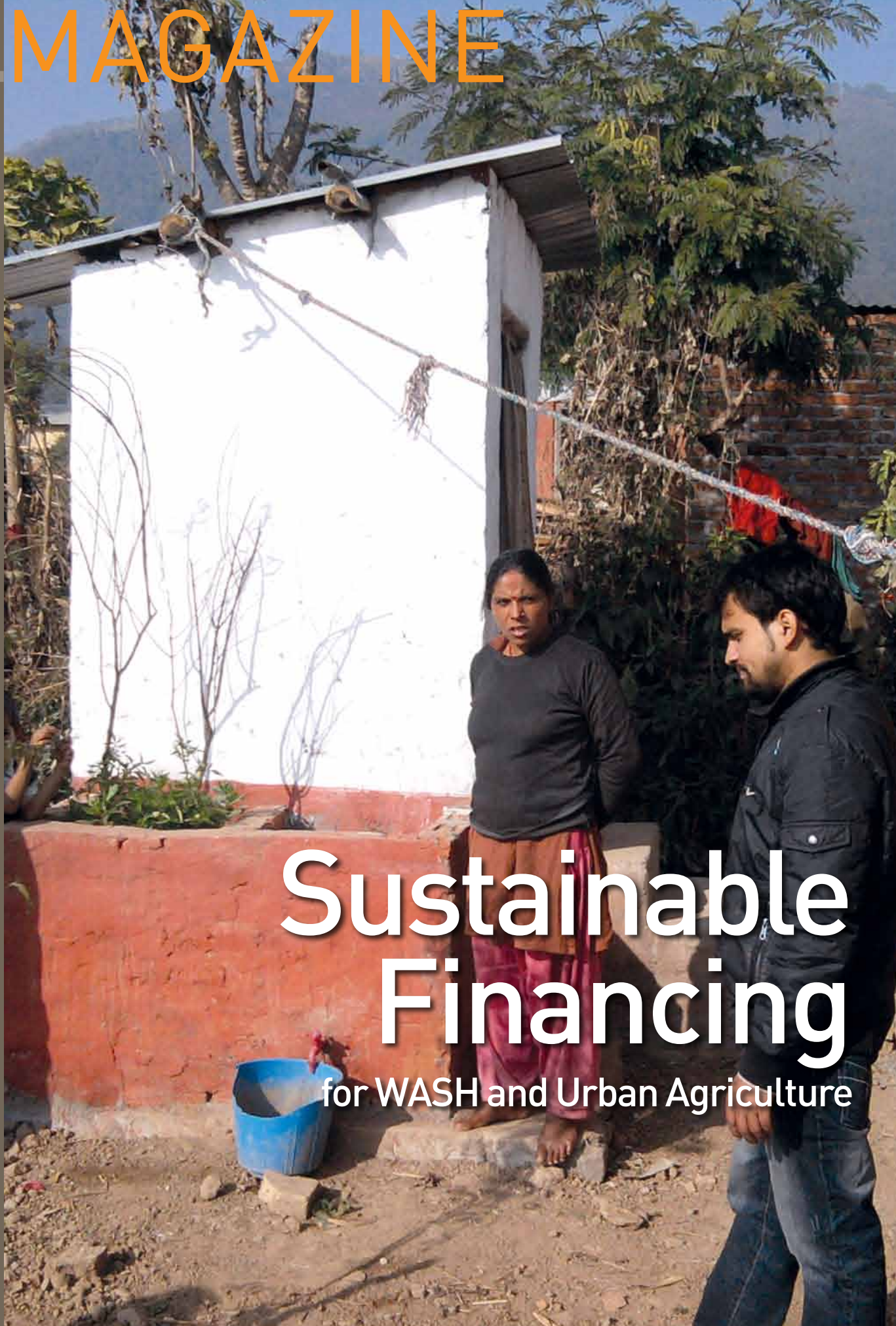


URBAN AGRICULTURE

UAMAGAZINE

26



Sustainable Financing

for WASH and Urban Agriculture

In this issue



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Cover

This issue is a collaborative effort of RUAF and WASTE, both members of the **Dutch WASH Alliance**. The focus of the issue in front of you is on sustainable financing of WASH and urban agriculture as part of the sanitation value chain.

Photo: EcoSan in Kathmandu, Source: Ren  van Veenhuizen

Sustainable Financing, Scaling Up WASH and Urban Agriculture

René van Veenhuizen
Gert de Bruijne
Miriam Otoo

Sustainable financing can be viewed from two perspectives. According to the first, an adequate mix of public and private financing, and significant reliance on local finance options, for any activity is necessary to avoid dependency on external funding (often project related). The second perspective relates to the purpose of the investment, focusing here on value chains in the sanitation and (peri)urban agricultural (UPA) sectors.

This issue, no. 26, is a collaborative effort of the RUAF Foundation and WASTE, both members of the Dutch WASH Alliance. The emphasis is on exploring options for the financing of urban agriculture as part of the sanitation value chain: valorisation of urban waste with clear benefit impacts to the urban and periurban agricultural sector.

This Issue

Articles in this issue explore financing options and linkages in the urban and periurban sector from various perspectives. The contributions in this issue show that there similarities in financing sanitation and urban agriculture. Yves Cabannes, from the Development Planning Unit of University College of London, provides an update on finance experiences in urban and periurban agriculture (UPA). The authors of WASTE share insights on novel financing options in the WASH sector with an emphasis on sanitation. Experiences from RUAF partner IWMI, on Resource Recovery and Reuse from waste, and the work of RUAF under the WASH programme, on linking WASH and UPA, both look at the nexus of waste, water, agriculture and energy. Sustainable financing of both UPA and related value chains with clear benefit impacts such as the urban sanitation sector are imperative contributors to food security. This is a relatively new, yet critically needed area of research and development, and we hope to garner support for these initiatives through continuing debates with you via a variety of media.

In a rapidly urbanising world and in the face of declining



Financing is needed for this raincollection and drip irrigation system
photo: UBUNTU

donor funding, exploring new financing opportunities and options is paramount. In recent years many have argued that donor aid has proven to be countereffective. Authors such as Moyo (2009) or Easterly (2006) argue that greater benefits to the poor ensue from increased access to markets and financial resources. Increasing trends of private sector engagement in the provision of social goods and services, particularly targeted at the poor, will become more evident as the roles of international donor agencies become more focused.

The fact remains, however, that accessibility to financing is significantly difficult for entrepreneurs in various subsectors of the sanitation value chain and urban/periurban sector. With their operations mainly characterized as informal and small scale, the thresholds of formal financing services for these businesses are relatively high. This is additionally compounded by the entrepreneurs' limited skills set in "pitching" business ideas/initiatives to potential investors. Greater facilitation through business training, awareness creation and policy intervention will help address these bottlenecks and incentivise financial institutions to make considerations for such initiatives, oftentimes considered "obscure" sectors in their investment portfolios.

The experiences shared in this *UA Magazine* issue indicate that bottlenecks related to provision and accessibility of finance to the aforementioned sectors, UPA and WASH, can be addressed through a multitude of approaches and avenues. Additionally, even with adequate accessibility to financing, these entrepreneurs require support from authorities and other stakeholders via mechanisms such as strategic partnerships and multi-stakeholder platforms, in order to ensure the bankability of their business propositions.

Where farmers meet sanitation service providers

The value chain of UPA has been discussed earlier, in the UAM 24 issue. Any farmer who sells part or all of their agricultural produce becomes a part of the value chain — which in its broadest sense is defined as the complex range of activities implemented by various actors linking input suppliers, primary producers, traders, processing enterprises, wholesalers, retailers and the customers. Although urban farmers are considered as part of society requiring sanitation services, as stakeholders in (or linked to) the sanitation value chain, they primarily represent a market for agricultural inputs such as value-added waste products (e.g., nutrients and irrigation water).

The sanitation chain can generally be split into two distinct components: a) a service chain and b) a value chain (also see the article on page 31).

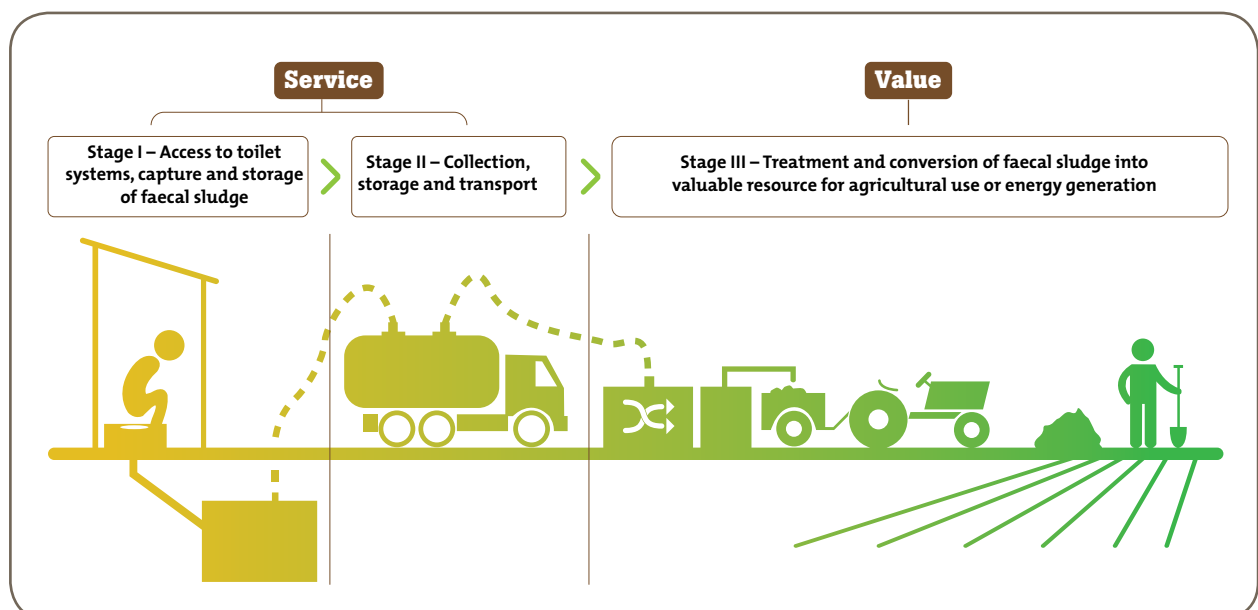
Traditionally, WASH service providers in communities have focused on the tail end of supplying sanitation technologies, with limited emphasis on services of greater demand, such as drinking water provision or solid waste collection — and also, importantly, reuse/valorisation of the collected waste, particularly in developing countries.

A common flow in the service chain entails households with an on-site toilet paying for collection of their excreta by a pit

emptier, who then takes it to a (legally or illegally designated) disposal site. Currently in many situations, human waste has mostly a negative value as households are paying for waste removal services; and whilst the service providers earn revenue from these charges, they incur substantial costs from fees charged for the disposal of the collected waste. There is a potential for reversing the economics of waste collection, particularly from the waste-collectors' perspective, in the instance where the waste is treated as a resource input sold to entities involved in waste valorisation. Potential exists for key economic actors in the waste value chain to capture huge benefits in the conversion of such products as faecal sludge or municipal waste, to compost, bio-energy, or nutrients (NPK). This represents opportunities for farmers to have access to alternative agricultural inputs. In the effort to ensure the viability of such initiatives and potential benefits to related stakeholders, some key questions to explore here relate to: 1) what processes are required to produce affordable and high-quality agricultural inputs from waste? and 2) what mechanisms need to be put in place to change the paradigm of waste disposal to treatment and processing for reuse?

New opportunities for entrepreneurship and/or new product market combinations (PMCs) can be created (for some examples, see the article on page 31), when key economic actors — for example, sanitation service providers and engineers — work hand-in-hand with farmers and/or agricultural agents to meet their product demand needs. When decentralised use, such as nearby farmers, are seen as a prime market, this will have consequences for the sanitation and waste service system.

In many countries, the solid urban waste sector has become a thriving business service sector, but is also increasingly seen as a resource supplier in production processes. For centuries, human manure was a scarce and desired form of agricultural input, until its replacement with fossil and artificial products during the last century. Resource scarcity is



Sanitation value chain (BMGF, modified)



Small scale business development along the sanitation chain in Ouagadougou.
Source: CREPA

moving the waste business into the domain of the formal economy and we must and do re-evaluate traditional practices, and innovate on them, in technologies and in city planning. However, for waste pickers, sludge collectors and urban farmers, banks have insurmountable thresholds. UPA can be a matchmaker, and at the same time reap its rewards.

Linking WASH and Food Security

Lack of access to sanitation negatively impacts food security, but at the same time both issues are related in seeking solutions. Increasingly it is acknowledged that water, sanitation and hygiene issues need to be seen in relation — a nexus — (German WASH Alliance, 2011) to areas such as health, food security, energy and economic growth. There are multiple interactions among improvements in household sanitation and hygiene practices for increasing the quality and quantity of water consumed, multiple uses of the water and, as we set to explore here, safe and productive use for urban agriculture. Improved WASH relates to better human nutritional and health status and, as such, contributes to several pillars of food security (Chambers, presentation at World Water Week 2012), and to improved production and income. Taking such nexus perspective helps to identify drivers and enabling factors that would otherwise be overlooked, and can create synergies. Sanitation systems allowing for reuse of treated water, nutrients and energy facilitate important energy savings compared to drinking water treatment and reticulation, artificial fertiliser production and electricity for cooking. In earlier issues of *UA Magazine*, we reported work done by RUAF and such partners as IWMI, SWITCH, WASTE and SuSanA on building and bridging water and sanitation service chains.

The safe treatment and productive use of domestic wastewater and human excreta (urine and faeces) have been important issues throughout history, whether related to protection of the environment or to growing food. As Evans, et al. state on page 24, “the idea is indeed not new, but limitations prevent scaling up, which include issues other than technology”. New, integrated approaches are being developed to overcome these limitations: approaches such as business thinking, multi-stakeholder involvement and cross-sectoral partnerships.

Safe and productive use of wastes

The informal and oftentimes illegal status of existing waste management services, and the adoption of western infrastructural solutions have been cited as major causes of limited wastewater treatment in most developing countries. A significant quantity of wastewater is disposed of, untreated, directly into the environment (see discussions and references in earlier *UA Magazine* issues). Productive sanitation is a general term used for the variety of sanitation system solutions that aim to make productive use of the nutrient, organic matter, water or energy content of human excreta and wastewater in agricultural production and aquaculture. Such solutions can be sustainable, if adequate emphasis is placed on understanding the functioning and dynamics of technical, institutional, social and economic aspects.

From the sanitation point of view, urban agriculture as well as wastewater-fed aquaculture offers opportunities for converting urban waste into productive resources. Productive reuse of waste water in urban agriculture has the potential to reduce the demand for freshwater supply as well diminish the discharge of untreated waste water into

rivers, canals and other surface water sources. Urban waste water can be recycled for irrigation/fertilisation of horticultural crops, i.e., floriculture and fruit crops, as well as for irrigation of forest plantations, turning steep slopes and low-lying lands into urban green areas. Decentralised collection and composting of urban organic wastes also present opportunities to reduce the costs of public waste management even while large quantities of nutrients are reclaimed. The reuse of faecal sludge as an alternative nutrient source for agricultural production will reduce the demand for finite mineral resources (like phosphorus) and the energy requirements for producing related artificial fertilisers. Empirical examples of such cases are presented in this article on page 23. These cases are presented from a business perspective, indicating the potential for cost recovery to the sanitation sector but also revenue-generating opportunities to private sector entities.

Creating demand and seeking scale

In view of the potential benefits from waste reuse, such as cost-recovery to the sanitation sector, there is a need to shift from significant dependence on subsidies towards treatment for reuse. Many organisations, including RUAF and its partners IWMI and WASTE, are working on the interface of agriculture, water and sanitation (including solid waste) to develop sustainable solutions for growing cities facing waste challenges. Improved sanitation brings opportunities when closing the loop on a decentralised scale, but recycling needs to be economically driven (business thinking), and needs to seek to achieve other, social and environmental, benefits in (urban) development perspective.

An increasing number of entrepreneurs are engaged in such activities as commercial recycling and the reuse of faecal sludge. As a result, urban and periurban areas are hot spots for various resource recovery options. There is general agreement that reaching scale is better accomplished in urban areas, although the market for water, nutrients and energy products might also have to be sought out beyond farming (urban departments in charge of landscaping or the private sector engaged in housing) and in the periurban and nearby rural areas (rural farmers and enterprises).

UPA may have direct access to urban waste resources, yet not to finance

Most products coming from UPA are perishable, such as green leafy vegetables, fresh milk and poultry, and as such generally complement our daily menu of produce from rural agriculture. Close proximity to consumers and availability of relatively cheap resources (e.g., organic wastes and waste water) can create comparative advantages for food production in and near urban centres. Despite increased evidence of the benefits and political support for urban agriculture, financial support for urban growers remains quite limited. Most urban producers still lack access to credit and have to develop their activities with limited resources. Lack of access to (affordable) capital for the poorer population involved in urban agriculture hinders or shuts down urban producers' ability to acquire the inputs and equipment which may increase the returns on labour and investment, or to add

value through better processing, storage and packaging. This lack of access further prevents these farmers from using resource-conserving farming technologies, producing higher-value crops and livestock, and minimising the risks involved.

There are indeed similarities with the sanitation sector, including the fact that urban agriculture financing cannot simply be unlocked by providing credit. Cabannes argues, in the article on page 13, that financial support for urban agriculture is best based on a combination of all three mechanisms: savings, subsidies and credit or micro-credit. Savings, for example, could serve as collateral for receiving credit. Tax incentives or other subsidies could motivate people to become involved, and could complement credit systems with training and assistance, and in this way could better guarantee success and sustainability of the (integrated) support programmes.

Financial-economic sustainability of local investment mechanisms is essential to lessen the dependence on external financial funding. In each city, various types of urban and periurban agriculture are available and could be seen and supported as a sector of the social economy (valuing its potential environmental and community development benefits) or as a sector of the "formal" economy that, in principle, should be totally self-sustainable. There is a need to fine-tune the type of financing to the level of engagement of the communities and/or entrepreneurs. Similar to the step-by-step development continuum and sustainability index for community-based agriculture that Abalimi designed for their work in Cape Town, South Africa (see UAM 17). This index was created to support urban agriculture development, and acknowledges the variation in producers and communities, each with their own pace of development. It tracks the development of community agriculture projects through four levels: from survival, through subsistence, into livelihood and then to commercial.

This development - or transformation - thinking, is further elaborated on in the article by Cabannes. It has a consequence for the way business plans could be formulated. First, the financial plan needs to indicate the specific contribution of various sources of finance (the mix). Secondly, financing needs to be part of an integrated development strategy, showing its externalities, and linking it to other activities such as training, technical assistance and the creation of a favourable policy framework.

Sustainable finance and business approach in sanitation

WASTE has experience with a sustainable-financing and business approach to sanitation as developed through such programmes as ISSUE and SPA (2003-2012, see the articles on pages 35 and 40 on the Malawi and Philippines). Witnessing the reluctance of external donors to invest in sanitation and integrated waste management, WASTE became convinced that one has to mobilise structural, preferably local finance for sustainable WASH service provision. Whether existing or still to be developed, these financing mechanisms are to be

Business Models for Resource Recovery and Reuse (RRR);

New research needed and on the way

In view of the opportunities for the recovery of resources from waste streams and its challenges, there is an urgent need for a better understanding of market-based and business-oriented approaches to enhance and scale up the productive use of urban waste resources. Although resource recovery and reuse from waste streams appears to be a win-win situation for waste management, the environment, and economic development, until now most attempts have remained small in scale or lifetime. A common thread across failed attempts is the lack of any business plan, beyond reliance on external support and subsidies. As a result, sustainable market-driven mechanisms to support the development, viability and up-scaling of enterprises in resource recovery are largely missing. The International Water Management Institute (IWMI) has found it timely to undertake research that analyses emerging waste reuse business models for further testing and dissemination in the public, private and educational sectors, and also to quantify economic and social benefits for the society at large to support private and public-sector investment with facts on possible returns.

In partnership with the International Fund for Agricultural Development, the Swiss Agency for Development and Cooperation, and the Bill and Melinda Gates Foundation, the new program of the CGIAR on Water, Land & Ecosystems (<http://wle.cgiar.org>) is addressing the challenge. Its Resource Recovery & Reuse (RRR) Strategic Research Portfolio is identifying innovative enterprises that reuse domestic and agro-industrial waste resources, including faecal sludge, in low-income countries and is gathering pertinent data on how their businesses operate. Based on this analysis, a variety of scalable business models is being described and their feasibility tested in selected cities across Asia, Africa and Latin America. The new research program seeks to understand current waste management and RRR practices while assessing the resulting environmental and health impacts. Data-gathering exercises will help map the significance, scale, constraints, opportunities and needs of the industry. Findings from these studies will be shared with relevant stakeholders (authorities, private sector, NGOs, community leaders, donors, development banks, etc.) who will help to initiate and facilitate related dialogues and investments. The research on business options is accompanied by a consultative process to support or formulate policies and guidelines for safe septage management and reuse where appropriate. This process will consider all key economic actors along the sanitation value chain, and work closely with the World Health Organization (WHO) on the assessment and mitigation of potential health risks.

based on self-support and a market approach, and enabled by the government. Structural access to local private and public finance for women and men became a mantra for WASTE. This translates into adopting the principle that — also for improvement of WASH services and infrastructure — the users of the facilities (the polluter), hence eventually the local community, has to pay.

Banks and microfinance institutions had to be convinced that waste and sanitation activities can be businesses, and can generate revenues and profit for entrepreneurs. Reluctant to invest in new sectors with presumably high risks, banks were persuaded by offering guarantee arrangements. Once loans and credits became available, it became clear that local business found it difficult to develop bankable proposals. Businesses had to be supported to develop and/or improve their business plans and marketing strategies. Not money, but good plans (requests for finance) seem to be a real bottleneck. In the meantime, municipalities had to get used to supporting and guiding the private sector instead of directing and dictating it. Public-Private Partnerships are easily argued on paper but require a major culture shift, transparency and trust, and (need to) evolve over time.

But, as the articles in this issue also show, no grand designs or immediate solutions are expected to be found soon. Impatient foreign NGOs, often wrongly seen as key stakeholders, and donor agencies accountable not to local, but to external investors, have been cheap advisors. Nevertheless, remarkable is the growing acknowledgement for the need in sanitation to shift from subsidies towards cost recovery. Evans et al., on page 24, define business cases in the resource



Zoomlion, a private player on the waste management market in West Africa.
photo: René van Veenhuizen



Bags of compost waiting to be distributed at DeCol in Tamale, Ghana.
photo: René van Veenhuizen

recovery business, and on page 35 an example is given on how to develop a business in sanitation in Malawi.

Not surprisingly, there are similarities in the WASH sector to the findings on financing UPA, as discussed in the previous section. Barendse, on page 31, also states that, although lack of finance is a main obstacle, it is only part of the problem. Micro-entrepreneurs face other challenges, such as lack of proper business skills, lack of support services by authorities,

negative perceptions and attitudes, and the need for more networking and information sharing.

The WASH programme

The Dutch WASH Alliance, or DWA (www.washalliance.nl), was formed by six civil society organisations that collaborate with a wide range of southern and northern civil society organisations (CSOs) under the main objective to provide women and other marginalised groups with sustainable access to safe water and sanitation services and improved hygiene practices (as part of its five-year programme: 2011 - 2015).

RUAF and WASTE collaborate in the WASH Alliance with special attention for urban sanitation and re-use, and for stimulating business approaches. Sustainability of WASH is sought through the systematic adherence to five key sustainability principles: “the ‘**FIETS**’ principles”.

These criteria can be used to monitor and evaluate certain innovations, or to assess project proposals, and to check if all sustainability issues have been addressed (for how they are used to assess work on safe and productive use by RUAF, see page 43). In the Netherlands, the FIETS sustainability principles have been adopted by the Dutch parliament as guiding principles in the context of Dutch development cooperation. The Dutch WASH Alliance seeks to operationalise these FIETS principles further in its work, with an emphasis on “the F and the I”, and is increasingly seeking scale and system change. In this *UA magazine* the focus is on the F, although — as will be argued below — it cannot be seen without the others in seeking for scale and transforming urban design and development.

F.....IETS

As illustrated earlier, local financing and investment for the improvement of WASH services remain insufficient to meet

FIETS Principles

Financial: provide innovative financial concepts which diminish dependency on external subsidies and make optimal use of business approaches and private sector involvement, thereby strengthening the “in-country” structural finances.

