

Developing-country Producers and the Challenge of Traceability

At the opening of the last century the introduction of mass production techniques (the assembly line, specialization, and replaceable parts) fostered unprecedented expansion of consumer goods through the production and distribution of identical goods at increasingly lower unit costs. In the early decades of the 21st century, the basic concept of a commodity as a mass-produced unspecialized product is evolving with the growing recognition that every unit of product has uniquely identifiable traits that can be tracked from origin to consumption and that confer different market value.

The implications of product traceability, or tracking products from origin to consumption (“farm to fork”), affects virtually all development sectors—agriculture (food safety), health (counterfeit pharmaceuticals), security, the environment (carbon footprint), governance (diversion of commodities), and the application of technology. While the impact of traceability is most immediate for goods entering developed country markets, traceability will increasingly be adopted in

developing countries, particularly given the rise of a growing consumer middle-class and the relatively higher levels of fraudulent or dangerous products entering those markets.

Governments and donors are implementing numerous programs that seek to expand opportunities for developing-country producers, particularly in the agriculture sector, to export directly to developed country markets. The benefits are obvious—higher prices and improved quality standards. The costs related to implementation of traceability, however, will require substantial investment, and will be especially challenging for the small-scale agricultural producers targeted by assistance programs. The challenges for integrating women producers will require special attention, given that female smallholder farmers are generally both less capitalized and have less access to new technology.

As developing countries seek to diversify their economies beyond exports of primary agricultural commodities and integrate into global manufacturing supply chains, the challenges



Sorting organic coffee beans in Aceh, Indonesia. USAID is improving production and processing techniques that bring added value to the local coffee. | Photo: USAID/Indonesia

associated with compliance will only grow more complex. Traceability is a challenge that developing-country producers already struggle with in products such as apparel, where eligibility to claim tariff preferences depends on the importer's ability to identify the source of every fabric and trim used to produce a given garment. Development of competitive agricultural and manufacturing export industries will depend on finding innovative and scalable solutions to address these challenges.

Traceability in Your Kitchen and Your Medicine Cabinet

Traceability is no longer an abstract concept. Anyone who has recently baked cupcakes for a kindergarten class understands that our relationship with the products we consume has

dramatically changed. With the rise of childhood food allergies and dietary restrictions, baking requires a precise understanding of exactly what we are consuming. We must know the list of ingredients, and also whether they have been processed with other products that contain allergens.

The time when products were indistinguishable is disappearing. Consumers, government regulators, and private companies are demanding to know not only the country but the farm where a tomato or pepper was grown, the date and time it was harvested, production conditions (seeds, fertilizers, pesticides, water usage, labor), and how and when it was transported (temperature). The capability to track such information is not new. The U.S. agricultural sector has already developed a sophisticated capacity to track the flow of food along the supply chain, with some sectors capable of

tracking food from the minute of production or the exact area of a field where it was grown.¹ What has changed is the breadth of products covered, the level of detail, the technology, the need to integrate data across firms, and the disclosure of that information to consumers. The products where traceability is being applied include livestock, agriculture, toys, apparel, pharmaceuticals, consumer products, construction materials, jewelry, and “conflict minerals.”

Traceability has overwhelmingly been driven by the private sector, utilizing private voluntary standards, in response to its own economic incentives. On the “soft” side, traceability is being introduced to provide assurance, via independent auditing by third-party organizations, to consumers that are willing to pay premiums for organic, fair trade, hormone-free, “local,” or “sustainable” products. Beyond appealing to consumers, it is used widely as a supply-chain management tool to reduce the costs of recalls and improve inventory management and controls.

Increasingly, however, traceability is also being driven by “hard” requirements, such as laws, regulations, and international agreements that require importers to document the chain of production and custody to ensure a variety of societal objectives, including:

- Food and medicine safety
- Protection of intellectual property rights
- Human rights
- Labor standards
- Environmental protection

Examples include the Lacey Act (wildlife/fish/plants/timber), the Extractive Industries Transparency Initiative, the Kimberly Process (diamonds), Consumer Product Safety Improvement

¹ Elise Golan, Barry Krissoff, Fred Kuchler, Linda Calvin, Kenneth Nelson, and Gregory Price, “Traceability in the U.S. Food Supply: Economic Theory and Industry Studies,” USDA Economic Research Service, Agricultural Economics Report No. 830, March 2004.

Act (children’s products), and Dodd-Frank (conflict minerals). Enhancing enforcement of sanctions regimes is an area where traceability will also become increasingly important.

While these “hard” requirements have largely been legitimate responses to demonstrated failures of private markets to offer sufficient protections, the potential for abuse of traceability requirements by governments will need to be watched closely. Some would use them as trade barriers to protect favored domestic industries in sensitive products, such as agricultural goods. Governments and donor agencies should monitor the development and enforcement of these requirements closely, lest they undermine fundamental objectives, such as the development of harmonized regional markets for agricultural products.

