



# Safe and productive use of waste for urban and periurban agriculture - RUAF experiences in WASH

## Key lessons

Increasingly, people recognise the value of municipal wastes and farmers are willing to use and pay for organic fertilizers such as urine and (co-)compost. Bringing added value to these resources requires stimulation of the demand for urban and periurban agriculture and its multiple functions. Key challenges are the negative perception by the general public and authorities on use and profitability.

In each city or town, the potential for safe and productive use of solid and liquid waste for urban and periurban agriculture is unique and requires proper analysis, piloting, monitoring and planning, and policy development.

The paradigm shift required along the WASH (urban) sanitation, Energy and Food Security Nexus, requires an integrated approach, seeking synergies among different sectors and multi-stakeholder involvement, stimulation of small and medium entrepreneurs along the chain, and participative monitoring of innovations. Indeed the challenge to ensure that innovations are safe and protect the environment is key.

Although contextual conditions in other, smaller, towns and cities are different from those in or around the larger cities, opportunities exist in these rapidly growing urban centres in relation to greening and other environmental functions, small scale commercial farming and home (backyard or rooftop) gardens of low income households.

FIETS monitoring shows the important role of multi-stakeholder involvement and participatory piloting of innovations in creating change in financial and institutional sustainability.

## Introduction

'Safe and productive use of solid and liquid waste' implies using rainwater or wastewater (treated or untreated) and organic waste (including human/ animal excreta) in small-scale urban and peri-urban agricultural production, as part of resilient urban development.

Within the framework of the WASH Alliance International (WAI), the RUAF Foundation, worked on this theme with local partners in five countries: Ghana, Nepal, Kenya, Ethiopia, and Bangladesh. The objectives were to:

1. put this theme on the policy agenda and to raise awareness among key stakeholders;
2. support innovations, demand creation and business thinking along the sanitation – agriculture value chain, and
3. support farmers and their organisations, in business development and in giving them a voice and place in city multi-stakeholder platforms.

Activities were:

- multi-stakeholder involvement, assessments on UPA and the potential use of wastes, policy influencing, and awareness-raising, linking WASH, food security, and climate change adaptation and mitigation;
- stimulation of local, small-scale innovations and commercial and social enterprises along the service and value chain;
- Participatory research and systematisation of experiences (including FIETS monitoring), and the development of various materials including policy briefs and fact sheets;
- an international sharing and learning workshop that included the other WASH partners.

All of these seek to contribute to the WAI theory of change: developing a functioning and enabling WASH market, an enabling public sector, and empowered citizens, by creating synergies among sectors, stimulating short cycles (of water and nutrients), bringing added value to the sanitation chain, and facilitating changes in perception and policies.

## Seeking synergies

More and more, people are concentrated in and around cities. This urbanisation goes hand in hand with an urbanisation of poverty and with living in slum areas where people lack proper service delivery. Other related challenges are the increased pressure on efficient waste management, on preservation and protection of the environment, and on ensuring (food) safety. Sustainable urban development in the context of climate change and food security requires enhancing the quality of life while simultaneously minimizing resource extraction, energy consumption and waste generation, and also safeguarding ecosystem services. This depends on proper planning, on how settlement-based energy, waste, transportation, food, water, and sanitation systems are expanded and/or reconfigured.

RUAF and the WASH Alliance develop environmentally sustainable solutions, such as eco-sanitation and safe and productive use of wastes. These consist of sanitary facilities that not only utilise water recycling, but also process sewage for agricultural purposes, or rainwater retention – a good alternative to the use of ground water. Synergies are sought along the WASH, food security and climate change nexus, developing innovations and business opportunities. Closing the water and nutrient loop is a key aspect, taking a business approach in developing service and value chains together and connecting to resilient city region food systems. Building resilience in and around towns and cities requires an integrated approach and facilitation of new alliances between the water, sanitation, and environmental and agricultural sectors.