Institutional: integrate WASH in national policies with NGOs in close collaboration with local stakeholders working as capacity builders, facilitators and watch dogs representing the voice of ordinary people and complementing governmental efforts, working from a rights-based approach.

Environmental: adopt and mainstream IWRM and ecosystem-approach principles and build climate-resilient solutions.

Technological: seek and apply locally appropriate technologies and innovative ICT solutions that are context-specific, affordable and demand-driven.

Social: appeal to local demand and local and cultural incentives and focus on the role of women as change agents.

the demand. In particular, low-income groups in developing countries lack access to financial resources to invest. On the other hand, on a day-to-day basis this population is paying more for water and sanitation than the average household. People increasingly realize that free services do not exist, as their costs have to be covered one way or another. Local banks and microfinance institutions provide hardly any loans to the poor for this purpose. WASH therefore argues that there is a need for:

providing innovative financial concepts which diminish dependency on external subsidies, following the principle "local finance first", leading to the strengthening of the "in-country" structural finances.

WASH main strategies are: business approaches, private sector involvement, innovative financing, and tracking and utilizing government (WASH) budgets.

Sustainable financing is based on the principle that communities pay for WASH products and services from their own earnings and incomes. Whether these are direct payments from individuals or tax revenues, or loans or public investments, it is important that recurrent cost and depreciation be paid from local resources. External financing from grants or other sources should be used primarily to mobilise and strengthen local finance for the WASH sector. Instruments being promoted are microfinance, guarantees and cross-cutting subsidies to rely more on local finance and on the ability of people to be or become a customer as opposed to a recipient of support.

Financial sustainability of WASH and waste management systems is linked to (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 maintenance of these systems; and (iii) the opportunity to create income-generating and employment opportunities for local people, which would increase the ownership and the desirability of WASH and waste management systems. WASH partners seek to enhance a shift away from a spending (donor money) model for basic needs towards self-financed service delivery. In addition to several innovative approaches related to all FIETS criteria, this includes the valorising of materials and nutrients found in the waste stream, to seek cost recovery, develop businesses and make linkages to other issues and stakeholders in and around urban centres.

RUAF participates in the Dutch WASH alliance with a focus on the issue of safe and productive use of water (including household grey wastewater) and organic wastes (including human excreta) in agriculture (with an emphasis on urban and periurban agriculture). RUAF and local partners seek to develop urban sanitation systems that include safe and productive use of solid wastes and wastewater. The articles on pages 43–62 present the current state of the art.

Scaling up sustainable financing

Sustainable financing includes a mix of finance streams, whether through direct payment for services, linkages to subsidies through taxes, or external finance (to mobilise and

strengthen local finance and set up private-sector involvement). It is paramount that the development of UPA, WASH or combined business models and/or pilots or demos fit within the development momentum of cities, towns and their surrounding rural areas. In each city and country, the potential for resource recovery and UPA is unique and requires proper analysis, planning and policy development. In each of these locations, one needs to identify and agree with multiple stakeholders on initiatives that fit into the transitioning of the city or town. This can be done by developing and agreeing on scenarios for development ("theory of change"), and includes sustainable governance and financing arrangements.

Innovations do not occur by themselves, and many types of socio-technical transitions result from proper management and the creation of environments for innovative niches to grow sustainably (FIETS). Directions are given for implementing strategic niche management processes for rolling out innovations in cities through pilots, and supporting businesses with a mix of finances. In its support to enhance UPA, RUAF has supported multiple-stakeholder platforms in several cities, which facilitate this joint planning and implementation. And earlier, *UA Magazine* also highlighted the work of the SWITCH programme (www.switchurbanwater.eu) with learning alliances and transitioning frameworks (reported on in *UA Magazine* 20 and 23).

There is a need for distinguishing steps in development and varying degrees of FIETS sustainability (development is not a linear process, and not the same in different locations).

This need is also acknowledged, and is being developed, in the WASH programme. In addition to the abovementioned FIETS, the so-called "FIETS3" is being discussed: adding "Systems change" and "Scaling up" as important additional considerations, partly driven by the need for another role for civil society, and more involvement of the private sector. WASH partners engage with entrepreneurs & business approaches that experiment with new technologies. This approach means a shift of focus from delivering WASH services as an NGO 'one by one' (household or communities) to thinking in scale with the support of multiple stakeholders. But as Evans et al. state on page 24, "because the sanitation sector is still financed by the public sector, any improvement in RRR is important". IWMI in their work, as well as the partners of the WASH Programme, take a close look at issues such as: What are current business models in WASH? Why do they work or not? What is "scale"? What is the role of different stakeholders like government, business, financial sector, households, etc.? What is the added value of NGOs?

All actors involved in this process need to be aware of each other's role, being equipped for that role, and supporting each other. WASH partners therefore seek to emphasize the creation of demand rather than supply, and the building of strategic partnerships in their work (WASH, 2013 internal discussion paper). Following experiences with finance facilities and multi-stakeholder platforms (where often the private sector and financing institutions are still missing), it is



Ms. Shova Dhungana, explains her ecosan toilet to a WASH delegation in Birendranagar, Nepal.

Source: ENPHO

BUSINET

In this Magazine, it has been acknowledged and illustrated that there is a need for business thinking in the sanitation sector, whether completely privately financed, or — as is mostly the case — through a mix of financial support and inputs. In addition, these sanitation businesses need scale in order to be sustainable; and to achieve this scale, there is a need for multiple approaches and linkages of PMCs and business initiatives in the sanitation service and value chain. This is where the idea of “Businet” comes in.

IWMI (page 24) and other actors (see box on SupUrbFood on page 13) are developing business cases for UPA, Reuse or combinations, using a set of criteria or a business canvas. Issues listed include demand, market segment, value proposition, income, and impact on social and natural environment. But mostly this concerns one business or initiative.

The “Businet” is based on the idea that in a complex situation, with many different and often small players or initiatives (in terms of financial capacity or willingness) — such as in the sanitation sector — there is a need to include in the business model a variety of sources of funding, as well as a network of business initiatives. In Switzerland, the Businet for Integrated Resource Management is such a business model. It includes the efforts of knowledge centres, NGOs, authorities and several private initiatives, or Key Partners, at different components, levels and stages of the process, or as responsible for various value propositions.

Based on information from Johannes Ceeb, CEWAS.

argued that so-called “scaling platforms” are needed, where 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 can discuss and select promising systems, developing demos on new innovations or enhancing business (or businet: see box) development of existing innovations, develop dissemination and capacity-building material and support-training activities. In addition, policy-influencing and lobbying are important activities of these platforms: developing transitioning scenarios for the cities and towns on how sanitation and use of waste could sustainably fit into this development, and seeking multi-stakeholder agreement on this.

A paradigm shift in sanitation from a disposal-orientation towards a recycling-oriented, productive sanitation is on-going, but it requires alliances between the agricultural and sanitation sectors, fostering resource recovery and productive use for UPAF as a facilitating element.

Here more on scale and improved access to finance...

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Learning from best practices in the Global South for sustainable (peri)urban food systems in Europe

To provide input for the design of sustainable modes of urban and periurban food provisioning in European city regions as part of the SUPURBFOOD project, the RUA Foundation made an inventory of best practice and failure cases in the Global South. SUPURBFOOD is funded by the European Union and coordinated by Wageningen University (see www.supurbfood.eu). Despite the growing level of interest, urban and periurban agriculture (UPA) and urban food policies are, in many respects, more developed in the Global South than they are in the Global North. There are therefore important lessons to be learnt and opportunities for North-South exchange and collaboration.

The cases for the inventory were divided into three thematic areas: short food supply chains; multifunctionality of UPA; and waste and wastewater recovery and reuse for agriculture or energy production. For each thematic area an initial scanning of 15 to 25 cases was made, followed by an in-depth analysis of 8 to 10 cases on successful policies and approaches, major facilitating and hampering factors, adequate institutional models, successful business models and, financing modalities. These cases were then discussed in a recent meeting of the SUPURBFOOD project held in June of this year in Vigo, Spain for which also a number of representatives of successful cases from the Global South were invited (see www.supurbfood.eu).

General lessons

- Development of UPA and short chain food delivery involves the creation—or re-creation—and strengthening, at the city-region level, of networks and linkages, many of which were broken in earlier globalisation and specialisation processes.
- Relevant networks and linkages include: food producer and consumer relationships, newly and re-localised processing and distribution systems, food and other waste recovery and reuse, productive activities and ecological sustenance mechanisms, and market and



- non-market functions.
- UPA and short chains are driven by initiatives of market parties (including producers), government agencies and civil society. Generally, initiatives that build on a balanced and complementary mix of governance mechanisms (e.g., through public-private partnerships, multi-stakeholder platforms and an increased role for SMEs) appear to be relatively successful and more resilient.

Waste recovery and reuse

With respect to waste there is increasing attention for, and growing experience with, projects that recover and reuse water, nutrients, organic matter and energy from domestic and agro-industrial waste streams. Both public and private entities are developing businesses around these issues. However, large-scale applications of systems at the city level are still difficult to find. (This is the focus of the RRR programme of IWMI and WHO; see page 24). An important reason that so few examples exist is a lack of market analysis of demand for recycled products.

The main challenge is to further develop linkages between waste recycling and safe, productive use of end products. Finding synergies with other sectors (water-energy-food nexus) and multiple use of waste and wastewater may generate creative solutions. There are technically safe options for water and nutrient reuse, but water, sanitation, solid waste management and agriculture are, too often, still unconnected policy sectors.

Policy support for recovery & reuse is key in all success models. This may concern support for:

- creating awareness and/or a market for products and services;
- development of infrastructure;
- access to land;
- arrangements regarding licenses or sanitary regulations;
- waste collection and pre-sorting.

In addition to policy support, there is a need for a reliable information supply, training for farmers (e.g., safe waste handling), and gaining political support to break through the many taboos and health concerns (relevant and otherwise) regarding recycled waste and water.

Furthermore, business models are needed that generate value and reduce costs, and that allow operation at a larger scale (something IWMI is also working on, see page 24). Revenue generation is very difficult to achieve due to the limited market; creative business models are needed, looking for larger and diverse markets for the recycled waste products (parks and gardens; rural agriculture; energy creation). These initiatives may attract policy support in return. One of the ways to finance these experiences and support in the development of business models is through the use of credits/loans and combinations of funding sources (see the various articles in this issue).

Conclusion of the Vigo workshop

With respect to the cases highlighted in the three thematic areas of SUPURBFOOD, there are many interesting localised and often small-scale experiences to learn from in the Global South. The general challenge is how to up-scale and disseminate and to apply these at the level of the city-region. In all three themes there is a considerable range of business opportunities for SMEs. Clear business models, as well as entrepreneurial skills and capacities, appear to be key success factors. In all respects, better insight is needed regarding options for creating value or reducing costs.

However, it should be clear that SMEs cannot create successful business models alone; network creation is essential. The government plays an important supporting role in these networks, but at the same time the accompanying potential risk of over-dependence on government support makes UPA initiatives vulnerable to government change or imposed budget cuts. In this respect there is a need for clear exit-strategies and options for basing policy implementation on forms of market- or civil society-based organisation.

The cases have revealed a variety of business types: intermediate SMEs, producer-led SMEs, cooperative initiatives, franchise models, government-led businesses, social economy initiatives etc. Cutting across these business types are various business aims: cost saving, cost recovery, revenue generation, profit maximisation, portfolio diversification, social enterprise, etc. These examples have shown that clear business models are important, but that they should

always be attuned to the specific contextual setting and historical conditions which determine the success or failure of a case. The participatory nature of multi-stakeholder processes can play an especially important role in success and impact.

The study identified research gaps regarding evidence on the impacts of the cases, appropriate indicators to assess these, social cost-benefit analysis, and access to financing. Also the role of social enterprises was seen as an important issue for further analysis.

Most of the cases focus on businesses, yet see an important role for the public authorities and policy makers in the facilitation of SME development in short food supply chains, multifunctionality and waste recycling. Clearly, in some situations policy plays a more prominent role than in others; this is also related to the phase of development and life cycle stage of cases. During the discussions between policy makers and SME representatives at the workshop, there was general agreement on the pivotal role of policy makers with respect to aspects such as:

- awareness raising and capacity building capacity on the potential societal benefits of urban agriculture amongst citizens, policy makers, consumers, etc.;
- enhancing information on, and access to, critical resources such as land, knowledge, etc.;
- better legal recognition of UPA activities and practices;
- establishing close, longer-term network relations between UPA practitioners and policy makers to facilitate mutual learning and understanding;
- active creation of markets and infrastructure, and stimulation of public procurement;
- more integrated policy and spatial-planning approaches;
- more SME-sensitive regulations and support systems.

In order to live up to these expectations, policy makers need a favourable context in which to work. In general, a clear vision on urban agriculture within integrated policy-frameworks, for example established in the form of a well-defined Urban Food Policy or Strategy document, should be a starting point. The issues of disintegrated policy fields, limiting regulatory frameworks and contradictory governance systems were mentioned as important hampering factors. Designing more experimental space within regulatory frameworks would boost developments and assist in dealing with conflicts involving differentiating sustainability and land-use claims. In turn, such experimental space can also stimulate the creation of new coalitions that can better deal with the diverse issues to which UPA gives rise. Clearly, extra financial budgets for UPA and more creative use of available public funding is necessary to further explore UPA benefits and potentials.

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Farmers market financed by the guarantee fund in Gampaha, Sri Lanka.
photo: IWMI, Hyderabad Office

Financing Urban Agriculture: Seeking the right mix of subsidies, credit, savings, and resource mobilisation

Yves Cabannes

A 2008 - 2011 study on “financing urban agriculture”, coordinated by RUAF and carried out by local teams from 17 very diverse cities¹ in Latin America, Asia and Africa, concluded that financing urban and periurban agriculture is and will be a major bottleneck for the maintenance, expansion and scaling up of affordable and accessible food production in cities². This article elaborates on this research, looking at common purposes and the development of types of finance over time.

Based on concrete examples, the study clearly showed that urban and periurban agriculture cannot survive only through market forces, and that it needs strategic and practical decisions. Examples of these are (i) national and municipal policies with an explicit subsidy component aimed at unlocking the key bottlenecks of the finance system; (ii) specialised training courses and modules, both academic and vocational, on the financial dimension of

urban agriculture; and (iii) support for creating a powerful international funding facility that could channel a mix of funding and subsidies to the sector, including small grants for subsistence agriculture, revolving local funds, grants for technical advice and support to business plans, guarantee funds, and insurance facilities³.

Another key aspect of the research was that urban agriculture financing cannot, as is too often the case, be limited to “access to microcredit or credits delivered by banks and MFIs of all kinds”, as if credit could be the key to unlock an expansion of agriculture in cities to meet, at a significant scale, the growing need for nutritious food for an urbanizing world. Instead, UA financing was considered as a highly complex and changing combination of resource mobilisation (both monetary and non-monetary) + individual and collective savings + subsidies in different forms + microcredits and conventional loans. One central argument is that this equation needs to be taken into account and serve as a basis for any consolidation of the financing system for urban agriculture in any given city. Approaches only focusing on credit may only be useful for a small minority of urban farmers.



Farmers in Magadi, Bangalore improved their access to finance by organising themselves.
source: IWMI, Hyderabad Office

Urban agriculture finance = monetary and non-monetary resource mobilisation + individual and collective savings + subsidies in different forms + microcredits and conventional loans.

Two subsequent and challenging questions are both unanswered thus far: Is there a right or optimum mix among these various components that would increase the chances of long-term sustainability of urban and periurban agriculture? And if there is, how can it be made operational? Instead of giving a general answer, four specific and quite innovative cases presented in this special dossier bring to light their local mix and combination of savings, subsidies, credits and resource mobilisation for business-oriented and self-consumption practices. The present paper simply put them in perspective and identify whether any more general rules can be proposed: is there a common mix among the follow-

ing cases that all have a similar purpose?

- Village Savings and Loans Associations (VSLA) have been expanding since 2009 in *Liberia*, and there are more than 3000 VSLA members. VSLA improved access to credit for urban and periurban farmers, and even bridged community-based finance with microcredit and central government banking (see article on page 18).
- Community Land Trusts (CLTs), as nonprofit, community-based institutions, retain permanent ownership of land on behalf of their members and have been expanding swiftly, primarily in the United States since the early 80s, in order to provide affordable housing for lower and lower-middle class citizens. Interestingly enough, an increasing number of CLTs have non-residential components and support urban agriculture in diverse forms (see box).
- Sanasa Cooperative Bank, in the city of Gampaha, Sri Lanka, recently set up an innovative revolving fund operating partially as a fixed deposit account bringing

Urban agriculture insurance system in China

Both Beijing and Shanghai have been setting up insurance and security systems for urban farmers; this is probably one of the most interesting mechanisms for consolidating urban farming activities. In Minhang district (Shanghai), Anxin Insurance Cooperation Ltd., a public finance institution, provides insurance to urban farmers, subsidized in 2009 to the value of 4.5 million Yuan (ca. USD 470,000). Fifteen types of insurance are tailored to different equipment and crops, including greenhouses; vegetable plants; fruit and wheat; pig, cow and fowl breeding; seed production; agricultural implements; and property insurance. The insurance system is one of the 10 pillars of a comprehensive subsidy policy. Information to date is insufficient to calculate what proportion of the

insurance is devoted to small-scale urban agriculture, as it seems earmarked essentially for what in China is called "upper end" urban agriculture. In Huairou and Tongzhou districts in Beijing a similar system was started in 2007, and so far 18 kinds of plants and breeds are insured for approximately 1,600 households; 30 per cent of the total cost is subsidised.

Source: Cabannes, Y, Financing urban agriculture, Environment and Urbanization 2012 24: 665. Based on: Jianming, Cai and Guo Hua (2010), "Financing for urban agriculture in Tongzhou and Huairou district, Beijing", and Yin Zheng, Liu Ming and Cai Jianming, (2010), "Urban agricultural financing in Minhang district, Shanghai", RUAF Foundation Report, Leusden, the Netherlands.



With a small loan farmers organized themselves to develop a box scheme in Freetown, Sierra Leone.
photo: René van Veenhuizen

financial resources to urban farmers; and partially as a savings and short-term loan device opened up to small groups (see article on page 21).

- Both Beijing and Shanghai have been setting up insurance and security systems for urban farmers, introducing what is probably one of the most interesting mechanisms for consolidating urban farming activities (see box).

Based on this limited number of cases, and referring back to the 17 cities mentioned previously, it seems that there is not one right mix, but many: successful combinations are country- and city-specific. Accordingly, no standard recipe will be proposed here. However—and this is important—successful local cocktails tend to use the same four basic ingredients (monetary and non-monetary resource mobilisation by farmers; savings; credits; and subsidies). Even if some local financial systems might initially be based essentially on one or two components (for example, credit or subsidies only), the systems which last and grow through time are precisely the ones that gradually integrate the missing elements. For instance, even if CLTs, as their name denotes, are community-based organisations drawing on the community's own resources, their resilience through time goes hand in hand with their capacity to obtain financial subsidies from a wide array of sources in order to acquire “free” land, and at the same time access low cost credits from cooperative or commercial banks. Another remarkable common thread between the cases that was not highlighted during the study is the subtle combination of *individual* and *collective* savings. Each one of the four cases sheds some light on this issue. For instance, VSLA in Liberia are certainly collective saving groups, composed usually of 15 to 30 members who voluntarily get together to save in order to allow one or more member of the group to take a loan from the fund. These associations share common features with *sou-sou*, *tandas*, *banquitos* or *tontines*, sometimes called rotatory saving systems that exist often among urban farmers. They share features in the sense that saving amounts, number of members and frequency of deposits are fixed by the members, and collected resources are highly controlled and managed by the community. The essential difference in the case of VLSA is that the collective saving group authorizes

individual loans to its members, with interest rates decided collectively. Discussions between SANASA Coop Bank, urban farmers and their advisors in Gampaha, Sri Lanka led to setting up a collective saving scheme with a unique account. However, each individual who deposits his or her saving has a passbook clearly indicating the amount of savings.

A third common thread is that each one of the cases presented includes an amount of subsidies of various origins; these subsidies were largely underestimated, or at least kept quiet in the first drafts, as if a key for success for financing urban agriculture were that they could function without a certain level of subsidy. Making these subsidies explicit is key in order to make the best use of them, as is having their destination defined by the urban farmers. Why should NGOs, international aid, researchers, local or central government decide on the destination of subsidies? One lesson learned from Participatory Budgeting experiences open to urban farmers, in cities such as Seville in Spain or Porto Alegre in Brazil, is precisely that the farmers themselves decided the best way to optimise scarce public resources that were made available, and in both cases they were quite successful.

Quite interestingly, subsidy for training, and for technical assistance to urban and periurban producers, appears as a common feature in the cases presented: CARE Liberia is supporting the training modules and one year of a technical officer for VSLA in Liberia; CLT provides information and training courses to any candidate, for instance, on banking conditions and affordability; and in Gampaha, training workshops and services are offered free of charge to participants (first by RUAFA, now by Gampaha Agricultural Department). Specific subsidies to each case and situation, such as subsidized insurance premiums in China or limited ground lease permitting affordability in CLTs, are referred to in the dossier cases.

Our last observation refers to the credit dimension. A surprising aspect is the limited role of MFIs and microcredit institutions in spearheading innovations in finance: they are largely absent, as noticed in the conclusions of the research on 17 cities. Quite remarkable and counter-intuitive is the fact that public banks such as those in Beijing or Shanghai, or cooperative commercial banks such as those in Sri Lanka, or the Central Bank of Liberia through its microfinance unit are introducing innovative solutions and also taking some risks.

Examining the financial products offered and the loan conditions is quite revealing and inspiring. First, they tend to be customized and tailored to specific needs, as the financial needs of an individual starting with small-scale agro-processing are quite different from those of a farmer needing to buy seeds and equipment before a rainy season, or those of a family who would like to expand its production of chickens. Each one of them needs different amounts, for different reimbursement periods—depending on when they will sell their vegetables, chickens or transformed products—and at quite a different period in the year. Second,

CLT

Secure access to land is always cited by urban and periurban farmers among the primary constraints. Local governments often tend to see urban agriculture as a temporary use of land until it can be used for other “more profitable purposes”; this view tends to overlook the non-monetary benefits and services of urban agriculture in its contribution to public health, greening, waste management and climate change adaptation. To benefit from all the potential contributions that urban and periurban agriculture offer, cities need to include urban agriculture in their strategic development plans in order to regularise the use of land for cultivation. Even limited acceptance by government can influence the status of urban farmers in two ways. First, acceptance encourages a sense of security which will lead the farmers to make more improvements to their farming system. Secondly, it allows urban farmers to access credit and to use their land occupancy as collateral for small loans, thus overcoming the barrier of not having formal “property”. There are examples of innovative mechanisms that could be applied elsewhere: short-term user right agreements, zoning of urban agriculture areas, or community land trusts.

Community Land Trusts (CLTs) are non-profit, community-based land organizations with a place-based membership, a democratically elected board, and a charitable commitment to the use and stewardship of land on behalf of local communities. In most cases, CLTs retain permanent ownership of land, which is then leased—through a system of inheritable leases—to various users that own the improvements upon the land, such as residential homes, recreational facilities or, more recently, urban agriculture. Such ground leases have various benefits: (1) they secure occupancy rights for land users; (2) they preserve affordability by restricting the resale price of improvements; (3) they prevent undesirable uses and improvements of the land; (4) they prohibit predatory lending and reduce foreclosures; and (5) they create a source of income through monthly lease fees to support CLT activities (Rosenberg and Yeun, Lincoln Institute of Land Policy, 2012).

While the majority of CLTs currently focus on the development and stewardship of owner-occupied housing, some organizations have broadened their focus to include emerging opportunities in such non-residential development as urban agriculture. CLTs for urban agriculture have played the following roles:

- Securing access to land through a variety of land tenure

arrangements. The CLT may be the land-owner, lessor or lessee. In some cases, land management may be delegated to urban agriculture groups or associations who pay utility fees to the CLT. As acquiring land may be costly, some CLTs—such as Troy Gardens in Madison, Wisconsin, USA—combine housing, agriculture and conservation goals (housing lots may be leased at market or social rates and agricultural land use is cross-subsidised). The land tenure agreements mentioned do not automatically include long-term secure tenure for agriculture producers, which require building of a trust-relation with the CLT (to avoid changes in land use); longer-term leases to allow for making investments and compliance with certain land use and conservation rules.