The promise of traceability to improve public health and food safety is particularly noteworthy. The massive increase in counterfeit drugs on the market—associated with drug cartels and other organized crime—has been particularly high in developing countries. And millions of people each year in the United States alone are stricken with foodborne illnesses. New technologies that identify bad actors involved in manufacturing counterfeits or that speed recalls of contaminated food demonstrate the potential gains to be made for consumers and public health outcomes.

Seeking Innovative, Cost-effective Solutions That Can Achieve Scale

The challenge for developing-country firms, governments, and donors is to adapt programming to the rapidly evolving realities of the market. Firm-level solutions to meeting export standards are well known and have been integrated into numerous USAID and other donor trade capacity-building programs. However, these interventions have generally worked with a relatively small number of firms



Naz Gul sits outside school in the village of Chaghai with her family's monthly ration of wheat, received from USAID. | Photo: WFPP

or farms concentrated in a handful of products. The results at the firm level may be meaningful, but rarely do they transform the sector or the country. What is required are innovative technical assistance models with the potential for scale-up and cost-effective delivery.

In pursuit of innovation, the potential for public-private partnerships is compelling. Virtually all interventions will benefit from the technical expertise and financial resources of the private sector, leveraging potential collaborations with international buyers and retailers, private and government standard organizations, third-party auditors, traceability solution providers, transport providers, and financial institutions.

Given that the growth of traceability has been enabled by the increasingly low costs of the underlying technologies—such as electronic product codes, labeling systems, and radio frequency identification devices—the opportunities to partner with technology firms are particularly interesting. The African Cashew Initiative, for example, is a public-private partnership with SAP Research to create a smartphone application that enables tracing of Ghana's cashew supply.² The technology assigns every farmer a unique barcode

² Grace Hoerner, "Innovative Technology Brings Traceability to Cashew Sellers and Buyers," West Africa Trade Hub, August 12, 2011, <http://www.watradehub.com/activities/tradewinds/aug11/innovative-technology-brings-traceability-cashew-sellers-and-buyers>.

that is attached to each sack of cashews produced from that farm. The buyer then uses a smart-phone that registers the barcode and generates a price based on the weight of the cashews and prevailing market prices. A digital receipt of the sale is sent via text message and can serve as the basis for demonstrating sales and cash-flow data that could also help farmers obtain financing. Although the initial pilots rely on subsidies, the more exciting possibility is that private firms or associations develop a sustainable business model that can accelerate the widespread adoption of these emerging technologies.

Integrating developing-country producers into international supply chains, even in large countries with major export sectors, is not an insurmountable task. In Thailand, technology-driven traceability techniques have already been introduced for some commodities (chicken, seafood, fruits, and vegetables) to document the farm of origin, date of harvest, location, and even temperature during shipping.³

Technology is not a panacea. Structuring collaborations with local financial institutions to deliver innovative financing mechanisms to small firms will be required. Developing credible local standards bodies to audit and certify compliance with both public and private traceability requirements should be a priority given the small presence of such organizations in the developing world. Success will also require partnerships within the U.S. government that recognize and leverage the expertise of other agencies such as the Department of Agriculture, the Food and Drug Administration, the Department of Commerce, and Customs and Border Protection.

³ IBM, press release, "IBM, FXA and Thailand's Ministry of Agriculture Join Forces on Global Food Safety," March 26, 2011, <http://www-03.ibm.com/press/us/en/pressrelease/29756.wss>.

An Afghan vendor arranges mangoes on a mobile stand in Kabul. Fruit production levels have increased in Afghanistan in recent years, but problems with packaging and distribution are stifling the country's ability to reach markets beyond its borders. | AFP Photo: Shah Marai

Making Government More Responsive and Accountable

For the public sector, traceability has the potential to improve service delivery while reducing opportunities for corruption and waste. USAID's experience in working with developing countries on supply-chain management of health commodities such as antiretroviral drugs, test kits, and laboratory supplies has demonstrated the possibility of tracking the movement of all products from the point of shipping, through regional distribution centers, down to local medical facilities operated by ministries of health. The technology allows the tracking of inventory down to the location of pallets, as well as the capacity to manage stock levels, plan purchases, and monitor expiration dates. The effectiveness of these systems directly contributes to saving lives, while building confidence for the public and donors supporting these systems. Traceability can begin to give governments, citizens, and donors the information necessary to track the delivery of medicines, equipment, fertilizer, textbooks, construction materials, and emergency food and humanitarian supplies to their destination. The technology exists if the political will is present.

The world is changing. It's time our development model did as well.

Cory O'Hara is a trade and investment advisor in USAID's Trade and Regulatory Reform Office. The views expressed in this essay are his own, and do not necessarily represent the views of the United States Agency for International Development or the United States Government.