidence based standards" in service of Indian consumer safety (Misra 2007). At the 2008 meeting, a Codex representative presented risk-based systems as the only viable option under WTO rules (Miyagishima 2008), while the Ministry of Food Processing Industries advocated for the "risk analysis concept" on the basis of consumer safety and adoption of HACCP systems on the basis of foreign demand (Rao 2008).

https://doi.org/10.1111/lasr.12106 Published online by Cambridge University Press

Why the Expansive Approach?

There are four potential explanations for industry and state actors' expansive framing of the risk management project. One is the typical normative account of scientization: that risk management became a valued and taken-for-granted script for doing food governance and certifying competence to western governments. But this possibility is undermined by plausible alternatives. I turn to each below.

There is limited but convincing evidence that industry and state leaders instrumentally sold a broader package of reforms *in service of the export sector*. A 2005 report from the Indian Council for Research on International Economic Relations laid out a succinct case for this connection. The cost of meeting importers' standards was too high, and fiscal support from the state was going to be limited.

> If fixed costs have to be recovered from export markets alone, even if the costs are affordable, Indian exports are liable to be rendered price uncompetitive . . . It is thus desirable that fixed costs are also spread over domestic markets . . . Segmentation of domestic and export markets is no longer possible. One cannot cater to higher standards for export markets and lower standards for domestic markets. (Debroy 2005: 13)

Two informants, one regulator and one industry representative, offered similar arguments. The regulator suggested that one motivation for the 2006 reforms was, in fact, to boost exports: "Government thinks that if you apply these regulations to the domestic economy, gradually it will help the exports also." The industry informant offered a similar story: If "you have a systems based approach for the entire country it will also help exports and it will reduce the cost of compliance for exporters and make the products competitive." We could apply the same logic to broader efforts to educate the whole food processing sector on risk-based approaches and build institutions of scientific expertise. More farmers and processors convinced of the model and capable of enacting it would certainly benefit exports.

There is also some evidence that once introduced in exports, the risk management model acted as a policy demonstration for the domestic sector, kick-starting a mimetic process facilitated by newly expert actors and organizations. As of 2009, the new domestic food safety regulator, Food Safety and Standards Authority of India (FSSAI), was collaborating with at least one export promotion body "to set up systems not just for exports but also for the domestic market," said one informant. Having seen the successes of the Spices Board, GrapeNet, and the seafood sector in Kerala, "they

https://doi.org/10.1111/lasr.12106 Published online by Cambridge University Press

are also learning from this," he said, "and they have sought our help in developing their food safety traceability systems." A 2006 news article similarly claimed that the agency tasked with implementing Europe's HACCP requirements—the Central Institute of Fisheries Technology—had since "been instrumental" in training the rest of the Indian food industry (*The Hindu*, 14 June 2006).

FSSAI was also working with the country's major certification body, the Quality Council of India, on bringing the same total quality management systems it had long been certifying in exports (like HACCP) into the new system for domestic regulation. One public official involved in this collaboration explained that this was not simply a matter of those systems' perceived superiority (a normative mechanism) but rather of simplifying governance (a matter of reducing transaction costs): "once the regulators are becoming aware that something should be exported from India to meet any other country's regulation, and it needs to come from an accredited body . . . then . . . why make a difference between the domestic market and export market? We might as well also prescribe that."

Finally, it seems likely that for some, building a strong politico-scientific network was part of a larger strategy for exercising voice at the Codex. It should be noted that this was not the kind of reputational competition posited by prior work on scientization (e.g., Drori and Meyer 2006; Schofer 2004), but rather a more immediately political struggle for standard-setting power (e.g., Quark 2012). This is evident in the annual reports analyzed in a prior section, which linked investments in laboratories and other forms of institutionalized expertise to "projection" of India's "viewpoint" within the Codex. An informant made this case also, contending that scientific capacity was a form of power in the Codex. He began by arguing that developing countries seeking a voice in the Codex needed to "make themselves strong." When pressed on what he meant by strength, the man replied: "It's not a bargaining position. You have a position which is stronger on its own. . . . you are able to talk science."

How Far does Scientization Go?