Along the Sanitation Service and Use/UPA value chain, there are various opportunities for small and medium enterprises to develop innovative businesses. This needs to be stimulated and allowed by governments at various levels and supported by

### Five Criteria for Sustainability

To assess, decide upon and monitor actions to ensure that water and sanitation services are reliable and lasting, the FIETS sustainability approach has been developed by the Dutch WASH Alliance. This framework is also used by the Dutch Government, and identifies five key areas of sustainability that need to be addressed in order to achieve structural impact: Financial, Institutional, Environmental, Technological and Social sustainability. RUAF and its partners developed a simple and qualitative tool to monitor their work under the WASH alliance, using the FIETS framework, designed in such a way that it facilitates awareness and understanding of sustainability, and stimulates discussion (see separate fact sheet on this).

financial institutions. The multi-stakeholder policy influencing (Institutionalisation) and the WASTE-diamond approach (Financial) have shown their importance in working with recycling-oriented productive sanitation, creating new alliances between the water, sanitation, and environmental and agricultural sectors and linking to the development of resilient city region food systems.

In each country, key actors in and around the cities of Tamale in Ghana, Birendranagar in Nepal, Satkhira in Bangladesh, Dire Dawa in Ethiopia and Nakuru in Kenya regularly meet to discuss and learn together, jointly influence policy and regulations, and as such contribute to a functioning and enabling WASH market, that empowers farmers and citizens. RUAF and their local partners stimulated a number of innovations in safe and productive use of waste for urban and periurban agriculture. These are briefly highlighted on the next page, and a separate innovation fact sheet is available on each.

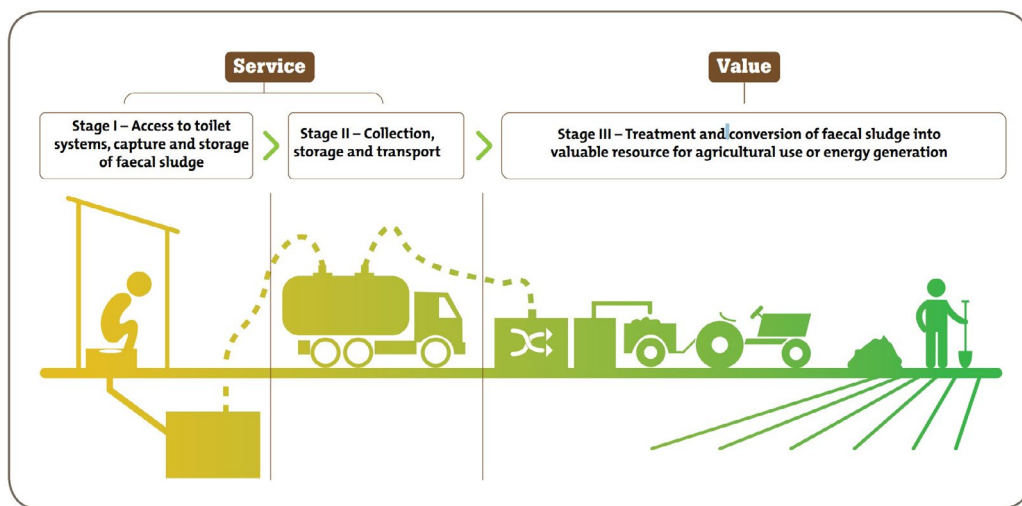
### Possible sources of WASTE:

- Kitchen, garden and market bio-wastes for producing (co-) compost (in combination with faecal sludge);
- Bio-solids from dry/composting toilets and faecal sludge from septic tanks and pit latrines (drying, storage and co-composting or pelletisation);
- Urine diversion preparation of liquid fertiliser (public or eco-san toilets);
- Rainwater collection and multiple use services (MUS), low-cost and water-efficient irrigation;
- Household wastewater use (on- and near-site low-cost treatment systems and health risk reduction along the chain).

### Creating demand of these resources in:

- Backyard / home gardening (container gardening and other “low-space” technologies; small livestock);
- Community gardening and multi-functional agriculture;
- Consumer-supported organic or conventional horticulture, box schemes and other “direct” marketing mechanisms;
- Institutional integrated gardens, such as school gardens (with rainwater harvesting, eco-sanitation, and biogas);
- Periurban and (nearby)rural small-scale and larger farms that are willing to buy “new generation” fertilisers.

Possibly linked to energy recovery: linking it to biogas (especially as part of business development and health-risk reduction).



