

# Final Report

Developing a Business Model for  
Solar-Powered Watershops in Kenya



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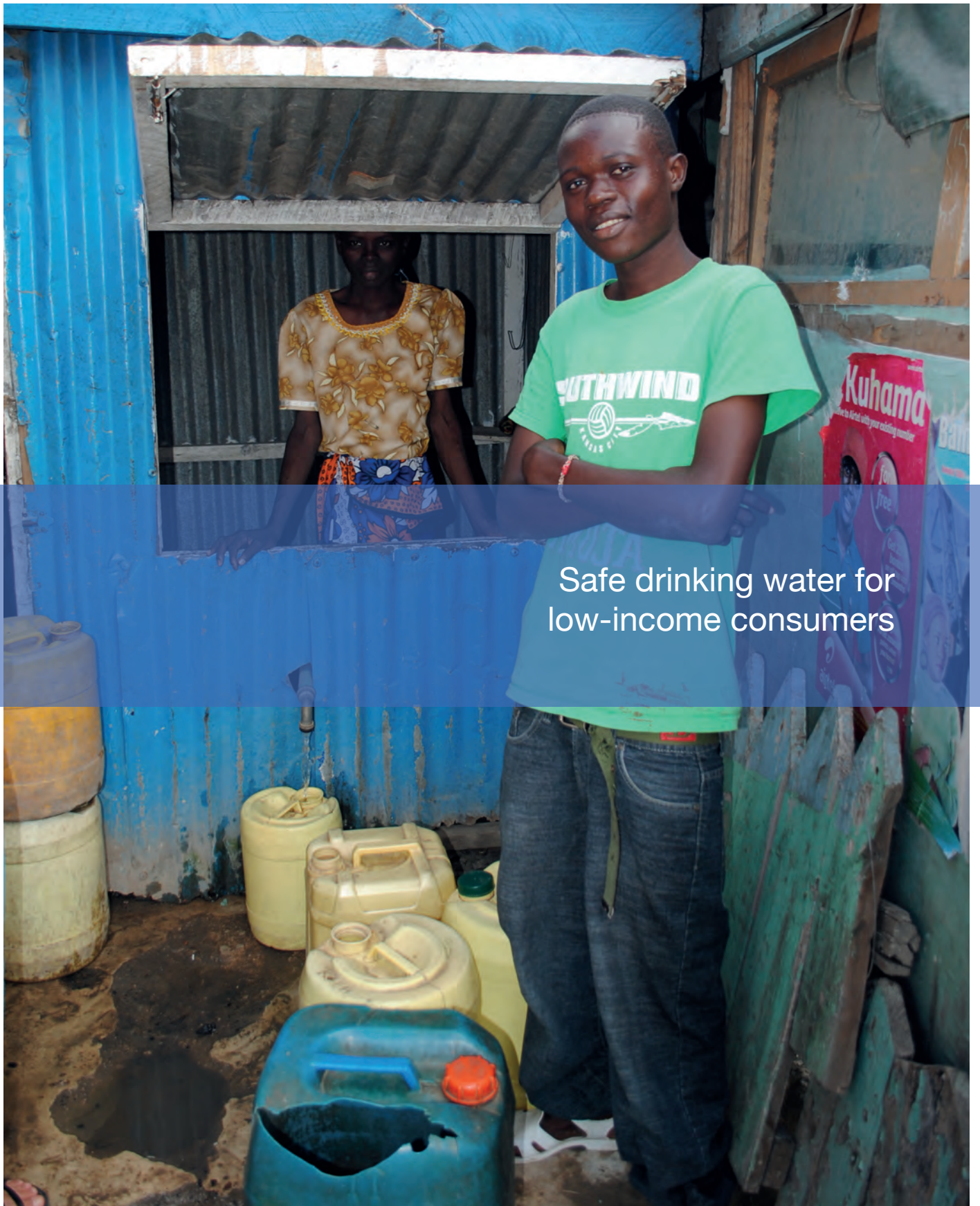
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Safe drinking water for  
low-income consumers

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# Content

## 01 Summary

## 02 Objectives

- Development of the business model
- Writing of the business plan
- Objectives of the Watershop concept

## 03 Technical Solution / Applied Method

- Phase1 - Business Modelling Phase
- Phase2 - Field Visit
- Phase3 - Finalizing the business model and plan

## 04 Results

- Main Findings
- Achievements

## 05 Impacts

## 06 Future Prospects

## 07 Conclusions

- Strengths
- Challenges
- Recommendations
- Conclusion

## 08 References

# Summary

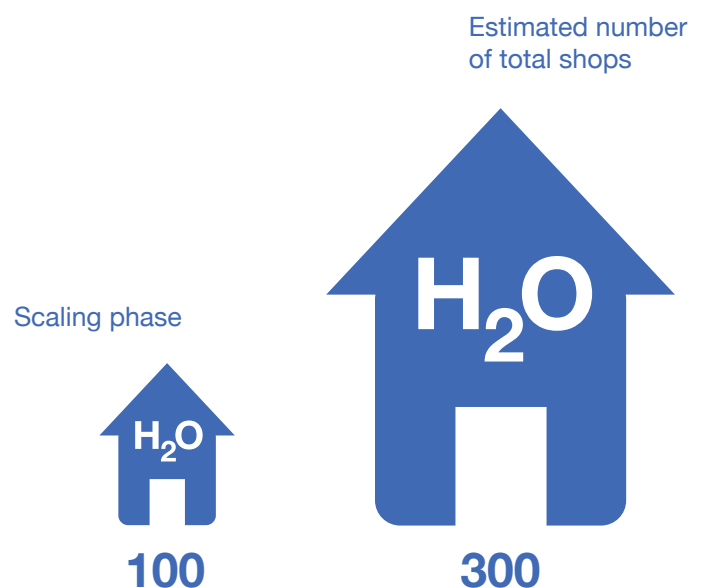
The aim of the project is to develop a sustainable business model for solar powered Watershops which deliver safe drinking water to low-income consumers in Kenya. Following a two year piloting phase, the business model is designed to be scaled throughout Kenya, and eventually, other developing countries. The Swiss SME, Trunz Water Systems AG (Trunz) is the primary technology provider and initiator of the project. Trunz aims to create an environmentally, socially and economically sustainable business model where long-term benefits of the technology are utilized. Trunz Water Treatment units can provide ultra-filtration or reverse osmosis purification and are powered using solar power.



Kenya was chosen for researching and developing the concept due to its existing water access and quality problems, its varied market and the presence of a strong local partner. The project team completed a seven week field visit in Kenya, visiting more than 25 locations from the Coastal region to the Rift Valley.<sup>1</sup> The market situation, water quality and consumption were studied and pilot locations were identified based on criteria developed by the team.<sup>2</sup> Observations of the status-quo, successful models on the ground, as well as contacts with several key people and organizations were used to develop the complete Watershop concept.

Watershops are developed as self sustaining businesses that are supported through a local parent organization. Each Watershop is run by a local operator that is contracted to the parent organization. The operators receive a commission based salary from each litre of water sold and the rest of the water revenue is transferred to the parent organization. Each shop provides clean drinking water in branded jerrycans to the consumers for an affordable price. In addition to water, the Watershop operators have several additional revenue streams such as charging mobile phones, and selling other goods such as hygiene products. In addition there are two complimentary revenue streams that benefit the parent organization, namely, each Watershop contains space for rent to external businesses and advertisement opportunities.<sup>3</sup>

In addition to delivering the business model through a completed business plan, an overarching result is the conceptual feasibility of a Trunz Watershop model in Kenya. Depending on experiences developed during the pilot phase, it is estimated that an initial scaling phase could consist of approximately 100 Watershops. The total number of feasible Trunz Watershops in Kenya is estimated at 300 shops – based on a high-level analysis of appropriate population parameters.



<sup>1</sup> For the map of visited locations, see Appendix A.

<sup>2</sup> The criteria table can be found on page 9.

<sup>3</sup> For the business plan, see Appendix B.

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# Objectives

As mentioned in the project proposal, the project has two major objectives:

## Development of the business model

One of the major objectives of the project is the development of a business model for sustainable Watershops where local entrepreneurs sell safe drinking water to low-income communities at an affordable price. As a reference framework for the development of the business model, the project team used the Business Model Canvas and its respective modelling process.<sup>4</sup>

## Writing of the business plan

The primary outcome of the project is the written business plan. This business plan has been written:

- 1) As a roadmap for piloting and scaling of Watershops.
- 2) Demonstrating to investors the viability of the concept in order to enable funding for piloting.
- 3) Finalizing the Repic project with the business plan as a core part of the project report.

Trunz Water Systems AG could use the business plan for Watershop projects in other countries. In addition, SMEs and organizations from Switzerland could use the business plan, and its methodology, in order to establish and develop other shop concepts in developing countries.

## Objectives of the Watershop concept

- 1) Sustainability and ownership: The concept should ensure sustainability and ownership of the Watershop. This should be done through:
  - a) Development of an economically, socially and environmentally sound concept.
  - b) Enabling local entrepreneurs to take ownership for individual shops.
  - c) Creating economic viability of individual shops.
  - d) Making a positive environmental impact such as the decrease of boiling water in cook stoves.
- 2) Scaling-up: The Watershop concept shall attract investors in order to scale Watershops in Kenya and other countries.

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<sup>4</sup>Business Model Canvas by, Dr. Alexander Osterwalder a Swiss business model designer:  
[http://www.businessmodelgeneration.com/downloads/business\\_model\\_canvas\\_poster.pdf](http://www.businessmodelgeneration.com/downloads/business_model_canvas_poster.pdf)

# Technical solution/ Applied Method

As the project focuses on the business model, rather than on technology innovation, this section outlines the applied methods used during business model development.

The project was carried out in three phases: business modelling (two months), field visit (seven weeks) and finalizing the business model and plan (five weeks).

The first phase aimed at building a background for the project core team to understand dynamics of the water market in Kenya, develop contacts, prepare for the field visit and draft a framework for a business model and plan to be used as a working document in the field.

The second phase was an intensive seven week field visit in Kenya. Guided by the preparation of the first two months, the project team visited more than 25 locations, observed water consumption and quality issues, contac-

ted governmental local bodies as well as Non-governmental organizations (NGOs). Business modelling ideas for a sustainable Watershop concept were developed during the field visit and integrated into the first draft. Observing other successful business models and meeting with key people running the projects helped the team to learn from various experiences in the field. Four potential pilot locations for Watershops were chosen at the end of the field visit.

The last phase of the project was aimed at finalizing the business model and writing the business plan including potential pilot locations as well as approaching key financiers for implementation of Watershops.

Phase	Outcome
Business Modelling 1 <sup>st</sup> June - 2 <sup>nd</sup> August 2011	Reports including business model and business plan framework Site visit plan including possible pilot locations Draft version of a business model Locations criteria
Field Visit 3 <sup>rd</sup> August - 23 <sup>rd</sup> September 2011	Local network in Kenya Business model for Watershops Four potential Watershop locations including location profiles
Finalizing business model and plan 24 <sup>th</sup> September - 31 <sup>st</sup> October 2011	Business Plan REPIC Report Follow-up plan for piloting

**Table:** Outcomes of three phases of the project

Detailed steps of each phase of the project are as follows:

## PHASE 1 – Business Modelling Phase (1<sup>st</sup> June - 2<sup>nd</sup> August 2011)

The following activities were carried out during the business modelling phase in Switzerland.<sup>5</sup>

- 1) Desktop research in Switzerland: Internet research is supported by communication with key stakeholders via phone calls and e-mails in order to create an understanding of socio-economic and political situation in Kenya, water market analysis, understanding of key players as well as technological aspects including an analysis of Trunz technology. Following areas are investigated through desktop research and archived as reports.<sup>6</sup>
  - Water market analysis in Kenya
  - Social, economic and political framework
  - Existing kiosk/shop concepts in Kenya and other countries
  - Business model framework
  - Trunz Water Systems and Watershop overview
  - Stakeholders list
  
- 2) Team meetings and workshops in Switzerland.
  - **May 2<sup>nd</sup> 2011:** Kick-off meeting at Trunz facility in Steinach: The project team members came together for a confirmation of project objectives, and planning of the next steps.
  - **June 27<sup>th</sup> 2011:** Technology workshop at the Trunz production facility: Team members were able to clarify technological framework conditions, through a half-day technology briefing from project manager Lars Willi.<sup>7</sup>
  - **June 27<sup>th</sup> 2011:** Communication strategy workshop at Trunz facility in Steinach: Team members discussed challenges as well as possible solutions related to communication with stakeholders in the Kenyan context. Tim Weiss, who led water projects (e.g., bore hole drilling) for the German NGO Welthungerhilfe in Kenya for 15 months, was invited to the workshop to present his experience in the field. Local partner, Tomas Planka joined the meeting via skype conference.
  - **July 25<sup>th</sup> 2011:** Methodology workshop at the Hub Zurich: The team was joined by Lars Osterwalder of EAWAG and Sabrina Conrad, an experienced field researcher in developing countries, who contributed to the workshop with their experiences from the field.<sup>8</sup>
  
- 3) Stakeholders map was created and an intensive communication with stakeholders via e-mails and phone calls was carried out continually. This process helped the team to get a deeper and more realistic insight into the situation on the ground.

<sup>5</sup> For the dates and the details of the activities, see the project logbook see Appendix C.

<sup>6</sup> For the list of deliverables during the Business Modeling Phase, see Appendix D.

<sup>7</sup> For the profiles of project members, see Appendix F.

<sup>8</sup> Swiss Federal Institute of Aquatic Science and Technology (EAWAG) has been working on projects on water and sanitation in developing countries: Solar disinfection method (SODIS) which is a simple method for water treatment in household level is an initiative of EAWAG: [http://www.sodis.ch/index\\_EN](http://www.sodis.ch/index_EN)

- 4) Tomas Planka carried out preparations in Kenya by creating contacts and assessing locations where a Watershop could meet the strongest demand. The project team in Switzerland held ongoing contact with Tomas Planka throughout the first phase.
- 5) Planning for field visit was completed: Preparation of meetings with key contacts, identification of locations to be visited, and administrative preparations such as visa requirements etc.

### Selection of locations to be visited:

The project team decided to focus on the Coast and the Rift Valley region of the country on the basis of following limiting criteria:

- Access to a water source (Northern Region left out given the lack of access to any kind of water source)
- Focus on areas where reverse osmosis technology is needed to treat water for drinking purposes (where chlorine or boiling does not work as effectively)
- Moderate level of safety
- Moderate protection from flood and drought

In addition to the limiting criteria, the team selected following factors to determine certain locations:

- Distance to a market
- Average income
- Size of population
- Road intersections
- Access to a number of other towns
- Child mortality
- Current water access
- Population growth rate
- Presence of fluoride or other chemicals in water sources
- Tribal conflict risk: Political risk 2012 elections<sup>9</sup>

## PHASE 2 – Field Visit (3<sup>rd</sup> August - 23<sup>rd</sup> September 2011)

The following activities were carried out during the field visit in Kenya.<sup>10</sup> Observation and meeting protocols were used as a form of recording the information gathered. An interim report was sent to REPIC after the second week of field visit.<sup>11</sup>

- 1) More than 25 sites were visited in the Coast and Rift Valley regions of Kenya. While the locations were planned before the begin of the field visit, several modifications were required once the team was on the road. Based on the information gathered from local people and from the water service providers, new destinations were added to the initial travel plan.

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<sup>9</sup> The Kenyan population is divided into 40 different tribes and there are ongoing tensions between tribal groups in some areas which could create risks for the safety of a potential Watershop.

<sup>10</sup> During the field visit, a field agenda was used to organize and record the observations and the meetings, see the field agenda attached see Appendix F.

<sup>11</sup> For the interim REPIC report, see Appendix G.

- 2) The project team contacted private companies with innovative business models in the water and sanitation sector, visited their facilities and had meetings with several managing directors. Grundfos Lifelink, Ecotact, Pureflow, Water and Sanitation for Urban Poor (WSUP) were some of the companies and organizations visited.<sup>12</sup>
- 3) The project team built a network with local authorities and NGOs as well as international organizations actively working in the water sector in Kenya. Potential entrepreneurs for operating pilot projects and NGOs to partner in community mobilization were identified. The team had several meetings with the CEO of Ecotact, David Kuria in order to discuss the possibilities of collaboration for piloting the project.<sup>13</sup>
- 4) Four potential pilot locations were identified based on the criteria list below:

## Criteria

<b>Population</b>	Minimum population size of 10'000 people in 7km radius.
<b>Current water source</b>	<p>Current accessible water source is not suitable for drinking purposes, treatment is needed and chlorine or boiling do not work to purify the water.</p> <ul style="list-style-type: none"> <li>• High turbidity in surface water</li> <li>• Total Dissolved Solids (TDS) in the water exceeds acceptable limits (maximum 1'000 PPM according to WHO standards)</li> <li>• High fluorid levels (maximum 1,5 mg according to WHO standards)<sup>14</sup></li> <li>• Chemical contamination in the water such as arsenic etc.</li> </ul>
<b>Current water access</b>	People have limited access to safe drinking water. Either municipal water does not reach the area regularly, or it is not possible to drink tap water because of contamination and/or salinity.
<b>Electricity access</b>	Electricity infrastructure does not meet the needs: Unreliable and/ or not affordable.
<b>Road infrastructure</b>	Area must be accesible to other towns and serve a geographically broader consumer market.

<sup>12</sup> For the contact details of companies/organizations visited with innovative business models for water and sanitation, see Appendix I.

<sup>13</sup> Detailed profile of Ecotact profile is attached to the business plan, see Appendix B.

<sup>14</sup> For the World Health Organization (WHO) requirements for drinking water:

[http://whqlibdoc.who.int/publications/2011/9789241548151\\_eng.pdf](http://whqlibdoc.who.int/publications/2011/9789241548151_eng.pdf)

**Additional concept:  
Possibility of price  
differentiation  
(Eco-lodge Model) <sup>15</sup>**

Focus on areas where price differentiation with high-income customers (e.g. tourists) is possible. The location for Eco-lodge model was chosen according to this criterion even though the criterion for population is not met in the respective location.

**Table:** Location criteria

Types	Comments/ Events	Dates
Field Observation	<p><b>Water source closest to the location (river, spring, boreholes, etc.)</b></p> <ul style="list-style-type: none"> <li>• Marere spring</li> <li>• Spring in Archers Post</li> </ul> <p><b>Water Sale Points (kiosks, private boreholes, etc.)</b></p> <ul style="list-style-type: none"> <li>• Supermarket observation in Nairobi</li> <li>• Dutch Water Limited</li> <li>• Natures Limited Mombasa (bottled water production facility)</li> <li>• Water Kiosks in Changamwe</li> <li>• Water Kiosks in Archers Post</li> <li>• Naivasha WSUP Water Kiosk</li> <li>• Water Sale Points in Narok</li> </ul>	<p>12.08.2011</p> <p>06.09.2011</p> <p>04.08.2011</p> <p>11.08.2011</p> <p>11.08.2011</p> <p>22.08.2011</p> <p>06.09.2011</p> <p>09.09.2011</p> <p>15.09.2011</p>
Meetings	<p><b>Water Service Providers (WSPs)</b></p> <ul style="list-style-type: none"> <li>• Mombasa Water &amp; Sewerage Company, Fatma A. Awale &amp; Moses K. Kinya</li> <li>• Malindi Water Company, Priscillah Oluoch</li> <li>• Nakuru Water Company, James Nganga</li> </ul> <p><b>Non-governmental Organizations (NGOs)</b></p> <ul style="list-style-type: none"> <li>• Welthungerhilfe, Melanie Bruns</li> <li>• Umande Trust</li> <li>• Plan International, Njoroge Kamau</li> <li>• KWAHO, Caroline Mramba</li> <li>• WWF, Johnstone Mulary</li> <li>• WSUP, Kariuki Mugo</li> </ul> <p><b>Private Companies</b></p> <ul style="list-style-type: none"> <li>• Pureflow, David Maina</li> <li>• Gauff Engineering, Steffan Maul</li> <li>• Ecotact, David Kuria</li> <li>• Grundfos Lifelink, Louise Koch, George Masaba, Kisoichi Mwanyange</li> <li>• Nakuru Defluoridation Company, Peter Mania Mutheki</li> <li>• M-PESA (mobile payment), Angelah Madara &amp; Kevin Odulah</li> <li>• KWFT Kinango (Microfinance), Jacob Komen</li> </ul> <p><b>Governmental Organizations</b></p> <ul style="list-style-type: none"> <li>• GIZ &amp; Ministry of Water, Patrick Onyango</li> <li>• Water Services Trust Fund (WSTF), Nelson Bosuben</li> <li>• Kenya Investment Authority, David S. Serser</li> <li>• Coast Water Services Board, Andy Marotolo</li> <li>• Ministry of Public Health and Sanitation, Kepha Ombacho</li> </ul>	<p>18.08.2011</p> <p>24.08.2011</p> <p>12.09.2011</p> <p>05.08.2011</p> <p>06.08.2011</p> <p>12.08.2011</p> <p>02.09.2011</p> <p>12.09.2011</p> <p>22.09.2011</p> <p>04.08.2011</p> <p>05.08.2011</p> <p>05.08. &amp; 21.09.2011</p> <p>19.08. &amp; 19.09.2011</p> <p>12.09.2011</p> <p>20.09.2011</p> <p>12.08.2011</p> <p>04.08.2011</p> <p>04.08.2011</p> <p>18.08.2011</p> <p>19.08.2011</p> <p>23.08.2011</p>

<sup>15</sup> Eco-lodge model is included in the business plan as an additional concept, please see the business plan for the details about the concept, see Appendix B.