- Providing agricultural programmatic support such as management support, technical assistance or other services. One example is the Athens Land Trust in Georgia, USA, which is involved in soil preparation, providing inputs and training workshops. Most of such services require good agricultural expertise, though support can also more easily be provided in the form of infrastructure for processing or for meetings.
- Engaging directly in agricultural production, growing and selling of produce. More indirectly, CLTs may support urban agriculture by including spaces for gardening or orchards in their housing plans and designs. (Rosenberg and Yeun, Lincoln Institute of Land Policy, 2012).

Most CLTs described in the Lincoln study focus on community types or urban agriculture. In France however, there has been initial experience with concerned consumers/communities acquiring agricultural land ownership and leasing the land to selected commercial farmers who are willing to produce more organically grown and healthy foods. Such arrangements make the activity more economically viable. Partnerships with experienced agricultural organisations are another important factor for success to maintain community interest and successful agricultural operations. The study concludes that CLTs should focus on the management of land-based resources, rather than solely on the ownership of land, to advance contributions in comprehensive community development.

Sources:

Rosenberg G. and J. Yeun, 2012, Beyond Housing: Urban Agriculture and Commercial Development by Community Land Trusts. Lincoln Institute of Land Policy.

Hickey R., 2013., The Role of Community Land Trusts in Fostering Equitable, Transit-Oriented Development: Case Studies from Atlanta, Denver, and the Twin Cities, Lincoln Institute of Land Policy, Working Paper



Rainwater harvesting greenhouses in Beijing, China, receive a mix of financial support, both from local government and from the farmers.
photo: René van Veenhuizen

the intricate individual / collective dimension is maintained, even if different from what was observed in savings: peer pressure for reimbursement, mixed with solidarity in case of proven hardship, seems to be a recurrent feature, associated with collective guarantee and individual responsibility.

These findings have a direct consequence on the way business plans are formulated. Once they are formulated and the cost of the operation is defined, the next exercise is to establish a financial plan that would indicate the specific contribution of the four ingredients: credit, subsidy, savings and resources mobilised. As the combination might vary over time, a systematic exercise that any business plan should consider is to anticipate how the mix of components could and should vary. For instance, the proportion of subsidies (e.g., for training) might go down when in parallel credit and might increase, and the proportion of own resources mobilized by farmers might increase as well. The work of RUAF with SupUrbFood – see the box – illustrates such an approach.

In conclusion, urban agriculture finance as an emerging field is offering unconventional and quite innovative solutions that are not standardised, and this is probably one key of their—as yet— limited but expanding success. However, they tend, as described above, to gain strength gradually through relying on the same combined local mix of resource mobilisation, savings, subsidies and credits.

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Moestuin

De Moestuin (The Kitchen Garden) covers 3 ha and is located in Utrecht, between the river Kromme Rijn and a small natural area on the one side, and a business centre, the football stadium, a highway and a railway on the other side. The site has been used for farming since the beginning of the 19th century, and since then it has been gradually swallowed by the city.

De Moestuin has been re-established as a public benefit organisation at the request of local government, and is supported by various foundations. Today it features a greenhouse and a garden with fruits and vegetables, an organic shop, a lunch café, a wood workshop, a herb garden, a petting zoo and a playground. These multiple functions are integrated into its business plan:

- 1) De Moestuin is a social enterprise dedicated to the re-integration of people with mental disorders into the job market. This is a main function of the organisation.*
- 2) The organic garden provides about 50 kinds of fruits and vegetables, which are sold in their own shop and lunch café as well as in 8 other shops in Utrecht and also directly to consumers (box-schemes).*
- 3) Education for the general public and children is provided via the playground and petting zoo and by organising summer schools or other special activities. The farm also cooperates with the neighbouring school for children with mental health problems.*

This mix of functions and income sources allows De Moestuin to operate its business. Subsidies come from the non-governmental sector, the European Union, and private companies; income is raised through the sale of products and services, and there are several volunteers as well. Re-integration subsidies provide about 60% of its income, and commercial activities 40%.

De Moestuin features some of the typical characteristics of an urban farm: a small area of available land, short supply chains and low transport costs, contributions to the improvement of the urban environment, and a mix of finances.

By: Lucie Sovová

Note

- 1) Bulawayo, Accra, Ibadan, Amman, Sana'a, Cape Town, Belo Horizonte, Freetown, Bogota, Lima, Shanghai, Beijing, Ndola, Bobo Dioulasso, Porto Novo, Magadi and Gampaha.
- 2) Cabannes, Y. (2011:9), "Financing Urban Agriculture: Current challenges and innovations", in *Urban Agriculture Magazine*, No 25, September, pp 32-35
- 3) Cabannes, Y., *Financing Urban Agriculture*, (2012:10) Environment & Urbanization, International Institute for Environment and Development (IIED). Vol 24(2): 665-683.

From Microsavings and Lending to Linkages with the Central Bank

Hilary David

Village savings and loans associations are improving access to finance for urban and periurban farmers and micro retailers in Liberia.



A farmer group meeting in Monrovia, Liberia.
photo: Welthungerhilfe

In December 2009, CARE Liberia, Welthungerhilfe, and RUAF started the Urban and Periurban Agriculture Project for residents of Greater Monrovia (the capital city of Liberia and its environs) as well as the cities of Tubmanburg and Gbarnga. In Greater Monrovia, over 5,000 households are engaged in urban and periurban agriculture (UPA), mostly for domestic consumption. Urban farmers (75 per cent of whom are women) generally produce vegetables and fruits, with staple crops such as rice and cassava produced on larger open spaces and swamps in periurban areas. Although demand is high, improved storage facilities and post-harvest technologies are needed. Farmers also lack reliable access to good seeds and formal credit systems: they do not feel comfortable with the formal structure of formal banks or MFIs, and they do not need loans as large as the minimum amount that these institutions offer.

The overall objective of the UPA project has been to contribute to poverty reduction in the most vulnerable communities of urban centers and to promote sustainable urban development in Liberia. Over the past years, the project has worked in and around the capital cities of Monrovia, Tubmanburg and Gbarnga, promoting advocacy for urban

farming, improving agricultural practices, enhancing access to markets and promoting access to finance. The Village Savings and Loans (VSLA) methodology has been at centre stage of the UPA's strategy of promoting access finance among targeted populations of these three cities.

Many community members were very hesitant at first, and lacked trust: "What kind of loan scheme from an NGO does not simply hand out the cash to us?" In the course of more than 10 years, people had gotten used to seeing microfinance schemes in which development organizations would transfer or inject a substantial amount of cash into their groups. The VSLA was different, as group members had to participate in training and mentoring sessions for about a year, and practically save and loan "from their own money" for a protracted period.

What is VSLA?

A Village Savings and Loan Association (VSLA) is a group composed of 15 to 30 members who agree to make a contribution to a shared fund at regular meetings. Members help the fund grow by borrowing from it and paying back the loan with interest. The group agrees on a pay-out date when each member will receive a share of the common fund plus accumulated interest. Using lockboxes and notebooks, VSLAs provide a way to borrow and save for people without access to formal financial systems and without getting into debt with an external institution. This makes VSLAs a powerful tool for breaking the cycle of economic instability and poverty.

The Village Savings and Loan (VSL) model is also a self-managed and self-capitalised microfinance methodology. By having its members mobilise and exchange local pools of investment finance, it offers savings, some type of insurance for bad times (also through the social fund), and credit services in markets outside the reach of formal institutions. The model was developed by CARE International in Niger in 1991 and has

Key facts about VSLA:

- *Repayment rates are the highest in the microfinance industry;*
- *Over 75 % of group members are women*
- *Over 90 % of groups continue to operate more than five years after receiving training;*
- *The average annualised return on assets is 35.4 %;*
- *The cost incurred by external facilitation per member averages USD 22.2 (and as little as USD 8) per cycle.*



Wkrubo Siazia harvesting her potato leaves in Fiamah, Monrovia.
photo: Welthungerhilfe

A typical VSLA in Liberia under the CARE programme shares certain characteristics:

- a one year cycle;
- an average of 30 members (minimum of 25);
- members pay a weekly contribution (share) of 1 to 5 times an agreed amount, such as 10 Liberian dollars (conversion rate is about 70 Liberian dollars to 1 US dollar);
- each member can borrow up to 3 times what they have put into the system in terms of shares;
- due to use of loans, hardly any funds are in the hands of the bank or the group (in general, more than 70% is being used for loans);
- after one cycle, usually one year (10-12 months), the money is divided among the members, and the members decide what to do with the social fund;
- interest on the loan (approximately 10%) and the social fund are determined by the group members;
- loans are used for agricultural purposes (e.g., seeds, tools), but also for other expenditures such as medicine, school fees, etc.

spread to at least 61 countries in Africa, Asia and Latin America, with over 6 million active participants worldwide.

The VSLA members use the loans for a variety of expenditures:

investment in trade	41.84%
school fees	23.64%

agriculture	22.7%
home repairs	4.73%
home construction	2.96%
death matters	2.48%
medical costs	0.95%
land purchase	0.71%

This survey was conducted on about 50 VSLA groups within the project's coverage area.

VSLA within the UPA Project context

From an initial target of 40 groups, over 150 groups have now been trained and established by CARE's EU-funded UPA Project and the new UPANI project of Welthungerhilfe and ACF on UPA. More than 3000 VSLA members have been mobilised, trained and equipped with VSLA kits over the past 3 years. During this period, these groups have been able to generate over 30 million Liberian dollars, with a return on assets of nearly 10 million Liberian dollars (see table).

Example of saving trends for 3 VSLA groups (in LRD)

VSLA GROUP NAME	1 ST YEAR SAVINGS	INTEREST ON LOAN	SOCIAL FUND
Kukatonton	122 225	50 112	15 600
Wilikama	74 788	16 685	7 800
Ziewelekezi	109 567	24 005	1 300

For farmers and microretailers under the UPA Project, there have been significant social and economic benefits of participating in their respective VSLA groups. In addition to access

to small loans, these impacts include:

- increased financial literacy and improved financial management through participation in the training and regular sessions;
- decreased reliance on free inputs from NGOs and aid organizations;
- improved access to finance by smallholder farmers;
- greater economic empowerment of women;
- improved land tenure by group organisation; and
- improved negotiation as a group.

VSLA groups also contributed to further peacebuilding through group formation and attention to conflict management, increased participation of women in decision making, social integration and peacebuilding within communities, and also confidence building among the vulnerable.

Starting up VSLAs

The implementation of the VSLA methodology within targeted communities follows a specific pattern of training, capacity building, mentoring and technical backstopping during a minimum period of one year per group.

A total of 7 training modules are included in the VSLA methodology. These training modules are centred around the following topics: (i) group formation, leadership and election; (ii) share purchase and social fund; (iii) development of a constitution; (iv) first share purchase meeting; (v) loan disbursement; (vi) loan repayment; and (vii) action audit. After participating in these training modules, the group members graduate in the VSLA.

The training package is implemented for a period of one year during which the groups are assigned an extension officer who takes part in weekly VSLA meetings and ensures capacity building and technical support. This package is provided for free by CARE. The payback for this initial subsidy comes in subsequent cycles, or if graduates of one VSLA initiate other groups.

Monitoring and Evaluation

The performance of each VSLA group during the first year is consistently monitored and evaluated against a given set of indicators such as client satisfaction rate, attendance rate, retention rate, membership growth rate, return on assets, return on savings, average write-off per graduated group, cost per member assisted, etc. This monitoring and evaluation is accomplished by the members themselves, with assistance of the NGO.

All VSLA groups' data are compiled into a Management and Information System (MIS) on a quarterly basis and submitted to CARE's regional VSLA coordinating body known as Access Africa, which is based in Tanzania. The information collected is then compared against VSLA groups of other projects locally and regionally.

Linkage to financial Institutions

Upon completion of the first cycle, groups become eligible for both financial and non-financial linkages. Linkages after the first year become necessary for reasons such as: lack of



Savings for investing in seed business, in Gbarnga, Liberia
photo: René van Veenhuizen

long-term savings options in VSLAs; need for more elaborate investment schemes and opportunities for VSLA group members; inflexibility of VSLA groups in terms of allowing larger saving options; and the need for VSLAs to move on from the informal to formal sectors of the economy.

In the case of the UPA Project, 500 VSLA members have been linked to the Central Bank of Liberia's Loan Extension and Availability Facility (LEAF), as well as the USAID-funded Liberia Investing for Business Expansion (IBEX) program.

The way forward

During the external evaluation of the project, the majority of producers interviewed indicated that gaining access to loans helped them avoid exploitative money lenders, obtain loans at reasonable rates, and expand their vegetable production by acquiring seeds, tools, inputs and labour. However, the integration of the savings and loan service with both the production and marketing components within the overall UPA Project implementation needed special attention.

To build on this record of success, as producers evolve into larger scale commercial production and sales, the CARE UPA staff has started to create linkages to larger sources of capital. CARE has linked at least 10 S & L groups to micro-finance institutions such as the Micro Finance Unit of the Central Bank of Liberia (to increase the amount of the loans, though this is still managed by the group). CARE has also created 6 regional VSLA networks which have been tasked with coordinating activities of individual groups within their respective communities/townships. Each VSLA network has also been provided with the capacity to undertake action audits of their members at the end of the project, when extension support will no longer be provided by CARE.

In the future, VSLA groups will build on the discipline and training it provides to micro-entrepreneurs to construct a very solid foundation for microfinance in Liberia. Meanwhile, in their UPANI project Welthungerhilfe, RUAF and ACF have identified another 50 VSLA groups in St. Paul River and Greater Monrovia District. The successes of the past are clearing a path to the future.

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Guarantee Loans for Urban Agriculture in Gampaha, Sri Lanka

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Vajira Hettige
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Agricultural development towards security of food, nutrition and livelihood is high on the political agenda in Sri Lanka. Recently, national priorities have included the development of food-secure and resilient cities; in this regard, the Western Province has been a forerunner, having commenced its urban agriculture campaign as early as 2000.

One of the cities in the Western Province, Gampaha, was the first to start a process of design and revision of urban and periurban agriculture policies, bringing together stakeholders and partners for synergistic action and to consolidate the multi-stakeholder action planning process (Amerasinghe et al., 2011). The RUAF Foundation, together with its regional partner, the International Water Management Institute, facilitated these linkages as well as further development of national programmes on urban and periurban agriculture, through their global programmes CFF and FSSt (Amerasinghe, 2013; Amerasinghe et al., 2011).

The RUAF-FSSt programme was launched by the RUAF partners IWMI India and Practical Action Sri Lanka. Comprehensive discussions led by the Multi-Stakeholder Forum (MSF) and experiences gained by adopting a City Strategic Agenda on Urban Agriculture have highlighted vital policy issues related to promoting urban and periurban agriculture in the cities. Forming a producers' organisation to strengthen marketing capacities for urban and periurban agriculture was a novel concept. The formation of Seemasahitha, Krishi

Nishpadana Samagama – Green Agro Products of Gampaha was highly successful owing to strategic planning and implementation processes in the key areas of organisational strengthening, credit and financing systems, and marketing strategies.

A study on financing urban agriculture

As described in the article on page 13 RUAF implemented studies to investigate the demand and opportunities for financing urban agriculture activities by small scale producers in all 17 RUAF partner cities. The specific objectives of the studies were: (1) identification and assessment of current practices of institutions and programs that finance urban agriculture; (2) identification of the needs and demands for finance among the urban poor engaged in urban agriculture, agroprocessing or marketing; (3) proposal and recommendations to facilitate the access of small-scale urban producers to financing.

These studies were also used to establish contacts with, and design lobbying strategies for, specific credit and financing organisations in the cities. By mid-2011, in 14 cities, 23 institutions had connected to urban farmer groups to jointly design credit and financing schemes; 11 financial institutions had modified their loan and financing conditions to enhance access to financing (accepting group loans; lowering collateral requirements and interest rates); and 14 institutions increased their level of annual financing for urban agriculture. In Sri Lanka, RUAF partners developed schemes with the

FSSt

The main activities of RUAF / From Seed to Table (FSSt) in Gampaha (2009–2011) were:

- institutionalisation of the MSF and adoption of the City Strategic Agenda;
- development of policy statements for UPA;
- strengthening of farmers' organisations and their marketing capacities (Seemasahitha, Krishi Nishpadana Samagama);
- enhancing access to credit and financing systems.



Vegetable sale by farmer business.
photo: IWMI, Hyderabad Office

SANASA City Bank in Gampaha.

The study in Gampaha showed that most of the existing Financing Institutions (FI) showed “a positive attitude” and/or “sympathy” towards urban agriculture, in general. Nevertheless, when it comes to the issue of providing financial support, small-scale agriculture in general—and definitely urban and periurban agriculture (UPA)—does not take a prominent place. In fact, the knowledge of urban agriculture within those FIs was limited. There is a wide variation amongst the different types of FIs with regard to their willingness to finance UPA, with state banks and cooperatives more willing, and private institutions less willing to do so. Reasons given for this lack of interest were common ones such as lack of collateral, high rates of default, and the high risk involved in financing small- to medium-scale agricultural projects. Another issue raised by some FIs was that farmers “lack the motivation for repayment”. However, SANASA City Bank, People’s Bank and Wayamba Development Bank were willing to partner with an external body to formulate and implement strategies and programmes for financing UPA.

The study also showed that Urban Agriculture Producers (UAPs) mainly utilised their “own funds and savings” for agricultural practices, and virtually none had accessed formal sources for this purpose. Reasons for this varied, from the strict and unfriendly treatment of small farmers—who feel uncomfortable entering such a formal bank—to lack of awareness. Another personal issue for some farmers was “dignity and self-respect”. Most UAPs responded positively to a “suitable” financial package for their venture, but emphasized the need for flexibility, in relation to both obtaining financial support and paying it back. The UAPs also requested other forms of assistance from intermediaries, such as training in both technical and business-related skills.

SANASA City Bank (SANASA is an acronym in Sinhala) was the institution with a relatively higher potential and ability than the other FIs analysed.

Services provided by SANASA Bank

SANASA City Bank (SCB) in Gampaha city is specifically geared to supporting livelihood development activities. It provides loans to city residents under a structured programme that has a strong loan recovery system. SANASA was founded throughout the country as a cooperative business spread across cities and villages. Members undergo training at two of the training centres, Kegalle Training Centre and Yatagama Training Centre.

The cooperative bank reaches out to its customers, offers a wide range of loans, and encourages working closely with the bank, offering an array of services to its customers. A loan is customised to suit the requester, but is closely monitored to enable repayment according to an agreed timescale. This is a feature that was appreciated by the customer.

SCB was interested in developing a package for urban and periurban agricultural producers. The bank’s previous experience in dealing with producers engaging in farming was limited, but the bank was willing to work out a process suit-



Business planning meeting of farmer group.
photo: IWMI, Hyderabad Office

able for the urban farmers. SCB had experience in working with Gampaha City, and was seen as capable in developing and implementing novel financial packages and services for small-scale farmers. It also has other facilities, such as field officers and profit-sharing mechanisms.

The bank had not funded a UPA venture before, and understood that there was risk involved in the recovery of the loans. However, they were willing to go through with the new idea, and felt confident that there was an international organisation and NGO behind this venture.

Ideas were shared concerning the nature of the loan scheme that would be needed for the communities engaging in UPA. It was noted that the bank had positive experiences in dealings with the city customers, and high flexibility in the way they develop financial packages for city dwellers for the purpose of livelihood enhancement. The bank also had other facilities such as field officers for the collection of loan repayment, which the community found convenient, and profit sharing mechanisms for investments made with the banks.

The loans are provided to individuals of well-managed small groups of urban producers in order to ensure the return of the loans at the group level. These groups produce vegetables (Okra, tomatoes, chillies, beans, yams, green leafy vegetables) and value-added products (e.g., packed vegetables, pickles, fried potatoes). The loans are used for buying inputs (e.g., seedlings and fertilizer), building nursery sheds, and other small-scale infrastructural work related to value addition, such as equipment for the production of pickles, the construction of sheds, etc. In total 64 households, clustered in smaller neighbourhood groups, participated in the FStT programme. These smaller clusters undertake most of the agricultural activities together, share their experiences and support each other.

The loan amount is increased for non-defaulters. This group-level personal guarantee system appears to work very well. When the peer-pressure system for recovery is not effective, a field-level collector ensures the recovery of repayments. According to officials, this works because the bank is sympathetic about the customer's problems and is willing to allow a margin to adjust for unforeseen events. This personal touch also acts as a deterrent by virtue of the personal engagement of the bank: the loan recipient knows that a person from the bank will follow up. However, it must be noted that the expenses incurred by the bank are included in the repayment.

The participatory discussions on credit and finance yielded two schemes:

- A group level savings scheme, saving USD 1.00 (LKR 100, 2009) per month. The account was a common account, but individual had his or her own pass book that showed the individual savings. The pass books were under the charge of the group leader. This was the loan security fund that served as collateral for the loans from the revolving fund.
- A revolving fund scheme of USD 10,000 in two operational schemes.

Late in 2010, the total money was put on the bank to generate interest: half was placed in a fixed deposit and the other half was given out to the farmers as loans. The RUAF FStT Revolving Fund consisted of two components. The first was the fixed deposit account named "*Seema Sahitha Gampaha Haritha Krushi Nishpadana Samagama short term fund*". The total amount of the fund was USD 5000 (LKR 500,000); the interest generated by the deposit is used to cover the costs of the preparation and submission of annual documents as well as other overhead costs of the Seema Sahitha Gampaha Haritha Krushi Nishpadana Samagama in the first year. Once the fund grows, the fixed deposit will also be used to make loans to the farmers. The interest is still 15%. The producer company manages the fund. This is a fixed deposit, and the interest rates are higher than the 6% of the savings scheme. The funds are not available until the end of the deposit period, and it earned income for the company to cover the overheads.

The second component of the RUAF FStT Revolving fund was named "*Seemasahitha Haritha Krushi Nishpadana Samagama Loan fund*". This fund was maintained as a regular savings account and the money in this account was used to provide short term loans for the RUAF FStT producers and/or producer groups, based on the security accrued in the group savings accounts (loan security fund in Sanasa City Bank Ltd, Gampaha). The interest is 6%, and it is managed by the farmers (company). This component provided the money base for the recurrent loans provided to the participants.

A memorandum of understanding (MoU) was signed by Seemasahitha Gampaha Haritha Krushi Nishpadana Samagama, Practical Action and Sanasa City Bank Ltd for the establishment and maintenance of the Revolving Fund of the RUAF FStT Project, until such time as the Association was



Farmers meeting with the agricultural officers.
photo: IWMI, Hyderabad Office

able to run the finances on their own. Regular payments, progress in business and attendance at meetings are some of the conditions the groups have laid down.

Now, after two years, the fixed deposit continues to earn the income to cover the overheads and the savings deposit still provides loans to the farmers. To date, 90 loans have been awarded, amounting to nearly 1.3 m Sri Lanka Rupees (LKR), for diverse urban agricultural activities ranging from production to value addition. The loans that started at LKR 5,000 in 2010 have risen to LKR 100,000 per person, under strict loan conditions. The loans are repaid rather quickly, but with an interest of 1 to 2 per cent, there is no real growth in total amount. According to the association (company) treasurer, the current loan status is for 16 members and totals LKR 390,000 (LKR 115 = USD 1.00 in 2013). Loans vary from LKR 5,000 to 100,000.

The system relies upon: a) deposits from household savings, and interest on loans; b) a deposit from the project and the interest it earns; and c) free technical assistance and training (workshops). In addition to financial support, the programme provided technical support. Training and technical assistance from the department of agriculture was provided for free. The support has been taken over by the government, while certain institutions such as SEEDS and CIC Agri Businesses (*Urban Agricultural Division*) emerged and were able to provide other forms of services, such as training and workshops on special topics of interest for the Urban Agricultural Producers (UAP).

Thus far there have been no defaulters. The number of participants has declined, however, though the current members feel that a committed group has remained. These members are determined to take the company to a next level of development. Roadside market stalls also bring in revenue, which demonstrates diversity in the types of UPA activities, and benefits from the company.

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Developing Typologies for Resource Recovery Businesses

Alexandra Evans, Miriam Otoo, Pay Drechsel, George Danso

The idea of closing the nutrient and water cycles by using municipal organic waste, fecal sludge, and wastewater for urban and periurban agriculture is nothing new. Not only has it been practised for generations in many countries, it has also been proposed and tried on a small scale as a green solution for modern cities (Smit and Nasr, 1992).