Sanitation Service and Use / UPA value chain

## Tamala, Ghana: decentralised co-composting

The production of high-quality and relatively cheap organic fertiliser has great potential in Ghana. RUAF supported the University of Development Studies (UDS) and URBANET in experimenting with and upscaling co-composting. Co-composting is controlled aerobic degradation of organic materials using different types of organic waste. A successful social enterprise in Tamale, DeCo!, segregates waste and sells compost to communities. In addition to municipal waste, chicken droppings, shea butter slurry, etc., faecal sludge was added as a component to demonstrate cost recovery and business opportunities along the sanitation chain. Together with different farmer groups and URBANET, UDS undertook research and conducted field experiments on the benefits and improvements of co-compost. To allow for participative experimentation, awareness-raising and joint learning, they chose a local, decentralised approach; this also favoured joint learning with other key actors, and the development of small businesses. This work was done in close collaboration with TUWSP (the Tamale Diamond) and with the Multi-Stakeholder Platform on UPA. A Policy Framework and City Agenda on UPA, including co-composting, was developed and adopted by the platform. Monitoring was undertaken for the co-composting of several small farmer groups.



## Surkhet, Nepal: integrated WASH for schools and households

In Nepal, many new municipalities have recently been created by adding VDCs (Village Development Committees) to urban centres. These municipalities are responsible for solid and liquid waste management, but the majority of them lack a proper solid and liquid waste-management system. In Surkhet/Birendranagar, there is neither a proper landfill site for waste disposal nor a central sewerage system. RUAF collaborated with ENPHO (and with Dutch WASH Alliance members WASTE and RAIN) on capacity development, awareness-raising and dissemination. As well, collaboration extended to the development of innovations and a business approach to sanitation, like eco-san and public (and mobile) toilets and the use of urine and compost by periurban, and selected urban, households (with a rooftop or small garden). ENPHO also collaborated with selected schools in Birendranagar Municipality and nearby Baddichaur (Janajyotee Higher Secondary school) on an integrated school-WASH system. In addition, ENPHO regularly met with the DWASCC and MWASCC (WASH committees at district and municipal levels) to promote awareness and learning, and assist in the development of municipal planning on WASH and food production.



## Satkhira, Bangladesh: adding value to faecal sludge treatment

The Government of Bangladesh strongly encourages waste recycling to produce and promote the use of biofertiliser. Practical Action Bangladesh (PAB) and WASTE developed a pilot in Satkhira for the collection and treatment of faecal sludge. This is a profitable business. In order to prevent sludge dumping practices and stimulate linkages with other issues and sectors (adaptation to climate change, flooding and food security), RUAF collaborated with PAB on the development of co-composting of the de-watered slurry, and the use of organic fertiliser in both urban low-income settlement and periurban small-scale agriculture. PAB and RUAF organised a series of meetings with key

stakeholders, also involving linkages to other support to urban development in order to include attention to safe and productive use of wastes. PAB worked with periurban farmers and with households in selected slum areas in testing and awareness raising on the use of the co-compost in Satkhira. Monitoring of the faecal sludge treatment plant and the compost production showed high business potential and a rapid increase in perceived sustainability. Key stakeholders were involved in this work, and lessons were fed back to the multi-stakeholder platform on UPA and the Diamond.



## Kajiado and Nakuru in Kenya and Dire Dawa, Ethiopia: linking UPA to the national programme

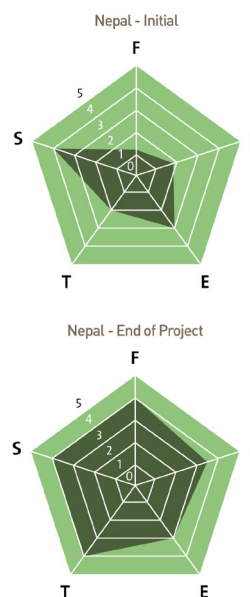
Using experiences with UPA in Nairobi, RUAF collaborated with Practical Action Kenya (PAK) and WASTE in stimulating awareness. They also developed capacity building for local communities and small-scale pilots for gardening using animal and human manure in Kajiado. As well, they supported the Nakuru Municipality in reviewing practices and discussing policy linkages between WASH and UPA, using the example of co-composting. In Dire Dawa, RUAF and RiPPLE (Research-inspired Policy and Practice Learning in Ethiopia) and WASTE supported local business initiatives, and identified, with the Bureau of Agriculture and members of the Learning and Practice Alliance (LPA), the potential role of UPA. For both Nakuru and Dire Dawa, RUAF supported the development of a localised policy framework. For both Nakuru and Dire Dawa, RUAF supported the development of a Policy Framework on Productive Use of Wastes and Urban and peri-urban Agriculture (UPA) for the local administration.