	<p><b>Hospitals (Public Health Officers)</b></p> <ul style="list-style-type: none"> <li>• Anna Ndupha, Kwale Public Health Officer</li> <li>• Geoffrey Piuguna, Lunga Lunga Public Health Officer</li> <li>• Joshua Omno, Magerini District Health Officer</li> <li>• Ukunda Public Health Officer</li> </ul> <p><b>Other Institutions and Organizations</b></p> <ul style="list-style-type: none"> <li>• University of Nairobi, Daniel Olago</li> <li>• EU Delegation to Kenya, Sanne Willems</li> <li>• True North College, Martine Kappel</li> <li>• Stanbic Bank, Felix Gichaga</li> </ul> <p><b>Eco-lodges and Hotels</b></p> <ul style="list-style-type: none"> <li>• Nature Expeditions, Adam Jilio</li> </ul> <p><b>Other Key People</b></p> <ul style="list-style-type: none"> <li>• Abdul Jaffarani, Indian Business Owner</li> <li>• Raymond Matiba, Business Man</li> <li>• Lucy Kurgat, Senator Candidate</li> <li>• Rebecca Lolosoli, Umoja Uaso Womens Village</li> </ul>	<p>12.08.2011</p> <p>17.08.2011</p> <p>25.08.2011</p> <p>01.09.2011</p> <p>31.08. &amp; 20.09.2011</p> <p>21.09.2011</p> <p>21.09.2011</p> <p>22.09.2011</p> <p>16.09.2011</p> <p>10.08.2011</p> <p>10.08.2011</p> <p>10.08.2011</p> <p>06.09.2011</p>
Workshops	<p><b>Hotel Workshop in Lamu<sup>16</sup></b></p> <p><b>Workshop with Local Entrepreneurs</b></p> <p><b>Team Workshops</b></p>	<p>27.08.2011</p> <p>22.09.2011</p> <p>08/ 09/ 10.08.2011</p>

**Table:** Selected events, meetings and location observations during the field visit

### PHASE 3 – Finalizing the business model and plan (24<sup>th</sup> September - 31<sup>st</sup> October 2011)

1) Main activities carried out during final phase in Switzerland:

- Finalized recommended list of pilot locations and completed location profiles based on field research.
- Business model finalized and business plan written.
- Key financiers were identified and approached as a preparation of business model implementation.
- The team determined follow-up activities for Trunz Water Systems, Tomash International Ltd., and with respective financiers.

2) Events and meetings in Switzerland:

- **October 3<sup>rd</sup> 2011:** Team meeting in Zurich to discuss findings from the field visit and plan next steps
- **September 19<sup>th</sup> 2011:** Presentation of interim results at a workshop panel discussion at The Sustainability Forum Zurich.
- **October 27<sup>th</sup> 2011:** Presentation of business model and business modelling methodology to Swiss start-ups entrepreneurs at the Hub Zurich.

<sup>16</sup> For the workshop invitation which was sent to the hotel owners/managers, see Appendix I.



The second phase was an intensive seven weeks field visit in Kenya.

# Results

## Main Findings:

- Having one highly capable and well-connected entrepreneur in the country is crucial for business success of a Watershop concept initiated by Swiss technology providing SME. Screening a target country for such individuals and organizations, and understanding their backgrounds and motivations must be at the core of entering a market such as Kenya.<sup>17</sup>
- Full (financial) ownership of local entrepreneurs is very challenging and not recommended in the initial years of piloting and operations.
- Corruption can be a severe challenge for all the businesses in Kenya. Mobile payment system ensures a transparent system and eases monitoring of water revenues. The role of the operator shifts from someone who arranges payments to someone who promotes safe water consumption, good hygiene and helps in dispensing water into clean jerrycans.
- Branding is quite important since people often base their decisions on the brand value also in developing countries.<sup>18</sup> Therefore organizing marketing campaigns, using a unified brand throughout Kenya and promoting branded jerrycans are crucial for Watershop success.<sup>19</sup>
- Using a rotating jerrycan system not only reduces costs associated with the jerrycans but also eliminates the need for paying a bottled water tax, hereby significantly lowering cost.
- Very remote, rural areas are not suitable for a profitable business model for Watershops due to the lack of purchasing power and limited market size. Small towns and peri-urban areas are better suited.<sup>20</sup> Although pricing limits access to the poorest of the poor, it does increase access to safe water for lower middle-income customers.
- During the field visit observations, it became clear that additional revenue streams are required to be added to the concept to create a self-sustainable business case.<sup>21</sup>
- Overall, there is a very low level of knowledge about safe water practices in Kenya. Collaboration with local NGOs and Community Based Organizations (CBOs) is required for building capacity and ability to differentiate between water sources. Suggested partnerships and collaborations with other organizations can be found in the marketing section of the business plan.<sup>22</sup>

<sup>17</sup> This finding was echoed by conversations with a Swiss business angel network on their due diligence priorities when evaluating the potential of Trunz watershops in Kenya.

<sup>18</sup> Dutch Water Limited is a successful company in Mombasa which uses branded jerrycans for creating brand value. For more details about the company, see Appendix J.

<sup>19</sup> For the business plan, see Appendix B.

<sup>20</sup> Drought in Lake Turkana region and scarce population make the region not suitable for a watershop, therefore this region was left out of the travel plan.

<sup>21</sup> Ikotoilet concept by Ecotact was observed as a successful model with add-ons to the toilet and shower services creating additional revenue streams. Details of the model can be found attached to the business plan, see Appendix B.

<sup>22</sup> For the business plan, see Appendix B.

- The market gap for clean water at eco-lodges in Kenya's nature reserves creates an opportunity for water to be sold to the visitors of eco-lodges as well as surrounding local villages. The eco-lodge model could be served by the Trunz Watershop on a consultancy basis for strategic planning, training, education, and recommendations daily operational activities.<sup>23</sup>
- Learning from other business models on the ground is a critical part of the development of the concept. A number of elements observed as best practices within other business models in water and sanitation sector were integrated into the Watershop business model, these are outlined in the following table:

Company	Element	Comments
Ecotact	Diversification of services	Branded and modern look: Attracting customers using several different revenue streams
	Renting out space to other businesses	Additional job creation and revenue streams
	Renting out advertising space	Sponsorship revenue
	Locating the shops in high-traffic market areas	Easily accessible and recognizable
Grundfos Lifelink	Mobile payment system	Transparent payment, easy control, increase in the sales <sup>24</sup>
Dutch Water Limited	Branded refillable jerrycans	Creating brand value and decrease of the use of dirty jerrycans

**Table:** Successful elements from different business models

<sup>23</sup> For the business plan, see Appendix B.

<sup>24</sup> M-Pesa is the initiator of electronic payment and store of value system in Kenya and has had an exceptional growth since its introduction in 2007. For more information about M-Pesa, please see the report:

[http://siteresources.worldbank.org/AFRICAEXT/Resources/258643-1271798012256/M-PESA\\_Kenya.pdf](http://siteresources.worldbank.org/AFRICAEXT/Resources/258643-1271798012256/M-PESA_Kenya.pdf)

## Achievements:

The project successfully developed a business model and plan for a sustainable, scalable Watershop concept. Four potential piloting locations were identified and proposed. Two differing business models were created, in addition to the standard Watershop model, the eco-lodge model is elaborated within the business plan. An Eco-lodge model uses price differentiation to cross subsidize the sale of water to local communities with sale of water to tourists. The model for the other four locations includes only one standard price that is set as a minimum to secure financial sustainability of the model while being more affordable than comparable high quality water.<sup>25</sup>

Suggested pilot locations for the basic model include Lunga Lunga, Gongoni and Ukunda in the Coast Region and Shabab in the Rift Valley Region. The location for Eco-lodge model is Talek Village in Maasai Mara.<sup>26</sup>

Planned	Achieved
Financially and socially sustainable concept for Watershops	Business model is developed; business model elements are combined to balance financial viability with social objective of providing safe drinking water to target customers (incl. locations with primarily low-income population).
Business plan to enable piloting and scaling	Business plan is written as a basis for evaluation and initiation of piloting for the Watershop concept. Discussions with Alain Schilli, Gaia Global SA, to provide project management for piloting phase (incl. fundraising).
Identification and confirmation of four pilot locations	Four pilot locations are suggested as well as one location for the additional Eco-lodge concept. Decisions criteria for shops sharpened and larger areas for potential scaling are provided.
Contact with a minimum of 20 experts related to business models for Watershops in Kenya	Contacted with more than 20 experts in Kenya. Introduced and facilitated conversations with key contacts to Trunz Water Systems and Tomash International. Initiated concrete partnership conversation with Ecotact
Identification of at least five potential financiers for piloting and scaling the Watershop concept after the project	Connections with multiple investors were built. Conversations about financing possibilities are still ongoing. <sup>27</sup>

<sup>25</sup> For the business plan, see Appendix B.

<sup>26</sup> For the profiles of the locations, see Appendix K.

<sup>27</sup> Names and contact details of the potential investors can be provided by the authors upon request.

# Impacts

As outlined in the proposal the project aims to develop a business model and a corresponding business plan as opposed to generating direct impact on the ground. However during field visits a number of positive social impacts occurred such as:

- Engagement of local people during the field visit created awareness about water quality for the people involved.
- Local entrepreneurs were informed about possibilities of starting a profitable business within the Watershop concept.
- Business modelling initiative was promoted as an alternative approach in development cooperation.
- Promotion of project partners, i.e. Trunz Water Systems, Tomash International, and REPIC amongst companies, entrepreneurs, NGOs, public institutions, banks, government officials, academics, students and general public in Switzerland and Kenya.<sup>28</sup>

The business plan, as the core result of this project, is suggested to be utilized for setting up pilot Watershops. The future prospects of scaling up the Watershop concept in Kenya and beyond depends on practical experiences gained from the piloting phase. The conceptual viability is described in the business plan and key success factors, such as partnering with a local entrepreneurial organization, are provided. Yet, direct investments into a large number of shops cannot be suggested before piloting.

Please note that the project findings will be also utilized for the other existing projects within Trunz Water Systems AG, thus resulting in the multiplication of the benefits.

The following impacts are expected as a result of implementation of the business case during the piloting and scaling phases:

## Pilot Phase

- 1) Job creation: With the installation of four pilot Watershops several jobs can be created:
  - During construction of Watershops: Minimum of two workers temporarily for each shop.<sup>29</sup>
  - For the operations of one Watershop: An operator and a security staff.
  - Renting out space to an average of two other businesses: Employment of two people for each business.
  - The parent organization will require two administrative staff for the piloting phase: One full time manager as well as one assistant.

<sup>28</sup> For newspaper and magazine articles, see Appendix L.

<sup>29</sup> This estimation for construction of watershops is based on our conversations with Marek Fuchs, Kenyan representative of Flexibuild Ltd, a Check Republic based trade and production company which uses environmental friendly construction materials for building houses. According to Marek Fuchs, construction of a 40 m<sup>2</sup> watershop would take four to eight weeks with two to four workers when standard brick is used and two weeks with two workers when Flexibuild material is used. For more information about Flexibuild: <http://www.flexibuild.cz>

- 2) Social change: An average of 8'000 litres of safe drinking water (daily) can be provided to low-income customers for an affordable price in each location. This means that there is a potential that 4'000 people having access to safe water which might not otherwise be able to afford safe water.<sup>30</sup> A total of 16'000 people in the four primary locations (Ukunda, Gongoni, Lunga Lunga, Shabab) would be initial beneficiaries.<sup>31</sup>

The decline of the water-borne diseases is expected with the increasing awareness of the communities as a result of marketing campaigns of the Watershops.

## Scaling Phase

- 1) Job creation: It is assumed that the Watershops will be scaled up to 100 installations within the first scaling phase:
  - 200 full-time employments could be foreseen in addition to a minimum of 200 temporary employments for construction of Watershops.
  - A total of 400 full-time jobs could be created as a result of renting out spaces.
  - The parent organization would require employing one more manager and two administrative assistants for management of increased numbers of Watershops.
  
- 2) Social change: Scaling up to 100 Watershops would create a positive health impact of providing safe drinking water to approximately 400'000 people. This would result in a substantial decrease of water borne diseases throughout the country.
  
- 3) Environmental impacts: Use of solar panels for solar purification technology provides an emission free process. If the impact is compared with the process of boiling water in cook stoves: Purification of 8'000 liters of water for each installation could save 292 tons of CO<sub>2</sub> which would otherwise be revealed to the atmosphere as a result of boiling in cook stoves using charcoals. This is equivalent to 87'600 tons of CO<sub>2</sub> saved yearly when scaled up to 100 installations.<sup>32</sup>
  
- 4) Please note that there is a replication potential of up to approximately 300 Watershops in the longer term based on the concept and location described in Kenya alone.<sup>33</sup>

<sup>30</sup> As stated at the WHO Drinking Water Guideline page 83: "It is assumed that daily per capita consumption of drinking water is 2 liters for adults although actual consumption varies according to climate, activity level and diet".

<sup>31</sup> Within eco-lodge model, lodges around the watershed in Talek Village in Maasai Mara will be sold safe drinking water thus cross subsidizing the costs of water therefore reducing the price for the local people in the village. See the business plan for details, see Appendix B.

<sup>32</sup> Calculations of the comparison of baseline scenario are attached, see Appendix M.

<sup>33</sup> Number of urban population in Kenya without an improved source of drinking water is taken as a base for calculating the predicted number of watershops for the scaling phase. Calculations can be found attached, see Appendix M.

# Future Prospects

The developed business model and the business plan will be evaluated by project partner, Trunz Water Systems AG, and serve as a basis for conversations with piloting financiers. In addition the document serves as a guideline for implementing the pilot Watershops in the suggested locations in the business plan.

For piloting, financial overhead costs for pilot projects are suggested to be covered by public funds or foundations as a grant. Gathering practical and real experience with shops for at least 24 months of operations is indispensable. This phase is unlikely to be fully financed through commercial funds.

Potential collaboration with David Kuria may expedite the process through building local knowledge and experience. It is therefore recommended to establish a partnership with Ecotact/ David Kuria. There may be few, if any, equally high-calibre and well-connected entrepreneurs and organizations to initiate piloting.

Conversations with Alain Schilli, of Gaia Global SA, are underway in order to initiate a follow-up project for piloting. Financial resource may be realized by, amongst others, KTI funding for SME and/or follow-up investment for piloting and scaling by REPIC.

Pilot projects in respective locations should be used to test the concept and further develop best practices for further installations. Reference pilot projects will also be used to secure capital for the scaling phase through a proven financially sustainable model where the payback time is limited to eight years.

Repic project report and the business plan are recommended to be used by other (technology-driven) SMEs from Switzerland as a reference for further development of projects with comparable concepts.<sup>34</sup>

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<sup>34</sup> E.g., project lead, Christoph Birkholz, described and recommended the business development process to the Paul Scherrer Institute during a panel discussion on The Sustainability Forum Switzerland (19th September 2011).

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# Conclusions

## Strengths

- 1) There is a market gap for safe drinking water provision for lower middle income consumers since available water is often contaminated and bottled water in the supermarkets is not affordable. Trunz Watershop can fill this gap with a potential to scale up throughout the country.
- 2) Unreliable and expensive electricity results in outages in water supply because of the dependence on grid power or diesel. Solar powered water purification is advantageous in many places in Kenya given that interruptions and high ongoing costs of electricity can be avoided.
- 3) Although bacterial contamination can be treated using chlorine, there are numerous contaminants which are more complex to treat using home treatment systems alone. In particular, salinity in groundwater is widespread throughout the Kenyan coastal region.

## Challenges

- 4) The ability, and desire, to pay for water in many areas of Kenya is very low, even where the need for clean drinking water is quite high. Low-income communities in rural areas typically do not have strong purchasing power. Therefore it is not feasible to set up Watershops in scarcely populated rural areas.
- 5) High costs of the Trunz technology make it difficult to pay back the up-front costs in less than eight years. Financial ownership of local entrepreneurs is not recommended in the piloting phase.
- 6) High level of corruption in Kenya can hinder the business in several forms. These include, but are not limited to, bureaucratic inefficiencies for obtaining permits (e.g. drilling a borehole), difficulties with cartels or bribe seeking government entities, business practices based on tribal or personal interests rather than business acumen.
- 7) Many Kenyans consistently search for business opportunities, this sometimes can cloud open dialogue about investments or developing a business model since advice can be construed to accommodate personal interests.
- 8) Limited knowledge of people concerning the quality of water creates a risk about product acceptance. Branding, marketing campaigns and community engagement activities are imperative to increase the penetration of the product.

## Recommendations

- 9) While there is a large need for improved water access and water quality, there are also numerous readily available solutions. In some cases there are less sophisticated technologies or solutions available that may better suit the community. In very rural, or very poor settings, other solutions such as rain water harvesting, chlorine, or bone char technologies may be more ideal than Trunz Water Systems technology. Therefore, options for incorporating some of these technologies in Watershops may be worthwhile exploring.
- 10) Reliable data for water quality is nearly impossible to find (especially when being outside of Kenya). The project team did measurements with existing possibilities: Salinity levels of water samples were measured using the Trunz TDS meter, which is a small portable device. Reliable estimates surrounding water quality over time can be made through rates of waterborne diseases. Measuring the bacterial and/or chemical contamination of the water is only possible with detailed analysis of the water in laboratories, which is recommended as a preparation for pilot installations.
- 11) Given the limited time available in the field as well as the need to visit many locations to a broad understanding, the team spent an average of two days in each location. Therefore detailed group discussions and interviews were not feasible for all locations. Extensive evaluations before and during the pilot locations are recommended to gather experiences and refine the scaling model.

## Conclusion

Despite the aforementioned challenges, the information density is sufficient for a business model to be developed and a plan for Watershops in Kenya to be written for piloting. Scaling-up in the future will require experiential learning from piloting. Based on the business development process, the scale up for a Watershop seems feasible, yet it depends strongly on the quality of the local partner (i.e., collaboration with David Kuria or equally experienced entrepreneurs). The supported local network consisting of entrepreneurs, private companies, as well as governmental and non-governmental organizations will be useful for piloting as well as scaling in the long term.