There are, however, limitations to nutrient and water recovery that have prevented scaling up in many locations. These include economic feasibility, administrative frameworks, socio-cultural perceptions and acceptance, environmental issues and, to a lesser extent, technology (Rijsberman and Dada, 2001). Following a range of analyses, we suggested that the fundamental factor that could result in the scaling up of resource recovery and reuse (RRR) efforts is the introduction and implementation of “business thinking” in the sanitation sector, to generate value and allow cost recovery—or even profits, if well designed (Drechsel et al., 2011; Otoo et al., 2012).

Box 1: What do we define as business cases?

In our definition, resource recovery and reuse (RRR) business cases are any practices that we observe taking place that utilize the resource value in waste to support waste management and/or a healthy environment. For our purposes we limit that resource value to that of water, nutrients and energy.

Because sanitation, including urban solidwaste management, is still predominantly financed by the public sector with limited attention to cost recovery, we consider any improvement that RRR can support, from partial to full cost recovery, as a step in the right direction and as business models worth our attention.

To better understand what drives nutrient and water reuse and recovery in the sanitation sector, and to identify limiting factors, our research approach was to identify and analyse existing and emerging reuse examples, which we have termed RRR business cases (see box 1). The RRR cases identified in this study can be categorised into typologies to enable consideration of the key components of the



Small businesses has developed along the sanitation chain.
photo: IWMI

businesses: principally, how value is created and by whom, and whether that value can be returned to support the sanitation value chain. Based on this analysis, “business models”, which could be replicated and scaled up, can be extracted or designed.

There are of course many options to sort and cluster business cases in the sector, based on such factors as the type of waste, type of recovered resource, type of partnership or ownership, or modes of income generation. In the example presented in this paper we will reflect on the value addition for the recovery and reuse of nutrients, water and energy from faecal matter and wastewater, a form of resource recovery which has received less attention than other forms, such as nutrient recovery from municipal waste through composting.

Typologies for Nutrient Use

Inappropriate management and reuse of waste containing faecal matter can cause contamination of water, soils and crops, and endanger human health and the environment. This situation is a common reality in many low- and middle-income countries.

A controlled resource recovery approach can reduce the negative impact on the environment and have positive public health impact—not only through removal of contamination, but also through the potential use of well-treated waste resources for the production of nutritious food. Depending on the context, the type of business model and the market for produce, reuse offers opportunities for employment, income and cost-recovery. Waste can be an alternative source of nutrients for low-income farmers, or

energy for poor communities. When the business model goes to scale it will eventually reduce the waste challenge as we know it by catalysing waste entrepreneurs to seek the resources they need.

Faecal sludge (FS) is an abundant and valuable resource, similar to other organic manure such as farmyard manure. For the reuse of excreta or FS from on-site sanitation systems, such as septic tanks and latrines, we can observe a pathway of value proposition for agricultural reuse:

- Direct land application of raw FS for agricultural purposes: value addition occurs in the form of collection and transportation to the field, usually followed by solar treatment (sun drying).
- Composting of FS or co-composting of FS with organic solid waste before sale: value addition by removing pathogens, reducing the volume, and concentrating the nutrients. Some value loss may relate to nitrogen loss during composting.
- Pelletisation and blending of FS-based compost: value addition through nutrient addition and product structure improvement to improve competitive advantage, marketability and field use.

Direct land application of FS for agricultural purposes

With a limited number of functional wastewater collection and treatment systems in many parts of the developing world, on-site sanitation systems remain crucial. Often, the entities that empty latrines or cesspits discharge the waste indiscriminately onto open lands or into watercourses. In areas where resources for agricultural production are limited and fertiliser prices are increasing, smallholder farmers frequently resort to the use of FS for crop production. For example, farmers in West Africa and South India are redirecting cesspit truck operators to their fields to provide them with the nutrient-rich manure. In Northern Ghana, this typically occurs after cereal harvest in the dry season. Due to the aridity and heat, the sludge dries over several months and is then incorporated into the soil. Most pathogens die during sun exposure, so health risks for consumers of cereals grown on this land are minimised (Seidu, 2010). To further mitigate associated health risks, farmers working with raw sludge are required to use protective gear.

However, in most developing countries, faecal sludge as a source of fertilizer has not received much recognition, due to both the informal nature of reuse and consumer perceptions of agricultural products grown with human excreta. Also, the disposal of FS onto land, particularly agricultural land, is often prohibited by law—or is, at least, a grey area governed by “tacit approval”: “culprits” have not been punished, especially where engineered, official dumping places are still an exception and the authorities are left with little choice. Where official dumping sites exist, cesspit truck owners pay to use them.

The observed reuse business model is reversing the cash flow, as farmers pay the drivers for farm-gate delivery. In an

optimised business model, the revenue would support the operation and maintenance costs of the cesspit operation, supplementing the FS collection fees. A drawback to the sustainability of the system in West Africa is the seasonality in demand for FS; the contrary exists in India, with plantation crops requiring FS throughout the year. Another difficulty that must be overcome is that farmers in some places currently receive raw sludge for free or a low fee, and will require field demonstrations to appreciate any other form of sludge with a higher price tag.

Composting or co-composting

To explore business opportunities in agriculture, horticulture, landscaping and gardening, both public and private sector entities across Africa and Asia have adopted commercial strategies to add value to FS. The main approach is composting, usually in an aerobic process, which sanitises, dries, and reduces the volume of the FS. The FS may be processed alone or combined with solid waste (co-composting) to improve the properties of the resultant compost (Cofie et al., 2009).

However, composting also adds additional capital and operation and maintenance (O&M) costs. Many governmental, community and non-governmental organizations (NGOs) in Asia and Africa have introduced composting with varying degrees of success, cost recovery and sustainability. Key reasons for failure were often a lack of market research and poor institutional linkages (Evans and Drechsel, 2010). To address market-related constraints, some businesses adopt strategic partnerships with the local government, private enterprises and community-based organizations (CBOs) to optimise the allocation of resources and activities, reduce risk associated with high capital investments, and establish an assured market for their product. On the one hand, CBOs are contracted to do the collection and separation of waste, which ensures a consistent supply of high quality input (waste) and income for the CBOs. As part of their marketing strategy, these businesses sell their compost product through the established marketing and distribution system



Wastewater treatment is not always possible.
photo: IWMI



Risk reduction measures in the use of waste water have been developed.
source: IWMI

of other private companies, providing an assured and large market base for their product.

Additional financial leverage for these entities might be created by using anaerobic digestion to produce biogas with a higher commercial value than the compost, as well as nutrient-rich slurry.

Pelletisation and enrichment

While value-added waste products such as composted FS represent alternative nutrient sources for cash-constrained farmers cultivating on poor lands, nutrient levels of composted FS are comparatively lower than those of alternative products such as poultry manure and chemical fertiliser. This gap represents additional costs to farmers, as they are often required to invest in supplementary inputs. Additionally, the bulky nature of composted FS acts as a barrier to the transportation of the product to markets, increasing distribution costs to the producers that are often borne by the end-user.

Opportunities to increase the accessibility and usability of value-added FS products in agriculture are emerging, with cases identified in Nigeria, Ghana and South Africa. Various entities have adopted innovative value-addition techniques such as fortification and enrichment of FS with nutrients to boost its fertiliser value. Another option is pelletising composted FS, resulting in an easy-to-handle, safe, high-value product. These commodity-value based approaches represent opportunities for both public and private entities to increase their income-generating options by gaining

market access to agricultural producers, giving them a competitive advantage.

Water reuse related typologies

Urban wastewater is produced from a number of sources, including urban drainage, domestic sewage, grey water, and industrial and commercial liquid waste streams. In many cities across the developing world, the effluents flow through open drains, canals or sewers into natural water bodies or onto irrigated land; less frequently, they are received by functioning treatment plants. As on-site sanitation systems prevail in many low-income countries, the wastewater flowing to fields or treatment plants will predominantly be grey water, contaminated by septic tank overflow, illegal connections or open defecation. It is not uncommon for domestic waste streams to be mixed with untreated industrial waste, despite laws to prevent this. This poses a particular problem for RRR options, and care should be taken to utilize those streams that contain only domestic waste, or to treat or handle other wastes appropriately before use.

Typologies for wastewater use have been proposed before; for example, Van der Hoek (2004) has defined typologies for agricultural reuse (Figure 1).

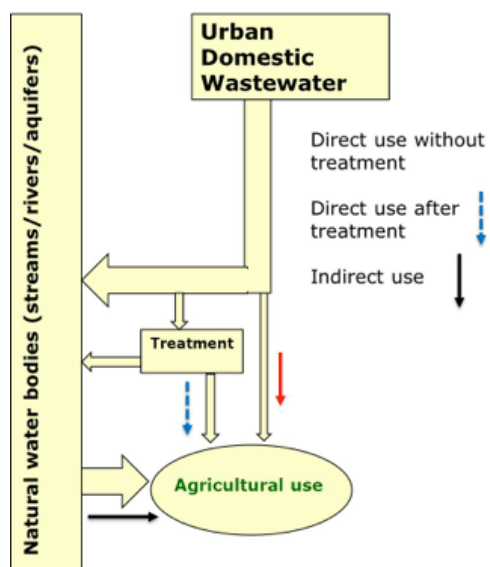


Figure 1: Urban wastewater reuse types (After: Van der Hoek, 2004).

- **Direct use of untreated wastewater** – the application to farmland of wastewater taken directly from sewers or other purpose-built wastewater conveyance systems.
- **Direct use of treated wastewater** – use of treated wastewater where control exists over the conveyance of treated wastewater to the point of irrigation.
- **Indirect use of wastewater** – the application to farmland of water from a wastewater-receiving water body (e.g., stream). The pollution level can vary, as can farmers' awareness of it.

Table 1 - Examples for typology of value propositions in the water reuse sector

Type	Value addition to the resource	User pays for	Value addition through resource use	Reuse-based business model	Examples of business cases
Direct or indirect use of untreated wastewater for agriculture, forestry or aquaculture	None, except for facilitation of access (canals) or some dilution and natural treatment depending on distance from source to use.	Farm land (with water access) or fish pond rent; or water fee where water access is regulated and this water is the only source.	Growing crops, trees, aquatic plants or fish benefiting from water and (diluted) nutrients. Natural treatment (soil infiltration, stabilization in dugouts and ponds).	Where resources are scarce, farmers might pay for access to land or water (which could support wastewater collection, basic treatment or health care).	Mexico, India, Pakistan, Cambodia, Vietnam
Direct use of treated wastewater for agriculture, forestry or aquaculture	Provision of safe water for agriculture, forestry or aquaculture	As above. In this case, the added safety value could justify a higher fee than for untreated wastewater.	Growing crops, trees, bio-fuel, aquatic plants or fish benefiting from water and nutrients. Products sold directly or processed, e.g., duckweed for fish feed.	Paying for resource access contributes to recovery of O&M costs at various scales.	Syria, Tunisia, Egypt, Morocco, Pakistan (agriculture and forestry); Bangladesh, Peru, Ghana (aquaculture)
Exchange of wastewater (treated or untreated) for freshwater	None	Farmers swap their freshwater allocation for a regular supply of wastewater for cropping out of season and greater income generation.	Release of fresh water for other sectors with high demand. Off-season crops for farmers.	Reduces water supply costs incurred by the city. Higher income for farmers.	Mexico, Spain, Bolivia, Iran
Groundwater recharge	Water treatment	Water supply	Greater access to fresh water for drinking or other high-value purposes	Lower treatment (and pumping) costs	India, Mexico
Use of treated sludge from wastewater treatment processes (with or without wastewater use)	Provision of organic fertiliser (nutrients) for agricultural use, alongside water recovery	Treated biosolids (and water)	Growing crops or trees	Paying for multiple treatment products supports the recovery of O&M costs. Reduces water-supply and fertiliser costs.	India, Uganda
Production of energy (with or without sludge or treated water use)	Provision of bioenergy with or without safe water and fertiliser recovery	Treatment plant saves on external energy needs or sells energy (and water and/or biosolids).	Energy may be used for productive purposes by the treatment plant or external small businesses or households. Growing crops or trees.	Model for multi-resource recovery for cost reduction or revenues even exceeding O&M costs.	India, Jordan

The typology that we initially worked with drew on elements of Van der Hoek's classification, particularly with respect to the division between treated and untreated wastewater. Some of the most commonly practised forms of wastewater use take advantage either of the regular supply of wastewater, for example for growing crops or breeding fish, or of the nutrient value of the wastewater (Table 1). However, from a reuse business perspective the situation is more complex, and other systems emerged, such as groundwater recharge as well as "sub-systems" of the initial use types. Some examples showing different cases are described in Table 1.

Direct or indirect use of untreated wastewater for agriculture, forestry or aquaculture

This is the most common scenario across Asia, Sub-Saharan Africa and Latin America. The dominant type is the use of polluted streams (indirect use of untreated wastewater). Where natural streams are lacking or are not perennial, wastewater can also become the only water available, resulting in direct use. In both cases, there is no planned value addition to the wastewater that could increase its market value, except if authorities provide canals for water access. However, where water is scarce or supply is irregular, farmers might still be willing to pay for access to water or to the land which allows access. Depending on geology and soil characteristics, other market segments could also be accessed if the wastewater is used for groundwater recharge and farmers/households pay for aquifer access.

How much could be charged for untreated water will depend

on the local understanding of water as a free commodity, and on national water quality standards. Since authorities have to dispose of the wastewater anyway, it can be difficult to charge for it. This is seen in Pakistan, where farmers have paid for untreated wastewater for many years but have fought against these fees in courts of law (Weckenbrock et al., 2012). In this situation, it may be better to base a business model on income generation through leasing of land rather than sale of water; however, barriers still exist and local land-use rights need careful consideration. In all cases, value is generated as a direct result of the use of wastewater to grow cash crops or wood, or to raise fish. Capturing part of that value—e.g., through water fees, land rent or a product tax—can provide an opportunity to support the sanitation service chain through funds for wastewater collection or primary treatment, or for safety measures from farm to fork.

Direct use of treated wastewater in agriculture, aquaculture or urban greening

This type represents the most common business model, in which payment is received in direct exchange for the use of the resource. Most examples are from drier regions such as the Middle East, North Africa and Latin America; for example, in Egypt, Morocco, Tunisia and Peru treated wastewater is sold to farmers. Cost recovery appears to increase where there is no fresh-water alternative. Cost recovery can exceed O&M costs where the treatment system is cheap (e.g., pond systems) and productivity high (duckweed, fish). In some cases, part of the water is deliberately returned to streams or rivers to protect the environment, or may be used to generate hydropower before being used again.



source: IWMI

Exchange of wastewater (treated or untreated) for freshwater

Where farmers currently use freshwater and where domestic water is in short supply, “water swaps” can take place. In this situation, farmers do not pay for the water but get paid to accept the swap, as the city can make a significant profit from a greater freshwater supply (FAO, 2010). Depending on the geographical location, the exchange might have advantages for the farmer in terms of additional nutrient supply, or disadvantages if the wastewater will increase soil salinity. In some cases, the farmers may not need payment because the result is a more reliable overall water supply, often outside the normal growing season, which allows farmers to generate more income. However, pumping is required to either gain the freshwater or return the wastewater, which adds a cost.

Groundwater recharge

In this reuse type the authorities may dispose of the water to a pond or land in a location that allows groundwater recharge. The hydrogeology must be understood well so as to prevent contamination of the aquifer. The desired quality of the groundwater may differ depending on its use (e.g., agricultural, industrial or domestic), but in many cases the aquifer may have multiple uses and thus drinking water standards will need to be the aim. In certain circumstances—in Mexico, for example—farmers may also be part of the solution. In this particular case the farmers are provided with wastewater, and their land acts as a recharge field. The groundwater obtained is of drinking-water quality and is used by the authorities to pump water back to the city.

Use of treated sludge or biosolids

Examples have been recorded of wastewater treatment plants (WWTPs) providing (in addition to treated wastewater) sludge from aerobic treatment processes—such as activated sludge—to farmers or for landscaping. This usually occurs after anaerobic digestion to ensure that pathogens have been removed from the sludge. Combined treatment systems are increasing the opportunities for nutrient- and cost-recovery while reducing the burden of finding alternative uses or deposits for the ever-increasing amounts of organic residues. Problems may occur if the wastewater is combined with industrial waste, or if the origin of the waste is not known. In Bangalore, for example, there is anecdotal evidence that the farmers are unwilling to use WWTP sludge because of perceived heavy-metal contamination. More advanced models could use waste valorisation options as discussed above for FS, such as pelletisation.

Energy production

This model adds energy recovery to the previous one. Multiple-resource recovery, particularly considering energy, offers the best value and opportunity for cost recovery. There are, so far, limited examples where treatment plant operators run “businesses” based on all three recovered resources (water, biosolids, energy). Usually, recovered energy is used internally. Some treatment plants are able to operate (nearly) entirely on the energy generated, providing a major cost reduction and protection from fluctuations in energy costs



Sorting the solid waste in Conakry
photo: Roland Linzner

(Lazarova et al., 2012). Depending on the type and running costs of the WWTP and the market for water, organic fertiliser and energy, a WWTP that recovers all three products has a high probability of covering its O&M costs.

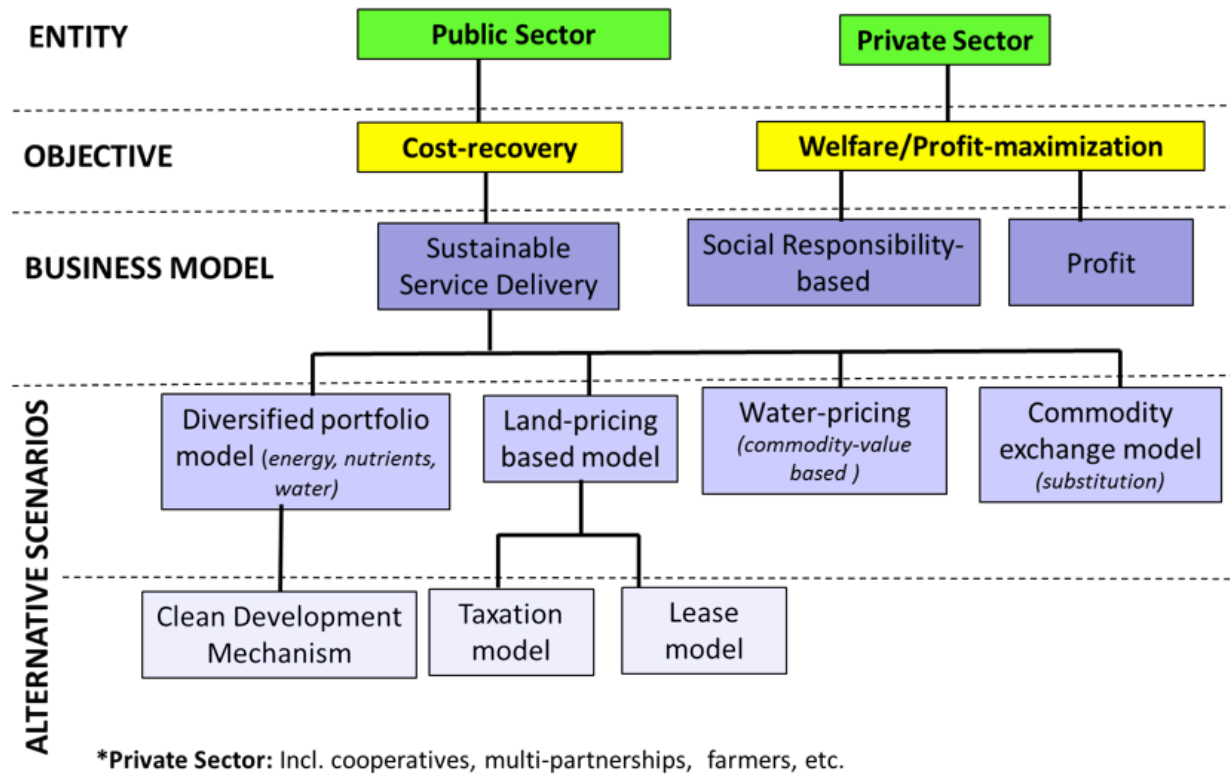
Alternative Typologies

The typology shown in Table 1 is just one way of classifying different reuse options. As our understanding of reuse systems grows, flow charts or organograms might allow a better visual representation of larger and smaller differences between reuse types, value propositions and business models. An alternative typology could be proposed based on the ownership of the “business” and the motivation of the owners. For example, the public sector may seek cost recovery rather than the generation of profits (Figure 2). The schematic is not exhaustive but represents another mode of classification which is likely to be more appropriate when converting the RRR cases observed into generic business models that could be selected and implemented by private sector organizations or by authorities responsible for sanitation.



source: IWMI

Figure 2. Examples of business models for wastewater use based on ownership and motivation



Source: IWMI, unpublished.

Work in progress

Screening the sanitation-agriculture interface around the globe results in the daily discovery of interesting approaches for commercial RRR. The RRR team at IWMI is reviewing these cases, and the most promising ones will be reported in a compendium. Each new case will be used to refine the typologies and to develop business models for replication. The conditions in which the business models function are critical to the analysis. In addition to nutrient and water recovery, energy business cases are also being analysed across the

domestic and agro-industrial waste sector, as they are likely to contribute significantly to the viability of water and nutrient recovery models.

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Linking banks to small sanitation entrepreneurs, in Kajjado, Kenya

photo: René van Veenhuizen

The African Finance Facility for Water and Sanitation

Based on a study by WASTE, Triodos Facet, and Fair and Sustainable in 2012

In 2006, 62% of the population of Africa lacked access to improved sanitation facilities. Only five of the 54 African countries are on track to reach the Millennium Development Goals (MDGs) sanitation target. This is both disappointing and surprising, as unsafe water and sanitation are an impediment to economic growth.

It is unlikely that, within a short or medium time horizon, governments will have sufficient resources and capacity to close the gap and to meet their citizens' demand for water and sanitation. There is a need to try multiple approaches such as the Finance Facility suggested here.

Background to a study

Reasons for the failure to reach the MDGs include limited resources and lack of priority setting. Due to the limited resources of governments in developing countries, their primary interest has been in maintaining the piped systems most likely dating from colonial times and located in city centres. However, in many countries population density and growth is highest on the outskirts of town, in the new urban areas, the slums and the periurban areas. Often these periur-

ban areas are beyond the formal scope of governments and are ignored in municipal development plans. Infrastructure is often lacking: no piped water and no sewerage system to provide services on a large scale.

Solutions have emerged to serve the inhabitants' immediate demand for safe water and sanitation services. Often these services, especially in sanitation, are small scale, delivered by local individual entrepreneurs and provided on a household-by-household basis. In fact, in periurban areas many, frequent, small transactions related to water and sanitation take place every day. It is a buzzing market place, but the scale is too small to reach the MDGs.

The study

WASTE has conducted a study on the delivery of safe water and sanitation services in a setting of local markets and entrepreneurship. The objective of the study was to investigate the need and feasibility of a mechanism to improve the "access to finance" for both suppliers and beneficiaries of water and sanitation services.

The focus of the WASTE study was on small entrepreneurs in water and sanitation. Identifying these entrepreneurs was a challenge, especially in the lesser known sanitation entrepreneurial markets, as they remain largely informal and

“invisible”. To provide evidence of activities of these entrepreneurs, some of the interviews were videotaped and presented to bankers to ask for their opinion. Furthermore, market sizes were estimated based on extrapolation of collected information and the experience of WASTE, TriodosFacet, and Fair & Sustainable.

A total of 81 entrepreneurs were interviewed in four countries, Benin, Ghana, Kenya and Uganda (countries where WASTE and partners are active), 46 of these were sanitation entrepreneurs, and 35 were water entrepreneurs. In addition, 11 construction entrepreneurs were interviewed in the four countries. The main research questions included:

- Where and who are the entrepreneurs in water and sanitation?
- What are their financial and general needs?
- Is local financing available, and who would be the best partners?
- How should a facility (such as the AFF) be set up, and who should be the implementing partners?

The sanitation value chain

As is illustrated in the editorial, the sanitation chain can be split into two distinct parts: the service chain and the value chain. A common flow in the service chain is that a household has an on-site toilet and is willing to pay for collection of their excreta by a pit emptier who then takes it to a disposal site. The human waste has negative value, as the household is paying the pit emptier for its removal.

In the sanitation value chain there is potential for a positive value in human waste: it can be used for compost, bioenergy or valuable nutrients. In this case customers are willing to pay for products based on human excreta. The crucial “linking pin” between the service chain and the value chain is at the disposal / treatment level, and it is a topic of this magazine issue.