## Sustainability

RUAF and its partners, developed a simple and qualitative outcome monitoring tool, based on the **FIETS** framework. For each "Sustainability Letter" a set of questions has been developed that reflect the sustainability of the innovation but also facilitates discussion and awareness (for more information, see the Fact sheet on FIETS, or visit the WAI website: [www.washalliance.nl/sustainability](http://www.washalliance.nl/sustainability)).

**Sustainable Financing** is based on the principle that communities pay for WASH products and services from their own earnings and incomes. Sustainable financing includes a mix of local finance streams, whether these are direct payments from individuals, tax revenues, loans or public investments. Financial sustainability has been used by RUAF and partners as: (i) the need to reach out to more users with limited financial resources (users of sanitation, including urban farmers); (ii) the need to generate a flow of resources to pay for re-use systems; and (iii) the opportunity to create local income-generating and employment opportunities. In addition to several innovative approaches, this includes the valorisation of materials and nutrients found in the waste stream, the stimulation of businesses, and linking to other issues and stakeholders in and around urban centres. It is paramount that the development of UPA and WASH pilots and business models fit within the development momentum of cities, towns and their surrounding rural areas. Therefore, It is necessary to distinguish steps in development and varying degrees of (FIETS) sustainability and carefully monitor these. In its support to enhance UPA, RUAF has supported multiple stakeholder platforms in several cities that facilitate this joint planning and implementation.



**Institutional sustainability** focused on empowerment of urban farmers and on multi-stakeholder interaction. Multi-stakeholder processes are important in policy design, action planning and implementation. By involving multiple stakeholders in decision-making, it is much more likely that policies and programmes will be developed that are more inclusive and successful in their implementation. RUAF's participatory and multi-stakeholder approach, MPAP (Multi-stakeholder Policy formulation and Action Planning), has been adapted to the WASH programme. It facilitated joint action planning in an open and transparent process of collaboration and interaction between, local (and national) government, community-based organisations, NGOs, private enterprises, and research institutes. Policy influencing and lobbying was done by developing transitioning scenarios for the cities and towns and seeking multi-stakeholder agreement on how linkages between agriculture, sanitation and use of waste could sustainably fit into urban development. This was done in close collaboration to the WASTE-supported Diamond Approach, which brings together key actors in financing sustainable WASH. Core stakeholders are the private sector and its clients, as well as enabling organisations (see [www.waste.nl](http://www.waste.nl)). In these "scaling" platforms, major partners meet and seek to reach scale advantages for clients, providers, farmers, etc., to provide negotiating power and to coordinate social marketing, demand-creation, and the development or adaptation of legislation and policies. Institutions and businesses participating in these platforms discuss and select promising systems, generating demos on new innovations or enhancing business (or "busi-nets") development of existing innovations. Transition towards recycling-oriented, productive sanitation requires alliances between the agricultural and sanitation sectors, with resource recovery and productive use for UPA as a facilitating element.

## Safe and productive use of waste for urban and peri-urban agriculture; RUAF experiences in WASH

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WASH Alliance International is a multi-national consortium of over 100 partners worldwide, working together with local NGOs, governments and businesses to make sure everyone on this planet has sustainable access to water and sanitation. This document has been prepared with, and based on collaboration with, the following partners:

In the Netherlands: [WASTE](http://www.waste.nl)

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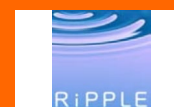
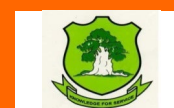
In Ghana: [University of Development Studies \(UDS\)](http://www.uds.edu.gh)

In Ghana: [URBANET](http://www.urbanet.org)

In Kenya: [Practical Action](http://www.practicalaction.org)

In Bangladesh: [Practical Action](http://www.practicalaction.org)

In Ethiopia: [RiPPLE](http://www.ripplewater.org)



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This innovation brief is part of a series of briefs on UPA, and is available on the [RUAF](http://www.ruaf.nl), [WASH](http://www.washalliance.nl) and partner websites.

The RUAF Foundation is a global network with member organisations in Africa, Asia, the Middle East, Latin America and Europe, together constituting a leading centre of expertise in the field of Urban Agriculture and City Region Food Strategies. RUAF seeks to contribute to the development of sustainable cities and feeding an urbanising world by facilitating awareness-raising, knowledge generation and dissemination, capacity development, policy influencing and design, and action planning regarding urban agriculture and resilient and equitable city-region food systems. RUAF facilitates the integration of agriculture and food systems in the policies and action programmes of city actors, with active involvement of all food chain actors.

