BUSINESS MODEL PROFILES: WATER
SUMMARIZED FROM THE FORTHCOMING PUBLICATION
RESOURCE RECOVERY FROM WASTE

CGIAR RESEARCH PROGRAM ON Water, Land and Ecosystems
LED BY: IWMI International Water Management Institute

Increasing Safety in Informal Wastewater Irrigation

Business characteristics

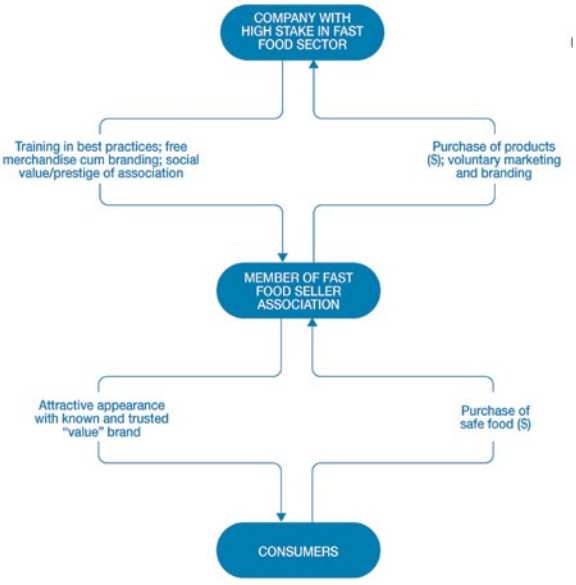
Geography	Informal irrigation sector in the Global South using unsafe wastewater in semi-arid to humid regions; estimated at about 30 million hectares globally
Scale of production	Small to medium scale (e.g., at farm level: 100 to 1,000+ farmers per city)
Type of organization	Private sector
Investment cost range	E.g., USD 900,000 (targeting 2,000 farmers), USD 1,400,000 (targeting 5,000 street kitchens) for awareness creation and training
Key costs	Training and awareness creation, brand promotion, merchandizing items, social marketing studies, credit and input support for farmers, and compliance monitoring/certification
Revenue stream	Product sales on national market, with option for export, and long-term revenues via sustainable sourcing, image support (clean, safe, responsible, green), and international competitiveness

Business model

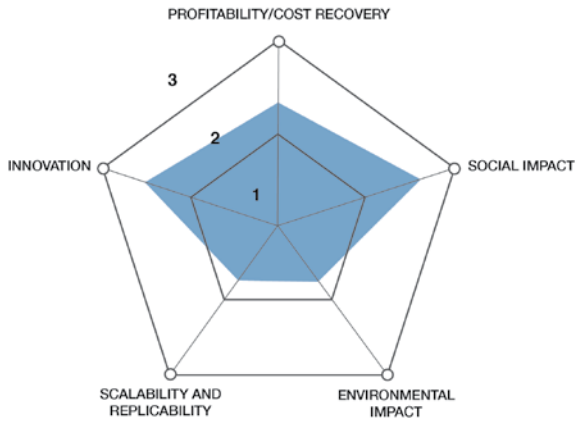
Informal wastewater reuse with untreated raw or diluted wastewater is ten times more common than the planned reuse of treated wastewater. **The business model looks at ways in which these informal wastewater reuse practices can be formalized through public and/or private initiatives, and thereby increase the safety of the water consumed.** This can be achieved, for example, through:

1. **Corporate Social Responsibility (CSR):** Where the public sector is facing its limits, the private sector can play an important role in supporting occupational and consumer safety, while improving its own personal image at the same time. Companies can intervene at various risk barrier points along and beyond the food chain, including: at the wastewater treatment stage, by investing in their own water treatment facilities; at the farm level, by ensuring that their suppliers using wastewater for irrigation meet international quality and sustainability standards; and during post-harvest and food processing, by training food sellers using their products to ensure the food is properly prepared and health risks eliminated.
2. **Selling wastewater:** Where farmers compete for wastewater rights, water sales or auctioning can improve cost recovery for local water utility companies. It can also turn informal wastewater use into formal wastewater use, and gives farmers and authorities a platform for dialog to address issues such as health risk mitigation.
3. **Farmer innovation:** Farmers often work together to set up basic wastewater infrastructure (like storage reservoirs), which also serve water treatment processes. Supported by dialog and awareness creation, these basic systems can be upgraded to improve their water treatment capacity for reduced health and environmental risks from wastewater use.