How to make these services part of profitable businesses?
photo: WASTE

Each “link” of the sanitation chain offers opportunities for entrepreneurship or, in market-terms, for “Product Market Combinations” (PMCs). Following the sanitation value chain, WASTE has identified the following PMCs:

- toilet construction
- exploitation of public toilets
- sludge collection
- disposal
- treatment and reuse.

For example, demand on the toilet-building market for public toilets is defined by the needs and expectations of the user population towards the service, in terms of type of toilet, proximity, price, washing disposal and cleanliness. It is also of interest to understand the barriers perceived by people who have no in-home toilet but don't use public toilets.

The treatment and reuse PMC is growing, but is not yet a mature PMC; as illustrated in this magazine issue, however, a range of technologies and business cases are available.

Results of the study

For sanitation, in all four countries the gap between existing market and aspired market (based on MDGs and to be reached in 2015) is wide, indicating an enormous potential for market development.

Entrepreneurs at the bottom of the pyramid address immediate needs, are often informal and employ only themselves or immediate family (subsistence). Many of the entrepreneurs are not able to grow their business due to a lack of financing. Only a limited amount of information on turnover and profit figures could be obtained. Most entrepreneurs stated a need for external capital to stock up on material and machinery.

In the case of the public toilet PMC, self-reported annual profit ranges from €1,500 to €7,000. Six entrepreneurs indicate that they need external capital to rehabilitate or expand the facilities. One entrepreneur indicates that he would need capital for acquisition of a plot. Most of the interviewed collection entrepreneurs indicate that they need external capital to grow their business. Turnover ranges from €6,000 to €190,000 per year. The self-reported annual profit figures range from €4,000 to €43,000. In all cases, such capital is needed to procure a truck, either for replacing an existing truck or in order to expand the car park. A few interviews were conducted with entrepreneurs in the PMC of “treatment and reuse”. The common denominator of the entrepreneurs in this sector is the rather sizeable external capital requirement, ranging from €12,000 for a Ugandan toilet constructor to as much as €190,000 for the setup of a new waste treatment line in Kenya.

The markets in which these entrepreneurs operate are substantial, averaging about €1 million per PMC per country, but more importantly, there is good growth potential fuelled by a growing population and a demand for improvement of services once customers are familiar with basic facilities.

In the water sector, lower amounts of finance are needed; water kiosk operators, for instance, are looking for modest amounts in the €1,000 to €1,500 range, so these entrepreneurs benefit from microfinance institution (MFI) loans. In the sanitation sector, on the other hand, a different picture emerges, since finance needs range from €15,000 to €90,000 for collection entrepreneurs and from €15,000 to €60,000 for public toilet operators. These funding requirements clearly exceed the offerings of MFIs; hence, access is required to small and medium enterprise (SME) loans from commercial banks (see also the discussion on the Waste Venture Funds on page).

Lack of access to finance is a main obstacle to up-scaling and business growth. It is, however, only part of the problem. Microentrepreneurs face other challenges, such as:

- a lack of appropriate entrepreneurial / business management skills;
- informal, unregistered status, and therefore exclusion from municipal services—and if they want to register, expensive and complex registration procedures;
- facing negative attitudes, especially for the pit emptiers;
- a lack of information on financing options and other issues.

Sustainable Financing

Even if “access to financing” is arranged, it will not be enough to achieve the up-scaling that is needed for substantial market development (see also the discussion in the editorial). New approaches and new forms of partnerships and organisations are required to trigger real change and drive for scaling up. These new approaches should:

- enable large scale delivery;
- focus on affordable services for water and sanitation;
- fulfil certain minimum quality standards, i.e., guarantee the provision of safe water and safe sanitation;
- allow for (and not destroy) local employment.

All four countries have ample financial institutions, both banks and microfinance organisations, who in principle are able to meet the needs of the informal entrepreneurs in the water and sanitation sector. Moreover, the study indicates that, in fact, many of these organisations offer financial products that could be offered to the WASH entrepreneurs without much adaptation. Only in Kenya are specific financial products offered to WASH entrepreneurs. Availability of funding itself seems not to be an issue. The problem is that the financial sector does not yet make funding available for WASH, or does so, on a very limited basis.

The study and wider experience in the sector provide some clues to why microfinance and other banks are reluctant to lend. Water and sanitation are often viewed as social goods with little ability to generate financial return. The WATSAN

sector is unknown to banks: they have no knowledge of markets at the bottom of the pyramid (BoP) and of the willingness and ability of consumers to pay for services. More bottlenecks appear at both household and enterprise levels.

The African Finance Facility

A proposal has been developed by WASTE to develop the African Finance Facility (AFF). The suggested Facility has the objective to help overcome bottlenecks in matching suppliers of finance with needs of entrepreneurs, and would have a number of roles for different actors (banks, entrepreneurs, households and the enabling environment).

To develop the market, the AFF should work with all stakeholders and address the issues as identified (see box).

AFF roles in relation to stakeholders

Banks – AFF should:

- *improve banks' awareness and provide insight into the real risk of financing WATSAN;*
- *encourage banks to create products or adapt existing products for the WATSAN market;*
- *help to overcome risks associated with a lack of collateral.*

Support to entrepreneurs – AFF should:

- *improve the vocational, administrative and financial capacity of entrepreneurs;*
- *help them to overcome bottlenecks associated with a lack of collateral;*
- *support them to organise themselves (in cooperation with local NGOs and chambers of commerce).*

Households

The municipality, possibly supported by or in cooperation with NGOs, has a role in creating awareness at the household level of the positive health impacts of safe water and sanitation. The AFF has no direct role here, but can be of assistance through the entrepreneurs or the municipalities.

Improving the enabling environment – AFF should:

- *support the municipality in developing, implementing and monitoring policies for sanitation and water;*
- *encourage local stakeholders (entrepreneurs, municipality, financing institutions, NGOs) to jointly develop a strategy for market development;*
- *encourage local stakeholders, including utilities and others, to pilot new approaches.*

An important component of the AFF are Guarantee Funds; critical to the success of the fund will be the identification of successful entrepreneurs and the provision of adequate technical assistance and training.

Guarantee Fund

Each PMC has its specific characteristics, and each PMC will require a product structured for its specific needs. This is true not only with respect to the financing product itself (e.g., loan size, tenure, type of collateral), but also in terms of procedures (e.g., risk assessment, origination, execution, monitoring, closing). A common bottleneck for most of the WASH financing products is that banks perceive the risks as too high. The experience of WASTE with „WASTE Ventures (see next article), indicated that guarantees help banks to obtain insight in the sector and the risks.

Training

Basic training in bookkeeping and business planning will help ambitious entrepreneurs to start discussions with banks. We propose, where possible, to link the business training to a credit rating.

Rating is common for MFIs (e.g., Planet Finance) or for large enterprises (Moody's, Fitch). A rating is an indication of the health and creditworthiness of an enterprise. Recently, initiatives for ratings of microenterprises have emerged. A rating can be compared to an exam, whereby a good rating would strongly enhance the microenterprise's chances of obtaining a loan.

Combining training and "rating" may improve the effectiveness and the efficiency of the business training because:

- it will help to clearly target the training and to identify the immediate training needs of the entrepreneur. Next to this, a successful student may finalize the training with an "entrance ticket" (a positive assessment) to the financier.
- for banks, assessment of entrepreneurs and microentrepreneurs is costly, especially if the chances of failure are high. Usually banks assess the creditworthiness of organizations themselves. However, this is often costly and banks may not be willing to assess enterprises with a perceived low creditworthiness (as in the WASH sector).

The indicative business plan for AFF shows that with only a limited amount of donor funds the set-up of a guarantee fund can be feasible. Basic training in bookkeeping and business planning will be combined with innovative rating exercises. Combining training and rating may improve the effectiveness and the efficiency of the business training.

For efficiency reasons, a regional AFF servicing multiple countries, is most desirable. Since, the study WASTE has taken a practical approach and is now in the process of setting up 'facilities' on a country by country basis, a.o. Ethiopia, Zambia, Kenya in cooperation with Dutch and local financial partners.

Contact WASTE for more information on the Facility.

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Supporting small business around re-use of plastics.
photo: WASTE

Experiences in Developing and Supporting a Lead Sanitation-Focused Business in Malawi

Joe de Gabriele

In Malawi, WASTE and partners have been implementing 2 urban-based sanitation projects: SPA (Sanitation in Periurban Areas) and PSS (Productive School Sanitation). Experiences are shared regarding the development of a lead sanitation-focused business over the last 2 years, providing sanitation services with a financing structure which is less reliant on external (donor) funding.

The lead businesses that have been developed in Malawi provide goods and services on what is called “the service” part of the sanitation chain: the construction of toilet facilities in homes, schools and markets, the operation of public pay-toilets in markets, and pit emptying services. No activities have yet been developed for treatment and reuse of the sludge (what is called “the value chain”), although the SPA programme has some good experiences in this vein—for example, in piloting solid waste management at the market and the neighbourhood level. However, there are certainly similar challenges and lessons to learn, namely the relatively low demand for paid services by customers, how to deal with competition on subsidised services, the perception by businesses and banks that the investment is risky and unprofitable, and the reluctance of banks to finance loans either to businesses, to invest in order to conduct their operations, or to clients, to purchase the goods and services on credit.

SPA

The main focus of the SPA project has been the development of sustainable service delivery. WASTE, SNS REAAL Water Fund and Plan Nederland developed this proposal based on lessons learned from the ISSUE 1 and 2 programmes (2003-2010), the ROSA-programme (2006-2009) and Plan’s Water & Sanitation Programme. The proposal was planned for a period of five years and submitted to DGIS in October 2007 for funding. Plan Nederland assumed the role of manager of the programme and WASTE became the main executing organisation. The project is carried out in five cities: Arba Minch (Ethiopia), Blantyre and Mzuzu (Malawi), Parakou (Benin) and Kabwe (Zambia).

Objectives and strategy

The overall objective of the programme is to support local partner consortia in providing sustainable sanitation services to poor periurban communities in the above-

mentioned five cities. A lead role is to be played by the responsible bodies for provision of local water & sewerage in cooperation with local entrepreneurs.

In order to achieve this objective, four supporting results need to be realised in the course of the project:

- the local responsible bodies and private sector are capable and equipped to provide these services to poor and unsewered communities;
- local institutional structures and arrangements exist to support these services;
- financial instruments and means are in place to fund and expand the sanitation systems and services; and
- the project activities are in line with local and national water and sanitation policies.

SPA in Malawi

In Malawi, the development of sustainable service delivery focused on the development of a model sanitation lead company, and the development of financial services by Corporate Banks. While the programme is still struggling to develop solid partnerships to provide financial services, WASTE has made some good progress in supporting a private sector company to become a successful lead company in the delivery of sanitation services, and on developing a business model for providing sanitation-related services.

Why a lead business? And why did the programme work with only one business at a time, rather than several businesses? It was found that, although many businesses dabble in sanitation, none are reliant on it for survival. So starting with one company allowed for learning what it takes to survive and expand a sanitation focused business, and to scale up these services to other business entities, either by developing similar businesses or by using a franchise model.



photo: WASTE



The business provides an increased number of toilets.
source: René van Veenhuizen

Donors focus on “goals” such as improved health, reduced impact on the environment, etc., often without sustainable funding. The beneficiaries are seen as passive recipients of whatever is handed out, rather than as clients who actively demand goods and services—and put pressure on design, quality, costs, etc. The “usual business model” in sanitation businesses that have been attempted over the years by (international) donors and NGOs can be summarised in this way:

- The demand for the goods or services is often exaggerated. Just because there is a gap in service provision does not mean people are willing to pay for these services.
- NGOs target “entrepreneurs”, usually on a very small scale and with no or little investment, pay allowances, etc., but with a high drop-out rate and often high service charges.
- Too many businesses are trying to be developed at the same time, leading to too much competition while demand is still low.
- There is little client segmentation, but usually the programmes focus on only one client: households.
- NGOs expect businesses to behave like NGOs, with such targets as number of toilets, pits emptied etc. However, these targets should be sales targets: turnover, growth, etc.
- Finally, there is an overreliance on expensive consultants, and many businesses are so heavily supported and subsidised that they fold almost immediately after these subsidies come to an end.

Indicators

Because businesses provide services to clients in order to make profits, “WASTE” used the following indicators to gauge success with regard to the supported business success:

- turnover in sanitation activities (improved),
- margins on services (improved),
- net profits (improved) and profitability.

In reality, however, supporting sanitation businesses—at least initially—needs to be donor funded, a gradually changing mix of financial support. So the challenge at the onset is to link the interests of donors and NGOs with the interests of one or more businesses in supporting the service provision to paying customers.

How does one link these different interests? The programme developed business indicators as proxy indicators for sanitation-focused business. The usual way of measuring sanitation activities is by recording the number of goods and services delivered to clients over a period of time (usually a project period). Another way to measure the goods and services is to include the relative business parameters. The benefit of this method is that it can give an indication of whether the business is sustainable and growing. The relative business parameters to include are:

- turnover: meaning that the goods and services are actually sold, reflected in sales;
- market segments: clear diversification into separate demands by households and institutions, cash clients and credit clients, etc.;
- value proposition: where is profit made, and how can the business grow, in terms of cost/quality, innovations, rehabilitations, links to credit, etc.;
- margins: to indicate efficiency;
- net profits: to indicate the sustainability of service provision.

The lead company

Many NGOs and service providers did not understand the “no subsidy” principle that we applied to the lead company. In the sanitation sector, this dependency and the availability of grants and subsidies proved to be a major challenge to shifting to a climate in which customers pay in full—or even in part—for goods and services. Many household clients in urban areas expect free or subsidised toilets (but not other services).

Most businesses had little experience with ecosan, but were amply exposed to working with donors and NGOs. Furthermore, most of them focused on the rural areas, and had a poor reputation on timely completion and delivery.

The lead sanitation company was recruited in an open competition for small businesses (less than USD 50,000 annual turnover) and by using some of the key criteria, such as having some experience in WASH business (proven track

record), registration and commitment to invest personal time and money in business development with the programme. The SPA programme facilitated and brokered, but did not subsidise the business itself.

The following targeted technical and business-related support was provided:

- technical support (including new technical designs of ecosan, and regarding how to meet environmental and context challenges);
- financial support (e.g., related to cost control: working on an expanding market with a range of products, working to improve the margins of the business, by reducing overhead, etc.);
- awareness and exposure to school markets;
- value proposition, such as the rehabilitation of school toilets
- entry into the periurban market;
- branding – the brand: “Chatonda!”

Achievements

The programme in Malawi has now been running since 2009, but tangible results appeared in 2011. It took time to get everything organised, and only by trial and error was progress made that led to success.

In 2012, the first completed year, WES Management, based in Blantyre but operating all over the country, has managed to increase its turnover for sanitation-related businesses by 44%. Net margins are up from 10% to 15%, and net profits increased by 40% for the sanitation activities. Sanitation is now 82% of the business, up from 66% in 2012.

For 2013 the projections are:

- for sanitation-related activities there is a 45% increase in turnover;
- net margins have increased from 15% to 25%;
- net profits have increased from 2012 to 2013 by 55%;
- The sanitation part of the business now represents 91% of turnover, compared to 66% only 2 years ago.

Through its improved turnover, the business has managed to build up its capital and asset base and has invested MWK 8 million, about USD 25,000, in equipment and vehicles in 2012. Investments for 2013 are USD 31,000 and include a 3-ton lorry and a portable machine for emptying pit latrines.

Despite this track record, the business has not been able to secure bank loans (yet). Cash flow restriction is one of the major bottlenecks for ensuring timely operations in completing large works. This is because companies are required to put in a performance bond (usually 10% of the value of a contract) and payments are processed only upon completion of part of the works.

Schools turned out to be a very important market segment, and the business provides an increased number of toilets, not all in the “project” area.

Cash flow management is extremely important in this work, and, with it, also proper access to financial services (such as overdraft facilities); but as is shown in other experiences, there is still a reluctance by the local banks to support this—the risk is perceived to be too high.

It is, then, clear that you can do good business in sanitation without being an NGO. This also provides a good example for the WASH sector: a financially sustainable business that provides not only products and services, but also knowledge.

market segments: business CANNOT rely on only one market segment;

- *households = 6% of business volume (1 toilet USD 100–200); margins 15%*
- *schools = 94% of business volume (government / private / NGOs). USD 500; margins 30%*

Next steps

In the short term, we would like to see the following results or outcomes from our investments:

- We need to ensure that the business model is robust enough to survive and flourish in the coming years, so that it is an “institution” that can contribute to the sanitation sector in terms of the regular goods and services, but also that it be sustaining in terms of capacity and knowledge.
- Replicating the business model (either through other businesses investing in sanitation, or by WES management setting up a franchise) would contribute to scaling up of the services and achieving more outputs, both in Blantyre City and in other cities and rural areas in Malawi.
- The sanitation business also needs to be regulated at the national level, through a national certification system that is modelled on the existing construction industry certification and can be administered by the same government body.
- The monitoring includes such issues as tax compliance and client references. The cost of regulation and monitoring is sustained through the annual fees.
- We need to invest more in adding value to the waste collected (e.g., sludge from emptied pits, garbage from markets or households, which is approximately 94% organic). The main constraints of recycling include high capital investment costs, high costs of waste separation, and the low price customers are willing to pay for processed waste, especially compost.
- Lastly, we have to get the banks on our side. Till now they have not been willing to come on board to lend money at normal rates to a sanitation-focused business, as they see this as high-risk lending. They are also not willing to lend money to clients to access goods and services, as the transaction costs are high, and banks also consider “the poor” as having a high risk of default.

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Waste Ventures Fund

Over the years, WASTE staff has observed that local banks rarely service the small urban environment private sector. The latter includes solid waste collectors and recyclers, small companies that empty septic tanks and pits and the like. Interactions between the private sector and WASTE's partners, yielded the information that loan and credit demands of private sector operators were too large for most microfinance institutions, yet too small for normal banking operations—because of high-risk perceptions, high transaction costs, some incidence of legal obstacles, and generally unfamiliarity with the sector.

WASTE initiated a survey in 2003 in Costa Rica in order to get a clear picture of local demand for, and supply of, credit. Later, similar surveys were done in Mali and Kenya. These surveys also initiated discussion with the financial sector on how to break the deadlock described. The surveys showed that there is demand for relatively small loans (below € 50,000), yet this demand needed to be translated in a manner acceptable both to the financial sector and the small urban environment private sector.

Costa Rica has a relatively well-developed financial sector. It also features a national guarantee scheme, containing about Euro 24 Million, for small and medium enterprise support. Following extensive negotiations, agreements were reached between (1) WASTE and its local partner, and (2) the local partner, a bank and the national guarantee scheme on the Waste Ventures Fund (WVF). As the bank, despite having a national guarantee, remained very cautious, the initial coverage by the Waste Ventures Fund for urban environmental enterprises was 50% of the loan amount, with the national guarantee and the enterprise each backing 25%. Additionally, some of the strict technical–legal requirements for lending to the sector were waived.

One year later the bank requested that their share in the guarantee be increased to 50% and the WVF share reduced to 25%. The first 6 companies that took a loan used the money to purchase trucks for waste collection (3 companies), an autoclave (1 company for medical waste) and the augmentation of their working capital (2 companies). All loans were medium- to long-term (5–10 years). All were being repaid in time. Two more years down the line, the bank and the national guarantee scheme were sufficiently convinced about the viability of small-scale urban environment enterprises that they no longer require the WVF. Instead they

moved into a new sector: coffee processing. Twelve outstanding loans in 2011 using the Waste Venture Fund and FODEMIPYME have an approximate total value of USD 360,000. Most of these ventures are microprocessing plants for coffee. This process is carried out by small producers in cases where multiple benefits are obtained, such as better prices and decreased use of fossil fuels; also, organic waste is produced that can be reused on the farms and 90% less water is used than for a traditional process.

These experiences and the WVF have both now been exported from Costa Rica to neighbouring Nicaragua.

In 2004 in Mali, a detailed survey was conducted targeting both the demand and the supply side. The demand side was well represented by loan services relating to purchase of equipment for emptying septic tanks and pits. A contract was signed with an organisation that itself guaranteed 60% of the loan. This organisation has developed two types of loan products (short, small loans and medium-term larger loans) and is in the process of developing more. So far four loans have been granted.

In Kenya, a detailed survey was conducted in 2004, the demand was identified and the vibrant financial sector was reviewed. Our local partner identified the most interested financial institution (Family Housing, later to be the Family Bank) and, following a complex negotiations process, a contract was drawn up. At the time of approving the first loans, post-election violence erupted, and all applications were on hold. Earlier applicants did not return; a new set of applicants has now been issued loans.

In India the WVF aimed to promote an innovative sanitation system (urine diversion). The underlying financials were a mix of guarantees with a local bank, subsidised revolving loan funds to cover higher investment costs and developmental funds to hardware manufacturers and relevant applied research.

Success

The main conclusion is that WVF has been successful in so far that it has convinced financial institutions to get involved in the small-scale urban environment sector. The urban environment sector—often informal, unrecognised, unregulated, under-capitalised and, in all cases, unfamiliar—has simply not been on the radar screen of local financial institutions. Prior to WVF, this sector pretty much a no-go area for financial institutions, and this change has been the major achievement.

Urban environment MSMEs often generate substantial cash flows and need financial institutions that can offer cash transaction support services. Quite often this is coupled with

some form of technical assistance, whether in financials or involving environmental issues such as disposal or working with municipalities. Where the urban-environment actor is not an enterprise but a group, the financial institution will look into a different form of additional security as well as investigating the group formation and functioning.

The WVF has involved financial institutions, and they have gained practical experience in working with the sector. We can safely say that without the WVF this experience would not have been gained.

At the same time, the shortcomings in the WVF are recognised, as it has been implemented. First and foremost, setting limitations on its use, both sector-wise and geographically, has restricted the number of borrowers. Those that have built up confidence are encouraged to expand both geographically or sector-wise, provided the environmental / social angle remains intact.

WASTE has gathered some valuable experiences; these are currently applied when we are dealing with local financial issues. Clear guidelines and criteria are issued through our local partners. For instance, WASTE insists on good insight into demand for and supply of financial services. This can be done through a local study on supply and demand, in which case WASTE will provide a draft Terms of Reference to all partners. Another example is financial templates for reporting.

The conclusions from the four cases, Costa Rica, Mali, Kenya and India, are presented in the table below. In the annex, the schemes are presented graphically.



source: WASTE

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Country	Costa Rica	India	Kenya	Mali
WASTE's partner	ACEPESA	SCOPE	Practical Action	ALPHALOG
Type of partner	NGO	NGO	INGO	NGO
Financial partner	Banco Popular	Indian Bank	Family Bank	CVECA-ON
Type of financial partner	Listed Bank	Government Owned Bank	Housing finance co.	Credit cooperative
Preparation time	1-2 years	2 years	2-3 years	2 years
Starting date	2004	2006	2007	2006
Bottlenecks demand	Mismatch	Awareness	Interest rate	No product available
Bottlenecks supply	No market potential seen & legal	No market potential seen	No market potential seen	No market potential seen
Non-financial interventions	Yes	Yes	Yes	Yes
Type of financial instrument selected	guarantee	Hybrid, mixture of different elements	guarantee	guarantee
Amount	EUR 84,000	EUR 40,000	EUR 77,000	EUR 35,580
Short conclusion	Positive; bank has taken over; small market – need to expand into different areas (coffee market)	Mixed; FI is not at core and thus difficult to replicate, yet some activities sustainable	Positive; FI involved, demand growth, support costs may need to be modified	Positive; FI is involved, demand to expand (areas, target groups and products)
Recommendation	Expansion into new sectors (coffee) including wastewater treatment	Restrict use of grants; leverage funds against deposits to be explored; MSME increase to be explored	Need to expand; support cost structure to be derived	Need to expand to more clients, new areas, and increased products; support cost structure to be derived



Demonstration to farmers on how the ecosan system works
source: Robert Holmer

Harvesting Knowledge on Sustainable Financing in the Philippines

Based on an article by Leo de Castro (2012),
Center for Advanced Philippine Studies (CAPS)

The Philippine sanitation sector remains a highly fragmented sector, mainly due to weak regulatory arrangements. Sanitation service delivery is poor, as are the capacities to facilitate sustainable sanitation. Achieving universal coverage for sustainable sanitation is not likely to happen unless there is a clear national sanitation policy and programme, effectively managed by a lead institution and supported by an alliance of champions for sanitation to facilitate demand creation and access to resources at national and local levels.