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## Appendices

- A) Map of Visited Locations
- B) Business Plan
- C) Project Logbook
- D) Business Modelling Phase Deliverables List
- E) Profiles of Project Members
- F) Kenya Field Agenda
- G) REPIC Interim Report
- H) Contact Details of Companies & Organizations
- I) Hotel Workshop Invitation
- J) Dutch Water Branded Jerrycans
- K) Location Profiles
- L) Newspaper and Magazine Articles
- M) Calculations of Scaling of Watersheds and CO2 Savings
- N) Selected Photos

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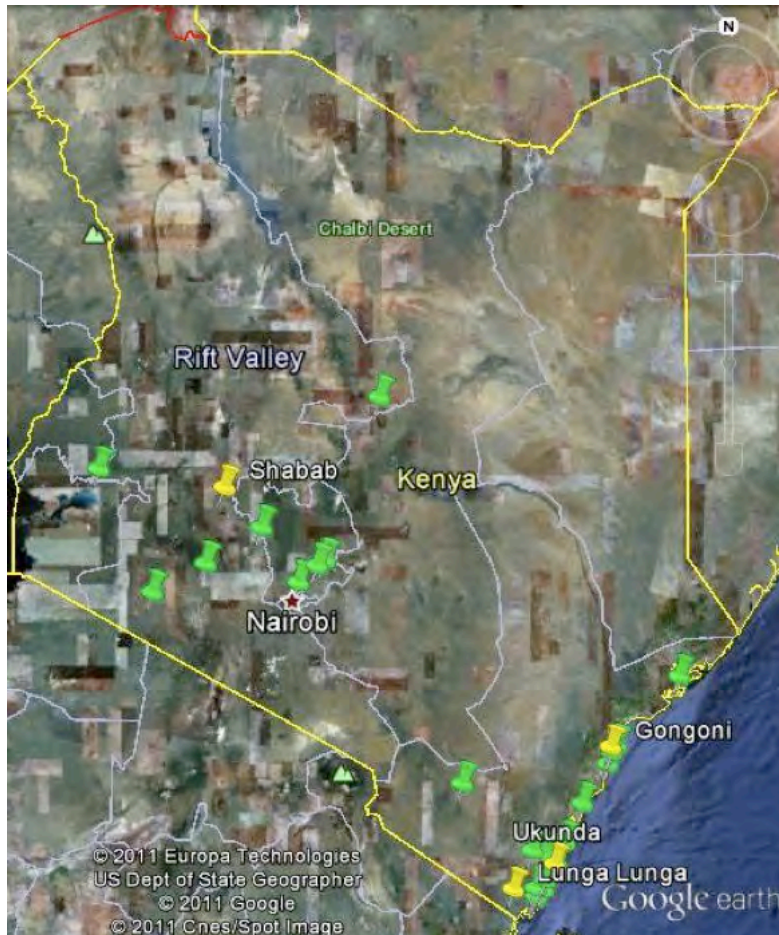
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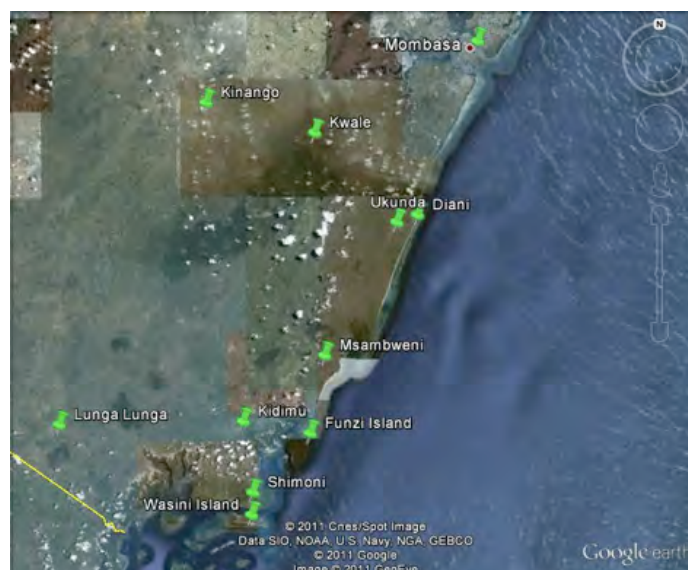
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## Appendix A

Map of visited locations during the field visit in Kenya



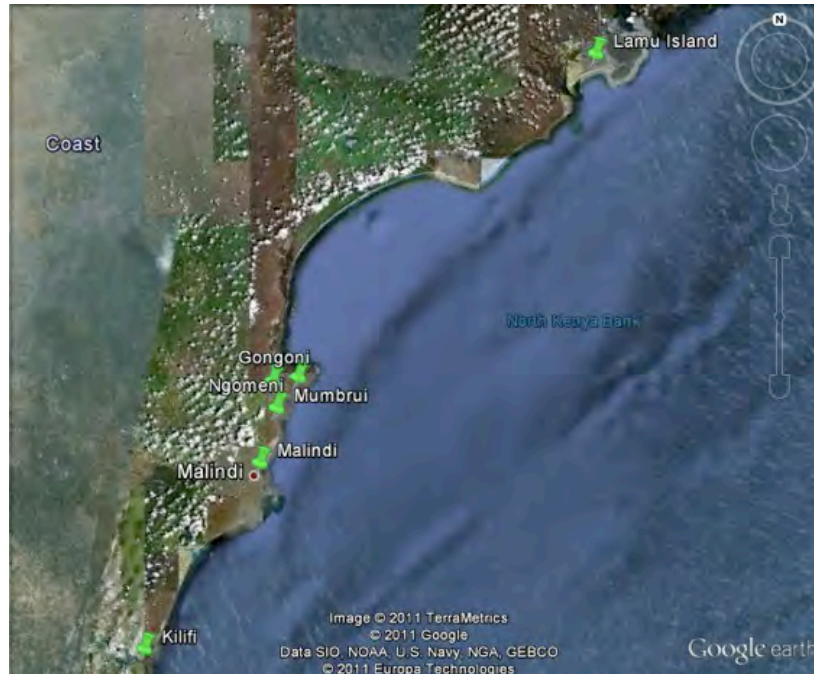
**Map of visited locations in Kenya:** Please note that the yellow icons indicate the locations where the pilot workshops are suggested in the business plan.



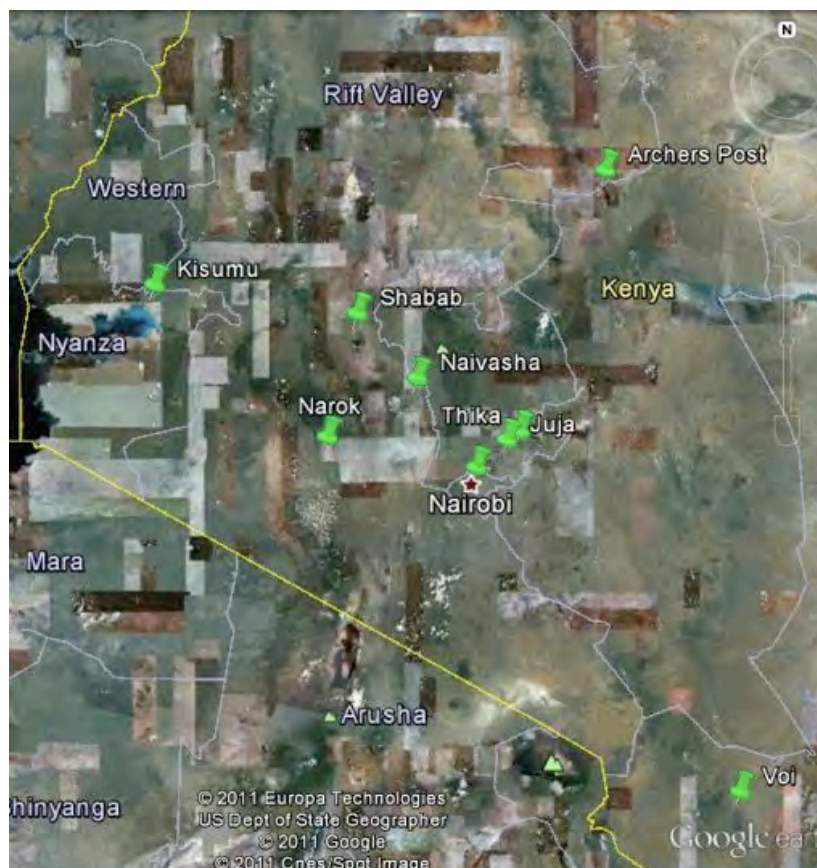
Locations visited at the South Coast of Kenya.

## Appendix A

Map of visited locations during the field visit in Kenya



Locations visited at the North Coast of Kenya.



Locations visited at the Rift Valley, Western and Nairobi region.

# Trunz Watershop

Business Plan for Solar Powered Water Purification Outlets  
Using Trunz Water Systems AG Technology in Kenya

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# Table of Contents

01 Executive Summary

02 Background

03 The Watershop

**In Short**

**Buying Water**

**Additional Revenue Streams**

04 Competition: Where People Get Drinking Water Now

05 Competition: Concept Alternatives

**Other Purification Technologies**

**Competition from Household Level Treatment**

**Competition from Purified Water Kiosk Concepts**

06 Marketing & Target Groups

07 Partners

08 Governance

09 Risks

10 Financial Overview

11 Next Steps



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## Explanations

Exchange rate used herein:	108 Kenyan Shilings to 1 Swiss Franc
Abbreviation:	CHF: Swiss Franc
	CSR: Corporate Social Responsibility
	FTE: Full Time Equivalent
	KEBS: Kenya Bureau of Standards
	MFI: Microfinance Institution
	RO: Reverse Osmosis

## Disclaimer

This document contains expressions such as “will happen”, or comparable. Though the business plan works with assumptions based on the best knowledge of the authors, the authors, nor the stated organizations, can be held accountable for any future projections.

This document uses the female form ‘she’ when referring to Watershop operators, however, the authors would like to note that both males and females are equally qualified to be operators. The female form is chosen arbitrarily

# Executive Summary

The Trunz Watershop is an entrepreneurship driven profitable enterprise, which seeks to deliver safe water at an affordable price to low income consumers in Kenya. Using solar powered Trunz Water Systems AG technology, the Watershop is able to purify locally sourced water to the same level as bottled water without the costs associated with sealing or transporting this water. Registered customers are able to dispense water into clean jerrycans, which are provided by the operator who manages the Watershop. The Watershop is supported by several additional revenue streams including advertisement space, space rental to external businesses, as well as mobile phone charging and the sale of small items such as hygiene products and grocery items.



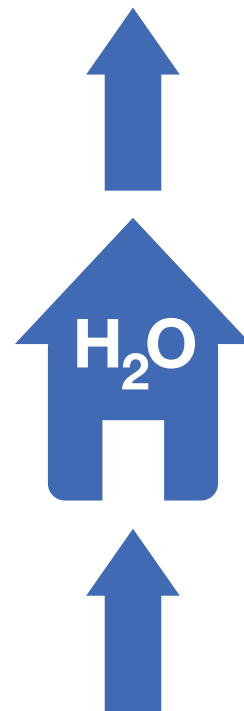
Watershops throughout Kenya are supported by a local Kenyan parent organization, which manages education and training, marketing and back end financial transactions. The parent organization is able to ensure sound accounting and payment practices as a result of a proven yet innovative mobile banking system, whereby customers will only be able to purchase water using an electronic payment system. This system ensures that revenues are re-invested effectively, thereby creating a scalable business model to increase access to safe water for all.

Each Watershop can serve 4.000 people and requires an initial investment of an average 122.000 CHF.

The cost of production for a 20 litre jerrycan of water is 0,20 CHF and pricing of water within the watershop includes a margin of 0,17 CHF on each jerrycan sold, this is based on a final sales price of 40 KES or approximately 0,37 CHF.

With sales projections set at 60%, 90%, and 100% in years one, two and three respectively, the watershop will reach positive EBITDA in year one of operations. Watershops are governed through a parent organization, which supports the Watershops through marketing, training and back end financial management. Watershop will be scaled through a process of three phases, following an initial pilot phase of four shops, the Watershop concept will be expanded to 16 shops in year three, and subsequently scaled to 100 shops throughout Kenya. Within the scaled model the parent organization attains a positive profit in year six.

Each Watershop can serve 4.000 people.



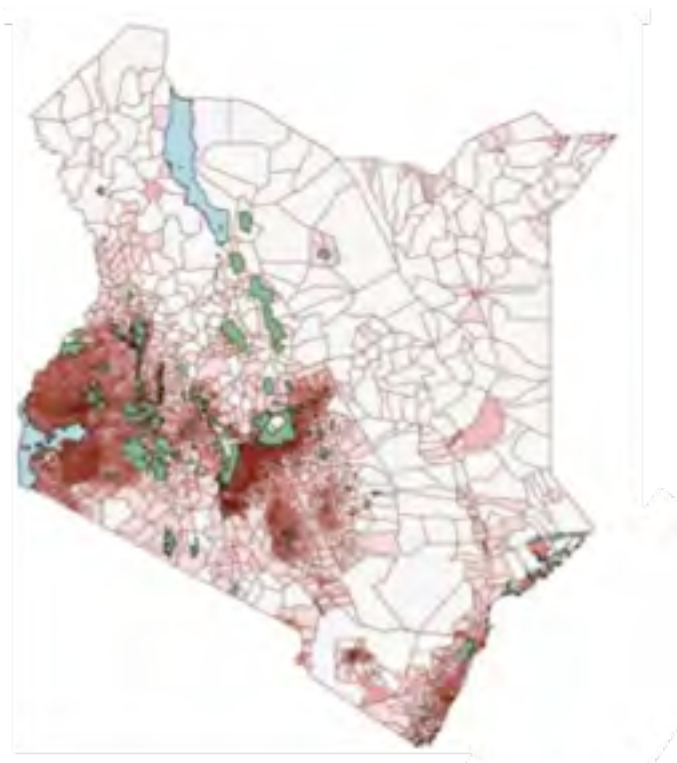
Initial investment of an average 122.000 CHF is required.

# Background

The Trunz Watershop concept would work well in many parts of the developing world, but there are a number of reasons Kenya was chosen to pilot the concept.

Kenya lags behind in municipal infrastructure, including both water and electrical supply, particularly in peri-urban and rural areas. The country is plagued by both a water access and a water quality problem. In the arid northern parts of the country, water is both scarce and saline, while the subtropical climate of the south-west is more prone to cholera and other water born diseases. Bacterial contamination of water is exasperated by unsafe storage practices and poor hygiene knowledge. In addition, the Rift Valley, as well as some areas around Nairobi and eastern province have dangerous fluoride levels. While the water infrastructure gaps are numerous, watershops cannot mitigate water access problems, and is also less advantageous in locations that struggle with bacterial contamination alone.<sup>1</sup>

Map 1: Population Density



Map 2: Major Cities and Major Contaminants



Kenyans drink water from many different sources including surface water, wells, boreholes and municipal water. Unfortunately, there are no widely available home desalination systems and thus, many wells have been abandoned because of salinity. Using these abandoned wells will save costs. Geographically, the project thus focuses on areas with saline water or water high in fluoride, using existing boreholes, shallow wells or surface water sources. In addition to the varying water quality issues, Kenya has stark differences in population density. The lifestyles and purchasing habits of urban, peri-urban and rural communities differ widely. These varying parameters allow the concept to be tested under different conditions to develop best practices.

<sup>1</sup> In locations with bacterial contamination alone chlorine is accepted and effective, and often provided free of charge by government and NGOs.

While Kenya is a driving commercial hub for the East African community, the business environment is restricted through high corporate taxes, high corruption levels, and a relatively volatile currency.<sup>2</sup> Furthermore, rigorous accounting is not a part of standard Kenyan business practices, and thus it is commonplace for businesses to lose money through unreported revenues remaining in the hands of employees. These weaknesses within the Kenyan business environment will be mitigated using a well-structured governance model, financing that reduces the impact of currency fluctuation, and a transparent revenue collection system using mobile banking.

In addition to creating a positive social impact through increased access to safe water and the creation of employment opportunities, the Watershop seeks to generate revenue. While the concept may not be suited for Kenya's most vulnerable communities initially, there are numerous locations both within Kenya and globally where improvements to health and economic well being can be achieved through a profitable watershop. The long-term impacts are difficult to measure, however, there are documented effects on the positive effect safe water access has on health, education and economic stability.<sup>3</sup>



Creating a positive social impact through increased access to safe water and the creation of employment opportunities.

<sup>2</sup> Ease of Doing Business Report.

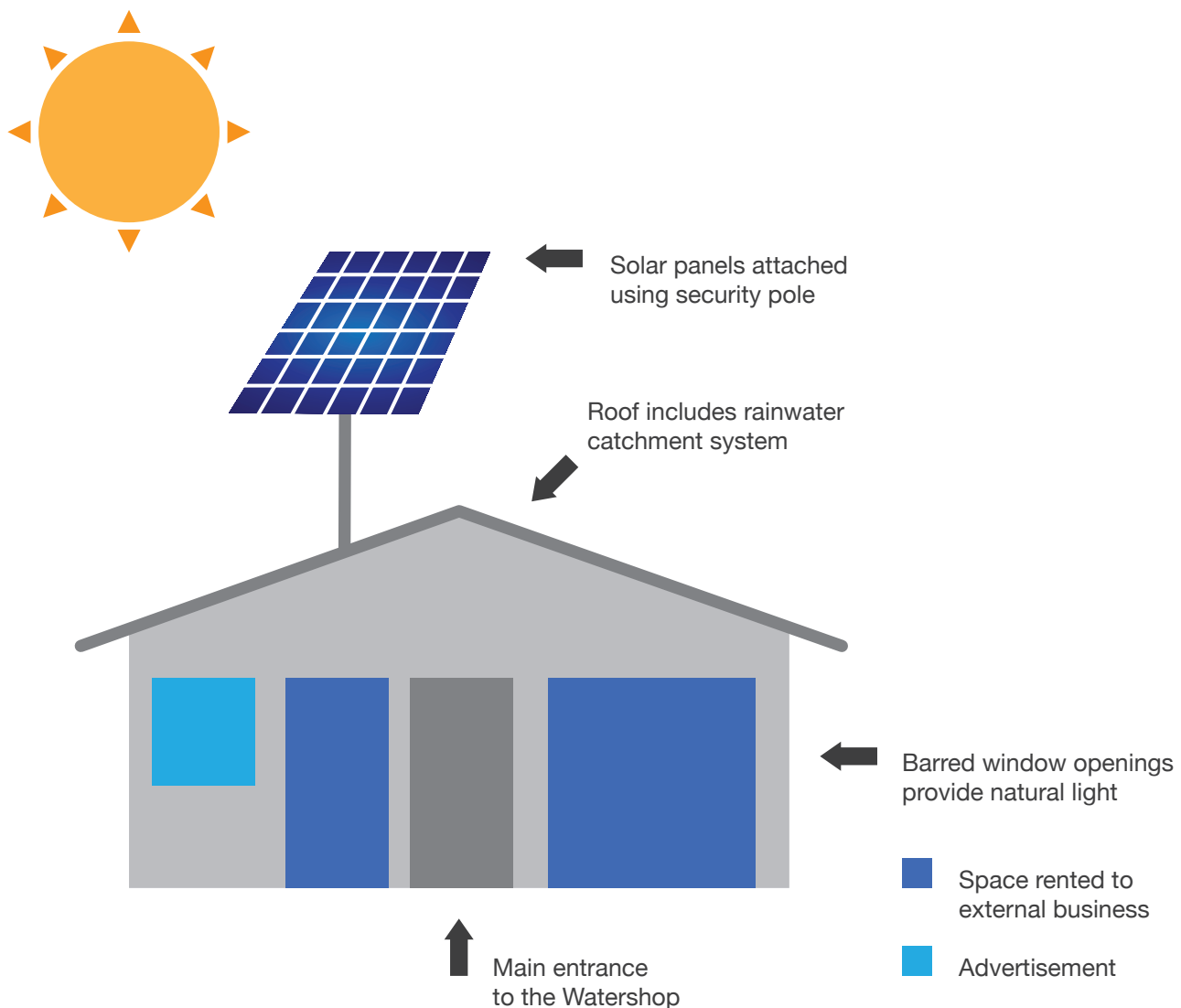
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# The Watershop

## The Watershop: In Short

Watershops are small, self-contained solar powered water purification businesses that are located in high traffic market areas. These areas lack basic municipal infrastructure for safe water, but have vibrant economic activity and a consumer base that includes some consumers with regular income beyond casual labour. Watershops have a very branded and modern look and feel and attract customers using several different revenue streams. Central to the business is the ability for registered customers to dispense safe water into branded jerrycans. In addition, each Watershop will contain space that is rented to other businesses, include advertising opportunities and provide other services.

Image 1: Sample Watershop Front



### The Watershop in Numbers:

Liters of safe water produced per day: **Approx. 8.000**

Cost of 20 litres of water: **40 KES**

Population served: **4.000**

Number of mobile phones charged daily: **15**

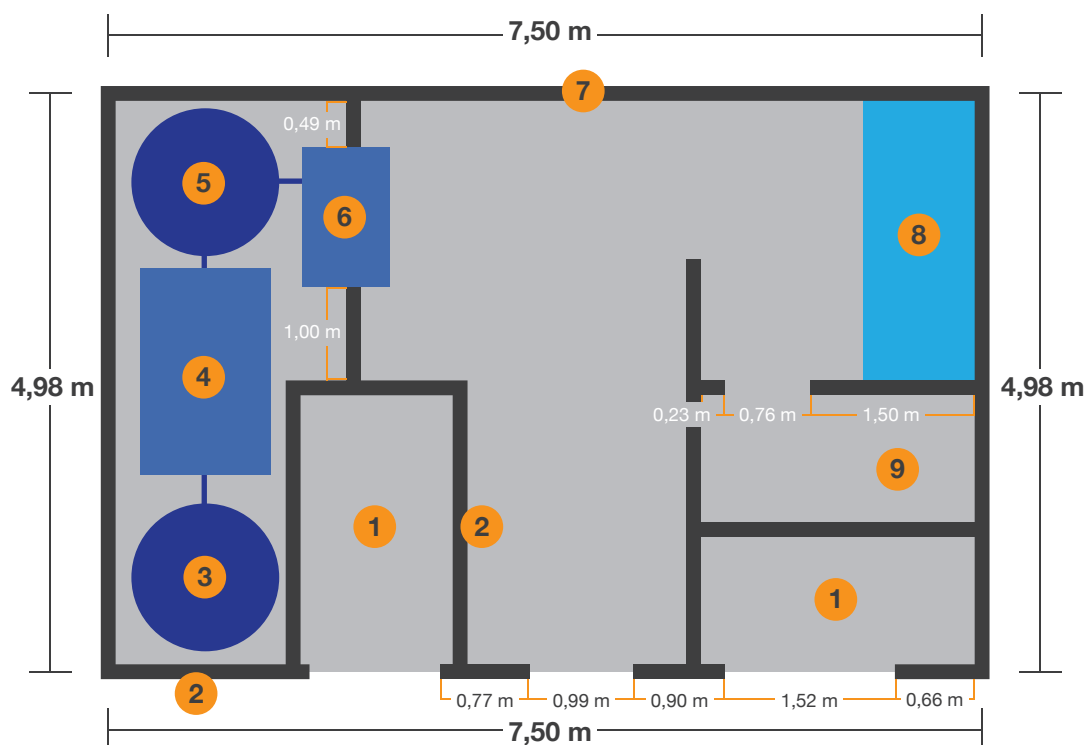
Jobs created: **6 FTE**

Positive EBITDA on shop level: **Year 1**

Average cost of installation per shop: **122.000 CHF**

Average annual opex per shop: **27.000 CHF**

Image 2: Layout of a Typical Watershop Front



- |                        |   |
|------------------------|---|
| 1) Space for rent      | 6) Payment and dispensing system                |
| 2) Advertising space   | 7) Barred window openings provide natural light |
| 3) Dirty water storage | 8) Jerrycan cleaning area                       |
| 4) Trunz technology    | 9) Storage for clean jerrycans                  |
| 5) Clean water storage |   |

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## The Watershop: Buying Water

Upon arrival at the shop customers are given a clean jerrycan by the operator in exchange for their used jerrycan, or for first time customers, a deposit of 200 KES (or 1,85 CHF). This deposit is calculated based on the equivalent price of the jerrycan itself.<sup>4</sup> This deposit money is retained by the parent organization, which supplies the initial jerrycans. Customers are encouraged to pay deposits on jerrycans during registration days, however, additional jerrycans can be bought against a deposit through the operator directly.