The claim here is not that India has fully embraced the scientific risk management model. Indeed, industry continues to prod the public sector on its adherence to scientific norms. As recently as 2010, for instance, FICCI produced a report on industry bottlenecks which recommended that the new domestic food safety agency give "science . . . the preeminence" and that it base standards on "proper risk assessment based on the available science" (11). And in interviews, virtually all informants noted the difficulties

https://doi.org/10.1111/lasr.12106 Published online by Cambridge University Press

they have had in norm building: spreading awareness of and compliance with HACCP, instituting new hygiene norms in Indian production, developing proper risk-based standard-setting procedures, or building industry demand for laboratory services.

The material, institutional, and infrastructural components of science-based regulation are still far from entrenched. An industry informant suggested, in our interview, that much of the HACCP certification happening in the country was purely symbolic, and that substantive compliance was rare. Furthermore, the much-lauded scientific advisory panels established by India's 2006 reforms were eventually challenged by a consumer group for failure to appoint independent experts. The country's Supreme Court agreed, forcing the government to reconstitute the panels in 2011 (Datta 2011). A recent report by consumer group Centre for Science and Environment (CSE) underscores just how difficult the system project is in the Indian case (Prakash 2012). In the 2003–2008 period, India undertook massive food laboratory investments as part of a loan agreement with the World Bank. The report, written by the former director of the Central Food Laboratory, claims that most of the laboratories are deeply underutilized or nonfunctional, hampered by a failure to locate qualified staff and regular electricity outages.

But norms need not be fully adopted to be understood as meaningful, nontrivial forms of diffusion. Indeed, past work suggests that all diffusion is partial: that states take on global templates piecemeal (Djelic 1998) and substitute symbolic compliance for substantive adherence (Boyle and Meyer 2002). The question is not then whether India looks like an ideal-typic risk-based food regulator. It is rather how the country has come to embrace some global regulatory norms.

And it is clear, in the Indian case, that the risk management model has become widely accepted. One indicator is general industry attitudes, reflected in a 2007 FICCI survey, which found that 68 percent of respondents saw science-based standards as a main advantage of recent reforms (3). Similarly, a deeply cynical informant, after expounding in-depth on perceived failures of the current regime, qualified his remarks to acknowledge the progress of the risk management approach:

> Between 95/96 and 2000 if you would use the word HACCP there were people giving you strange looks and saying "why is he making that funny noise?" . . . If you go to industry or government or any minister concerned with this topic today, they will know what HACCP means, they will know what Codex means. . . . in 15 years, you have gone from 0 to a great deal of advantage on the subject.

https://doi.org/10.1111/lasr.12106 Published online by Cambridge University Press

A more meaningful indicator is the aforementioned reconstitution of expert panels in 2011. Legal norms can be understood as powerful to the degree that they establish a constrained set of legitimate justifications and justificatory strategies (Reus-Smit 2004). The new food law did just this; it established a risk-based food regime organized on scientific principles, and did so well enough that activists were able to force political reform through legal channels. Even before this case, one informant—a public health official—seemed impressed by the changes the structure of panels had wrought. He contended that the process of choosing experts under the new law was far more meritocratic, and that their ties to the new food safety agency had already improved the translation of expertise to policy.

Conclusions

Most prior work on global scientization has focused on its ideological production and diffusion through fundamentally consensus-based mechanisms. But there are strong institutionalized incentives embedded in the global food trade that effectively force participants to adopt a risk management approach. These include access to high-value markets, exercising power in global standard setting, and compliance with WTO mandates. For developing countries, achieving risk management in line with western standards is a major project of institution building and technology investment. Furthermore, it is a project that is both escalating and iterative, driven by ever-more-stringent risk management technologies in affluent markets.

In India, the global risk management regime was initially seen as an expensive imposition, but quickly became part of local reform agendas. The two-stage model of scientization I have sketched here—from coercion and competition to consent and localization—is specific to the food safety field. But it is worth asking, in future research, if this model extends to other scientized policy fields with similar institutional structures.

The findings here also have implications for the local legitimacy of the WTO in other policy spheres. Many have noted that effectively engaging with the WTO requires strong and specialized administrative capacities (Chorev and Babb 2009; Conti 2010; Ginsburg and Shaffer 2010; Sinha 2007). One consequence, among less affluent states, has been investment in new institutions, experts, and expertise designed specifically to engage WTO negotiations. When these investments are grand enough to require public justification and mobilization, we might expect the same kinds of ideological transformation I've described here.

https://doi.org/10.1111/lasr.12106 Published online by Cambridge University Press

References

Acharya, Amitav (2004) "How Ideas Spread: Whose Norms Matter? Norm Localization and Institutional Change in Asian Regionalism," 58 *International Organization* 239–75.