The Philippine Sustainable Sanitation Roadmap (PSSR)¹ was published in 2010 by the Department of Health and presents the vision, goals, outcomes, outputs, activities and inputs required to make sustainable sanitation a reality in that country. The development of the PSSR provides sanitation with the necessary focus it deserves.

The ISSUE (Integrated Support for Sustainable Urban Environment) Programme, is implemented in the Philippines by CAPS in partnership with WASTE, and aims to support key

stakeholders to modernise their systems for management of excreta and solid waste, leading to increased living standards and stable livelihoods of disadvantaged people and communities in at least 15 districts in the south.

During the first phase of ISSUE (2004-2006), CAPS pioneered the first ecological sanitation (ecosan) pilot project in the City of San Fernando, in the province of La Union. The project targeted the poorest households in two Barangays (neighbourhoods) for the use of urine-diverting dehydration toilets and encouraged active participation of stakeholders during the social preparation, planning, implementation (actual construction of toilets) and monitoring of results. The City of San Fernando financed the construction of the sub-structure, and the superstructure was to be financed by the households themselves.

In the second phase, ISSUE2 (2007-2010), the focus of the programme expanded to cover sanitation and solid waste management, and explicitly looked at the aspect of financing. Partnerships were established with the provincial government of La Union in order to reach out to other local government units, the 19 municipalities and one city, as implementation partners. The programme was designed to enable the capacity development of local stakeholders on sanitation and solid waste management. Sanitation inter-

ventions were focused on targeting the poorest of the poor, or the bottom of the pyramid (BOP), which is the section of the population that usually lacks access to safe, improved sanitation.

The innovative approach to finance sanitation in poor urban areas in this programme was characterized by these elements:

1. low-income groups were offered information about various options of finance;
2. users and communities decided for themselves on financial contributions and other financial arrangements with the project;
3. finance schemes acknowledged the need to cover soft costs (training, advocacy, knowledge) as well as hard costs (infrastructure);
4. the local private sector was involved;
5. user fees were the main source of finance (in order to be sustainable).

The approach did not require the development of new financial instruments, but included a creative way of using existing commercial instruments, together with available funds (from government and international agencies) allocated to the sector. It also tapped into the expertise of the sector's non-profit players (NGOs), which could help to bridge the implementation gap by reducing the associated risk" (Sijbesma, et. Al 2008).

Sustainable financing for sanitation: for whom?

There are related pro-poor water and sanitation programmes being implemented by the Philippine Government, and the idea of convergence in investments on certain programmes is being utilized. The funds are made available by the national government and disbursed through various line agencies as counterpart funding to donor funds.

However, these water and sanitation programmes, financed through the national government, do not meet the financial requirements of the poor in both urban and rural areas. For poor households, the problem is not so much the cost or the willingness to pay but the need for a sizeable up-front lump sum investment. Saving is not an attractive option for poor people because it postpones access to toilets and their benefits while other, more urgent cash needs may cause them to use the savings for other purposes.

Financing sources made available either at the micro/local level or at the meso/intermediate government level include grants, loans, group saving schemes, and investments in and by individual entrepreneurs. At the meso or intermediate level, sources of financing could originate from the central government transfers, local revenue sources, donor funds, north-south solidarity funds (city twinning), private-sector/water company investments (national/international), market-linked sources and international financing institutions (Sijbesma, et. Al 2008).

One of the main bottlenecks to be addressed is the creation of

both demand for and supply of WASH services to the poor and underserved communities. At the national level, there is a low level of investment in the public and private sector when it comes to WASH. Furthermore, there is an enormous lack of support for building the needed capacities of local government, utilities (LGUs) and water and sanitation service providers. At the local level, LGUs do not effectively coordinate, which leads to inadequate, inefficient, ineffective and unsustainable WASH services. There is weak technical and financial planning and implementation capacity. At the community and local level, community-based service providers provide inefficient, weak and unregulated services that are unable to operate and maintain viable and sustainable community water systems. Lack of access to financing aggravates the low level of investment, and financing of WASH service provision is a major concern for the sector (Unicef, 2011).

Defining Sustainable Financing

In searching for a definition of what sustainable financing is, WASTE, in its document entitled "FIETS" (see also in the editorial) offers the following:

"Sustainable financing is based on the principle that communities pay for WASH products and services from their own earning and incomes. Whether these are direct payments from individuals or tax revenues, or loans or public investments, it is important that recurrent cost and depreciation are paid from local resources. External (grant) finance should be used to mobilise local investors. Sustainable finance also implies that local stakeholders are in control of the financial resources." (WASTE, 2012)

In the selected areas, the ISSUE2 programme focused on getting banks and other financial institutions to understand the financial and earning profile of commodities, service, supply, and secondary enterprises, and service organisations needed to understand the requirements of financial institutions for credit and lending.

To accomplish the above, CAPS and the consortium planned the following activities:

- Invite local financial institutions and service providers to exchange information and assess the local credit and lending practices.
- Provide financial guarantees and other financial instruments of financing organisations to facilitate opening up financial windows to entrepreneurs (male and female) in MSEs, CBOs, NGOs, parastatals and the public sector.
- Set up a transparent, fair and broadly supported tariff & fee system (taxes, subsidies, surcharges, investment funds, and the like) which supports sustainable financing of solid waste and sanitation activities. To accomplish this, 'willingness and ability to pay' studies and market assessments for fee and tariff systems for (new) household sanitation and waste infrastructure and services were initiated. Strong and long-term markets exist for value-added uses and are based on real economic demand for significant volumes of recyclables, compostables, recovered nutrients and materials.

Application of financing mechanisms during ISSUE2

There are three concrete experiences for which the idea of financing for sanitation services was given attention during the period of implementation:

- 1) Loan assistance to *Wisdom Ceramics*, a local manufacturer of sanitary wares (small scale enterprise). Loan assistance was provided to Wisdom Ceramics by a consortium partner, the Foundation for a Sustainable Society, Inc. (FSSI).² The loan package came in two tranches amounting to PHP 2,000,000 (UDS 45,000). With the loan, Wisdom Ceramics developed a mould suitable for the production of ecosan UDDT toilets.
- 2) An (approved) loan application to the Dutch SNS Bank, at 6% interest, by the City of San Fernando, one of the consortium partners who was assisted by the ISSUE Programme in the formulation of the City Sanitation Plan (considered to be one of the first models of sanitation planning in the country). The loan applied for had a total volume of EUR 399,250 and was intended to finance several projects prioritized in the sanitation plan of the city. In the end the loan did not follow through for two reasons. The first reason was that, when the final decision had to be made, the payback conditions turned out to be very unfavorable for the City: because the payback currency was negotiated in euros, this brought about—given the inflation rates in the Philippines—a huge risk of paying much more (in local currency) than initially was estimated. The second reason was that, at the time of signing, due to the monetary crisis, SNS Reaal decided to cancel all loan applications issued through the SNS Reaal WaterFund³.
- 3) The Sanitation Loan Programme of the Tulay sa Pag-unlad, Inc. (TSPI), which is an innovative financing mechanism for the poor⁴. This programme facilitates housing and/or toilet construction or renovation with loans of up to PHP 100,000 for housing and up to PHP 15,000 (USD 450 in 2008) for toilets. Loan terms range from eighteen months to five years. The programme provided several loans for toilets.

TSPI's housing and sanitation loan programme:

Features of the toilet loans are as follows:

- the loans focus on the construction or repair of toilets worth PHP 5,000 to PHP 100,000 with a 6–18-month payment term.
- the programme offers a 1.5% interest rate with a prompt-payment discount (half the interest on regular loans);
- the programme extends credit life insurance and micro-insurance benefits offered to TSPI clients with at least a one-year membership in the livelihood loan programme;
- TSPI mobilises local manpower for construction works; and
- the programme is implemented in partnership with local foremen and hardware stores.

Observations and lessons learned

Application of the financing mechanisms in the ISSUE programme did result in more interest on the part of the banks in sanitation and waste issues, as well as loans to enterprises and to households for toilets. Some MFIs have actually introduced this last product as part of their housing or social loan programmes. They offer it to existing clients with a proven track record of up-to-date repayment. And although the existing cases show the viability of the product line, the roll-out is slowed down by targeting existing clients only.

Additionally, the market could expand if an MFI would come in and partner up with a water-service provider (WSP), especially one with a sanitation management programme. As it is in the interest of the WSP to get more households with properly constructed toilets and septic tanks, the WSP can point out to the MFI the communities where households need toilets and septic tanks. The MFI can enter into an agreement with the WSP to tie the toilet loan repayment to the water service—meaning that, in case of default on the toilet loan, the water supply service will be cut off.

It is important to build customer awareness and interest. Promotion and marketing should be done by the MFI and the water utility. In developing the marketing plan, the appropriate medium for the target audience must be considered. For instance, advertising a WSS programme or product in the newspaper is inappropriate considering that members of most poor households rarely read a newspaper.

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Notes

- (1) The PSSR presents the vision, goals, outcomes, outputs, activities and inputs required to make sustainable sanitation a reality in the country. Its development was spearheaded by the Department of Health (DOH) with the National Economic Development Authority (NEDA) as co-chair. The World Health Organization (WHO) has provided financial and technical support for this activity. A team of experts from Streams of Knowledge and the Center for Advanced Philippine Studies served as consultants to this project.
- (2) The Foundation for a Sustainable Society (FSSI) is a social investment organization committed to support the development of sustainable communities through social entrepreneurship. See: www.fssi.com.ph
- (3) The Philippine peso dropped 40% since 2008 in relation to the US dollar (in reference to 2013)
- (4) See: www.tspi.org

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Safe and Productive Use of Waste, bringing in RUAF experiences in WASH

René van Veenhuizen and Chloe Naneix

Within the framework of the Dutch WASH alliance, the RUAF Foundation focuses on the issue of safe and productive use of water, including household grey wastewater, and organic wastes, including human excreta in urban and periurban agriculture. The WASH programme is introduced in the editorial on page 2.

The “safe and productive use” of solid and liquid waste implies using rainwater or treated or untreated wastewater and organic waste (including human/animal excreta) in small-scale agricultural production with the purpose of securing household consumption and improving nutrition. Bartering or selling the surplus produce can generate income, as can linking waste to other productive uses of waste such as energy production (see box).

There are many possible entry points for the inclusion of safe and productive use of wastes in WASH projects:

- **collection of kitchen, garden and market biowastes** compost production and application (also teas and vermicompost); safe reuse of fresh and composted organic wastes in agriculture (co-composting in combination with faecal sludge);
- **collection of biosolids from dry/composting toilets and faecal sludge from septic tanks and pit latrines** drying, storage and co-composting or pelletisation; new fertilisers, and safe application in agriculture;
- **urine diversion** preparation of liquid fertiliser, and its safe use in crop production and straw enrichment (fodder);
- **rainwater collection**, Multiple Use Services (MIS), low-cost and water-efficient irrigation systems and practices;
- **household wastewater diversion on- and near-site** low-cost treatment systems; adequate wastewater handling, crop selection and irrigation practices; health risk reduction in the post-harvest period.

In relation to:

- *backyard / home gardening door gardens, container gardening and other “low-space” technologies; small livestock;*
 - *community gardening social, organisational, technical and economic aspects;*
 - *consumer-supported organic or conventional horticulture, box schemes, farmers markets and other “direct” marketing mechanisms;*
 - *periurban and rural small-scale and larger farms that are willing to buy “new generation” fertilisers;*
- and also in relation to:*
- *energy recovery, linking it to biogas (especially as part of business development and health-risk reduction).*

In each city the potential for resource recovery and UPA is unique and requires proper analysis, planning and policy development. The “safe and productive use” focus is also applied in the context of water and sanitation projects in rural areas. Although context conditions are different from those in or around the larger cities, opportunities for “productive use” exist here as well, both in relation to local farming and in food production, in home gardens by agricultural workers and by low income households in the villages and small cities.



Integrated community managed waste water management in Kathmandu.

source: René van Veenhuizen

Achievements so far

RUAF collaborates with local partners in four countries: Ghana, Nepal, Kenya and Ethiopia. Assessments have been undertaken in these countries, and workshops have been held to raise awareness and jointly select the innovations to work on (a training workshop on UPA&WASH was also given in Malawi). In 2013 an international sharing and learning workshop was organised in Tamale, Ghana; representatives of all WASH countries and some selected other countries participated (see below).

The main aim of this work is to facilitate the development of sanitation business models and/or pilots or demos that fit within the development momentum of the selected locations (cities and towns). In each of these cities, RUAF and the local WASH partner seek to identify and agree with multiple stakeholders on initiatives that fit into the transitioning of the city or town, by developing scenarios in the “theory of change”, and include— or aim to develop— sustainable governance and financing arrangements. Both of these terms implicate a right mix within a certain period of time: *governance*, including local administration, civil society and private sector responsibilities and initiatives, and *financing*, in a similar way: structural access to local or other subsidies, credit and/or savings. In addition, it is paramount that the developed systems are safe, that is, within the existing norms and using the recommendations of the WHO guidelines.

Based on the local assessments, and agreed upon in multi-stakeholder workshops, RUAF and local partners are developing the following activities:

a) Policy influencing and lobbying

Developing transitioning scenarios (papers, maps and presentations) for the cities and towns, on how sanitation and use of waste could sustainably fit into this development; seeking agreement in local multi-stakeholder (WASH or broader) platforms; developing dissemination material; feedback on findings to influence further policy development.

b) Developing urban and other sanitation systems that include safe and productive use of solid wastes and wastewater

Participatory selection of promising systems (developing demos on new innovations and furthering business development of existing innovations); adapting prototypes, developing capacity building material and support training activities; and developing a specific monitoring framework for selected implementation activities (see below).

c) Research on use for (urban) agriculture of compost and urine with variety of stakeholders

In addition to the monitoring of the selected systems, tests are developed with local farmers, departments of agriculture and others on compost quality and compost and urine application and gardening and/or production of high value crops.



Improved access to water and school sanitation in Tamale.

source: René van Veenhuizen



An entrepreneur combining various services in the sanitation service and value chain.
source: René van Veenhuizen

In the above-mentioned four countries, the selected innovations are quite similar and can be characterised as:

- 1) school sanitation, an integrated system of urine diversion, composting, and gardening, with rainwater harvesting and biogas;
- 2) public sanitation, improved services at selected public toilets, adding the use of biogas and improves access to water, as well as the safety and services of these toilets;
- 3) urine separation and composting of faeces at the household or community level, with own vegetable gardens or sale of co-compost to surrounding community;
- 4) improvement in the central system of handling and treatment of solid organic waste and faecal sludge.

In each location, these four systems have been specified in business opportunities and/or interesting demos or research and in each location several partners as part of the multi-stakeholder platform are involved. The following four articles illustrate the specific situation and ongoing WASH work.

The Sharing and Learning Workshop

Because of interest shown by local organisations involved in the WASH programme in sharing and learning from the above-mentioned experiences, an international workshop was organised. The workshop was held in Tamale, Ghana in

May 2013, and brought together representatives of the WASH countries (Bangladesh, Benin, Ethiopia, Ghana, Kenya, Mali, Nepal, and Uganda, as well as participants from Burkina Faso and Malawi) and RUAF partners from Ghana and Liberia to share and learn on the issue of productive reuse. Tamale had been selected as the location because WASH partners are testing co-composting here with a private co-composting business company, and WASTE had recently agreed on a WASH Consortium on Urban Sanitation that includes use of wastes and could be presented and discussed here.

Two participants were invited from each WASH country. The workshop was facilitated by RUAF, University of Development Studies, and the training on co-composting by IWMI. Participants from each country presented national experiences concerning productive use of waste and wastewater and sanitation, including - if applicable - use of faecal sludge and/or co-composting. Participants from Ghana, Kenya, Ethiopia, Nepal and Malawi also prepared a report on the status of their work (see elsewhere in this issue). In addition, all participants brought relevant information for sharing and further development.

The programme was adapted due to a tragic accident that involved three of the participants. The participants, however,

Sustainability Criteria

Financial Sustainability

- demand and willingness to pay for the product/output in and around the city/town;
- source of investment (mix of external, government, private, community);
- main expenditures (business, project, including overhead cost);
- revenue from sales of the product (data on turnover, margins, profits);
- increased income from savings and sale of products (with special attention to local sale, use of fertilisers, and increased income from sale of locally produce food);
- reduced cost in waste management (city level).

Institutional Sustainability

- multiple stakeholders (including urban farmers) are involved;
- awareness raised and local interest and commitment assured:
- a-commitment of local and national authorities and input/budget (for the latter, see F)
- b-commitment and involvement of private sector and input (for the latter, see F)
- c-commitment of citizens, innovation users, consumers, etc., and willingness to pay (see F)
- training provided to major stakeholders;
- legislation available (accommodative or prohibitive, and enforcement possible);
- linkages to other sectors (such as urban zoning/planning, city master plan);
- practices and products standardised, and/or certification.

Environmental Sustainability

- amount of waste (per stream) reduced (also see F);
- quality of product generated (compost, energy, and clean water);
- substantial reduction in use of artificial fertilisers, clean water, firewood;
- environmental risk assessment and mitigation strategies in place;
- part of urban zoning/planning, watershed management (see also under I) and/or link to climate-change adaptation and mitigation strategies of city (see also under I and E);
- awareness raised among citizens and major stakeholders (also see under I).

Technological Sustainability

- quality and quantity of product (compost, energy, and water) generated;
- innovation is according to local standards and uses local material (see also E and S);
- local maintenance and replication is possible, and private sector interest and involvement is assured (see also I);
- local artisans are trained;
- price: innovation is affordable and accepted (see also under S);
- use: innovation is safe, comfortable and hygienic (see also under S).

Social Sustainability

- citizens and/including farmers are involved as part of a group of multiple stakeholders (see also under I);
- emphasis in this area on pro-poor focus, gender, and community involvement;
- list externalities: health risk assessment and mitigation strategies in place;
- use: innovation is comfortable and hygienic (see also under T);
- price: innovation is safe, affordable and accepted (see also under T);
- innovation and products are accepted (link to perception, absence/presence of cultural barriers).

decided to continue with the workshop in the memory of Mr. Abdul Barik from Bangladesh who died in the accident, and in support of the recovery of Ms. Fauzia Alam of Bangladesh and Mr. Rajesh Adhikari of Nepal.

The experiences of the participants, and in particular the RUAF supported work under WASH in Ghana, Nepal, Kenya and Ethiopia and the experiences of Malawi and IWMI, were well presented and discussions were lively. The training on co-composting was appreciated very much. It was felt, though, that more time needs to be spent in further systematisation of the selected systems. The participants saw themselves as a beginning network on the issue, and for further sharing and linking. It was suggested to report regularly on each other's' activities, the RUAF facilitated work, and to make linkages to other (national and international) experiences. All materials are available and have been shared with the participants. Some of these materials will be made available on the WASH website.

During the workshop, the participants discussed possible indicators as part of the FIETS sustainability criteria (for more on the FIETS framework, see the editorial). The participants felt that a business plan of SPUW-UPA systems should include a mix of finances, including savings and subsidies, which can be part of regular government support. IWMI presented their business canvas which, in addition to financial information on the business itself, also included positive and negative impact on wider society. It was agreed that a monitoring framework for Safe and Productive Use of Wastes in WASH would be developed further, facilitated by RUAF and for use under WASH.

The participants listed possible indicators of the FIETS sustainability criteria and agreed on those that would fit into a FIETS framework for Safe and Productive Use for Urban and Periurban Agriculture (see the box).

A general description of each innovation will cover the following questions:

- Is there a business model, and is this an existing business case (private initiative with or without subsidies), or still part of awareness and mindset changing?
- What is the main waste source (solid, liquid, etc.) and what is the main output (fertilisers or nutrients, energy, cleaner water)?
- What are the main health and environmental risks, and are there any mitigation strategies?
- Is the model replicable?
- What links are available to other pertinent urban issues, or what linkages to ongoing efforts can be made?

This is a work in progress, and the issues listed are far from operational indicators. In the forthcoming months, the team will further select a few, appropriate and easy to use criteria, which can be rated from 1 to 5, so that the work progress during the next three years can be monitored.

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Business Opportunities in Safe and Productive Use of Waste in Tamale

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Tamale is the largest urban centre in Northern Ghana, with a current population of about 371,351 (Population Census, 2010). Many developmental challenges, such as limited drinking water availability, inadequate collection of urban waste and lack of planned areas for urban agriculture, are part of daily life in this rapidly growing community.

Over the past few years, Tamale has experienced very rapid increases in population, spatial expansion and economic activity. This situation has brought about an unprecedented amount of waste generation. Waste materials grow in complexity with the emerging influx of light- to medium-capacity processing activities which, in turn, are putting the city waste management authorities under such pressure that much of it remains uncollected. Almost all of urban waste is not recycled, even though it contains biomass with a high potential for bioenergy and compost.

Initiatives for safe and productive use of waste in Ghana

In Tamale and other metropolitan and urban centres in Ghana, the use of organic solid waste has a long history. Traditional reuse methods for faecal sludge are very common in the periurban areas in Tamale Metropolis (Cofie et al., 2005). Wastewater is being used by various urban farmers in the city, farming around the central drain as well as dams and wells. With the growth of urban areas, the importance of managing municipal solid wastes to avoid environmental degradation and public health risks has gained in significance, especially where population density is high. Although informal recycling activities for waste materials are widespread, the treatment and use of the biodegradable organic fraction is still fairly limited. Increasingly, municipal authorities are now looking at new ways to manage their organic solid waste.

The use of composts in urban and periurban agriculture is common in Ghana for several reasons. These include guaranteeing urban food security and at the same time providing an opportunity for recycling biodegradable materials in the municipal waste stream (Moore et al., 2007), and the increasing cost of inorganic fertilisers.

A pilot composting plant was set up in 2001 with the support



A farmer explaining how the current system of applying fecal sludge works.
source: René van Veenhuizen

of the Waste Management Department of Kumasi Metropolitan Assembly (KMA) to provide decision support on the best co-composting options for municipal solid waste and human excreta (Cofie et al., 2003). Further work in this direction was carried out by Adamtey et al., (2009a, and 2009b). In experiments with Comlizer—an excreta-based compost-fertiliser mixture—enrichment of co-compost with urea or ammonium sulphate reduced faecal coliforms and helminth eggs, thus sanitising the Comlizer and making it safe for use (Adamtey et al., 2009b). The techniques and technology of Comlizer production are applicable on a small or large scale by individual farmers, municipal authorities, cooperatives, or industries.

Urban and periurban agriculture

About 7 vegetable grower societies are at work in and around Tamale Metropolis, all forming a part of the Northern Region Vegetable Farmer's Union (NRVFU), which has a total of 614 members (URBANET, 2011). There are many other farmers who are not registered by any society, but who farm within the city boundaries. Within Tamale boundaries, these farmers grow a variety of food crops, mainly vegetables but also staples such as maize, rice and yam. Livestock and poultry are also kept under the extensive management system. A number of farmers operating in the periurban areas are

organised in the Faecal Sludge Farmers Association (see earlier reports in the UA-Magazine).

The WASH alliance

Under the Dutch WASH Alliance (DWA) programme, the Ghana WASH Alliance (GWA) Programme presently operates in the Northern Region in the districts of Tamale Metropolis, Tolon Kumbungu, Karaga, Central Gonja, Nanumba North and Nanumba South. The start-up partners of the Ghanaian consortium are New Energy, Simli Aid, AFORD Foundation, GYAM, WUZDA, INTAGRAD and Presby Church RWH project. UDS is a thematic partner of the consortium for research and knowledge dissemination. Government's Community Water and Sanitation Agency (CWSA) is the Chair of the Steering Committee of this program.

Collaborative work of UDS and RUAF

Research work on Urban agriculture in Tamale has been going for a long time, through series of collaborative research projects (Global Challenge Water for Food, 38, 2005-2008, WHO/FAO/IDRC - Minimising health risks from using excreta and grey water, 2007-2010, START, 2011-12 - Knowledge assessment on climate change and periurban/urban agriculture and others), and presently, through collaboration of UDS with RUAF, under WASH Alliance.

RUAF collaborates with UDS by capacity building, awareness raising, action research with the local partners, training of trainers on safe and productive use of water and sanitation products in urban agriculture, organising exchange visits to other countries, and/or monitoring and systematisation of experiences on this topic.

Scenarios on safe and productive use for UPA

In line with its mandate within the WASH Alliance, UDS has, for the past year, worked on the development of scenarios for safe and productive use of waste for urban and periurban

agriculture. These scenarios comprise an overview of the present situation with respect to waste collection, various types of waste categorisation (municipal, agricultural and human), and future possibilities for utilising these resources efficiently for urban agriculture in the Metropolis.