Customers buying water at the Watershop will pay a digital payment system powered by their mobile phone (for an illustrative explanation see Appendix 1). Over 14 million people have registered with M-Pesa in Kenya, this means that most adult Kenyans either have M-Pesa themselves, or have a close friend or family member who does.<sup>5</sup> Given how widespread the M-Pesa system is, using a mobile banking payment system exclusively is recommended.

**Payment system:** Water purchases will be completed using the Grundfos Lifelink mobile payment system. This system enables each water user to upload water credits onto his or her own personal water key (specialized RFID chip) using the mobile banking system, M-Pesa. The Watershop will not use cash payments for water purchase, thereby ensuring that correct revenues are generated and reported. Customers will use cash payments to pay for other services within the shop such as mobile phone charging, and to purchase hygiene products and small grocery items, etc. While using mobile banking for these revenue streams would further improve transparency, it is not possible to create an exclusive payment system for these products. Because of this limitation the parent fee is calculated based on water sales exclusively, thereby eliminating uncertainty that stems from unreported revenues.

Customers place their water key at the water dispensing machine that measures the water dispensed and immediately charges their personal water credits account with their water purchase. Thus, the customers fill jerrycans with water themselves, with assistance from the operator if needed.

The operator of the Watershop cleans the jerrycan that she received from the customers and places it in the clean jerrycan storage area. She also ensures that the area surrounding the water dispenser unit is clean and answers any questions that the customer may have about water dispenser, safe water, or safe water transport. In order to ensure safe transport the operator assists the client in closing the jerrycans using hygienic reusable screw tops. In the event that an unregistered customer would like to purchase water the operator may use her own personal water key to dispense the water, receiving a cash payment from the customer. She may also advise the customer on the process of becoming a registered user (for more information on becoming a registered user see Marketing & Target Groups).

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<sup>4</sup> Although this may create a financial barrier for some customers, the cost is only slightly higher than Dutch Water Limited, and 80% cheaper than bottling companies, which typically charge 1.000 KES deposit. As an alternative, it would be possible to offer two jerrycans as well as some water credits for a total of 500 KES, however, this may act as a financial barrier for some customers. Therefore, it is recommended to test these options in different locations during the pilot phase.

<sup>5</sup> <http://www.safaricom.co.ke/index.php?id=1073>.

## The Watershop: Additional Revenue Streams

In addition to water the customer has the opportunity to use a number of services and make purchases in and around the Watershop. This leverages customer traffic to realize synergies between different sales concepts and it increases advertising value.

**Rental of space:** The front end of the Watershop includes space for two small businesses. Each of these spaces is approximately four square meters large and rented out to local entrepreneurs. They are ideally suited for businesses such as shoe shining, hair salons, tailor shops and tea salons. Tenants of these small businesses will pay 5.000 KES per month (50 CHF) in order to operate a small business within the Watershop. Tenants of these small shops must rent the shop space for six months continuously. In addition there is an outdoor market style area beside the Watershop. This vendor area has a narrow roof covering to protect from the rain. The market area can be rented by vendors on a daily or weekly basis at a cost of 1.000 KES per week. These types of small business spaces are ideally suited for clients from microcredit programs, and it is recommended for the Watershop to develop a partnership with a microfinance institution to compliment the space rental opportunities.

**Advertisement space:** Each Watershop has three advertisement spaces available, one on the front wall and two inside of the shop itself. These advertisement spaces are two square metres large and will be suited for large corporations such as Safaricom, CocaCola, Tusker or Airtel. The advertisements will be painted onto the shops at the cost of the advertising company and changed annually, unless the subscription is renewed. The advertisement space will be sold at 3.000 KES per month. In addition to standard advertisement opportunities there may also be the possibility to 'adopt a Watershop' whereby a company purchases all advertisement within a shop over an extended period and may use the shop for CSR purposes or corporate functions. In addition to these paid advertisement opportunities the Watershop will also include a community notice board, which allows community members to post small advertisements or messages free of charge.

**Mobile phone charging:** Customers have the opportunity to charge mobile phones for 20 KES, or approximately 0,18 CHF. The mobile phones will be charged using the Trunz solar panels. It is expected that 15 mobile phones will be charged daily.<sup>6</sup>

**Small products:** The operator will be allowed to sell small products such as small grocery items or hygiene products within the shop directly. The operator will base the choice of products on the demand of the consumers, she is encouraged to find market niches and develop product lines based on this.

Throughout Kenya water is often delivered to the consumer using cart pushers. The Watershop will not include a delivery mechanism directly, rather the existing market for water delivery will be used when needed. If a consumer has a trusted water vendor that she would like to continue to use, she can request that this water vendor delivers water from the Watershop. Critically, however, this remains outside of the business model financially. Integrating into the existing distribution network poses some risks for recontamination, which are further discussed in the section titled 'Risk.' On the other hand, allowing existing distribution systems into the Watershop model allows the concept to integrate within to the social fabric of a town more quickly and also reduces tensions associated with perceived competition from other Watershops.

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<sup>6</sup> These mobile phones can be charged with existing solar panel infrastructure deducting the energy requirements for the purification process.

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As a portion of their training, entrepreneurs will also be advised on how they can personally expand their business to include delivery, including taking a loan from microfinance institutions to purchase a branded pushcart or tuk tuk<sup>7</sup> (for more information about training of operators see Appendix 2). While the model welcomes such innovations based on needs and interests in a specific location, it remains outside of the business case.

# Competition: Where People Get Drinking Water Right Now

Kenyans obtain drinking water from numerous different sources depending on what is available, the price of the water, and the quality they perceive this water to be. Although there is a broad spectrum of available water, generally speaking, Kenyans drink water from four different sources

**Community based sources (surface water, boreholes, shallow wells):** These sources provide water free of charge or at a low cost, generally revenues are used for periodic maintenance of the borehole or well. Ground water has widely varying quality, in particular because of the dangers posed by unprotected, or poorly protected wells. Surface water use is generally restricted to very low-income communities in rural settings – thus surface water is not an alternative used by potential customers of the Watershop. Unfortunately, community based sources are often contaminated with bacteria and sometimes contain salinity and fluoride levels that pose health risk.

**Municipal system (through private and shared taps):** Kenyans living in peri-urban areas and larger towns often have access to the municipal water system. While the quality of the water is not necessarily reliable (as a result of ruptures in the pipes contaminating the water), most Kenyans believe that the water is safe for human consumption. The largest problem associated with water coming from municipal sources is the unreliable provision. Irregular water in the taps is the result of water rationing, ruptured pipes, and electrical irregularities that cause water pumps to fail. Billed at a monthly tariff this water provides relatively affordable drinking water, although treatment would be needed to ensure this water is safe.

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<sup>7</sup> Tuk Tuks are small three-wheeled motorized vehicles, pushcarts are un-motorized transportation trailers. Both are already used to transport water for longer haul distances.

**Water kiosks:** In those peri-urban areas where municipal infrastructure is insufficient both privately owned and municipal water kiosks can be found. While there is a nationally regulated tariff of two Kenyan Shillings per 20 litre jerrycan this rate is often not observed and many tariffs significantly exceed this suggested rate ten- to thirty-fold. Often these kiosks operate in collaboration with cart pushers who deliver water to those consumers willing to pay for the service. There are also kiosk-based concepts that sell purified water in some locations. These are all elaborated in the section titled competition. For differing reasons, however, none of these concepts have been scaled and there are only a limited number of people using water from these sources regularly. Water kiosks can be an effective way to increase access to consumers in peri-urban areas, however, the prices remain relatively high and the quality of the water is often very low, as a result of poor storage and recontamination in the kiosk area.

**Grocery stores:** Those Kenyans who are aware of the dangers of contaminated water from the municipality, and can afford to do so, often choose bottled water from grocery stores. This includes large 20 litre water dispensers that can be ordered through a number of water bottling companies. These 20 litre bottled water range between 2,96 CHF and 5,55 CHF depending on brand and distribution. In addition a deposit of approximately 9,25 CHF is charged for each water container. Despite the very high costs associated with bottled water, the market is growing with more and more Kenyans drinking bottled water due to sanitary concerns caused by water shortages.<sup>8</sup>

The Watershop concept will provide an alternative for those Kenyans who are unable to afford bottled water from grocery stores but recognize the value of water that is safer than their community, municipal or kiosk based sources. Therefore, the Watershop does not aim to change the price that consumers are willing to pay for water, rather it seeks to improve the quality of this water without a drastic change in price.

Research in Kenya revealed that there is also a market gap for clean water at large lodges in Kenya's nature reserves. Currently these lodges order bottled water, which is often transported over far distances thereby incurring particularly high costs, as well as environmental damages which conflict with the values of many environmentally conscious tourists.

Water from a Trunz machine in such a lodge could also be distributed to local residents, unfortunately, however, these residents are often unable or unwilling to pay for water. There are numerous opportunities as well as challenges associated with this type of business model, called the eco-lodge model, which are elaborated in Appendix 3. The eco-lodge model could be served by the Trunz Watershop on a consultancy basis for strategic planning, training and education, as well as day to day operations. The eco-lodge model has deliberately been left out of suggestions for the pilot phase because of these limitations. Nevertheless, the business model provides valuable insight into various elements of the Watershop concept and could be tested or further explored if locally based financing becomes available.

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<sup>8</sup> Euromonitor International: Category Briefing: Bottled Water in Kenya (April 2011) p. 1.

# Competition: Concept Alternatives

Competition for the Trunz Watershop will come from three sides: other purification technologies for Watershops, home or point of use treatment alternatives, and the bottling industry. Each of these competitors are examined separately.

## Other Purification Technologies

In addition to Trunz there are numerous water purification technologies that remove some or all contaminants from the water.

While the use of a high-level purification technology within a water kiosk is relatively rare, in particular in combination with the branded experience that the Watershop will incorporate, such concepts may be developed using alternative technologies in the future.

These technologies vary in size from community-based solutions to household level filters. The technologies are manufactured by both Kenyan and international manufacturers and provide a range of qualities and prices.

Differentiating factors for community-based solutions include the type of contaminants treated, the amount of energy used, the reliability of the technology, maintenance options available within Kenya, and the cost.

Technology	Company	Treated Contaminants	Capacity	Energy Consumption	Approximate Cost	Weaknesses	Strengths
Reverse Osmosis	Davis & Shirtliff (products from GE and Dayliff)	Bacteria, suspended solids, fluoride, salt	400 - 3.000 litres per hour	0,75 - 3 kW	8.000 - 14.000 CHF	High operation costs especially in terms of power required	Service available throughout Kenya
Solar Distillation	Terrawater	Removes salt and other dissolved solids in the water	5.000 - 10.000 litres per day (up to 500.000 litres is also possible with a higher cost)	Solar thermal energy; waste heat energy	60.000 CHF without solar thermal installation	High upfront costs & no service available in Kenya	Low operation cost
Ultrafiltration	Seccua	Bacteria and suspended solids	1.600 litres per hour	35 W	6.000 CHF	Does not remove salt, fluoride or heavy metals & no service available in Kenya	High output and relatively cheap price

<b>Bone Char Method</b>	Nakuru Defluoridation Company	Fluoride	4.000 -12.000 litres per day	Gravity driven, no power needed for purification. Water pump and power system not included	2.000 CHF	Only removes fluoride & bone chars should be removed in every two years	Low costs of locally produced bone chars
<b>Ultraviolet (UV) disinfection</b>	Davis & Shirtliff (products from GE and Dayliff)	Bacteria	500 - 7.000 litres per hour	Low power requirements	2.000 - 4.000 CHF	Does not remove salt, fluoride or heavy metals & UV lamps should be replaced in every two years	Very low up-front costs and maintenance costs
<b>Gravity driven membrane filtration</b>	SkyHydrant	Bacteria	1.000 litres per hour	Gravity driven, no power needed for purification. Water pump and power system not included	3.500 CHF	Does not include pumps to pump water & does not remove salt, fluoride or heavy metals	Very low up-front costs and maintenance costs
<b>Sand filtration</b>	SkyHydrant	Some bacteria, suspended solids		Gravity driven, no power needed for purification. Water pump and power system not included	2.000 CHF	Does not remove salt, fluoride or heavy metals	Very low up-front costs
<b>Filtration &amp; Chlorination (chlorine is produced via anodic salts in the water)</b>	Autocron	Bacteria	200 litres per hour	Solar energy is used to cover power need for purification (120 Wp)	13.000 CHF (including solar energy)	Does not remove salt, fluoride or heavy metals & no service available in Kenya	Low operation cost while chlorine is produced during the process via anodic salts in the water
<b>Filtration &amp; UVC</b>	H2O Unlimited	Bacteria	1.000 litres per hour	Solar energy 3 - 4 Photovoltaic Modules (200 Wp per module)	12.000 Euro (including solar energy)	Does not remove salt, fluoride or heavy metals & no service available in Kenya	Low operation cost

The Trunz Water Systems AG technology uses solar powered ultrafiltration and reverse osmosis technologies. Trunz technology includes an effective back flushing system, making the technology ideal for brackish or turbid water. The solar powered energy supply makes the system ideal for areas without reliable electricity. Trunz Watershops will be located in areas where these advantages will be particularly evident. Areas with brackish water and limited electrical supply also pose challenges for home based treatment systems, and thus make community based solutions particularly viable. Additionally the technology will use silver ions within the storage tank in order to prevent re-contamination. Silver based disinfection offers the most reliable and cost effective alternative to chlorine. When used as a complementary method along side a primary purification technology, silver disinfection provides lasting antibacterial qualities.<sup>9</sup> There have been no toxic effects of silver found on human health.<sup>10</sup>

**Given these alternative technological solutions, the competitive advantage of Trunz Watershops lies in areas with unreliable electricity, turbid water or brackish water. (For a detailed analysis of alternative reverse osmosis systems, see Appendix 4.)**

### Competition from Household Level Treatment

All of these technologies ultimately also compete with home treatment solutions, given that consumers have the option of purchasing purified water at a higher price, or purchasing contaminated water and treating it themselves. Home treatment technologies include chlorine, solar disinfection, ceramic filtration, boiling, and bone char. The primary disadvantage of all home treatment solutions is that they require intensive training and education to ensure consistent and correct use. Community based solutions, on the other hand are hindered by re-contamination concerns as water is transported to the point of use. In order to mitigate this risk the Trunz Watershop will use silver ion disinfection technology.

### Competition from Purified Water Kiosk Concepts

In addition to these technology alternatives there are also several other concepts that pose competition for the Trunz Watershop. While none of these alternative technology providers have successfully implemented a scaled Watershop concept, they may do so in the future.

**Dutch Water Limited:** Has a manufacturing plant in Bamburi, north of Mombasa. They sell purified water in sealed 10 litre jerrycans for 50 KES. In addition to sales at the manufacturing plant directly, they also have a distribution network involving cart pushers as well as sales through participating corner stores and kiosk stands. When sold by a cart pusher or at a corner store the price of the water is higher, typically 0,92 CHF for 10 litres. The company targets middle income Kenyan consumers and receives donations from around the world in order to provide water for the poor. The company likely produces around 25.000 litres of water per day.<sup>11</sup>

<sup>9</sup> <http://ceae.colorado.edu/mc-edc/pdf/Silver%20Paper.pdf>.

<sup>10</sup> WHO Drinking Water Guideline 4th Edition:

[http://whqlibdoc.who.int/publications/2011/9789241548151\\_eng.pdf](http://whqlibdoc.who.int/publications/2011/9789241548151_eng.pdf).

<sup>11</sup> Communication with Dutch Water Limited during field work was limited, however, external sources including:

<http://thewaterproject.org/community/2011/02/18/reverse-osmosis-here-in-mtwapa/>

have listed daily production at 25.000 liters.

**MPI Industries:** Developed a micro water plant concept that was to sell water to different customer segments at different prices, using cross subsidization to cover costs. As a result of conflicting interests from local management and international financing the concept has since changed into a bottling company, called Imara water, servicing middle and upper class Kenyans only.

**Water and Sanitation for the Urban Poor (WSUP):** WSUP focus on improving water quality through kiosks in slum areas, they work in collaboration with municipal water service providers. The organization uses bone char filters manufactured by Nakuru Defluoridation Company as the basis of community water kiosks in Naivasha. The kiosk is designed to be operationally break even, but continues to be extensively supported by WSUP. The kiosk network is located within a low income community of Naivasha and sells both treated and untreated water. Treated water costs 0,018 CHF per 20 litres while untreated water costs 0,009 CHF. At the moment only 15% of water sales are for treated water. According to plans by WSUP the operator of the water kiosks should pay for replacement filters when they are needed, however, the operator did not detail such plans. WSUP is heavily supported through grants from USAID and the Bill and Melinda Gates Foundation among others.

# Marketing & Target Groups

Watershops are targeted towards lower middle class consumers in Kenya. As opposed to the poorest of the poor, which rely on casual work alone, lower middle class consumers in Kenya often have some form of reliable income through steady work. These types of jobs can be found in the tourism industry, in manufacturing plants or through other larger businesses. While these employment opportunities grant them some financial stability lower middle income Kenyans still struggle to meet basic needs including health care, education and adequate housing.

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The Watershop will be promoted within the community through four primary marketing channels:

**Branded jerrycans:** As opposed to traditional yellow jerrycans those containers used to transport water from the Watershop will be white and prominently display the Watershop logo on the front of the container. This will immediately signal to potential customers that the water comes from a Trunz Watershop, and is of different quality than water from other sources. Although the jerrycan will not be sealed it will be closed using a standard twist cap. In order to ensure that this branding strategy is not misused by cart pushers re-filling branded jerrycans with other water, cart pushers will not directly be integrated into the Watershop concept.

**Watershop as a social and economic hub:** The Watershop will contain two other small businesses as well as a small outdoor market area that attracts additional customers. These additional customers and the atmosphere created around the Watershop draw more attention than if water were sold through sealed bottles at corner shops, as has been done by some competitors. In addition the Watershop will have a clean and modern appearance including a nice vibrant colour, thereby making it stand out from other shops within the marketplace.

**Partnerships with CBOs and NGOs:** The Watershop will partner with CBOs and local NGOs, giving them the opportunity to learn to use the water dispenser as well as knowledge and training about water transport, and the health benefits of safe water. Collaborations with microfinance institutions may help to inform well-trained and financially savvy entrepreneurs about the opportunity to rent space within and around the Watershop.<sup>12</sup>

**Marketing through parent organization:** The local Watershop will also be supported through the marketing of the parent organization. This organization will carry out periodic marketing campaigns through print media as well as locally based events, such as marketing concerts.<sup>13</sup> These events will also occur in conjunction with registration days whereby new customers may register and receive a water key. In order to receive a key customers will have to complete a basic training course about safe water. This also gives customers the opportunity to meet the operator and practice dispensing water for the first time. After the training customers will pay deposit for the water key and are given assistance in loading their personal water credits accounts the first time.

In addition to these primary channels the local entrepreneur is encouraged to take on his or her own marketing initiatives including flyers, word of mouth, customer referral programs and loyalty programs. The parent organization will assist her with this. Given that a large portion of the operator salary is commission based, she is incentivized to create an effective marketing strategy.

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<sup>12</sup> Community mobilization coordinators and partner NGO recommendations including contact details can be found in the Appendix 6.

<sup>13</sup> One effective marketing technique in Kenya involves loud music being played from a truck or mobile stage, this is often accompanied by several dancers. The centre of attention around the music also includes several large billboards for brand awareness as well as information distributed to concert goers through word of mouth and flyers.

# Key Companies

The Watershop will operate in collaboration with three primary partner entities. Each of these organizations has separate roles and responsibilities within the Watershop and will support the concept using their core competencies.

**Trunz Water Systems AG as technology provider:** Trunz Water Systems AG will be the technology provider for the Watershop. The provision of reliable autonomous solar powered water purification technology is essential for the Watershop. Trunz Water Systems AG is chosen as exclusive technology provider because of their ability to provide tailor made solutions for differing water qualities including salinity, heavy metal and bacterial contamination. Although only four years old the company has a proven track record, having delivered 600 water purification units in 33 countries worldwide. Having an effective, reliable and well-outlined maintenance and service package also qualifies Trunz as a dependable technology provider.