Anders, Sven, & Julie Caswell (2009) "Standards as Barriers Versus Standards as Catalysts: Assessing the Impact of HACCP Implementation on U.S. Seafood Imports," 91 *American J. of Agricultural Economics* 310–21.

Athukorala, Prema-Chandra, & Sisira Jayasuriya (2003) "Food Safety Issues, Trade and WTO Rules: A Developing Country Perspective," 26 *World Economy* 1395–416.

Bakhshi, Kajli (1995) SPS Agreement Under the WTO: The Indian Experience. Indian Development Foundation.

Berdegue, Julio A., et al. (2005) "Central American Supermarkets' Private Standards of Quality and Safety in Procurement of Fresh Fruits and Vegetables," 39 *Food Policy* 254–69.

Bingen, Jim, & Lawrence Busch (2006) *Agricultural Standards: The Shape of the Global Food And Fiber System*. Dordrecht: Springer.

Boyle, Elizabeth Heger, & John W. Meyer (2002) "Modern Law as a Secularized and Global Model: Implications for the Sociology of Law," in Dezalay, Y., & B. G. Garth, eds., *Global Prescriptions: The Production, Exportation, and Importation of a New Legal Orthodoxy*. Ann Arbor: Univ. of Michigan Press.

Braithwaite, John, & Peter Drahos (2000) *Global Business Regulation*. New York: Cambridge Univ. Press.

Chandrashekar, K. (2008) "Major Fillip to Dairy Exports," *The Times of India*.

Chorev, Nitsan, & Sarah Babb (2009) "The Crisis of Neoliberalism and the Future of International Institutions: A Comparison of the IMF and the WTO," 38 *Theory and Society* 459–84.

Codex Alimentarius Commission (1997) Twenty-Second Session: Report. Geneva.

——— (1999) Twenty-Third Session: Report. Rome.

——— (2001a) Report of the Sixteenth Session of the Codex Committee on General Principles. Paris.

——— (2001b) Twenty-Fourth Session: Report. Geneva.

——— (2003) Twenty-Sixth Session: Report. Rome.

Codex India (2010) "The User's Manual on Codex: A Contemporary Approach to Food Quality and Safety Standards," http://www.codexindia.nic.in/Training%20Manual.pdf.

Conti, Joseph A. (2010) "Producing Legitimacy at the World Trade Organization: The Role of Expertise and Legal Capacity," 8 *Socio-Economic Rev.* 131–55.

Das, Kasturi (2008) Addressing SPS Challenges in India. Working Paper, New Delhi: Centre for WTO Studies, Institute of Foreign Trade, Government of India.

Datta, PT Jyothi (2003) "Food Sector Needs Integrated Law," *Business Line*.

——— (2011) "Food Safety Body Revamps Scientific Panels," *Business Line*.

Debroy, Bibek (2005) The SPS and TBT Agreements—Implications for Indian Policy. Indian Council for Research on International Economic Relations (ICRIER).

Djelic, Marie-Laure (1998) *Exporting the American Model: The Post-War Transformation of European Business*. New York: Oxford Univ. Press.

Dobbin, Frank (2011) *Inventing Equal Opportunity*. Princeton: Princeton University Press.

Dobbin, Frank, & John Sutton (1998) "The Strength of a Weak State: The Employment Rights Revolution and the Rise of Human Resources Management Division," 104 *American J. of Sociology* 441–76.

Drori, Gili, & John W. Meyer (2006) "Scientization: Making a World Safe for Organizing," in Djelic, M.-L., & K. Sahlin-Andersson, eds., *Transnational Governance: Institutional Dynamics of Regulation*. New York: Cambridge Univ. Press.

