

# The Welfare Effects of Trade in Phytomedicines: A Multi-Disciplinary Analysis of Turmeric Production

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**Summary.** — International trade in medicinal herbal products is growing, while value chains are becoming more complex and governed by a range of public and private standards. There is a debate over the extent to which phytomedicine production can be beneficial for farmers in low- and middle-income countries. More generally, there are varied views about the extent to which small farmers are disadvantaged by stringent public health and private consumer standards in northern markets for agricultural products. This paper proves a comparative analysis of value chains, using case studies of turmeric production in India. It marries a qualitative investigation of turmeric producing sites in India with an investigation into the chemical quality of various turmeric products. The aim of the paper is to understand the way that varied structure and governance of value chains changes the benefits to both producer and consumer. When production is for the organic northern market, we found evidence of a “captive” value chain, where the lead firm requires strict adherence to conditions of production and processing. Prices for farmers were relatively stable, at a reasonably high level. In contrast, where farmers were producing for local markets, including the major auction at Erode, prices were volatile and farmers bore considerable risk. We found that competition and volatility in the market-based chain can lead to turmeric adulteration and contamination, both intentional and unintentional. Our case study suggests that many small turmeric farmers would find it difficult to meet both public and private health standards, in contrast to some academic literature that argues that public health standards do not discriminate against small farmers. More than this, our study adds to the discussion of the impact of standards, suggesting clear consumer benefits in northern markets. However, there are also indications that only larger and more dynamic farmers can participate in the lucrative phytomedicine trade. As such, our study tentatively supports previous literature suggesting that the application of standards in northern markets lead to increasing farmer differentiation.

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## 1. INTRODUCTION

While there is a long history of trade in phytomedicine, (defined as medicinal products prepared from plants and used in the form of extracts or ground plant material), growth in the last few decades has been particularly rapid (Robinson & Zhang, 2012, pp. 5–6). Inconsistent terminology confounds clarity on production estimates, but the value of traditional medicine production (including herbal, mineral and animal products) was estimated to be worth US\$83 Billion in 2008 (Robinson & Zhang, 2012), on par with the American weight loss industry (\$61 Billion) (LaRosa, 2011) or the worldwide cosmetics industry (\$170 Billion) (Romanowski, 2010). Further, medicinal plant trade may be even more volatile than standard agricultural trade, as it is susceptible not only to weather shocks and disease outbreaks, but also to rapid changes in consumer fashions. Heinrich, Danji, and Casselman (2011) note that the declaration of a herbal medicinal product as a superfood leads to sudden consumer booms and rapid price rises.<sup>1</sup> A prime example is Honeysuckle, which is used in Influenza treatments and has recently been added to health drinks in China; consequently the price has increased from a stable average of US\$20 per kilo over the period 2004–08 to almost US\$100 per kilo in 2010 (Yeoh, 2010). This price volatility is likely to be greater at the level of the individual country, as global market volatility is compounded by sudden changes in the sourcing practices of dominant buyers, who provide access to lucrative Northern markets (Neimark, 2012, pp. 431–432).

This article will use the example of turmeric from India to explain how, along with changes in trade and production volumes, the nature of the value chains that link producer with consumer have grown more complex. Using an innovative multi-disciplinary approach, this paper is able to comment not only on market outcomes and participation, but also on product quality by including a study of chemical composition.

Overall the paper argues that in the case study areas, farmers who can sell medicinal turmeric to quality-controlled export markets are able to achieve more stable prices than those that sell it for food use in local markets. This in itself is unsurprising. What is of interest is the way that both public and private standards change market outcomes and participation. We shall see that there has been a debate about the impact of standards, commonly separated into public and private standards. Standards, like state-encoded health standards, may be thought of as public, as states regulate and enforce these standards. An example of the relevant public health standards in this case, are those produced and encoded by The Food Standards Agency (FSA) who are responsible for the safety and quality of foods and food supplements in the UK. Private standards are those that are adopted voluntarily by companies or organizations, even though they may be

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codified at the international level. In this case study, organic production is defined as a private standard.

We find that standard setting forces lead firms into closer relationships with producers. For consumers of turmeric, this leads to a superior product if assessed in terms of pesticide, colorant, and preservative addition, as well as active chemical compounds. There are clearly benefits for farmers who can participate in these higher value chains. However, these are likely to be large or middle-sized dynamic farmers. As such the paper is important in extending our understanding of the impact of public and private standards on the benefits of trade (Melo, Engler, Nahuehual, Cofre, & Barrena, 2014).

The overall implication of our research is that the constrained access to high value Northern markets and the complex public and private regulation of medicinal turmeric means that only richer farmers can participate. However, the quality of the product is far higher than that in unregulated markets, where market competition and volatility lead to adulteration. This paper contributes to the small literature on global value chains (GVCs) in phytomedicine. In its discussion of a “captive” value chain, using the definitions set out in Gereffi *et al.* (2005), our research also confirms many of the concerns raised in wider literature on food safety regulations and quality standards. Importantly, it adds to the debate over the impact of standards by combining qualitative analysis with the chemical analysis of turmeric products. Linking the results allows us to consider some aspects of the impact of standards commonly excluded in the literature – that is the impact for consumers.