**Tomash International as local distribution and maintenance provider:** Tomash international will be responsible for the distribution, installation, and maintenance of all Trunz technology. In order to ensure the long term sustainability of technology within the Watershop it is imperative that a local partner is knowledgeable about the maintenance requirements of the Trunz machine. Additionally, Tomash International is responsible for repairing the Trunz technology, including solar panels, in the event that the machine should break down. Tomash International is well equipped to fulfill this role with two fully certified local technicians living in Kenya who have been fully trained by Trunz Water Systems AG in Switzerland. Furthermore, the company has extensive experience with import of European goods into Kenya, including customs clearance and secure transportation within Kenya.

**Local parent organization:** Trunz watershops will be supported by one local parent organization that provides training, marketing support, and back end financial management. The local parent organization will ensure that each Watershop has the necessary tools to successfully build their local business. In addition, this franchise-like organization will have ownership of the local Watershops during the pilot phase. During the field visit to Kenya the project team met several times with David Kuria of Ecotact, who showed keen interest on a collaboration between the Trunz Watershop concept and EcoMaji, his new enterprise for water provision. Given the extensive experience of Ecotact within the sanitation sector and the development and financing of social enterprise within Kenya it is strongly recommended to further evaluate the possibility of Ecotact becoming the Trunz Watershop parent organization. A more thorough evaluation of Ecotact as a potential local parent organization can be found in Appendix 5.

In addition to these key companies there will be a number of other actors involved in each location where a Watershop is formed.

This includes the local operator, who will be in direct contact with the clients, who is responsible for maintaining the physical Watershop infrastructure, and who will promote the Watershop within the social fabric of his or her town. The local operator will also work together with local NGOs and community based organizations (CBOs) in order to improve knowledge about good hygiene and safe water practices to ensure the highest quality drinking water is distributed through the Watershop (for an overview of recommended community partners, see Appendix 6).

In addition the payment system will be supported using M-Pesa and the Grundfos Lifelink payment system. Depending on how negotiations develop with these organizations it may make sense to develop a partnership based on mutual benefits with one or both of these organizations.<sup>14</sup>

# Governance

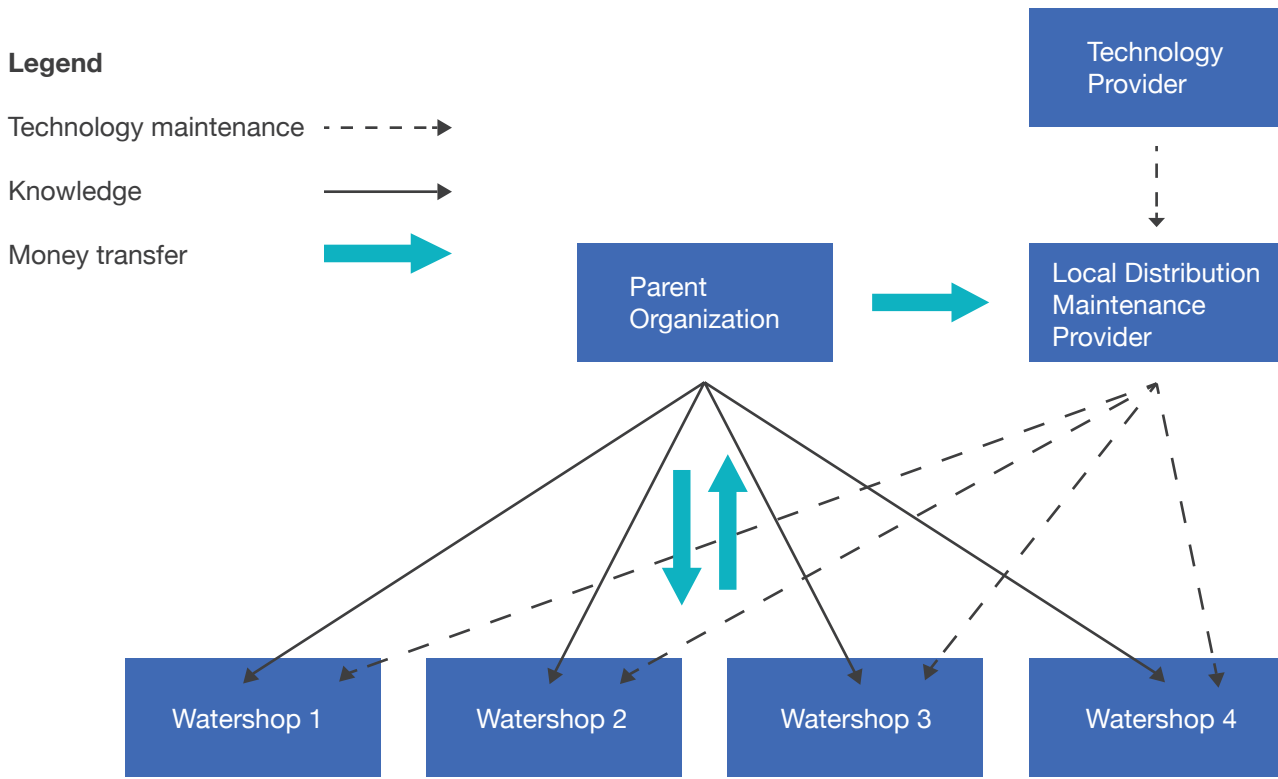
Governance of the Watershop will differ during the pilot and scaling phases. The pilot phase will be used to test the concept and develop best practices locally, which could later be scaled throughout Kenya and abroad. The local parent organization will be coached during this process by other successful social enterprises, NGOs and members of the private sector to fine tune the concept and secure investors for the scaling phase. For the proposed pilot and scaling plan, including key outcomes expected from each phase, see page 25.

During the pilot phase funding from an external foundation is recommended for financing the construction and overhead costs of four watershops. These Watershops will be wholly owned and governed by the local parent organization. This parent organization will be managed by one full-time manager as well as one assistant who will work as a team to develop a strong training and marketing program as well as a smooth back end financial management system. Additionally the local parent organization will maintain consistent communication with the Tomash International, Trunz Water Systems AG and the financing foundation, as well as all local Watershop operators.

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<sup>14</sup> The Grundfos Lifelink payment system combines M-Pesa mobile banking with an RFID payment system. It is currently in use in Kenya and is also available for sale from Grundfos directly. M-Pesa would also like to develop a similar RFID technology themselves, therefore, the Trunz Watershop may have the opportunity to choose between the Grundfos Lifelink payment system or a similarly developed product by M-Pesa.

## Organization chart for Trunz Watershop pilot:



**Financial management:** The parent organization will handle financial transactions for each Watershop. Revenues from water sales as well as advertisement space and sub-renting will be transferred to the headquarters directly. Revenues from water sales are paid to the parent organization in the form of a commission based rent. As opposed to other franchise concepts, which often use a flat rental rate the Watershop will charge operators a fee based on water sales. This is made possible through the mobile payment system, which allows exact revenues to be collected, and also ensures low entrance barriers for potential operators who may not have the liquidity to pay for shop rental up front. A commission-based salary of 2% of water sales will be transferred to the operator of each Watershop on a weekly basis using an automated M-Pesa transaction. Maintenance and service costs for each Watershop will be paid through revenue generated from each individual Watershop. Critically, however, the operator will not pay these bills, rather the parent organization will do so through a service level agreement for maintenance with the local distributor. This setup ensures that there are always funds available for the service and maintenance of the technology.

**Selection and training of operators:** Selection of operators is done by the parent organization on the basis of recommendations and personal networks. When no suitable candidate is found through recommendations, an open application process may be used. This includes the involvement of secondary training institutes as well as centres for vocational learning. In all cases operators should be chosen on the basis of proven track records in particular for honesty and punctuality. An emphasis in each location should also be placed on existing water distribution systems, ensuring that local social hierarchies are not overstepped. Training of operators in entrepreneurship, accounting and safe water practices is essential for the successful operation of Watershops. This training will be prepared and carried out by the parent organization as well as local NGOs.<sup>15</sup>

**Community mobilization:** Partnerships with NGOs and CBOs for community mobilization will be organized by parent organization in close cooperation with the operators according to the needs in each individual location.

During the scaling phase the Watershop will allow investors to invest in a portfolio of Watershops within Kenya. This portfolio will be managed by a social investment firm, while the operations on the ground continue to be managed by the local parent organization. Some investments may come from investors within Kenya who may prefer to invest into one Watershop, as opposed to a portfolio of several shops. In such a case, the parent organization would continue to support the Watershop as during the pilot phase, but the investing entrepreneur may choose to have a more active involvement in the Watershop strategy, such as marketing or additional revenue streams.<sup>16</sup>

# Risk & Mitigation

The Watershop faces risks, which may jeopardize the business. The Watershop faces risks associated with product acceptance, re-contamination and the challenging business environment in Kenya, political risks including the 2012 elections, as well as risks posed by climate change and the continued drought in Kenya. Finally, there are risks posed by competitors, both from the bottling industry as well as existing informal water suppliers. These risks, along with recommendations for their mitigation are elaborated in this section.

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<sup>15</sup> During the field research the project team also spoke with True North College, a small school which provides training on entrepreneurship and self reliance in addition to standard subjects. This college may be a good collaboration partner for training phases.

<sup>16</sup> A local businessman from the Ukunda/ Mombasa region has expressed a keen interest in investing into a watershop. In his specific case, he is interested in using the watershop as a secondary production and distribution centre for his existing water bottling business.

## Product Acceptance

**Risk:** As with all new products it is imperative that the consumers understand what differentiates the Watershop water from their current water supply and recognize the value of the water. In the Kenyan water market the risk of a rumour or suspicion clouding the image of the Watershop is possible. In fact numerous water sources and cleaning technologies have been rejected as a result of miseducation or superstitious ideas. In other parts of Africa this famously occurred with chlorine, where local people believed that the chemical causes sterility and therefore refused to use it even when given free of charge.

**Mitigation:** In order to ensure immediate and on-going acceptance of the water the Watershop will engage local CBOs and NGOs first, thereby ensuring that the concept becomes enmeshed in local social fabric. These organizations will then be used to support community engagement activities and educate consumers about safe water and good hygiene. The operators will also be advised to remind customers of this information whenever they enter the shop, and to maintain the shop to a very high hygienic standard to reduce risks of associated with perceptions of the shop. A portion of operator training will involve product perception and shop appearance (see Appendix 2). Finally, operators will be chosen using a process of recommendations thereby ensuring that they are also accepted and respected community members.

## Re-contamination Risks

After water is purified, there are risks of recontamination before the point of use. Recontamination can occur within the tank, as the water exits the tap, within the jerrycans or shortly before it is consumed. The Trunz Watershop has a clearly outlined strategy to mitigate each of these risks. These strategies are outlined in the table below.

Recontamination Risks	Mitigation
Within the clean water storage tank	Use of silver ions within the tank
At the tap, or through refilling process	<p>Silver ions are known to have lasting pro-active antibacterial properties</p> <p>Taps will be cleaned by the operator using a peroxide solution on a daily basis</p> <p>Clients, including children, will be instructed by the operator not to touch or play with the taps</p>
Within the jerrycan	Emphasis on safe water practices during training of operators

	<p>Clear agreement between the operator and parent organization emphasizing the responsibility of the operator to clean jerrycans correctly</p> <p>Operator uses clean hands to close jerrycan using clean screw top lid</p> <p>Strong control mechanism from the parent organization:  (1) Regular Checks by Parent Organization  (2) Consumer Feedback Mechanism</p>
Re-contamination at point of use	Community mobilization in order to increase awareness about safe water practices

In order to ensure that re-contamination risks are effectively addressed it is advised for Trunz Watershop water to be tested by an independent laboratory on a regular basis. Results from these tests may also be displayed within the Watershop, in order to inform the operator, customers and community about the water quality.

## Challenging Business Environment in Kenya

**Risk:** Government institutions in Kenya are laden with corruption that is so high that it is seen as a hindrance to business success in Kenya. This corruption can take many forms but most commonly involves paperwork and bureaucratic inefficiencies which seem to only be overcome by compensating the bureaucrat who oversees the regulation involved. Given the rapidly changing policies associated with the newly implemented constitution (August, 2010) there is also a risk that laws and regulations change which may hinder the Watershop operating as initially conceived.

**Mitigation:** In order to curb risks associated with government bureaucracy these institutions will be involved throughout the implementation process of the Watershop. In particular it will be imperative for the parent organization to maintain a good relationship with the government at all times, this holds especially true for ties to the local water company, regional water board and the ministry of water and irrigation as well as the ministry of health and sanitation.<sup>17</sup> Given that jerrycans from Trunz Watershops will not be sealed they will not be considered bottled water, and are thus not subject to the tax of 3 KES per litre levied on all bottled water. Nevertheless it is imperative for the local parent organization to be in touch with the Kenya Bureau of Standards and the Kenya Revenue Service in the event that regulations should change and require the Watershop to obtain permits or pay tax from this body.

<sup>17</sup> David Kuria, who is further discussed as potential local partner in Appendix 5, is also head of the main government roundtable for sanitation. His strong connections within the government will be particularly useful for mitigating these types of risks.

## Climate Change

**Risk:** As a result of mismanagement of water resources as well as global climate change the northern portion of Kenya was strongly affected by the 2011 drought and subsequent famine in the horn of Africa. These effects were even felt in the southern Kenya where lakes such as lake Jipe have dried for the first time in history and seasonal rivers and streams have disappeared. Many ground water sources throughout Kenya have also become increasingly saline as a result of depleting ground water tables and salt intrusion. Severe drought not only limits the availability of water for the Watershop to purify it also increases risks of violence associated with the struggle to obtain water.<sup>18</sup>

**Mitigation:** Locations for the pilot project as well as future locations will be chosen with climate change factors in mind. Specifically, Watershops will not be placed in northern regions where the arid climate is likely to be a limiting factor to the successful implementation of a Watershop. Furthermore, whenever possible wastewater will be returned to the ocean when RO is used for saline ground water so as not to increase salinity of the groundwater over time.

## Competitors (Bottling & Informal Sector)

**Risk:** Competition from water enterprises which recognize the market gap and use economies of scale to produce low cost bottled water or effective home treatment systems. In addition there is risk associated with the perceived competition by cart pushers and the informal water sector including cartels that operate in some parts of Kenya. This form of competition has been seen in some slum areas in Kenya where cartels destroyed the water tanks, taps or other infrastructure in order to continue to hold a monopoly on the water market in that area.<sup>19</sup>

**Mitigation:** In order to reduce risks associated with competitors the Watershop will price the water significantly below comparable bottling companies. This will only be possible because the jerrycans from the Watershop are not sealed and therefore do not incur the associated water bottling tax or KEBS certification. The Watershops will primarily be located in areas where home treatment systems do not work, as there are no effective desalinization systems for home use. Pricing water at a slightly more expensive level than the municipal kiosks also ensures that water cartels feel less threatened. In addition these existing water distribution networks will be incorporated into the Watershop by allowing them to distribute Trunz water to their existing or new clients.

## Political Risk

**Risk:** Upcoming elections in Kenya are scheduled for the end of 2012. Previously elections in Kenya have resulted in violence and tribal warfare that included vandalism and destruction of business property. In addition to capital loss, the chaos caused by such disturbances and could hinder business operations. The timing of the 2012 elections may be problematic for the pilot project, both in terms of obtaining financing and launching operations.

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<sup>18</sup> <http://sustainablesecurity.org/article/water-conflict-violence-erupts-along-ethiopia-kenya-water-stressed-border>.

<sup>19</sup> Experience by Umande Trust a Kibera based NGO in the water sector who attempted to provide water for 2KES per 20 litres as opposed to the going rate of 3-4KES.

**Mitigation:** Financing for the project will be secured before potential political turmoil begins. The later half of the year 2012 will be used to plan the pilot project further, and construction and operations will begin after the 2012 elections. In addition, standard security precautions including hiring a nighttime security guard and using well designed building infrastructure will be imperative. While eliminating political risk in a developing country such as Kenya is impossible, developing a strategic plan to combat it when needed is recommended. Aside from the election violence in 2007, Kenya is a country with an established democratic process including a newly enacted constitution.

In addition to these risks the volatile nature of doing business in the developing world will require constant awareness of new risks and challenges as they arise. The Kenyan Shilling has grown steadily in relation to the Swiss Franc, over the past five years. Critically, however, the currency was more volatile in quarters three and four of 2011.<sup>20</sup> These currency fluctuations, which can amount to nearly 20% of the value of the currency, can result in difficulties repaying loans that are issued in Swiss francs or depreciating capital valued in foreign currency. Therefore the risks must be considered under the terms of any loans, and in relation to the growth of the currency in the coming months. Additionally the Kenyan context poses risks associated with changing legal framework and policy measures. In order to curb these risks the parent organization will work in cooperation with a Kenyan lawyer<sup>21</sup> as well as Tomash International in order to pro actively adapt the business model when needed.

# Financial Overview

## Pricing

Jerrycans at the Watershop will contain 20 litres of water and be priced at 0,37 CHF (40 KES) each. Critically the price point is 60% less than Dutch Water Ltd, the leading competitor of purified water in the coastal region.<sup>22</sup> This price is higher than water from municipal kiosks, where the tariff is around 0,018 CHF (2 KES)/20 litres, however, in the pilot locations water from municipal kiosks is typically purchased at a much higher price than the regulated tariff. Specifically, water is often purchased for 0,18 - 0,27 CHF (20 - 30 KES) for a 20 litre jerry can, although this price sometimes includes delivery. Water sold at this price, however, is distinctly different in quality from water from the Trunz Watershop, and therefore cannot be compared. These higher prices are indicative of the willingness to pay for water as well as an understanding for the value of water as a commodity.

The average cost of production of 1 litre of water using Trunz technology in the Watershop concept is 0,01 CHF (1,08 KES) or approximately 0,21 CHF (23 KES) for a 20 liter jerry can. Thus the sale of a 20 litre jerry can yields a margin of 0,16 CHF (17 KES). This margin must be used by the parent organization to cover costs associated with marketing and training as well as servicing the loan upon agreement by investors.

<sup>20</sup> <http://www.xe.com/currencycharts/?from=CHF&to=KES&view=5Y>

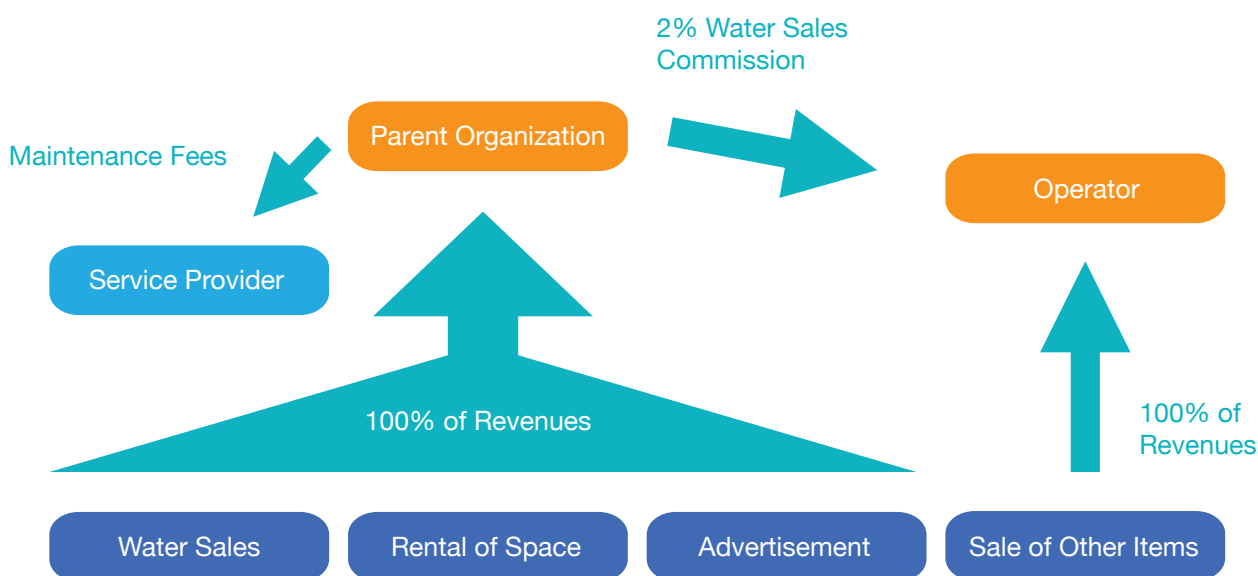
<sup>21</sup> For example, John O. Odullah, a trusted lawyer in Kenya would offer his services to the Watershop .

<sup>22</sup> In those areas where water is saline the two current options available are Dutch Water Ltd, and bottled water. The price of bottled water is between 2,96 and 5,5 CHF (320 and 600 KES), or approximately eight to 15 times more expensive than water from the Trunz Watershop.

The additional parent organization revenue streams, rental of space and advertisement, offer higher margins as they have negligible production costs. Critically, however, these revenue streams are only possible through water sales. These complimentary revenue streams are mutually beneficial as traffic generated through water sales allows high advertisement and rental prices to be charged.

## Financial Model

Revenue streams within the Watershop are clearly divided between revenues that benefit the parent organization and revenues that benefit the operator directly. Specifically, cash payments for petty items are not accounted for within the business case, rather they remain within the hands of the operator and are considered a portion of her salary.