Drori, Gili S., et al. (2003) *Science in the Modern World Polity: Institutionalization and Globalization*. Stanford, CA: Stanford Univ. Press.
Edelman, Lauren (1992) "Legal Ambiguity and Symbolic Structures: Organizational Mediation of Civil Rights Law," 97 *American J. of Sociology* 1531–76.
——— (1999) "The Endogeneity of Legal Regulation: Grievance Procedures as Rational Myth," 105 *American J. of Sociology* 406–54.
European Commission (2013) Food and Veterinary Office Audit Database.
European Commission Food and Veterinary Office (2005) *Report of a Mission Carried Out in India From 17/01/2005 to 27/01/2005 In Order to Assess the Public Health Control And the Conditions of Production of Fishery Products Including Aquaculture Products*.
FAO (Food and Agriculture Organization) of the UN (2005) "Food Safety Risk Analysis, Part I: An Overview and Framework Manual (Provisional Edition)," FAO and WHO.
——— (2006) FAO/WHO Guidance to Governments on the Application of HACCP in Small and/or Less-Developed Food Businesses. FAO Food and Nutrition Papers.
Federation of Indian Chambers of Commerce and Industry (2010) Industry Challenges in Food Regulations.
Finnemore, Martha (1991) "Science, the State, and International Society," Stanford Department of Political Science.
Foster, Caroline E. (2008) "Public Opinion and the Interpretation of the World Trade Organization's Agreement on Sanitary and Phytosanitary Measures," 11 *J. of International Economic Law* 427–58.
Frickel, Scott, & Kelly Moore (2006) "Prospects and Challenges for a New Political Sociology of Science," in Scott, Frickel and Kelly Moore eds., *The New Political Sociology of Science*. Madison: Univ. of Wisconsin Press.
Gereffi, Gary, & Miguel Korzeniewicz, eds. (1994) *Commodity Chains and Global Capitalism*. Westport, CT: Praeger.
Ginsburg, Tom, & Gregory Shaffer (2010) "How Does International Law Work: What Empirical Research Shows." Legal Studies Research Paper Series University of Minnesota Law School.
Goldar, Bishwanath (2005) Impact on India of Tariff and Quantitative Restrictions Under WTO. Working Paper, New Delhi: Indian Council for Research on International Economic Relations.
Halliday, Terrence, & Bruce Carruthers (2009) *Bankrupt: Global Lawmaking and Systematic Financial Crisis*. Palo Alto, CA: Stanford Univ. Press.
Henson, Spencer, & Steven Jaffee (2006) "Food Safety Standards and Trade: Enhancing Competitiveness and Avoiding Exclusion of Developing Countries," 18 *The European J. of Development Research* 593–621.
Henson, Spencer, et al. (2004) Impact of Sanitary Measures on Exports of Fishery Products from India: The Case of Kerala. Agriculture and Rural Development Discussion Paper 17: Cost of Compliance with SPS Standards The World Bank.
Hoberg, George (2001) "Trade, Harmonization, and Domestic Autonomy in Environmental Policy," 3 *J. of Comparative Policy Analysis: Research and Practice* 191–217.
Horton, Linda (2000) "Risk Analysis and the Law: International Law, the World Trade Organization, Codex Alimentarius and National Legislation," 18 *Food Additives and Contaminants* 1057–67.
Horton, Linda R. (2007) "Science-Based Decisionmaking: A Global Perspective," New Delhi.
Huss, H. H., et al. (2004) Assessment and Management of Seafood Safety and Quality. FAO Fisheries Technical Paper 444 FAO (Food and Agriculture Organization of the United Nations).
International HACCP Alliance (n.d.) "HACCP Questions and Answers," http://haccpalliance.org/alliance/haccpqa.html (accessed 1 September 2010).
Jasanoff, Sheila (1999) "The Songlines of Risk," 8 *Environmental Values* 135–52.