In methodological terms, the choice of contrastive case studies, semi-structured interviewing and non-participant observation has its strengths in uncovering the dynamics behind participation in particular value chains. However, it does preclude making strong statements about the net impact of various kinds of value chain on producers. At the same time, given the complexity of the issues raised by the trade in phytomedicines, this paper illustrates how inter-disciplinary approaches can give new insights.

The paper first reviews the literature on the impact of standards in agricultural value chains, before setting out the nature of phytomedicine production in India. The case study and research methods will then be outlined. The first of two results sections will describe the various value chains for turmeric, while the second will set out the character of standards and governance in those chains. The article ends with a discussion of the implications of this research for the wider debate over the value of agricultural standards and the impact of phytomedicine trade.

## 2. TRADE AND STANDARDS IN AGRI-FOOD VALUE CHAIN FRAMEWORK

Barrett *et al.* (2012) argue that the emergence of export value chains benefits participant farmers, who will improve their productivity and profitability, and in doing so, contribute to economic development. However, they recognize that the size of the benefit to participating farmers is uncertain, and is likely to be smaller where there are unanticipated risks or where buyers enjoy contractual bargaining power over farmers. There has been a long debate over the impact of contract farming (see Bellemare, 2012; Masakure & Henson, 2005). Bellemare's (2012) study of the impact of contract farming in Madagascar suggested a small positive income benefit, using an innovative statistical methodology that attempted to control for the differences between contract farming

participants and non-participants. However, much of the debate has moved away from looking at average impacts to looking at the distributional impacts, with Watts arguing that contract farming promotes social differentiation (1994, p. 54).

The GVC approach, with its investigation of power relations in agri-food chains (Fullbright, 2008; Gibbon & Ponte, 2005; Kaplinsky, 2004), can illuminate some of the reasons for differential outcomes, but has only been applied in a limited way to medicinal plant products. Where research has taken place, there is a concern that significant power imbalances in the chain work against producers and Neimark (2012, p. 424) has referred to these imbalances as “green grabbing”, arguing that the collectors of plants are at extreme disadvantage to pharmaceutical companies.

The strengths and weaknesses of the GVC approach have been debated widely, with concern that it cannot effectively analyze consumption and employment (Bair, 2005; Bernstein & Campling, 2006; Palpacuer, 2008; Riisgaard, 2009; Smith *et al.*, 2002). The GVC analysis usually ends at the level of the retailer (rather than consumer) and begins with the farmer (rather than the farmworker) (Bair, 2005). Similarly, our paper does not investigate how the demand for turmeric is formed in Northern markets, neither does it consider the environmental, gender, or labor issues related to turmeric production. As such, the study raises issues for future investigation.<sup>2</sup>

Using the GVC approach, many authors suggest that lead firms have increasing power in agricultural value chains due both to greater market concentration and more stringent food safety regulations in northern retail markets (e.g., Ortiz & Aparicio, 2007; Selwyn, 2007). Thus, the application of public and private regulations is a key issue in shaping power relations in agricultural value chains. Among the positive effects of regulations, they generate a common language for all in the value chain and stimulate demand by increasing consumer confidence (Melo *et al.*, 2014). On the negative side, certain farmers suffer due to an inability to meet standards. Crucially Melo *et al.* (2014) argue that the impacts are complex and extrapolating from one example of standards imposition can result in misleading estimates of their impact. However, Coslovsky (2014, p. 33) summarizes the empirical evidence to suggest that small producers, those in the poorest countries, and those exporting lightly processed commodities tend to experience the largest losses when standards are introduced.

In their review of the literature, Hansen and Trifković (2014) argue that the impact of food standards may induce negative externality effects on poor farmers because the inability to comply with food safety and quality standards in high value markets can result in selling to far less profitable alternatives. Similarly, they argue that it could be the case that the richest farmers already received high prices (for their high quality output) and so find that there is no gain from adopting new standards. In their study of the impact of standards on the pangasius value chain in Vietnam, the overall outcome of food standards seems to be positive only for upper-middle class farmers, while others only benefit from better labor market opportunities. However, not all standards are likely to have the same impact (Melo *et al.*, 2014). Tran, Bailey, Wilson, and Phillips's (2013) study of the shrimp sector suggests that food safety standards are within reach for small-scale shrimp producers, as generally they do not use antibiotics or other prohibited chemicals. However, the traceability requirements of social and environmental standards lead some processors to consider producing shrimp themselves or to promote vertical integration with larger shrimp producers. Both approaches facilitate traceability, but marginalize small-scale shrimp farmers and traders, forcing them to produce only for less

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