## Proposed Pilot and Scaling Plan

The Trunz Watershop operates as a profit oriented entrepreneurship driven business model. Recommendations for operations, sales projections, and costs associated with operating and developing a Watershop are made on the basis of a research trip to Kenya. There are several research-based assumptions which should be confirmed before a large scale investment is made to develop and expand the Watershop concept. It is therefore recommended for the Watershop concept to be developed in three distinct phases. Each of these phases serve distinct purposes and will allow the concept to become scaled over a period of five years.

	Time Period	Number of Shops	Assumptions tested
Phase 1	2 years	4	<ul style="list-style-type: none"> <li>Market penetration, number of customers served</li> <li>Frequency of customer visits</li> <li>Willingness to pay jerrycan deposit price</li> <li>Willingness to pay at price point</li> <li>Effectiveness of using closed, unsealed jerrycans</li> <li>Jerrycan replacement requirements</li> <li>Ability of existing distribution markets to provide delivery</li> </ul>
Phase 2	2 years	16	<ul style="list-style-type: none"> <li>Ability of parent organization to govern larger numbers of shops</li> <li>Relationship management with NGOs, the government and communities</li> <li>Creation of a streamlined marketing and education plan that can be applied to all locations</li> </ul>
Phase 3	1 years	100	No further assumption testing necessary, rather continuous improvement of management practice on parent level, relationship building with the government, and investigation of possible expansion internationally

## Pilot Project

During the pilot project four Watershops will be constructed and operate for a period of two years in order to gather best practices. An overview of locations can be found in the next steps section as well as in the REPIC Report. Each Watershop will differ in terms of type of technology used as well as the capacity of the technology. An overview of the cost and capacity of each of the different units are presented in the table below.

Type	Location	Production in l/hr	Production in l/d	Total cost in CHF
TWB 002	Ukunda	1.200	9.600	██████

TBB 002	Gongoni	650	8.352	██████
TBB 002	Lunga Lunga	650	8.352	██████
Low Brackish Unit + fluoride	Nakuru	650	6.234	██████
Total technology investment for all locations *				██████

\* including all required technologies and shipping

Despite these differing technological specifications each Watershop can operate as a profitable social enterprise.

To account for a slow start of sales that may result from Kenyan consumers slowly becoming accustomed to water from Trunz Watershop, sales projections are set at 60%, 90% and 100% of sales capacity in years one, two, and three respectively, with 100% capacity achieved each subsequent year. Full capacity is calculated with the shop open 300 days per year, open Monday-Saturday every week and closed on Sundays and all official bank holidays. In alignment with standard business hours in Kenya the shop will be open nine hours per day, from 9 in the morning until 6 in the evening. Although the machine will only purify water for eight hours each day, water can be purchased throughout the working day because of the water storage tank. Using these pragmatic early sales projections each individual Watershop has a positive EBITDA from year one. The parent organization has a positive EBITDA from year one as well as a positive profit from year six, with the proposed scaling plan.<sup>23</sup> Given the differing capacities of the Trunz technology income and expenditures for each shop within the pilot phase will vary. Profit and loss statements for all four locations from the pilot phase are included in this business plan, three are in the Appendix 7 and one illustrative projected profit and loss statement is included below.

<sup>23</sup> This scaling plan also experiences positive profit in years two and four, however, years three and five experience negative profit as a result of low early sales projections, despite amortization of all costs.

	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Total Revenue Shop 1</b>	33.533	50.556	55.889	55.889	55.889
<i>Water Sales</i>	32.000	48.000	53.333	53.333	53.333
<i>Additional Operator Income*</i>	926	926	926	926	926
<i>Additional Parent Income</i>	1.533	2.556	2.556	2.556	2.556
<b>Total Expenditures Shop 1</b>	8.688	10.796	11.496	11.496	11.496
<i>Comission Based Salary</i>	640	960	1.067	1.067	1.067
<i>Variable Ops</i>	3.235	4.860	5.400	5.400	5.400
<i>Jerrycan cleaning fluid</i>	35	60	67	67	67
<i>Replacement jerrycans</i>	3.200	4.800	5.333	5.333	5.333
<i>Fixed Ops</i>	4.081	4.081	4.081	4.081	4.081
<i>Spare parts</i>	644	644	644	644	644
<i>Maintenance</i>	1.504	1.504	1.504	1.504	1.504
<i>Land lease</i>	215	215	215	215	215
<i>Miscellaneous</i>	1.719	1.719	1.719	1.719	1.719
<i>Unforseen</i>	732	894	948	948	948
<b>EBITDA</b>	24.845	39.760	44.393	44.393	44.393

\* non included in Total Revenue Shop 1 - Calculation

#### Projected Profit and Loss in Ukunda, using TWB002 (in CHF)

Because financial management is organized through the parent organization, depreciation, interest and taxes will be paid on this level for all Watershops, rather than each Watershop paying these costs separately.

In the first two years marketing and capacity building around the Watershop will be particularly important. The operator plays a critical role in supporting these activities, both through word of mouth and active marketing campaigns.

Although the Watershop business model is designed to be a profitable entity the high risks associated with testing such a project do not make it an ideal investment for an investor seeking only financial profit during the pilot phase.

In order to provide proof of concept the up-front costs of the installation, including technology and installation costs, building costs, as well as training and marketing costs are needed.

The Watershop pilot project could be financed using both local and international foundation funds. The return on the investment from this pilot project will be re-invested into future Watershops.

The majority of financing will likely come from a European foundation, however, it is advisable for the parent organization to raise some capital for the pilot project in Kenya. Specifically, the local parent organization should raise capital to pay for installation costs as well as up-front overhead costs including finding qualified operators, and project planning.

The international foundation should finance the water purification and mobile payment technologies development of marketing strategies and training costs.

It is recommended for costs to be split in this way because the parent organization has the greatest leverage for bargaining for lower prices, which can be achieved in the Kenyan context. As they will pay for these costs themselves they also have greater incentives to ensure that it is arranged in a cost effective way.

## Scaling Model

Once the Watershop concept is fully developed and tested, the model should be expanded in order to broaden the social impact and also develop the efficiencies necessary to develop a profitable enterprise. Although there is a potential for up to 300 Watershops within Kenya,<sup>24</sup> the initially scaling within Kenya is planned for 100 shops built over a period of five years.

Following a one year long pilot phase with four Watershops, the model should be expanded to 16 shops. Once these 16 shops are fully functional a final roll out of 84 additional shops is planned. Although locations for these 96 shops have not been chosen, the ratio of various shop types (one low brackish, two brackish and one ultrafiltration unit) as present in the pilot phase are maintained for the scaling phase. Thus 24 of the 96 shops presented in the scaled profit and loss model are based in low brackish units.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Total Number of Shops	4	4	16	16	100	100	100
Income	114.600	172.922	516.722	709.767	3.170.600	4.395.367	4.775.000
Shop Based Expenditures	32.208	39.249	138.343	159.465	843.245	991.099	1.042.942
Overhead Expenditures	26.441	36.622	38.844	58.844	85.511	85.733	85.733
Human Resources (HR)	18.519	20.370	22.222	38.889	57.407	57.407	57.407
<i>Manager</i>	16.667	16.667	16.667	33.333	50.000	50.000	50.000
<i>Assistant</i>	1.852	3.704	5.556	5.556	7.407	7.407	7.407
Accounting	278	278	278	278	278	463	463
Training	1.574	2.963	2.963	2.963	2.963	2.963	2.963
Marketing	3.241	6.481	6.481	6.481	10.185	10.185	10.185
Rent	426	426	426	426	426	426	426
Unforeseen	2.404	6.104	6.474	9.807	14.252	14.289	14.289
<b>EBITDA</b>	55.951	97.051	339.535	491.458	2.241.844	3.318.535	3.646.325
<i>Depreciation</i>	60.963	60.963	243.851	243.851	1.524.069	1.524.069	1.524.069
<b>EBIT</b>	- 5.012	36.088	95.684	247.607	717.775	1.794.465	2.122.255
<i>Interest</i>	31.701	31.701	126.803	126.803	792.516	792.516	792.516
<b>PBT</b>	- 36.712	4.388	- 31.118	120.804	- 74.742	1.001.949	1.329.739
<i>Tax</i>	-	1.316	-	36.241	-	300.585	398.922
<b>Profit</b>	- 36.712	3.071	- 31.118	84.563	- 74.742	701.364	930.818

### Profit and Loss Scaled (in CHF)

As on the individual shop level, the scaled model follows sales projections of 60%, 90% and 100% in years one, two and three respectively for each individual shop. This means that in year three of the scaled model there will be four shops selling 100% of capacity and twelve shops selling 60% of capacity. Despite these lower sales projections, the full value of the shops are being amortized, this discrepancy results in a negative profit in year five. When shops reach full sales capacity, however, they return a positive profit.

It is advisable for the scaled Watershop model to be financed using social investments such as patient capital<sup>25</sup> from investors like the Acumen Fund as well as socially-oriented banks.

In addition the Watershop concept can raise private investments from investors seeking to receive both a social and financial return. The Trunz Watershop business model is calculated using a 6,5% interest rate in line with patient capital costs or equivalent low cost debt (e.g., Freie Gemeinschaftsbank Basel or Innovationsfond of Alternative Bank Schweiz). The loan is serviced beginning in year one, and provides earnings for the investor, while still being affordable for the Watershop.

<sup>24</sup> This figure is calculated based on locations where a Watershop may be feasible because of poor municipal infrastructure, population density parameters and economic factors.

<sup>25</sup> Patient capital is a low cost debt or equity investment, which seeks to improve the well being of low income communities in some way. These loans do not have full guarantee requirements due to their financial and social return.

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# Next Steps

In order to test the concept Watershops should be constructed in 4 pilot locations.<sup>26</sup> These pilot locations have differing water qualities, and different economic factors that make them interesting testing grounds for the concept.

## **Ukunda**

Ukunda is located close to the Diani tourist resorts and thus many residents of Ukunda have stable jobs. The town is not connected to municipal system, hence many people drink water from borehole sources, even though they would have the ability to pay for higher quality water. Although Ukunda does have some none saline sources there are many water sources, which become saline during the dry season. In addition nearby Diani has very saline ground water, and a Watershop in Ukunda could also serve this area.

## **Lunga Lunga**

Lunga Lunga is located on the border to Tanzania, this bustling market town suffers from very saline water. As a result many residents use rainwater harvesting techniques, unfortunately, however, the water does not last through the dry season. As a result, many residents travel to the next town, Kidimu, in order to fetch fresh drinking water. When they use this water they pay over 0,28 CHF per 20 litres, an indication of the ability to pay for high quality water.

## **Gongoni**

Similar to Lunga Lunga, Gongoni has a large problem with saline water, situated on the Mombassa-Lamu highway this town is also home to a large salt factory which employs many of the residents. The town also acts as a market hub for several surrounding villages, whose residents go to Gongoni for purchasing goods at the small shops that line the highway. The town also has a large medical clinic, which may be an interesting location for a Watershop.

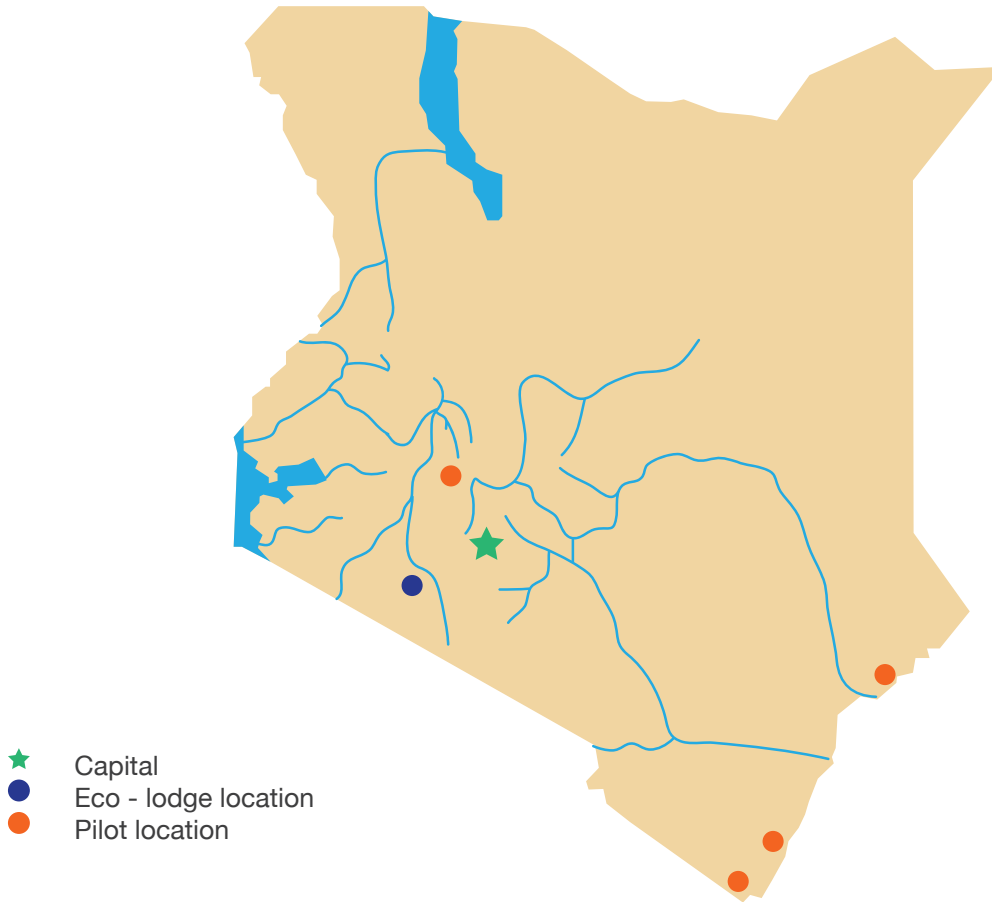
## **Nakuru, Shabab**

The fastest growing town in Kenya, Nakuru has a growing middle class which are employed in Nakuru's large industrial sector. While many residents are able to live a comfortable life, the municipal infrastructure is still inadequate in Shabab, a large middle class neighbourhood. In this busy family oriented community residents pay 0,23 CHF for a jerrycan of water, which is very high in fluoride.

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<sup>26</sup> In addition to these four pilot locations geographic recommendations for the Ecolodge model have also been included, see Appendix 2.

Map 3: Pilot Locations in Kenya



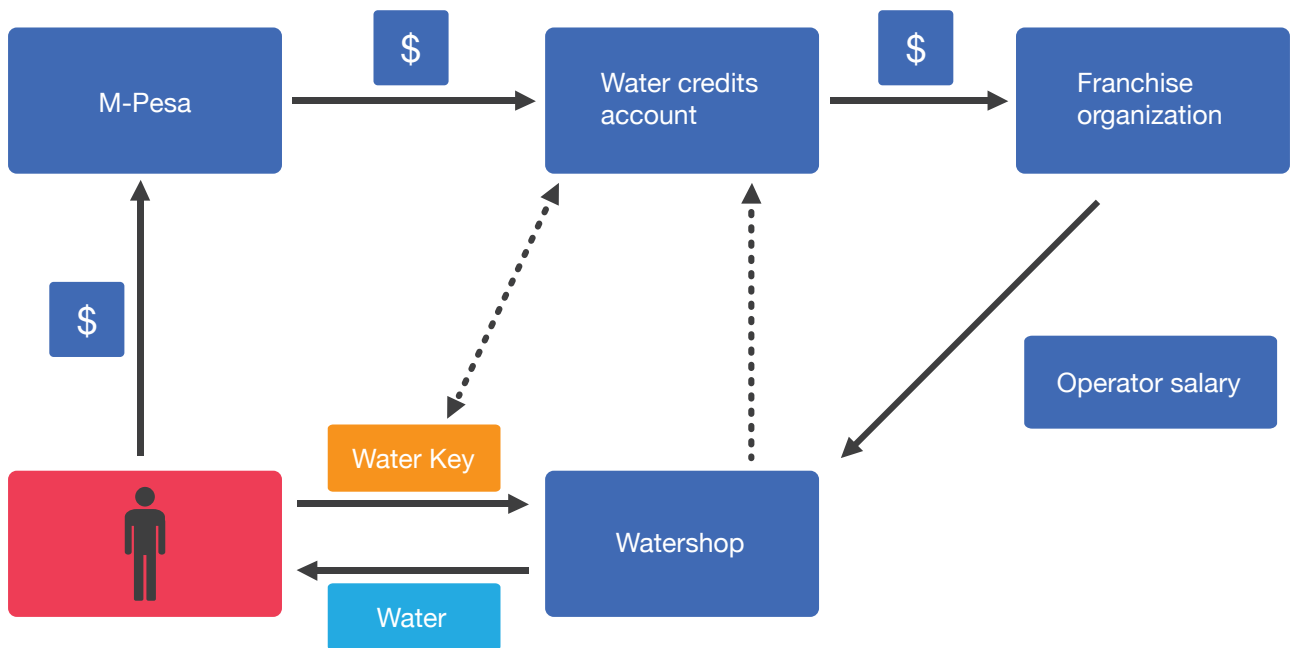
For more detailed information on each pilot project location, see the excel based location profiles in the REPIC report.

**Pilot Phase Timeline**

March 2012	August 2012	November 2012	January 2013	March 2013
Secure (min. 50% of) financing for pilot Choose local franchise organization	Confirme locations Secure full financing Order Trunz and Payment technology	Identify local operators Confirm building sites	Construct physical watershed Train operators Train local NGO's & CBO's	Begin Operations Marketing & capacity building in each location

# Appendix 1

## Payment Illustration



### Legend

Digital communication	
Money transfer	
Transfer of water	
Physically placing water key	

1. The customer transfers money via M-Pesa to his or her water credit account.
2. The Customer uses the water key to dispense water at the Watershop.
3. The water key is digitally linked to the water credits account, and automatically deducts water credits as the water is dispensed.
4. Money is transferred from the water credits account to the parent organization in accordance with the water purchased.
5. The parent organization transfers two percent of money from the water sales to the operator as salary.

## Appendix 2

### Operator Training

Training for operators will focus around three main areas, personal development, professional development and entrepreneurial skills. All three areas are targeted towards increasing revenues in the Watershop in both the short and long run. In addition this training offers a form of capacity building that enhances social impact of the Watershop.



Training in each area will be carried out in partnership with different educational partners.

**Personal development** may be done in collaboration with True North College a vocational training institute that specializes in fostering entrepreneurial attitudes and positive outlook in destitute young adults through hands on personalized workshops and educational initiatives.

**Professional development** may be done in collaboration with Tomash International for technical capabilities and requirements of the Trunz machine. Training about safe water will be done in collaboration with local parent organization and local NGOs. Explanation of the payment system and financial management will be done by the local parent organization with additional information from Grundfos Lifelink and M-Pesa where needed.

**Entrepreneurial skills** may be taught through the local parent organization with guest involvement by members of the private sector for ongoing workshops.

Training will be conducted in preparation for launching operations as well as ongoing for all three focus areas.

## Appendix 3

### Eco - lodge Model

Unlike the core Watershop, the Watershop within an eco-lodge primarily serves tourists, with local community members only composing a small customer segment. Given the potential conflict of interest from eco-lodge owners (as a result of differing customer bases), it is not advisable to support upfront costs of a Watershop through social investment.<sup>27</sup> The owner of the Watershop in this case is the eco-lodge, and this hotel must bear the full investment risk of the Watershop. The role of local parent organization in this case can be to provide consultative services on how to operate a Watershop, including distribution, maintenance and marketing. Here, the CSR benefit of serving low-income communities can be pointed out for tourist-customer differentiation.

### Idea and Vision

- Ec lodge owner runs a Trunz Watershop selling safe drinking water to nearby safari camps and lodges as well as the local population surrounding the lodge
- The eco-lodge uses reduced CO2 emissions from transport and plastic waste to distinguish itself from competition and attract more clients
- Trunz Watershop consults on implementation, including using safe local water as a client's unique selling proposition

### Service Offering

- Development and implementation support: Based on the client's particular circumstances Trunz Watershop local parent aligns the model to the individual needs (e.g., choice of location of installation for Ec lodges) and supports the implementation of the model
- Consulting and technical assistance: During operations of the shop, Trunz Watershop consults the client with management (e.g., marketing) and technical (e.g., remote metering) assistance

### Operations

- Ec lodge staff operate the Watershop and maintain the Trunz machine
- The shop is integrated into hotel facilities although only hotel clients may access it
- Surrounding lodges and local community are supplied with water through delivery method:
  - Lodges call the Watershop to place an order
  - Local community receives water on a scheduled basis
  - 4 wheel drive vehicle is used to deliver water to all locations
- Shop is equipped with 50 litre water dispensers and for one litre glass bottling and sealing for hotel clients

### Marketing

- Locally sourced and treated premium drinking water
- Reduction of plastic waste
- Solar energy and energy efficiency

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<sup>27</sup> For MPI industries in Kenya donations were used for the construction of a water treatment unit designed to have differentiated pricing. Given the higher profits available from higher cost water, they stopped producing lower cost water.