Jauhri, Anil (2007) "Infrastructure and Capacity Building for Food Safety and Quality—Indian Scenario," New Delhi.
Kumar, Rahul (2003) "Punjab to Grow Yellow Onions for UK, Europe," *The Economic Times*.
Livermore, Michael A. (2006) "Authority and Legitimacy in Global Governance: Deliberation, Institutional Differentiation, and the Codex Alimentarius," NYU Law Rev. 766–801.
Mathew, Mony K. (2004) "Seafood Industry Looks for A Lifeline," *Business Line*, Aug. 30.
Merry, Sally Engle (2006) *Human Rights and Gender Violence: Translating International Law into Local Justice*. Chicago, IL: Univ. of Chicago Press.
Ministry of Food Processing Industries (1993/1994–2007/2008) Annual Reports. Delhi: Ministry of Food Processing Industries, Government of India.
Ministry of Law and Justice, Government of India (2006) Food Safety and Standards Act.
Misra, Bejon (2007) "Consumer Expectations – Emerging Trends and Shifts – A Perspective from Consumer Organizations," New Delhi.
Miyagishima, Kazuaki (2008) "Codex Alimentarius International Food Standards," Noida.
Moore, Kelly, et al. (2011) "Science and Neoliberal Globalization: A Political Sociological Approach," 40 *Theory and Society* 505–32.
Nair, G. K. (2004) "Spices Board to Take up Sudan Dye Issue with EU at Spain Meet," *Business Line*, Jun.1.
Padmapriya, J (2004) "Grape Exporters Face Stricter EU Quality Norms," The Economic Times.
Palthur, M. Prasad, et al. (2009) "The Food Safety and Standards Act, 2006: A Paradigm Shift in Indian Regulatory Scenario," 7 *Pharmaceutical Rev.* 14–20.
Poli, Sara (2004) "The European Community and the Adoption of International Food Standards within the Codex Alimentarius Commission," 10 *European Law J.* 613–30.
Polillo, Simone, & Mauro Guillen (2005) "Globalization Pressures and the State: The Worldwide Spread of Central Bank Independence," 110 *American Journal of Sociology* 1764–1802.
Ponte, Stefano, & Peter Gibbon (2005) "Quality Standards, Conventions and the Governance of Global Value Chains," 34 *Economy and Society* 1–31.
Prakash, Satya (2012) Status of Food Laboratories in India. Centre for Science and Environment.
Quark, Amy (2012) "Scientized Politics and Global Governance in the Cotton Trade: Evaluating Divergent Theories of Scientization," 19 *Rev. of International Political Economy* 895–917.
Radaelli, Claudio M. (2004) "The Puzzle of Regulatory Competition," 24 *J. of Public Policy* 1–23.
Randell, Alan (2002) "Scientific Basis for Setting Food Standards Through Codex Alimentarius," *Food, Nutrition, and Agriculture* 7–13.
Rao, K. Rajeswara (2008) "Initiative by the MoFPI on Food Safety and Quality," Noida.
Reardon, Thomas, et al. (1999) "Global Change in Agrifood Grades and Standards: Agribusiness Strategic Responses in Developing Countries," 2 *International Food and Agribusiness Management Rev.* 421–35.
Reus-Smit, Christian (2004) *The Politics of International Law*. New York: Cambridge Univ. Press.
Roberts, Donna, & Laurian Unnevehr (2005) "Resolving Trade Disputes Arising from Trends in Food Safety Regulation: The Role of the Multilateral Governance Framework," 4 *World Trade Rev.* 469–97.
Ronald, Bindu Samuel (2006) *Market Access for Agricultural Products*. Working Paper, School of Economic and Business Laws, West Bengal National University of Juridical Sciences & UNDP.

Roy, William G (1997) *Socializing Capital: The Rise of the Large Industrial Corporation in America*. Princeton, NJ: Princeton Univ. Press.

Schofer, Evan (2004) "Cross-National Differences in the Expansion of Science, 1970–1990," 83 *Social Forces* 215–48.

Sinha, A. (2007) "Global Linkages and Domestic Politics: Trade Reform and Institution Building in India in Comparative Perspective," 40 *Comparative Political Studies* 1183–210.

Swinnen, Johan, ed. (2007) *Global Supply Chains, Standards and the Poor: How the Globalization of Food Systems and Standards Affects Rural Development and Poverty*. Cambridge, MA: CABI.

Thornsbury, Suzanne (2000) Sanitary and Phytosanitary Issues: Where Does the WTO Go from Here? Working Paper, Institute of Food and Agricultural Sciences, University of Florida.

Traill, Bruce W., et al. (2002) Report of the Evaluation of the Codex Alimentarius and Other FAO and WHO Standards Work. FAO & WHO.

Veggeland, Frode, & Svein Ole Borgen (2005) "Negotiating International Food Standards: The World Trade Organization's Impact on the Codex Alimentarius Commission," 18 *Governance* 675–708.

Vogel, David (1995) *Trading Up: Consumer and Environmental Regulation in a Global Economy*. Cambridge, MA: Harvard Univ. Press.

——— (2012) *The Politics of Precaution: Regulating Health, Safety, and Environmental Risks in Europe and the United States*. Princeton, NJ: Princeton Univ. Press.

Winickoff, David, & Douglas Bushey (2009) "Science and Power in Global Food Regulation: The Rise of the Codex Alimentarius," 35 *Science, Technology & Human Values* 356–81.

Jessica Epstein *is a Visiting Assistant Professor in the Sociology Department of Reed College. She received her PhD from the University of Arizona in 2011. Her primary research interest is the global governance of food safety. Her work examines how global and transnational governance institutions bring pressure to bear on domestic systems of regulation and production, and how scientific technologies of governance mediate the global–local relationship.*