Based on the current situation in the Metropolis, those scenarios have been developed that include a role for UPA in building city resilience, especially on: improved sanitation that is able to generate nutrients (urine and compost) for urban and periurban farming and for energy (biogas as well as waste as a fuel source); improved MSW management that includes studies of options for recycling plastics, and compost production for sale to urban and surrounding rural farmers in combination with improved handling of agricultural waste (UDS reports to RUAF, unpublished, 2012/13).

These scenarios have been discussed with the multiple stakeholders and further developed to include issues of demand creation, testing products with selected farmers, and monitoring use of compost and its effect on crops. In addition, on-going training programmes assist farmers to learn how to make their own compost from available waste.

Innovations and business opportunities

Based on the scenarios briefly described above, innovations in waste collection, management and processing have been discussed with multiple stakeholders. Some of these innovations contain business opportunities for interested individuals and groups as well as enterprises wishing to be involved in the processes described below:

a) Pit latrine emptying and use of faecal sludge (FS) by organised periurban and other farmers

The pit latrine system is under pressure due to urbanisation, but it still exists, especially in densely populated central parts of the town; it is likely to continue to operate



Urban vegetable farming in the city.
source: IWMI-Ghana office

into the foreseeable future. TAMA and the FS farmers have agreed to improve the current system through developing options for use, after co-composting, of the collected FS as organic fertiliser input for periurban farming of cereals. Drying and co-composting of the FS is carried out by farmers after training, to reduce contamination hazards and ensure that the process complies with the WHO Guidelines for Safe Use of Wastewater and Excreta in Agriculture (2006). Business opportunities for pit emptiers, transport of FS and sale of crops are analysed and supported by WASH through the TUWSP programme (see below).

b) Organic Waste separation and composting, including co-composting of FS

Zoomlion and DeCo! are private entrepreneurs both operating in Tamale. Zoomlion collects most of the waste in the Metropolis and sends some of it to the DeCo! main site for separation. The organic part is then separated and co-composted by DeCo!, together with other types of organic inputs such as neem tree leaves, chicken droppings and/or shea butter slurry. UDS has studied the process and the business of DeCo! and made suggestions for change. The current process can be improved by changing the central deposit to sorting in a decentralised system. At the same time, both the quality of compost

and the marketing process need to be improved, possibly under the PPP arrangement which DeCo! is presently developing. The production of high-quality organic fertiliser for sale to farmers has high potential in this area, and this enterprise can be a successful commercial venture if details of collection, separation, enrichment, distribution—as well as role of each partner—are carefully worked out (Box 2).

c) Improved sorting and co-composting at the central level

This activity is linked to the previous one. With increased volumes of plastic waste reported in the Metropolitan area (Puopiel 2010, Chainortey, 2013), there is interest in the possibilities of utilisation of these materials which are presently collected only in part, and which represent a main source of pollution and clogging of drains during the rainy season. Some local and foreign companies have already expressed interest in the establishment of a plastics processing plant within the Metropolitan area.

d) Development/Rehabilitation of Public Toilets

Public toilets in Tamale are operated as commercial entities, but need major improvements (Agyey, 2013) in terms of the quality of the services provided to the users, and of the training needs of operators, especially in the area of hygiene and business skills required for the operation of

DeCo!

The Decentralised Composting Company (DeCo!) was established in 2008 with the aim of producing compost for small farmers in Tamale. The project received the SEED award in 2010 and received funds from UNEP, UNDP and IUCN. Currently DeCo! is funded by GiZ, but is looking, together with WASH Alliance, into the possibility of franchising its operations.

The company produced about 50 tons of compost in its first year, with subsequent expansion to about 300 tons and ideas for further expansion, to about 600 tons per annum at present. The product is bought by farmers, companies and private individuals who use compost for gardens. DeCo! employs about 12 persons who are mainly engaged in sorting waste to separate organic and inorganic elements. The production of compost contributes to addressing the serious waste disposal problem in the Metropolis and improves soil fertility in the Region. There is potential for expansion of this effort.

The processing and production of compost is very simple: a private waste company (ZoomLion Ghana) collects municipal waste and brings the containers to the DeCo! composting plant. Waste is sorted to separate inorganic elements which are then returned to ZoomLion for dumping at the landfill site. The remaining organic waste material is mixed with rice husks, chicken

*droppings, charcoal and sheanut (*Vitellaria paradoxa*) residue (a by-product of sheabutter production, the main local women's industry), with added neem tree leaves (*Azadirachta indica*). This mixture is kept for about a month in large heaps to ensure the composting process and temperatures are checked. Subsequently, the mixture is bagged and sold locally.*

DeCo! seeks to develop into a PPP with 5 more sites for the processing of waste into organic fertiliser, with a capacity of about 3000 t/annum. Careful attention to a proper business plan is required, as are controlled quality of products and a reliable supply to the market.

UDS analysed DeCo! during the season 2011/2012; the business showed a profit margin, albeit a small one, not significant enough for the running of the company as a viable enterprise. The business needs upgrading from the present donor-dependent situation to a more self-sufficient business venture. In order to ensure sustainability, customers must be charged the realistic cost of the product and the entire operation must be run as a business venture.

The potential market is quite large, but the current compost needs to be developed into a better organic fertiliser, if DeCo! can increase the active ingredient of its produce. WASH is undertaking tests with DeCo! on this.



A first WASH multi-stakeholder meeting.
source: René van Veenhuizen

the facilities. There are improved designs developed for testing within the urban and periurban communities at various stages of implementation within the Metropolis. These include toilets designed to be suitable for children and for people with disabilities as well as models that separate faeces from urine, thus allowing for easier collection and use in agriculture. To accompany these efforts, there is a need to look very closely at improvements of the currently used operational model: it lacks sustainability and a sound business base, and also omits proper hygiene rules (see box).

Also needing to be explored are options for sanitation of FS through biogas production, and improvement of sale of FS or co-compost produced at the premises to surrounding farmers.

e) *Integrated school sanitation (toilet block, RWH, biogas, school garden)*

While school sanitation programmes are not a business option, they are nevertheless a very important component of scenarios proposed for improvement of the situation in Tamale. They help create early awareness within the young segment of the population and also have influence on environmental awareness at home and in the entire community. They highlight and promote positive solutions to sanitation issues available in the area of recycling, and reuse within urban and periurban food production.

f) *Household/community urine separation and composting of faeces*

UDS is actively pursuing studies of separation toilets for domestic and communal use. New designs separating urine and faeces could make a significant difference in the supply of valuable nutrients for home gardens in periurban areas, as urine is a source of nitrogen—as shown in Burkina Faso, where commercial quantities are collected and used for vegetable cultivation. Other business opportunities lie in the construction of improved toilets and the sale of compost prepared with treated human waste as one of the components, or the production of selected

Public toilets

A survey in 2011/12 investigated 86 functional toilets of four types, located in 66 neighbourhoods in the Tamale Metropolis. Most of the public toilets were concentrated in the town centre, where trading on the markets is high and economic activities are vibrant. The majority of the toilets are of the aqua privy type, with few KVIPs and pit, and a very small number of water closet systems. The capacities vary, from –8 to 20-seater toilets. The small number of toilets in relation to the large population results in long queues, and also indiscriminate ways of disposing of waste, such as using polyethylene bags. Certain vulnerable segments of the population (children, the disabled) are excluded from the use of toilets due to lack of adequate designs and/or the large numbers of people waiting. This situation is adding to the sanitation problems and environmental pollution in the Metropolis.

Toilet facilities in the Metropolis are owned by the Tamale Metropolitan Assembly (TAMA) but managed by private

individuals. Poor remuneration arrangements do not motivate attendants to do their best to keep the toilets clean. Salaries are not uniform or well structured. They range between as little as GHC 30 per month (USD 15) to a high of GHC 70 (USD 35). Since cleaning is generally considered to be part of the job, no extra cash is paid for this work.

It was estimated that income from public toilets ranges between GHC 10 and GHC 80 per day (USD 5–40), depending on where the facility is located and the number of users per day. There is obviously a financial base; this can be used to improve the present situation. Better management arrangements are needed for the use, cleaning and management of these public facilities. WASH seeks to improve hygiene awareness among both users and managers, as well as the financial and operational structure, which includes the processing of the waste.

high-value crops using these new organic fertilisers. At present, the campaign is focused on awareness raising as well as field testing of the new organic fertilisers on selected crops.

Urban sanitation and waste reuse consortium

As part of the Ghana WASH Alliance, WASTE is supporting the Tamale Urban Sanitation and Waste Programme (TUSWP).



Turning the compost heaps at DeCo!
source: University of Development Studies

The aim of TUSWP is to facilitate business planning and business support in the urban sanitation and reuse sector in Tamale. Members of this group are: Tamale Metropolitan Assembly (TAMA), Baobab Micro Finance Company, DeCO! private producers of compost and organic fertiliser, ZOOMLION Ghana private waste management company, and the WASH Partners, CLIP and UDS. The consortium focuses on the development of options for small-scale business in sanitation. Baobab will facilitate microloans to interested entrepreneurs, including waste separation, compost production, and construction of improved toilets. Urban and periurban farmers will benefit from this initiative through access to organic fertiliser which will be safe to use and also available at affordable prices.

Conclusions

There are simple and applicable methods for waste processing into useful products for urban markets. Recycling and reuse are providing much-needed nutrients for poor soils as well as ways of solving municipal waste accumulation prob-

lems. The access to financing for these, often small-scale, initiatives is improving. The main challenge in this process is financial sustainability and further up-scaling of these options. Not all of these practices will prove to be sustainable in the long run, although they do fulfil a role in the development process, piloting and awareness raising.

The era of waste processing is just beginning in the region, and many stakeholders are awakening to the possibilities of the new resource that is available, affordable and reliable. As increased urbanisation is taking rapid steps in Africa, options for processing waste and producing food in urban and periurban environments are more important than ever. Tamale Metropolitan area provides some examples of current thinking and options that can be applied to many other growing towns in sub-Saharan Africa.

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WASH and Food Security in Surkhet District, Nepal

Giri Raj Khatri and Purnima Shakya

Nepal stretches across 147,181 km² and is divided into three distinct ecological zones: the Terai in the south, the hills in the middle and the mountains in the north. Because of its unique and varied topography, only 20% of the land is cultivable. Agriculture is the main source of livelihood for the majority of people in Nepal, and provides employment to 66% of the total population and contributes about 36% of the GDP (MoA, 2012).

Reliance on external and costly inputs, such as chemical fertilisers, makes small-scale farmers vulnerable to frequent supply breaks and rising costs. The recent trend of urbanisation, at the rate of 4.7% in Nepal, adds new development challenges.

Waste Management

With increasing urbanisation, also high in the mid-hill and Terai region where the WASH programme is at work as in Surkhet, solid and liquid waste management is increasingly difficult for the local authorities. About 70–80 per cent of the solid waste is organic, such as waste from the kitchen, faeces and animal dung, and could be decomposed, and liquid

waste comprised of urine (human and animal) and wastewater, including overflow from storage systems. Both solid and liquid wastes can be valuable resources: they can be reduced, reused and recycled at minimal costs. For instance, human and animal waste (urine and faeces) can be reused as fertilisers in agriculture, floriculture and fishery, thereby reducing the use of chemical fertilisers and adding to the value of land, which is scarce.

In Nepal, the municipalities are responsible for solid and liquid waste management, but the majority of them have no proper solid and liquid waste management system, and only few have adequate budget, human resources or a disposal station. The WASH programme in Nepal identified a number of actions, from policy interventions to innovations at the grass-roots level in a selected number of districts.

Surkhet

Surkhet District lies within the Surkhet Valley which is about 50 km² in size and is situated approximately 580 kilometres west of Kathmandu. The district consists of 249,016 ha of land, of which 20% is presently fertile and cultivable; however, the total of 37,444 ha (15%) land now cultivated helps to sustain food deficiency in the Mid-western region of Nepal (DADO, 2012). Birendranagar is the administrative headquarters of Surkhet and the whole Mid-Western Development Region.

Waste management is a major challenge, primarily due to the rapidly growing population, and the lack of a management plan and awareness (ENPHO baseline study report, 2013). The municipality is the main responsible body; the collected waste accumulates and is disposed of in the temporary dumping site located at Kuinipani. A proper landfill site for waste disposal is under construction. However, the municipality is running a plastics collection centre, with direct involvement of private sector, to reduce the volume of solid waste. There is no central sewerage system, and drainage is provided only for rainwater or stormwater collection. In the centre business area, households have a septic tank that is emptied by a suction tank operated by a private company and then disposed of in the nearby jungle. One public toilet is currently operated at the bus station. Households in the periurban area manage their sludge and waste themselves. There is no municipal sludge and sewer management plan.

Many households in, and most around, Birendranagar depend on agriculture for their livelihood. They grow cereals (for their own consumption), vegetables and other cash crops (ginger, potatoes, etc.) using animal manure, organic



A local entrepreneur trying out EcoSan in Kathmandu.
source: René van Veenhuizen



Awareness raising at the Birendranagar demonstration centre.
source: René van Veenhuizen

wastes and excess water from their houses. As this manure is not sufficient, some add chemical fertiliser if available. The vegetables are sold at the local market or exported to neighbouring districts; also exported and sold elsewhere are vegetable and cereal seeds, ginger, mango and honey.

ENPHO, under the auspices of WASH, collaborates with Birendranagar Municipality, selected households and Janajyotee Higher Secondary school in neighbouring Baddichour, and Neta VDC (Village Development Committee) to improve WASH facilities and reuse innovations.

Major WASH activities

ENPHO collaborates in Surkhet with the Dutch WASH Alliance members WASTE, RAIN and RUAF. The activities include capacity development, sanitation promotion, open defecation free (ODF) area declaration, school WASH integrated systems, ecosan toilets, improved public toilets (urine or sludge reuse) with links to Biogas (provision of energy and reuse of sludge) and rainwater harvesting. A major aim is to develop sanitation business models and demonstration sites. ENPHO seeks to identify, and agree with multiple stakeholders on, innovations that fit into the transitioning of the city by developing scenarios and sustainable financing. It is paramount that the developed systems be safe, i.e., within the existing norms. Major initiatives undertaken for promoting urban WASH in connection with agriculture are given below.

Policy-influencing and lobbying

The importance of improved sanitation, and the role of using wastes for agriculture, is discussed and promoted at the Birendranagar Municipality and the MWASH coordinating meetings. ENPHO undertakes assessments on demand for

Integrated community managed waste water management in Kathmandu.
source: René van Veenhuizen



organic fertilisers, assists in mapping (GIS), makes presentations and seeks to create joint learning with local multiple stakeholders.

Development of (urban) sanitation systems that include use of waste and wastewater

ENPHO selects promising systems, adapts prototypes, develops capacity building material and supports training activities, as in the areas described below.

1) Integrated school sanitation

These activities focus on awareness raising at the school and in the surrounding community. They consist of rebuilding a toilet block, with RWH, biogas and composting, and use of the urine and the wastes in a school garden at Janajyotee Higher Secondary School which has a vocational agricultural (JTA) programme.

A workshop was held at Shree Jana Jyoti Higher Secondary School with community members and school board members to discuss the rebuilding of the school toilet into an integrated ecosan system with RWH and Biogas. The school has a farm some km kilometres from the school, with various gardens, two ponds and live-stock. The enthusiastic head master and agriculture teacher maintain this farm and facilitate the 15-month training in plant science. The students, after completing their full education, often end up working for government and NGOs in development projects. Rajesh... and Shreerendra Prakash Pokharel, of the SEWA project in Chitwan, gave two presentations on sanitation and reuse. After discussion with the community, who showed interest in the use of urine (which some were already applying), the Board accepted the plans and agreed to pay 2,000 Euro as its own contribution.

2) Household/community urine separation and composting of faeces

Ecological sanitation with vegetable gardens is promoted in Birendranagar. Already, several ecosan toilets have been installed, some with a biogas digester attached. These households will be supported in the application of the urine and the compost. Opportunities lie in the construction of toilets and the sale of the compost or of selected high-value crops. At the moment, business plans are being developed and awareness is being created. With other WASH partners, RAIN Foundation and BSP, the potential of biogas at the household level is being explored.

The open defecation free (ODF) declaration programme, guided by the National Sanitation Master Plan-2011, is running parallel to this programme and the municipality plans to declare itself an ODF area by 2015.

3) Public toilets

There is a high demand for public toilets in the municipality, but only one has yet been built. A business model is being explored for the marketplace in Birendranagar. ENPHO has started with a mobile toilet with urine diversion, operated by a private operator. The urine collected from the mobile toilet is used and tested on periurban land, while awareness is being created among users and farmers.

4) Centralised organic waste collection, segregation and (co-)composting with FS

This is still an idea, and being discussed with the municipality. There is interest and its viability, linking it to the new disposal site is currently being investigated. The production of high quality organic fertiliser for sale to rural farmers has high potential in this area (ENPHO assessment).

Research on use of compost and urine for urban or other agriculture

In addition to the monitoring of the selected systems, together with local farmers, the department of agriculture (DADO) and other stakeholders, tests are developed on compost quality, co-composting, the application of urine, and on gardening and/or the production of high-value crops.

The municipality of Birendranagar is planning to construct a landfill, and has expressed interest in including both the segregation of plastic and organic waste and co-composting. Tests are being conducted in 2013 and 2014 on developing and marketing organic fertilisers. Several projects and farmers have already expressed interest, and they will be included in the research. The High-Value Crops programme of MoA&C/IFAD/SNV, working in Surkhet and Dailekh, will collaborate in supporting those households that are interested and able to produce and sell specific niche commodities.

An F-training workshop took place in Kathmandu on 15–17 August 2012 for the NWA partners. The participants developed business ideas, which were ranked as follows: (1) public toilet in urban or high-traffic areas with sale of biogas; (2) reuse—selling urine and compost; (3) sanitary hardware and technical assistance; (4) toilet financing; and (5) training / capacity development for a charge. The general idea was to help the participants become clear and persuasive, and to believe in the idea (in short, to be entrepreneurial), to have a track record, to hold an account with the same bank, to think about loan size, to convince the bank that the loan can be repaid, and to offer sufficient and acceptable security.

During the training, eight banks and financial institutions presented their institutions and products: Bank of Kathmandu, NMB, Prime Bank, CEDB, Nefscop, Manaslu Bikas Bank (Gorkha), Diddhartha Bank, SKBB2 and Sunrise Bank. These financial institutions gave valuable and very positive feedback.

Some of the next steps were to:

- *visit the banks of the project areas and discuss loans for rainwater harvesting and toilets;*
- *identify the potential local financial institutions that can provide loans for investing in sanitation improvement;*
- *share lessons from the training with implementing partners and stakeholders (including bankers) in the district;*
- *accelerate the programme in real-life situations;*
- *prepare a WASH business plan linked with a microfinance institution.*



The school demonstration garden in Surkhet.
source: René van Veenhuizen

Crops programme of MoA&C/IFAD/SNV, working in Surkhet and Dailekh, will collaborate in supporting those households that are interested and able to produce and sell specific niche commodities.

Financing

A unique sanitation basket fund is being created to allow for easy access to low-interest loans for the promotion of sanitation in general and, more specifically, of ecological sanitation with biogas. This fund is developed and managed by the municipality with financial support from ENPHO. Per household, the maximum loan size is NPR 20,000 with 5% interest (which is substantially lower than current loans). The loan payback period is one year on instalment basis.

Businesses are being developed around the sale of sanitation services, biogas, urine and compost. In addition, vegetable production and sale will increase savings and income for households and farmers.

In its work on safe and productive use of waste for urban agriculture, ENPHO is facilitating local government, private sector, community and other concerned stakeholders to increase collaboration and cooperation. ENPHO has organised a regional workshop for sharing experience on reuse, developed demonstration and research sites, mobile public toilet operation, and finance mechanisms with the involvement of the private sector. In 2013 this work will be continued, as well as linking these initiatives to banks and local-level microfinancing institutions. Another main effort to be made by all partners concerns the tracking of funds from local governments (VDC and municipality).

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Ms. Shova Dhungana, age 27, permanent resident of ward number 2, Birendranagar municipality has constructed its first ecosan toilet. She got a chance to learn about ecosan from ENPHO and was excited to construct it. At first she was quite confused about to construct it but, knowing of the benefits, she asked for support from ENPHO and constructed it within just one year, as well as applying urine and faeces to her small vegetable farming land. She shared her experience: "After constructing the ecosan toilet it was quite difficult to use it, but these days I am happy to have an ecosan toilet because I have harvested 5 kg of potatoes by planting 1 kg seeds; before applying urine I was harvesting only 2.5 to 3 kg. Also, people from different places have come to my home to see ecosan and have asked me about ecosan toilet, and I feel proud myself to share its benefits and operation."

ENPHO will support Ms Dhungana and others to further improve their production of vegetables and income through savings and sales.

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Linking WASH to the National Programme on Urban Agriculture in Dire Dawa, Ethiopia

Harole Yoseph

The Government of Ethiopia (GoE) has implemented the Universal Access Plan (UAP) for improved Water Supply, Sanitation and Hygiene (WASH) since 2006. Even though significant improvements have been recorded, still more efforts are needed. In Ethiopia, an estimated 22 per cent of children under five die because of diarrhoeal diseases.

Ethiopia is on track to achieve the UN Millennium Development Goal (MDG) target related to water, which states that 62 per cent of the population should have access to improved sources of drinking water by 2015. However, on the sanitation target, Ethiopia is lagging behind. Whereas the MDG target is 58 per cent, only 8.3 per cent of the population has access to improved sanitation facilities. The National Water Sanitation and Hygiene (WASH) Inventory data show that only 33 per cent of schools have improved sanitation facilities for students and teachers, and only 31 per cent have access to water (GoE, 2013).

The WASH programme operates in the Afar, Oromia and Hararghe (Dire Dawa) regions in Ethiopia. RUAF collaborates in Dire Dawa with RiPPLE (Research-inspired Policy and Practice Learning in Ethiopia). RiPPLE has undertaken various assessments on WASH and productive use in Dire Dawa City Administration, focusing on capacity building and on

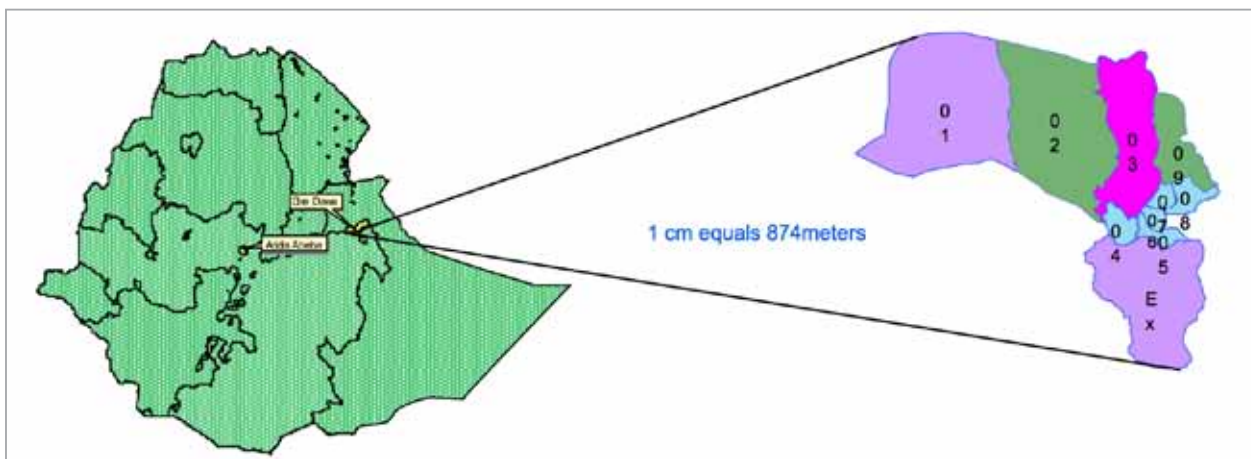
alliance building among stakeholders regarding integrated waste management, sustainable financing, and linking with urban agriculture.

Dire Dawa

Dire Dawa Administration is 505 km East of Addis Ababa and 306 km South of Djibouti. The proximity to Djibouti has made Dire Dawa an outlet for import and export between the hinterlands and the outside world. Regions neighbouring Dire Dawa are the Somali region to the north and the west, and the Oromia region to the east and the south. The entire master plan area of the city encompasses 187 km², making Dire Dawa the second largest urban centre, after Addis Ababa, in the country.