## Appendix 3

### Eco - lodge Model

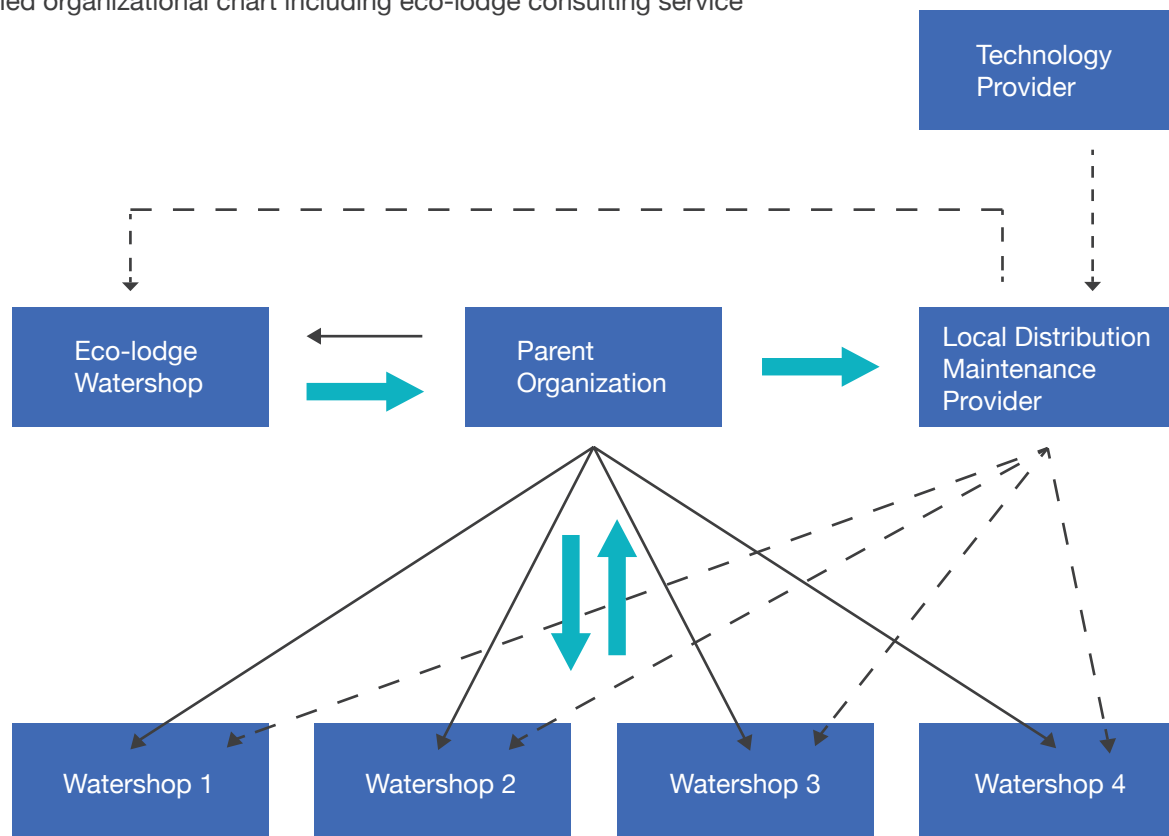
- Transportation is reduced (neither PET nor glass bottles need to be transported regularly)
- Providing clean drinking water for local community
- Creation of jobs for local people

### Revenue Model

- Sale of water to surrounding tourist lodges at a high price
- Water given to local community at very low cost
- Reduction in costs of bottled water for eco-lodge

### Financing and Governance

- Eco-lodge makes full investment for installation
- Modified organizational chart including eco-lodge consulting service



### Legend

- Technology maintenance - - - - ->
- Knowledge ———>
- Money transfer ———>

1. Money from all water sales, rental of space and advertisement goes to parent organization.
2. Parent organization provides training and marketing to shops and also transfers salary to operator.
3. Parent organization pays for service costs of each shop directly to technology provider, technology provider gives technology and service to shops.
4. Parent organization consults Eco - lodge on running a watershop, for which the Eco - lodge pays the parent organization a service

## Appendix 3

### Eco - lodge Model

fee. All revenues generated within the shop stay within the Eco - lodge and technology is provided by the technology provider directly.

#### Further Remarks

- Creates a CSR story for locally sourced premium water
- Trust must be developed in water quality, i.e. water treatment must be very transparent
- Location: In parks with high competition amongst Ecolodges; i.e. differentiation is key

#### Possible Pilot Location for Eco-lodge Model

Talek (Maasai Mara): A small town at the entrance to the Maasai Mara national park which is home to approximately 1.000 Maasai. In the vicinity of the town there are several large tourist resorts, many of which cater to eco tourists. The only way to acquire clean drinking water is by shipping it from Nairobi, nearly 6 hours away. This location would be suited for a model wherein water, free from high level of fluoride, is given at a very low cost to the Maasai community, with water being sold at an affordable rate to the tourist lodges. One reason Talek is particularly interesting is because a local entrepreneur, Adam Jillo is interested in building a Watershop within his lodge. Adam Jillo is chairman of the Kenya Association of Tour Operators and owns a tour company that well as eco-lodge in Maasai Mara. He is interested in building a Watershop within the resort to save costs, generate revenues and provide water the Maasai community.

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## Appendix 4

### Reverse Osmosis Technology Alternatives

Manufacturer	Capacity (litres/hr.)	Maximum PPM	Power requirement	Cost in CHF
General Electric	1.000	1.500	Generator	14.814
Dayliff	1.000	6.000	Generator	9.629
Dayliff	300	6.000	Solar	9.629

## Appendix 5

### Organization Profile of Ecotact Limited

**Year Founded:** 2006

**Country:** Kenya

**Focus:** Sanitation, Water, Urban Environment, Employment

**Number of Direct Beneficiaries:** 10 million (2009)

**Annual Budget:** 1,5 million USD (2009)

**Percentage Earned Revenue:** 40% (2009)

**Recognition:** Regional Social Entrepreneur of the Year, Africa, 2009<sup>28</sup>

Ecotact is a social enterprise working to provide affordable yet high quality sanitation services for low-income communities in Kenya. The toilet services are made possible through income generated by secondary revenues streams including the rental of space around the facility to small businesses.<sup>29</sup> Ecotact developed the “Ikotoilet concept” which has been attracted attention both locally and globally. Ikotoilets have been scaled up to a total of 50 facilities by 2011. Ecotact has plans underway to replicate the model also in Tanzania and Uganda.

*“Ikotoilet model is revolutionizing the sanitation industry into a dignified and decent service to the public. This is through setting up high hygienic standards, sanitation hospitality and an ambiance of convenience. Each Ikotoilet serves an average of 1.000 persons per day through provision of quality loo and shower services in urban, markets, parks and the Informal Settlements.”*<sup>30</sup>

#### David Kuria at a glance:

- Architect by profession
- CEO of Ecotact Limited, Founder of the Ikotoilet brand
- Member: Ashoka; Lemelson Technology Group; SUSSANA global network on sustainable sanitation and Rotary International
- Winner, Change Makers Competition and Hall of Fame (2008)
- Schwab Fellow 2009 and Ashoka Fellow 2007
- Interests: social transformation, change in the community<sup>31</sup>

David Kuria is currently designing the EcoMaji concept, a kiosk that sells purified water to low income communities. He expressed strong interest in a collaboration. The EcoMaji concept is not yet fully developed, and David Kuria is interested in receiving the knowledge developed through the Trunz Watershop project in order to shape an optimal concept.

Ecotact is particularly effective in community engagement and changing perception of consumers through innovative marketing campaigns. Ikotoilet changed the way in which consumers thought about toilets by using celebrities to promote toilet use.

<sup>28</sup> <http://www.schwabfound.org/sf/SocialEntrepreneurs/Profiles/index.htm?sname=222672&sorganization=0&sarea=0&ssector=0&stype=0>.

<sup>29</sup> <http://www.globalwaterchallenge.org/newscenter/news-detail.php?id=1068>.

<sup>30</sup> <http://www.ecotact.org/index.php/articles/ikotoilet.html>.

<sup>31</sup> <http://www.ecotact.org/index.php/articles/david-kuria.html>.

## Appendix 6

### Community Mobilization Coordinators and Partner NGO Recommendations

Community mobilization partners will be used to coordinate communication between the Trunz Watershop and the local community, including local community based organizations and self help groups. These contacts were chosen because they are most knowledgeable about activities within their community surrounding the issue of water and have expressed an interest in supporting the Trunz Watershop concept during meetings with the project team in Kenya.

Location	Community Mobilization Partner	Contact Information
Gongoni	Magareni District Health Officer	Joshua Omino 0701395272 & 0718864677
Lunga Lunga	Public Health Officer	Geoffrey Pjuguna 0722268 530
Nakuru	Nakuru Defluoridation Company	Nakuru Defluoridation Co. Ltd. Catholic Diocese of Nakuru P.O.Box 938-20100 Nakuru +254 724631158 www.cdnwaterquality.co.ke skype: peter.maina.mutheki
Talek	Adam Jilio	Kiveni House Kileleshwa P.O.Box 30506 Nairobi GPO 00100 Drop Zone Box No. 204 +254 2 2084918/ +254 2 8155969/ +254 2 2697453 Mobile: +254 734600625 Fax: +254 2 4347258 aj@natureexpeditions.com
Ukunda	Public Health Officer	072 7298 530

## Appendix 6

### Community Mobilization Coordinators and Partner NGO Recommendations

These locally based mobilization coordinators will work together with mobilization and capacity building partners. The following table summarizes the roles of each of the recommended partner organizations. Recommended partners were chosen on the basis of expertise in their respective fields. In addition they have all expressed some interest in supporting the Trunz Watershop concept.

Organization	Function	Contact Information
KWAHO	Active throughout Kenya has extensive experience in educating communities about safe water and sanitation. Would be great for training CBOs and Watershop clients about the importance of safe water.	Catherine Mwangi KWAHO P.O.Box 61470 Nairobi GPO 00100  Tel: 020 8042215 Fax: 020 558760 Mobile: 0725995381  carolinemramba@gmail.com
KWFT	Active throughout Kenya, the largest MFI for women. Can be contacted to finance additional revenue streams, to promote additional business rental space to entrepreneurs and for training operators on accounting practices.	KWFT Headquarters Kiambere Road Upper Hill Nairobi  Mobile1: 0729 920 920 Mobile2: 0732 633 332
Nakuru Defluoridation Company	Active in Nakuru and throughout the Rift Valley, has over 20 years experience building knowledge about the dangers of fluorosis in communities. Expressed keen interest in supporting Trunz Watershop. The company also has extensive experience in drilling boreholes and project management for water infrastructure.	Nakuru Defluoridation Co. Ltd. Catholic Diocese of Nakuru P.O.Box 938-20100 Nakuru +254 724631158 www.cdnwaterquality.co.ke skype: peter.maina.mutheki
Plan International	Active throughout Kenya, has extensive experience in community mobilization and education in the water and sanitation sector. Expressed keen interest in supporting Trunz Watershop and	Plan Kenya Dennis Pritt Road Opposite Silver Oak Kindergarten P.O.Box 25196, 00603 Nairobi Tel: 020 3870215

## Appendix 6

### Community Mobilization Coordinators and Partner NGO Recommendations

	potentially purchasing a shop for some of the communities they are active in.	
True North College	Located in Nairobi, True North College has experience in educating the destitute and fostering entrepreneurship. Would be able to support personal development training.	Martine Kappel True North College Langata Road Wilson Nairobi  0710 175 356 & 0738 445 550
WSUP	Active throughout Kenya has extensive experience in educating communities about safe water and sanitation. Would be great for training CBOs and Watershop clients about the importance of safe water.	Machera Court Suite A4 Komo Lane Kilimani P.O.Box 24642 00100 Nairobi  Tel: 053 800 9995 Mobile1: 0711 654 008 Mobile2: 0729 68 7078  kmugo@wsup.com

## Appendix 7

### Projected Profit and Loss

#### Projected Profit and Loss in Gongoni, using TWB 002 (in CHF)

	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Total Revenue Shop 2</b>	29.377	44.321	48.961	48.961	48.961
<i>Water Sales</i>	27.843	41.765	46.406	46.406	46.406
<i>Additional Operator Income</i> *	917	1.222	1.528	1.528	1.528
<i>Additional Franchise Income</i>	1.533	2.556	2.556	2.556	2.556
<b>Total Expenditures Shop 2</b>	8.153	9.892	10.596	10.596	10.596
<i>Comission Based Salary</i>	557	742	928	928	928
<i>Variable Ops</i>	2.824	4.237	4.707	4.707	4.707
<i>Jerrycan cleaning fluid</i>	40	60	67	67	67
<i>Replacement jerrycans</i>	2.784	4.177	4.641	4.641	4.641
<i>Fixed Ops</i>	4.081	4.081	4.081	4.081	4.081
<i>Spare parts</i>	644	644	644	644	644
<i>Maintenance</i>	1.504	1.504	1.504	1.504	1.504
<i>Land lease</i>	215	215	215	215	215
<i>Miscellaneous</i>	1.719	1.719	1.719	1.719	1.719
<i>Unforseen</i>	691	832	879	879	879
<b>EBITDA</b>	21.223	34.428	38.365	38.365	38.365

\* non included in Total Revenue Shop 2 - Calculation

#### Projected Profit and Loss in Lunga Lunga, using TWB 002 (in CHF)

	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Total Revenue Shop 3</b>	29.377	44.321	48.961	48.961	48.961
<i>Water Sales</i>	27.843	41.765	46.406	46.406	46.406
<i>Additional Operator Income</i> *	926	926	926	926	926
<i>Additional Franchise Income</i>	1.533	2.556	2.556	2.556	2.556
<b>Total Expenditures Shop 3</b>	8.148	9.977	10.586	10.586	10.586
<i>Comission Based Salary</i>	557	835	928	928	928
<i>Variable Ops</i>	2.819	4.229	4.699	4.699	4.699
<i>Jerrycan cleaning fluid</i>	35	52	58	58	58
<i>Replacement jerrycans</i>	2.784	4.177	4.641	4.641	4.641
<i>Fixed Ops</i>	4.081	4.081	4.081	4.081	4.081
<i>Spare parts</i>	644	644	644	644	644
<i>Maintenance</i>	1.504	1.504	1.504	1.504	1.504
<i>Land lease</i>	215	215	215	215	215
<i>Miscellaneous</i>	1.719	1.719	1.719	1.719	1.719
<i>Unforseen</i>	690	831	878	878	878
<b>EBITDA</b>	21.229	34.344	38.375	38.375	38.375

\* non included in Total Revenue Shop 3 - Calculation

## Appendix 7

### Projected Profit and Loss

Projected Profit and Loss in Narok, using Low Brackish Unit (in CHF)

	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Total Revenue Shop 4</b>	22.313	33.726	37.189	37.189	37.189
<i>Water Sales</i>	20.780	31.170	34.633	34.633	34.633
<i>Additional Operator Income*</i>	917	1.222	1.528	1.528	1.528
<i>Additional Franchise Income</i>	1.533	2.556	2.556	2.556	2.556
<b>Total Expenditures Shop 4</b>	7.220	8.585	9.040	9.040	9.040
<i>Comission Based Salary</i>	416	623	693	693	693
<i>Variable Ops</i>	2.104	3.156	3.507	3.507	3.507
<i>Jerrycan cleaning fluid</i>	26	39	43	43	43
<i>Replacement jerrycans</i>	2.078	3.117	3.463	3.463	3.463
<i>Fixed Ops</i>	4.081	4.081	4.081	4.081	4.081
<i>Spare parts</i>	644	644	644	644	644
<i>Maintenance</i>	1.504	1.504	1.504	1.504	1.504
<i>Land lease</i>	215	215	215	215	215
<i>Miscellaneous</i>	1.719	1.719	1.719	1.719	1.719
<i>Unforseen</i>	619	724	759	759	759
<b>EBITDA</b>	15.094	25.141	28.149	28.149	28.149

\* non included in Total Revenue Shop 4 - Calculation

Date	Category	Activity
02.05.2011	Meetings	Project Kick-off Meeting in Steinach, Switzerland
05.05.2011	Planning	Planning of project milestones
07.05.2011	Stakeholders	Stakeholders List is created.
26.05.2011	Field Visit Preperation	Confirmation of the rough schedule of Kenya trip
30.05.2011	Planning	Start of Project Logbook
01.06.2011	Official Start	Official Start of the project
17.06.2011	Planning	Deliverables List is completed.
20.06.2011	Reports	Existing Kiosks/Shops Concepts Report is completed.
20.06.2011	Business plan	Business Plan Must-Haves Report is completed.
21.06.2011	Stakeholders	Stakeholders Map created.
24.06.2011	Reports	Social, Economic and Political Analysis
27.06.2011	Workshops	Communication Strategy & Technology Workshop in Steinach, Switzerland
04.07.2011	Reports	Market & Water Report is completed.
06.07.2011	Reports	Trunz Technology and Water Shop Overview Report is completed.
26.06.2011	Stakeholders	Starting the contacts with stakeholders
08.07.2011	Field Visit Preperation	Outline of the Kenya Meetings Agenda
13.07.2011	Field Visit Preperation	Location achetypes are created.
13.07.2011	Field Visit Preperation	Potential locations for field visit are identified.
14.07.2011	Field Visit Preperation	Objectives of Kenya trip are confirmed.
22.07.2011	Field Visit Preperation	Draft of Travel Plan is completed.
25.07.2011	Workshops	Methodology Workshop for the field visit in Zurich
03.08.2011	Field Visit	Flight to Kenya for the field visit
03.08 / 23.09.2011	Field Visit	Field Visit in Kenya: See the Field Agenda
24.09.2011	Field Visit	The project team is back in Switzerland.
03.10.2011	Meetings	Meeting in Zurich to discuss findings from field visit
04.10.2011	Meetings	Meeting in Steinach to share findings from field visit with Lars Willi
05.10.2011	Planning	Planning of next steps for writing the business plan
14.10.2011	Business plan	Finalizing the business model for watershops
31.10.2011	Business plan	The Business Plan and REPIC Final Report is completed.

<b>DELIVERABLES</b>	<b>SELECTED QUESTIONS</b>
<b>Analysis: Water Market in Kenya</b> <b>Deadline: 24.06.2011</b>	
<i>Supply and demand in general</i>	<i>How is water distributed and consumed in Kenya?</i>
<i>Water availability - geographical water stress analysis</i>	<i>What are the regional differences in water availability? What are regional conditions for water stress? How does this fluctuate annually? What are the annual changes in water retrieval practices and how will our water retrieval installation have to be adapted accordingly?</i>
<i>Focal areas for Watershops</i>	<i>How is water distributed and consumed in potential focal areas? E.g., around Diani, in other touristic/ coastal regions, in remote areas, in peri-urban and urban areas</i>
<i>Key actors</i>	<i>Who are the key actors in water supply? E.g., state, municipalities, private firms, NGOs</i>
<i>Current costs of water</i>	<i>What do people pay for water now? (regional differences)</i>
<i>Climate change effects</i>	<i>What are the risks of floods / droughts in certain regions? Are certain regions less risk intensive?</i>
<b>Analysis: Social, Economic and Political Framework</b> <b>Deadline: 24.06.2011</b>	
<i>Relevant political actors</i>	<i>Which political actors are relevant for Watershops? What is the policy structure for water supply? E.g., local politics, village leaders</i>
<i>General political framework</i>	<i>What other major political conditions are to be considered? (E.g., elections in 2012, general political parties) How corruption effects business making? Which strategies do we need to cope with corruption problem?</i>
<i>General social framework</i>	<i>Which tribal and / or ethnic differences are there? How does this affect business-making? E.g., Tim Weiss mentioned one tribal group to be primarily business oriented ... What about knowledge about and acceptance of technology as well as water cleaning practices? Hygiene in general?.. Beyond political actors, what social actors are key figures that Kenyans listen to (ie, head of household, religious figures, elders etc.?)</i>
<i>Economic framework</i>	<i>What are the macro economic conditions to be considered? What economic factors on the household level that should be considered?</i>
<b>Analysis: Existing Kiosk/Shop Concepts</b> <b>Deadline: 17.06.2011</b>	
<i>Water Kiosks</i>	<i>Which other Watershops or Kiosks concepts exist already in Kenya?</i>
<i>Others</i>	<i>Which other shop concepts are there? E.g., IT kiosks, normal vendor shops, etc.</i>
<i>Business Models</i>	<i>Which business models are there for Shop concepts? (besides selling of goods only)</i>
<i>Chains / Networks</i>	<i>Which chains or networks of shops (e.g. franchising) are there?</i>

<b>Business Model Framework</b> <b>Deadline: 31.07.2011</b>	
Guiding framework	Which business model framework do we apply? E.g., a model that combines the reflective elements of a feasibility study with the determination of a business plan
Outline of business plan must-haves	
Business Plan Draft	
Scenario Planning	
<b>Trunz Water Systems and WaterShop Overview</b> <b>Deadline: 01.07.2011</b>	
Existing alternatives / competitors	Which other technologies exist rather than Trunz? (analysis of alternatives with pros and cons)
Strength/weaknesses of technology	Under which conditions is Trunz technology advantageous?
Implications for Watershops	Which restrictions for the business model derive from the technology?
Existing experience/ plans	Any other experiences or plans for Watershops? E.g., the business plan for the project in India
<b>Stakeholders List</b> <b>Lead meeting: 21.06.2011</b>	
Experts to contact now	Who can we contact now for any piece of information?
Experts to contact while in Kenya	Whom do we need to meet in Kenya?
Other stakeholders	Who else do we need to talk to?
Critical organizations/ individuals	Who might be critical for the development and implementation of Watershops but too critical to contact ourselves?
<b>Schedule and plan: Kenya Trip</b> <b>Deadline: 31.07.2011</b>	
Time and travel plan Deadline: 22.07.2011	When are we where? How to we get there? What is our agenda for meetings / planned calls?
Methodologies Deadline: 15.07.2011	How do we do things? E.g., personal visits, observations, interviews, video/ photos, surveys
Objectives Deadline: 07.07.2011	What are the main objectives to be achieved during Kenya visit?
Site visits Deadline: 15.07.2011	Which specific sites are we going to visit?
Price-setting methodology Workshop: 25.07.2011	Which methods do we use identifying ability/willing to pay of households?
Communication strategy Workshop: 25.07.2011	How are we going to ask questions to get correct answers? What should we consider /take care of communicating people?
REPIC Report Deadline: 25.07.2011	Update REPIC on the current situation of the project before the travel to Kenya

**Christoph Birkholz** (Project Coordination), is completing his PhD at the University of St. Gallen, Good Energies Chair for Management of Renewable Energies.