SOCIAL RESPONSIBILITY/MARKETING MODEL FOR INCREASING SAFETY IN THE FAST FOOD SECTOR



Business performance for CSR model



The business model scores particularly high on social impacts with reduced expenditure on public health and support for the informal irrigation sector often dominated by migrants or other social minorities. It is also highly innovative given the novelty of using CSR models to increase food safety. However, it requires more experience and practical examples before the scalability and replicability can be assessed, and its environmental impact is limited as long as the focus is on human exposure and behavior change.

Main risks

Market risks: Household demand for the microbiologically safer food will remain initially an unreliable factor as educational levels do not support such a risk awareness. Also, companies might not engage in the support of the farming communities using wastewater as long as they can source safer supply chains.

Competition risks: Unsafe produce can have a price advantage. Awareness creation and social marketing flagging the difference between safe and unsafe produce can decrease the market demand/share of unsafe produce. Care has to be taken that safe and potentially still unsafe marketing channels are kept separate.

Political and regulatory risks: As the public sector is a partner in the model, compliance will be monitored depending on local capacity. A challenge can come from a regulatory framework which is not supporting a step-wise and multi-barrier Hazard Analysis and Critical Control Points (HACCP) approach provided by the World Health Organization (WHO) to move towards safer wastewater irrigation or food safety in general.

Safety, environmental and health risks: Given low risk awareness, currently, all leafy vegetables have to be considered risky. As the model is based on a step-wise risk reduction, incentivizing human behavior change and a high degree of compliance, some risks will remain and have to be addressed through different mitigation measures.

Case study for CSR model: Ghana

In Ghana, about 90% of the leafy, exotic vegetables, like lettuce, are irrigated with highly polluted water and eaten raw as a supplement to popular fast food dishes in the urban street food sector, while cooked traditional vegetables are served at home. For authorities and nongovernmental organizations (NGOs), the street food sector is a highly challenging informal environment to enter and regulate. The food company, Nestlé, however, supplies the street restaurant sector across West Africa with ingredients, like Maggi™ bouillon cubes, and uses its branding power to maintain close links within the sector. As part of Nestlé's consumer service program, the company initiated the formation of trader associations, like the Maggi™ Fast Food (Seller) Association (MAFFAG) in Ghana, which has become the strongest association in the country's street food sector. MAFFAG regularly provides training in food preparation, cooking, environmental hygiene and food safety throughout the country, combining elements of corporate responsibility with branding, free merchandise and product promotion. Compared with governmental events, the MAFFAG workshops and training programs are very popular, well attended and positioned for addressing food-safety concerns related to contaminated vegetables. This offers a comprehensive entry point into the sector for health risk reduction.

For more information on the business model and related cases, see Chapter 18 of **Otoo, M.; Drechsel, P. (Eds.). 2017. *Resource recovery from waste: Business models for energy, nutrient and water reuse in low- and middle-income countries.* London: Earthscan/ Routledge. In press.** The book has been produced by the Resource Recovery and Reuse subprogram of the International Water Management Institute (IWMI), under the CGIAR Research Program on Water, Land and Ecosystems (WLE) and its Rural-Urban Linkages Research Theme. The support of the Swiss Agency for Development and Cooperation (SDC), the International Fund for Agricultural Development (IFAD), and CGIAR Fund Donors (www.cgiar.org/about-us/our-funders/) is gratefully acknowledged.