The city is situated just at the foot of the hills stretching from the south-east to the west by forming a border between the highlands of the Hararghe region behind it and the vast lowlands extending up to the red sea (EPA, 2010). The northern- and western-most area of the administration is flat land, and the rest is naturally rugged terrain. The altitude the administration varies from 950–2450 metres above sea level (EPA, 2010). The economy of the administration is urban in character because of the overall domination of the city of Dire Dawa in the formation of the administration entity.

RiPPLE conducted an assessment in Dire Dawa City Administration in nine *kebeles* in 2012 to study the current situation concerning waste management and urban and periurban agriculture (UPA) practices and opportunities for reuse.



Map of Dire Dawa Administration

Urban Agriculture in Ethiopia

In Ethiopia, urban agriculture is a practice described as the residents keeping cattle, sheep and chickens, or growing such rain-fed crops as maize and vegetables, on the plots adjacent to their houses. In Addis Ababa, the ability to grow food helps to increase the standard of living, access to healthy and abundant produce, and income for all residents, from the most disadvantaged populations on upward; it is also considered a vehicle for social inclusion. The use of wastes, both solid and liquid, is still below expectation.

Urban agriculture in Addis Ababa is considered a vehicle for empowerment and self-reliance, for income generation and sustainable use and management of natural resources. In Addis Ababa, urban agriculture contributes to food security, which ensures availability, accessibility and affordability of unprocessed and processed foods. In this regard, it has the potential to fight against urban poverty (AACCA, 2010).

Urban Agriculture in Dire Dawa

Urban agriculture in most other cities of Ethiopia, including Dire Dawa, is lagging behind—despite several initiatives and support by international organisations such as FAO. In Dire Dawa City Administration, for instance, the agricultural bureau is responsible for seed provision, yet there is no specific programme, and urban agricultural extension workers pay it no specific attention; at the same time, none of the hundreds of urban agriculture sites are recognized by the Bureau of Agriculture.

Urban farmers in Dire Dawa sell their produce for income diversification and for their own consumption. For many urban farmers, it is the main source of income (RiPPLE assess-



Zerihun farmer explains his business.
source: René van Veenhuizen



In Addis productive use and UPA are considered a vehicle for empowerment
photo: René van Veenhuizen

ment, 2012). As many as 81 per cent of the farmers use organic fertilisers; most consider these fertilisers “traditional”. This animal dung, especially cow dung, is considered to be the best fertiliser. One of the farmers in kebele 01 explained the fertiliser use and techniques :

I use dung from cows, and sometimes from goats. The purpose of using it is to bring back the soil fertility that I used to know 25 years ago. I do not mix it with any plant residue. It has been over 10 years that I do this, direct application of dung, but the production level is declining... but am surviving.⁷

The assessment further shows that 29 per cent of the farmers use “simple putting dung” techniques, and 14 per cent use no fertiliser. However, the production is considered to be the same (subsistence) every year. The main challenges observed in Dire Dawa’s urban agriculture are lack of land ownership (or lack of clarity about it), pests and diseases, weak weed control, and lack of expertise and training on composting, land and water management, and insurance.

The assessment further revealed that city farmers produce such vegetables as lettuce, cabbages, tomatoes, peppers (green and red), aubergines, courgettes, potatoes, onions, garlic, and broccoli. The climate and soil are favourable for the production of such citrus as oranges, lemons and mandarins. Most urban farmers are illiterate or have a basic education. As a result, farmers are using poor farming practices and have limited knowledge on nutrient application. Regarding water sources, 81 per cent of the farmers use groundwater, whereas 5 per cent have no access to irrigation water and thus depend on the rains. As the demand for vegetables and fruits is high in all *kebeles* of Dire Dawa, about 75 per cent of the farmers produce vegetables and fruits for the local market and only 5 per cent export their produce to different countries.

Waste management

According to the Sanitation and Beautification Agency (SBA), the daily solid waste projection rate is 0.4 kg per household, or a total amount generated in 2012 of 493 m³/day. The SBA has three trucks that each make an average of 7 trips per day (of 8 m³ bins). Combined with the use of side loader trucks, the maximum collection capacity in Dire Dawa is 204 m³.



Segregation of plastics at the landfill in Dire Dawa
source: René van Veenhuizen

According to the agency, the actual collected amount equals 119 m³/day. Thus, the daily total amount projected is greater than the maximum daily waste collection capacity of 204 m³.

For liquid waste, there are only two functional municipal vacuum trucks for disposal under the auspices of the Water Supply and Sanitation Agency (WSSA) and one additional non-functional truck. Each truck has the capacity to carry 8 m³ of sludge per trip, and the frequency of disposal averages 7 trips per day, which is equivalent to approximately 16 toilet facilities per day (SBA, 2011). With 3 trucks, there is the capacity to service 5460 toilet facilities per year and to collect and dispose of 168 m³ daily, and with a generation rate of 7125 m³ per day, this means that 6,957 m³ of liquid waste (grey and black water) is uncollected, which is 98 per cent of the liquid waste generated in the city of Dire Dawa. There is a new landfill with several drying beds for faecal sludge, and a good potential for co-composting.

Composted organic wastes are used by a few farmers. According to a representative of one of the enterprises, Birhan Compost, "We used to produce compost from the solid waste we collected from surrounding households without receiving any payment for the service. The compost was tested by the agriculture office and the quality was good. We once sold to SBA, by the time they established the Millennium Park. We continue to collect the waste and produce the compost, but we need to develop a proper market to sell our product. We haven't received any salary."

WASH

Under the WASH programme, RUAF and RiPPLE collaborate with the Bureau of Agriculture and members of the Learning and Practice Alliance (LPA) to enhance UPA in Dire Dawa by developing a scenario of development, including zoning of the city to include UPA and allow for use of solid and liquid wastes. Exchange visits to Addis are being organised, and an action plan is being developed with the Bureau of Agriculture to raise awareness on UPA. Furthermore, research is being done with the Bureau of Sanitation and selected *kebeles* on the production of high-quality organic fertiliser, and on linkages to decentralised collection and treatment of wastes at the community and *kebele* level. A market analysis is being undertaken on the potential of reuse of wastes in Dire Dawa.

RiPPLE is developing innovations into pilots or business-cases regarding such safe and productive uses of wastes for urban and periurban agriculture as public toilets, household ecosan and use by farmers (see the box below about Zerihun), co-composting at the landfill, condominium integrated recycling, and selected solid-waste recycling initiatives such as briquette making.

Sustainable Financing

In August 2012, members of the LPA/RiPPLE gathered for two workshops: one on UPA and WASH by RUAF, followed by one on Sustainable Financing. Financing WASH services poses a serious and growing challenge in Dire Dawa City Administration. Most small and micro enterprises (SMEs) are struggling with issues of adequate fund allocation and cost recovery. This 'F-workshop' (see also the box on page 45) aimed to share and discuss experiences of integrated waste management and reuse, and to bring potential entrepreneurs and financial institutions together. Nine enterprises were identified, and during the workshop these potential SMEs discussed their business proposals and presented them to banks and microfinance institutions. One such entrepreneur, Zerihun Urban Agriculture enterprise, was one of the successful enterprises, raising the interest of Abyssinia Bank. Zerihun had no collateral to provide to the bank and to further develop his business. But the WASH alliance will continue to support this process.

A farmer (under the name "Zerihun Urban Agriculture") produces vegetables, mainly tomatoes, and uses composted human manure. He said, "Using human manure boosts the production; however, finding potential buyers from this village is quite challenging. People perceive that the tomatoes are damaged and vegetables cause human diseases." Zerihun, therefore, is selling his products to another village so as to avoid such a stigma.

The experience from the workshop has provided the SMEs ways to overcome the challenges in Dire Dawa. During the next LPA meeting, and the upcoming exchange visits to Addis, further knowledge sharing and support to the development of these business initiatives will take place.

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Note

(1) kebele 01, farmers, February 2012

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An increased influx of people in Kajiado
source: René van Veenhuizen

Urban – Rural Linkages and WASH in Kajiado County, Kenya

Nancy Karanja
Peter Murigi

Kajiado county is located at the southern tip of the former Rift Valley Province, close to Nairobi Metropolitan. Kajiado County is a water-strained area with an annual rainfall between 500 and 1,250 mm. Its indigenous inhabitants are the Maasai people, though there has been an increasing influx of people from other ethnic groups (Practical Action 2012).

This is a low food production county: 97 per cent of the households in Kajiado obtained their food from the market, most of which is sourced from central Kenya or northern Tanzania, with only a small proportion of milk, meat and eggs coming from their own production. Access to water and sanitation is limited in the area. Critical water needs that are not met include livestock, irrigation, and domestic needs. Because livestock forms a major livelihood asset for the community, water for livestock supersedes that of domestic use, so interventions regarding water supply need to address essential assets (livestock) as well as domestic needs.

Kajiado part of Greater Nairobi Metropolitan

There is an increased influx of people settling along the Nairobi-Namanga route, including Kajiado county. With the inclusion of parts of Kajiado county within the vast Nairobi Metropolitan, this influx is likely to be on the rise, bringing

with it burdens of rapid urban growth (such as the development of slum areas). On the other hand, a large market is being created, especially for specific products, and with the increased influx of people from other parts of the country and Nairobi, bringing with them diverse cultures and lifestyles, there has been a shift towards crop farming.

Changing farming systems

Because the Maasai pastoralists make up the majority of the population, efforts to encourage agriculture as an alternative to cattle rearing are slowly being accepted. Still, with a majority of livestock keepers, 59 % of the population practise some form of crop production (maize, beans, vegetables and fruits). Due to limited knowledge on agriculture among the majority of the Maasai women, crops are grown that are not suited to the climatic conditions. The yields are still extremely low and insufficient to meet household food requirements, but the Maasai are slowly diversifying their diet and are consuming such foods as maize, beans, vegetables and fruits produced either inside or outside their regions, with women taking the lead in farming.

Another coping strategy of the Maasai community is the production of charcoal, which has resulted in land degradation and frequent flash floods, lowering of land-carrying capacity due to reduction in grass cover and, more importantly, loss of biodiversity, including species that are the source of traditional medicines and herbs.



A biocentre under construction
source: Practical Action

Livelihood diversification and urbanisation require innovative interventions that will be relevant to current changes in the Maasai communities. There is a need for the introduction of intensive production systems such as kitchen and container gardens and the use of glasshouses for both urban and rural communities, to address food and nutrition insecurity and free some of the households' incomes for use in other activities. There is also a need for capacity building concerning appropriate farming technologies and linking to extension services, input suppliers, credit facilities and markets, as well as alternative energy sources.

Urban Agriculture

Fifty per cent of the population in Nairobi lives in low income areas and below the poverty line, earning less than one dollar per day (Ministry of Planning and National Development, 2003). Urban and periurban agriculture (UPA) has a high potential for ensuring food security and providing necessary nutrition. In Nairobi, about 150,000 households are involved in urban farming, and 94% of them depend wholly on farming (Foeken and Mwangi, 2000). The crops grown are mainly vegetables (kales, spinach, African leafy vegetables), arrowroots, maize, beans, cowpeas, bananas, potatoes, fruits, pumpkins, sugarcane and fodder. There is both rain-fed and irrigated agriculture, and water for irrigation is from various sources: an estimated 36% from wastewater and 56% from rivers/streams.

For residents of the three WASH districts in Kajiado, improved water provision, sanitation and hygiene will contribute to

poverty reduction and improved child and maternal health, in addition engaging them in income-generation activities such as poultry rearing, dairy farming and vegetable growing. To ensure that the populations in the three districts are able to surmount the threat of food insecurity and poor nutrition, there is a need to begin engaging in both rural and urban agricultural systems.

WASH Innovations on Safe and Productive Use of Wastes in Kajiado

As part of the general WASH activities in Kenya, RUAF collaborates with Practical Action and the University of Nairobi in developing a number of sanitation and water business models and/or pilots or demos that fit within the development momentum of Kajiado as described above.

- a) **Use of wastes for intensive gardening** At both the household and community level, the use of human and animal wastes and linked businesses are propagated. This is seen as a way to link the outflow of nutrients and the need for improved nutrition among Maasai and other households to improved access to water through Rain Water Harvesting (RWH) and sanitation. Opportunities are seen in collection, segregation of wastes, briquette making, and the construction of innovative sanitation systems. Public toilets do not exist, nor does central collection of solid waste and faecal sludge. As part of the discussion on urbanisation and sanitation business opportunities, research and awareness activities will be undertaken. Production of high-quality organic fertiliser for sale to rural farmers has high potential in this area and will be investigated.

Commercialisation of branded and other sanitised manures through formal commercial women's groups that are linked to the traders/agro dealers, especially in Nairobi and environs, would generate income that could then be used as collateral for improved WASH programmes, including water-harvesting facilities. With the provision of water, then, this resource can be used to produce biogas (clean energy) that would have many benefits to the community, especially to women and girls who bear the burden of ensuring that water, food and energy are supplied to households, irrespective of their sources. Approximately two potential women's

There are numerous initiatives on productive use of wastes in Kenya and Nairobi.

Umande Trust provides community biosanitation services, through both the construction of biocentres that produce biogas from human waste, and the involvement of community-based organisations to own and manage these centres. Sanergy facilitates a network of franchised toilets within Mukuru Kwa Reuben (a slum area in Nairobi), collecting the waste produced (human faecal sludge) and processing it into compost. Human waste collected is co-composted with other dry organic waste resources, such as saw dust that is collected from sugarcane sellers and carpenters. WASTE and

RUAF seek to work with Sanergy to showcase this work for Kajiado area as well.

NAWACOM, the Nakuru Waste Collectors and Recyclers Management (NAWACOM), is registered as a cooperative association of waste collectors and is selling compost under the brand name 'Mazingira' in Nakuru town and surrounding towns.

These examples present strong cases for consideration and/or adoption in Kajiado county. Willingness of the local communities to be involved in recycling of waste and availability of markets for the products would also determine the viability of such an initiative.



WASH training on productive use of wastes
source: René van Veenhuizen

groups have been identified and are being supported by business mentors for business planning and business development before they are linked to K-REP Bank to borrow loans for investing in manure packaging, branding and selling to Nairobi and its environs.

- b) The main source of water in Kajiado central is from boreholes. The Kajiado WASH programme supports sand dams on seasonal rivers to provide water during the dry season, and also other rainwater harvesting systems such as harvesting from house roofs. Practical Action and the University of Nairobi will support households using this additional **water also for productive purposes (MUS)**, e.g., in intensive gardens. In addition, one women's group has obtained EUR 1,091 to drill a shallow well to extract water for domestic use, watering their livestock, and intensive gardening.
- c) **Integrated institutional eco-sanitation** This is actually not a business model as of yet, but the idea is to create awareness regarding recycling and gardening/food production. The Kajiado Prison and two schools have been selected. Schools and health centres show a lot of interest in investing in biogas systems (Practical Action 2012), which can be used to test and develop similar technologies at the household level, using available animal and human manure, after interventions targeting water provision have been implemented. The energy generated can be used for cooking, thus reducing the cost of fuel, especially firewood, significantly. There are still reservations, though, against using human faecal waste.

*There is abundant **manure** in the areas. Several households burn it to control flies, snakes and rats, but farmer groups from Mashuuru and Namanga are involved in the sale of manure to farmers in rural Kajiado Central, though trading livestock manure with horticulture farmers in Central Kenya through dealers in Nairobi is also taking place (Njenga et. al. 2010). There is interest in this among Kajiado farmers; as well, this manure forms an important source of nutrients (intensive horticulture gardens), energy (biogas), or income in Kajiado itself.*

Financing

The survey by Practical Action in Kajiado also explored the opportunities for scaling up water and sanitation interventions through improved access to finance. For the workshop on financing a quick scan of the financial sector in the country, the interested financial institutions active in the provision of loans to small entrepreneurs and households for WASH services were invited. Included were K-Rep Bank and Kenya Women Finance Trust (KWFT), who are both willing to partner with businesses involved in water and sanitation in Kajiado Central, Namanga and Mashuuru districts.

The WASH Kajiado fund was launched on 27 March 2013 after receiving funding from WASH and after the signing of the memorandum of understanding (MoU) between Practical Action and K-REP Bank Limited to operationalise the WASH guaranteed fund scheme, for the provision of sustainable water, sanitation and hygiene (WASH) financing of WASH enterprises/initiatives in the Kajiado County, some of which include Safe and Productive Use of Waste for (Urban and Periurban) Agriculture.

This MoU includes:

- an innovative programme that will blend commercial loans with subsidies for community-managed water supply for domestic and agriculture purposes, sanitation facilities, and energy-producing facilities such as bio-centres;
- enhancement of access to medium-term local-currency finance for infrastructure development by community-based water providers, to expand the role of private operators in the development and management of water supply;
- support to community-run projects becoming bankable to suit the lending criteria of domestic banks;
- the identification of potential and existing business to support community-managed projects through business planning and business development, and also to link them to K-REP bank to obtain loans for expanding their businesses.

Practical Action and K-REP Bank will ensure that the WASH interventions are scaled up by working in partnership with all the stakeholders in the Kajiado, Namanga and Mashuru



Farming systems are changing
source: René van Veenhuizen

districts. In addition, RUAF Foundation has backed Practical Action and Gamma Systems to specifically support practices that include safe and productive use of waste for UPA, in the same project area and supported by the established guaranteed fund. For instance, women's groups are ready to take out loans to invest in intensive gardening, shallow wells and household biogas systems.

Business mentors, who are persons trained in proposal preparation and business development, are allocated to support:

- creating awareness to ensure demand;
- developing viable business plans to be submitted to banks such as K-REP Bank;
- monitoring of the implementation process;
- identifying service providers relevant to the value chain;
- training small and medium entrepreneurs (SMEs) in business development (start-up models and growth models);
- providing customized one-on-one business development services;
- facilitating networking, information sharing, and financing.

The initial focus is on water, as this is in demand, and the portfolio will be expanded in time. SMEs will be trained in a business startup model which entails:

- identification of markets, appropriate service models and products;
- forecasting potential costs and revenue;
- legal aspects of starting businesses.

In addition, SMEs will be trained in a business growth model which entails:

- assessing their businesses;
- identifying opportunities for growth;
- planning for growth;
- managing expansion of their businesses.

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This is the first, new, online issue of Urban Agriculture Magazine!

With this online version we hope to reduce the costs associated with hard-copy publication, which will allow us to continue producing UA Magazine in the future. The online version will also enable wider distribution by electronic means; locally, it can still be printed. We invite you to disseminate this issue among all your contacts and networks.

For each future issue we will need, and seek alliances with, partners and sources of funding for publishing UA Magazine online, and for translation into French, Spanish, Arabic, Chinese and Portuguese, or for printing a certain number of copies and distributing them to selected contacts.

Selected articles of the Magazine will be translated and published in a Chinese Journal on urban and periurban agriculture (UPA); please contact IGSNRR, our Chinese RUAF partner, for further information: IGSNRR, Jianming Cai, caijm@igsnrr.ac.cn

For any other communication and information on UA Magazine please contact:
RUAF Foundation, René van Veenhuizen, editor, rvan.veenhuizen@ruaf.org

Feedback

We appreciate your input, support and views on this development and welcome suggestions or offers to collaborate regarding wide distribution of UA Magazine.

You can send us your feedback at any time, to rvan.veenhuizen@ruaf.org or info@ruaf.org.

NEXT ISSUE

No. 27: Contribution of urban agriculture to climate-smart urban development

Publishing date: January 2014

Deadline for contributions: 30 NOVEMBER 2013

Issue no. 27 will focus on:

1. the impacts of climate change on urban food security and resilience;
2. the contributions of urban agriculture to climate-smart urban development;
3. what cities can do to make optimal use of urban agriculture and forestry to build resilient and climate-smart cities;
4. innovating urban agriculture to become more resilient to climate change.

Impacts

How will climate change effect urban food security and urban livelihoods (especially among the urban poor), either directly or indirectly? And how can cities monitor such impacts?

Contributions

What can urban and periurban agriculture and forestry (UPAF) contribute to making cities more resilient to climate change, improving the urban environment and facilitating disaster reduction? And: how can such contributions be monitored?

Optimal use

Through what measures can metropolitan, municipal, and other local government institutions stimulate the role of

urban agriculture and forestry in enhancing urban food security and city resilience? How can the effects of such measures been monitored?

Innovating further

Climate change will also affect urban agriculture, and adaptations in urban agriculture and forestry systems and practices will be needed in order to become more resilient to climate change. How will increased or decreased rainfall, occurrence of floods, and changes in temperature affect urban agriculture, and what innovations could be promoted to overcome such effects and to build sustainable urban food systems?

We are interested to receive your articles and well-documented experiences, such as:

- articles on the assessment of impacts of climate change on urban food security and resilience and related monitoring methods;
- articles assessing / demonstrating the potentials of urban agriculture (local food systems) for building resilient and climate-smart cities;
- articles on how cities are including urban agriculture and forestry in their climate-change strategies and action plans;
- articles on local innovation in UPA for better adaptation to climate change:

Articles

Articles on urban agriculture should be a maximum of 2000 words (three pages), 1300 words (two pages), or 600 words (one page), preferably accompanied by an abstract, a maximum of 5 references, figures and digital images or photographs of good quality (more than 300 dpi, or in jpg format more than 500 kB). The articles should be written in a manner that is readily understood by a wide variety of stakeholders all over the world.

Please clarify in your article the concepts used and the relation to urban agriculture. Also, present where these experiences were gained, and the main actors, impacts, related costs, problems/challenges encountered and solutions found, the major lessons learned, and recommendations for both practitioners and planners or policy makers.

Other information on the subject

We also invite you to submit information on recent publications, journals, videos, photographs, cartoons, letters, technology descriptions and assessments, workshops, training courses, conferences, networks, web links, etc., especially those relating to this theme.

Of course, all other suggestions and comments concerning *UA Magazine* are also welcome. Please take a moment to voice your opinion by sending an e-mail to the editor of this issue at m.dubbeling@ruaf.org.

No. 28: Innovations in urban and periurban agriculture

Publishing date: July 2014

Deadline for contributions: 30 April 2014

This *UA Magazine* will highlight innovations in urban agriculture, from small-scale and low-tech innovations (such as the use of solar power for irrigating market gardens) to larger-scale and higher tech innovations such as vertical farming. The Magazine will also report on the 2014 Global Forum for Innovations in Agriculture.

Hosted by the city of Abu Dhabi, the Global Forum for Innovations in Agriculture will present the world's largest collection of sustainable agriculture inventions, and pool together the highest level of expertise, investors and suppliers to show the world how new ideas can be used to substantially increase food production and contribute to solving the world's ever-increasing food needs. Visit www.InnovationsInAgriculture for further information and registration.

Already, we invite you to continue with your innovations and suggestions (for interesting cases or contacts). No need to wait till next April to inform us about your ideas and suggestions: e-mail them right away, to info@ruaf.org.

Contributions

Articles for *UA-Magazine* should consist of maximum 2000 words, preferably accompanied by an abstract, a maximum of 5 references, figures and digital images or photographs of good quality (more than 300 dpi or in jpg format more than 1 Mb preferably). The articles should be written in a manner that is readily understood by a wide variety of stakeholders all over the world.

We also invite you to submit information on recent publications, journals, videos, photographs, cartoons, letters, technology descriptions and assessments, workshops, training courses, conferences, networks, web-links, etc., especially those relating to this theme.

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Urban Agriculture Magazine

Sustainable Financing

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UA Magazine

Urban Agriculture Magazine (UA Magazine) is produced by the RUAF Foundation (the International Network of Resource Centres on Urban Agriculture and Food Security), in close collaboration with strategic partners on particular topics addressed in each magazine.

UA Magazine is published twice a year on the RUAF website (www.ruaf.org).

UA Magazine facilitates the sharing of information on the impacts of urban agriculture, promotes analysis and debate on critical issues for development of the sector, and publishes "good practices" in urban agriculture.

UA Magazine welcomes contributions on new initiatives at individual, neighbourhood, city and national levels. Attention is given to technical, socioeconomic, institutional and policy aspects of sustainable urban food production, marketing, processing and distribution systems. Although articles on any related issue are welcome and considered for publication, each *UA Magazine* focuses on a selected theme (for previous issues, visit: www.ruaf.org).

Editors, No. 26

This issue was compiled by René van Veenhuizen (Responsible Editor), together with Gert de Bruijine, of WASTE, and co-funded by the Dutch WASH alliance.

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