**Deniz Köse** (Business Model Developer), is studying Master of Renewable Energy Management at the University of Freiburg in Germany.

**Lars Willi** (Project Management in Switzerland, Trunz Water Systems AG), is the Area Sales Manager & Director Business Administration for Trunz Water Systems.

**Naomi Rosenthal** (Business Model Developer), is studying a Master in Business and Development Studies at Copenhagen Business School in Denmark.

**Tim Lehmann** (Research in Kenya), is completing his PhD at the University of St. Gallen at the Research Institute for Organisational Psychology.

**Tomas Planka** (Project Management in Kenya, Tomash International), is the director of Africa Centric and distributor for Trunz Water Systems in Kenya, currently based in Diani Beach, Kenya.

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Date	Interviewee	Organization	Spot scouting	Type	Place	Objectives	Comment
<b>4. Aug 11</b>							
	David Maina Managing Director	PureFlow/Maji Safi Watershops	N/A	Meeting	Nairobi	Experience from Pureflow in clean water provision in Kenya	Entrepreneur who runs several watershops in middle income and low income areas
	Patrick Onyango Technical Adviser	GIZ / Ministry of Water	N/A	Meeting	Nairobi	Overview about water sector in Kenya and GIZ supported water kiosks	We discussed the role of GIZ in shaping the decentralized water sector in Kenya starting with Water Act in 2002 and got an overview of the work of the water ministry.
	Nelson Bosuben Senior Programme Officer	Water Services Trust Fund (TSTF)	N/A	Meeting	Nairobi	Functions of the Water Services Trust Fund and funding criteria	Public funds which finances waterkiosks and other water issues
	N/A	N/A	Watershop located in a supermarket	Observation	Nairobi	Observation of a water filling station in a supermarket	Guy who was doing the refill seemed very ill; no customers during 10 minutes; nobody seemed to be in charge; empty jerry 1000 KES; filling 20l 330; 10l in PET=260 KES
<b>5. Aug 11</b>							
	Steffan Maul Director Water & Sanitation East Africa	Gauff Engineering	N/A	Meeting	Nairobi	Insight about water provision in Lamu and Gauff experience there	Providing water supply as well as waste water disposal and treatment services. consultancy, feasibility studies, design and construction supervision to management and plant operation. worked to develop water supply in Lamu island. The meeting gave very useful insights into the project from an engineering perspective.
	David Kuria CEO	Ecotact	N/A	Meeting	Nairobi	Ikotoilet business model	Social entrepreneur currently developing a watershop concept built on his proven Ikotoilet concept
	Melanie Bruns Programme Coordinator	Welthungerhilfe / German Agro Action	N/A	Meeting	Nairobi	Projects in the field of water on the ground and Political framework in the water sector	International NGO active in water provision in relief work. Experts in the field of water supply as well as local staff from the ground welcomed us and gave us insights into water supply in Kenya from an NGO perspective.
	Paul Kanyi Programme Coordinator	Eastern African Social Enterprise Association Network (EASAN)	N/A	Meeting	Nairobi	Connection to other social enterprises working in water sector.	A membership organization committed to the development of the social enterprise sector in East Africa
	Taxi drivers	N/A	N/A	Observation	Nairobi	water consumption in Nairobi	Taxi driver with nice car ca 1000 KES for water per month, 7 people household, 400 KES through piped+600 PET because running out of piped water or for drinking
<b>6. Aug 11</b>							
	Fred	Umande Trust	Kibera slum	Observation	Nairobi-Kibera	Water kiosks in Kibera	Umande Trust, an NGO active in water and sanitation in Kibera was able to show us around the slum, given that it is unsafe to travel in this area alone. They were also able to show us their facilities which include a water kiosk as well as a biodiesel sanitation system.

7. Aug 11							
	Lilian Lehmann	IPA Global Programs Coordinator for safe water	N/A	Meeting	Nairobi	Chlorine practices for water purification	Provide dispensers that put a specific amount of chlorine into cans; only work in western kenya; last mile tap-consumption knowldge
8. Aug 11							
	N/A	N/A	N/A	Team Workshop	Diani office	Business models	Team Workshop: Business Models
	N/A	N/A	N/A	Team Workshop	Diani office	Business models	Team Workshop: Business Models
	N/A	N/A	Ukunda	Observation	Ukunda	Water consumption in Ukunda	Bike tour to Ukunda visiting wells and boreholes
9. Aug 11							
	N/A	N/A	N/A	Team Workshop	Diani office	Knowledge transfer	Team workshop Knowledge transfer
	N/A	N/A	N/A	Team Workshop	Diani office	Spot criteria and scouting	Team workshopSpot criteria and scouting
10. Aug 11							
	Abdul Jaffarani	Indian business family	N/A	Meeting	Diani	Information about existing water vendors/shops and getting contacts within bottling industry in Mombasa.	Indian business man with affiliations to water bottling company in Mombasa and strong local roots in Diani; could be interested in co financing a concept, active in Rotary Club
	Luci Kurgat Senator Candidate	N/A	N/A	Meeting	Diani	Perspective from a politician with NGO background	She focused on the importance of a good distribution model and gave us recommendations in terms of locations.
	N/A	N/A	N/A	Team Workshop	Diani office	Business models	Team workshop Business Models
	N/A	N/A	N/A	Team Workshop	Diani office	Spot criteria and scouting	Team workshop Spot criteria and scouting
	N/A	N/A	N/A	Team Workshop	Diani office	Spot criteria and scouting	Team workshop Spot criteria, scouting, models
	Rawlings and Masha (Trunz employee and Tomash International employee))	N/A	N/A	Meeting	Restaurant	Understand water consumption of local Kenyans	Water consumption patterns of local people

<b>11. Aug 11</b>							
	Raymond Matiba	Private business man	N/A	Meeting	Diani	Perspective from a local business man	Raymond Matiba, a respected Kenyan entrepreneur and son of a national hero, who understands gave us an idea of the Kenyan culture and how this may pose challenges for our business.
	N/A	Dutch Water Ltd.	Private Water Company surroundings	Observation	Mombasa	See similar model with water shop concept	Visit of water purification and water provider, very interesting model
	N/A	Natures Limited Mombasa (water bottling company)	Factory visit	Observation	Mombasa	Understand how a water bottling company manufactures	Visit of water bottling process. Natures Bottling company is also the only bottling company producing bottles in their own production facility, they also distribute a large portion of these bottles to other bottling companies around Kenya.
<b>12. Aug 11</b>							
	N/A	Waterkiosk Diani	Diani	Observation	Diani	Observation of the waterkiosk	Visited a water selling point of a business man at a main cross road in Diani. We asked the operator questions about the water supply and operations and also talked to consumers buying water from the point.
	N/A	N/A	Kwale capital	Observation	Kwale	Waterkiosk operations and governance, general observations	Visited Kwale markets, water vendors, ministries and NGOs
	Anna Ndupha Public Health Kwale District Officer	Ministry of Public Health and Sanitation	N/A	Meeting	Kwale	To determine what types of initiatives for health and sanitation awareness exist and to determine water quality or options for acquiring data about water quality.	Public health representative for Kwale district
	Njoroge Kamau Health Advisor	Plan International Kwale	N/A	Meeting	Kwale	General interest in Plan International's work in Kwale	Meeting with the health manager of Plan International's district office about community development and water projects
	N/A	N/A	Marere Water Source District	Observation	Kwale-Kinongo	Observation of the source of municipal water in Kinango and Kwale	Visit of natural water source (chlorine treatment point) in the middle of the National Park which provides the district with water
	N/A	N/A	Kinongo town	Observation	Kinongo town	Getting the sense of the rhythm of the town	Visited Kinongo town, market and water vendors, Microfinance Institution
	Jacob Komen	KWFT Kinongo	N/A	Meeting	Kinongo town	Information about Kinango and KWFT activities in the location	Meeting with Microfinance organization about general situation in Kinmango
<b>15. Aug 11</b>							
	N/A	N/A	Funzi Island	Observation	Funzi Island	Water consumption in Funzi Island	Visit of several boreholes, talks to village people and well owners; visit to eco tourist lodge and discussion with owner about water situation on Island

16. Aug 11							
	N/A	N/A	Wasini Island	Observation	Wasini Island	Watershop models, customer behavior at point of sales; build connection because potential partner, etc.	Meeting with community chief about water community CBO; visit of water tanks; discussion with restaurant owner
	N/A	N/A	Shimoni	Observation	Shimoni	Watershop models, customer behavior at point of sales; build connection because potential partner, etc.	Meeting with division chief, discussion with village chairman; visit of boreholes and water sales agents
	N/A	N/A	Kidimu	Observation	Kidimu	Water consumption in Kidimu	Had a look at the well which has non brackish water for the area, people come from Lunga Lunga and Shimoni etc in order to get water here. They pay 4KES per jerry can and the waterpoint is controlled by a community water organization
17. Aug 11							
	N/A	N/A	Lunga Lunga Town	Observation	Lunga Lunga	Getting insight into the clean water access situation in Lunga Lunga	Meeting with public health officer; visit of potential entrepreneur's grocery business; visit of hospital and water tanks in the community
	N/A	N/A	Msambweni	Observation	Msambweni	Getting insight into the clean water access situation in Msambweni	Visit of hospital, discussion with District health officer
18. Aug 11							
	(1) Fatma A.Awale Chairman of the board (2) Moses K.Kinya Managing director (3) Steve Olouch Technical Manager	Mombasa Water & Sewerage Company	N/A	Meeting	Mombasa	Water supply in Mombasa: tariff, coverage areas	Meeting with MD and chairman of Mombasa Water company; then head of technical services for more technical questions
	Millicent Odhiambo Executive Officer	Mombasa and Coast Tourist Association (MCTA)	N/A	Meeting	Mombasa	Connection to hotels and eco lodges	Decided to organize workshops together in Malindi, Lamu and Mombasa to introduce the concept to hotels
	(1) David S.Serser Regional Manager (2) Abdul H.Bante Project Analysis	Kenya Investment Authority Mombasa	N/A	Meeting	Mombasa	Requirements for investing in Kenya	Once we have a clear concept, they will assist with official procedures

19. Aug 11							
	Andy Marotolo CEO	Coast Water Services Board	N/A	Meeting	Mombasa	(1) Get an understanding of how the Coast Water Board operates, (2) Learn about the legal framework they use, and who is accountable to the water board, (3) Get contacts to Water Service Providers	Meeting with the CEO of coast water services board; connected us with Imera (MPI) Water
	Officers	Water Resources Management Authority	N/A	Meeting	Mombasa	Learning the procedures for the use of water sources	Meeting with Water Resources Management Authority - responsible for use of water resources
	James N. Mureu Chairman of MSA Branch	The Kenya National Chamber of Commerce & Industry	N/A	Meeting	Mombasa	Meeting not planned	Team met the chairman who is also engaged in Imera Water. He left early and suggested to have another meeting
	Joe Kiragu Managing Director	Nyali Clean Water Limited - Imera Water (MPI)	N/A	Observation	Nyali - Mombasa	Learning from experiences of the company in water production	Meeting with the MD and the regional chairman of chamber of commerce. MD showed the team the facility
	Louise Koch Programme Manager	Grundfos Lifelink	N/A	Meeting	Diani	(1) Experiences of Grundfos Lifelink in water supply in Kenya, (2) Grundfos experience with mobile payment system	Meeting with the programme manager of Grundfos lifelink; connected us with technical manager in Nairobi - we can also visit an installation near Nairobi with him.
22. Aug 11							
	N/A	N/A	Changamwe slum	Observation	Mombasa	Observation of water access situation in the slums of Mombasa	Observation in one of the slums in Mombasa; visited several water kiosks and Camp David Centre, one of the active NGOs in the area
	N/A	N/A	Kizongo	Observation	Mombasa	Possible installation either as a waterkiosk which serves other restaurants or perhaps selling to middle income neighbouring areas.	Visited the golf course and the restaurant; looking into water consumption
23. Aug 11							
	N/A	N/A	Kilifi Town	Observation	Kilifi	Visited on the way to Malindi to get a general impression - not considered as a location	Stopped by on the road to Malindi: visited the local chief and water company; responsible persons not available. General impression is that there is no water problem within the town. No protocol

<b>24. Aug 11</b>							
	Priscillah Oluoch Deputy Technical Manager	Malindi Water Company	N/A	Meeting	Malindi	Build knowledge about the local water situation in Malindi town and district. Understand the activities undertaken by the water company to improve water situation	Meeting with the deputy technical manager of water company; connected us to water services board coordinator in Malindi.
	Thomas Makanga, Malindi Area Manager Coast Water Board	Coast Water Services Board	N/A	Meeting	Malindi	Understand the activities undertaken by the Coast Water Board in Malindi, as well as the challenges they are currently facing.	Meeting with the coordinator of coast water services board; also a local farmer was present in the meeting.
	N/A	N/A	Mumbrui	Observation	Malindi-Magerini	Observing water consumption in Mumbrui	Visited several wells where cartpushers fetch water; meeting with the area administrator
<b>25. Aug 11</b>							
	N/A	N/A	Ngomeni	Observation	Malindi-Magerini	Observing water consumption in Ngomeni.	Visited wells where people fetch / sell water
	N/A	N/A	Gongoni	Observation	Malindi-Magerini	Observing water consumption in Gongoni.	Visited water taps where water is sold; meeting with the director of the hospital: quite interested in the concept
<b>26. Aug 11</b>							
	N/A	Lamu Water Company	Lamu	Meeting	Lamu	Services of water company in Lamu	Meeting with the managing director of water company
	Lamu Representative	Water Resources Users Association	Lamu	Meeting	Lamu	Water sources and consumption in Lamu from users perspective	Meeting with the representative of water resources users association; stressed the water problems created by hotels in the area
	N/A	Shela House	Shela	Observation	Lamu	Water situation in Shela	Meeting with manager of Shela House for preparation of Hotels Workshop; also observation of water situation in Shela
<b>27. Aug 11</b>							
	N/A	Hotel Workshop	N/A	Workshop	Shela	Introducing the Watershop Model to the hotel owners/managers.	Hotel workshop with hotel owners/manager in Lamu island: water shop hotels/lodges concept is presented
<b>29. Aug 11</b>							
	N/A	Planning and group meetings in Diani	N/A	Group Meetings	Diani Office	Group preparation	Preparation of location profiles and planning of coming field visits
<b>30. Aug 11</b>							
	N/A	Planning and group meetings in Diani	N/A	Group Meetings	Diani Office	Group preparation	Contact with organizations and people in the planned locations

<b>31. Aug 11</b>							
	N/A	Planning and group meetings in Diani	N/A	Group Meetings	Diani Office	Group preparation	Contact with organizations and people in the planned locations
	Daniel Olago	University of Nairobi	N/A	Meeting	Nairobi	Water sector and policies	Historical perspective of water sector, policies; Daniel Olage offers consultancy work around water, he is in contact with several initiatives similar to Trunz WaterShop
<b>1. Sep 11</b>							
	N/A	N/A	Ukunda	Observation	Ukunda	Observing water consumption in Ukunda.	Visited a water tap and a shop where dutch water is sold. Meeting with the local chief and public health officer
	Paul Sheunda	Kenya Broadcasting Company	N/A	Meeting	Nairobi	water sector and policies	Well connected to public public relations officials; KBC is the public broadcasting company packaging the media messages of the ministries
<b>2. Sep 11</b>							
	Lawrence Mwangi	Losai Management Ltd	N/A	Meeting	Nairobi	Water sector from an executive perspective	Former CEO Nairobi Water Company, current water consultant doing consultancy for Water Service Trust Fund and Water companies i.e. Coastal Area; Has been involved in the politics of water during the Water Act 2002 as a professional hired by the world bank, set up the first water board in the country
	Caroline Mramba	KWAHO	Ukunda	Meeting	Ukunda	Further information about clean water situation in Lunga Lunga where KWAHO works actively	KWAHO is supported by UNICEF, working all around Kenya. Caro lives in Ukunda and thinks that our model can work in Ukunda. Contacts given for Kisumu
<b>3. Sep 11</b>							
	N/A	Mzima Springs Rehabilitation Project Mbololo, Ngutuni Lodge near Voi, Supermarket in Voi town	Voi	Observation	Voi	Water consumption in the lodges in Voi	Ngutuni lodge is connected to the municipal pipeline, they also use this water for drinking ( while giving bottled water to tourists) and many other lodges have their own boreholes and purification solutions.
<b>5. Sep 11</b>							
	Daniel Gowi	Shine Bean	Nairobi	Meeting	Nairobi	Water related activities of Shine Bean	Contact from Tomas: NGO from Check Republic interesred in water shop concept. They have some projects in two locations near Kisumu. Not experienced in water projects.
<b>6. Sep 11</b>							
	Rebecca Lolosoli	Umoja Womans Village	Umoja Village	Meeting	Archers Post	Possibilities to set up a water shop in Umoja Womans Village	Rebecca Lolosoli is the chairman of Umoja Womans Village; she is internationally recognized: leading women in her village fighting for their rights.
	N/A	N/A	Archers Post	Observation	Archers Post	Water access situation in the Archers Post town	Meeting with the chairman of water company and the manager. Main source of municipal water inside the national park is visited.

<b>7. Sep 11</b>							
	N/A	Grundfos Lifelink	N/A	Observation	Samburu	Observation of Grundfos Lifelink installation	Visited Grundfos Lifelink installation in a rural samburu village; observed how the system works and talked to the villagers
	N/A	Catholics Mission	Archers Post	Observation	Archers Post	Observation of water supply from the Catholics Mission	Catholics Mission has a water desalination plant where they sell some of the water produced to local community.
<b>9. Sep 11</b>							
	Mr. Macharia Owner and operator of water kiosk	Naivasha WSUP water kiosk	Naivasha	Meeting	Naivasha	Understanding the functions of the kiosk as a model from WSUP	Two types of water is provided to the consumer: treated and untreated for different prices. Not much demand for treated water because of the higher price.
<b>10. Sep 11</b>							
	N/A	N/A	Nakuru - Shabab	Observation	Nakuru - Shabab	See how water is consumed in middle class Nakuru	Water distribution is a serious problem in Shabab as people pay 20KES for a jerrican of unsafe water to be delivered to their homes.
	N/A	N/A	Nakuru Industrial Area	Observation	Nakuru Industrial Area	Understand how developed Nakuru is, the industrial area is supposed to be a booming area which shows how Nakuru might develop in coming years	
	Gabriel Oyago, Food and beverage manager Waterbuck Hotel	Waterbuck Hotel	Nakuru	Meeting	Nakuru	(1) Understand how the hotel waterbuck consumes water and what types of water treatment they use, if any. (2) Differentiate between different residential areas of Nakuru, get the names of lower, middle and high income areas	The Waterbuck uses municipal water for all purposes except drinking, this is very hard water.
<b>12. Sep 11</b>							
	James Nganga	Nakuru Water Company	Nakuru	Meeting	Nakuru	Water services provided by Nakuru Water Company	
	Peter Maina Mutheki	Nakuru Fluoridation Co.	Nakuru	Meeting	Nakuru	Understand how the technology is produced and used to remove fluoride around Nakuru and determine what gaps in service exist where a Trunz technology could be useful	

	Johnstone Mulary	WWF	Nairobi	Meeting	Nairobi	Water sources in Naivasha and WWF involvement in WSUP	Member of WSUP, supporting the organization with ensuring availability and sustainability of sources. They also facilitate water management licencing structure of government. They can support our project, advised to attend "Nature Challenge Africa"
<b>13. Sep 11</b>							
	Dr. Oracio Boniface	University of Nairobi - Kisumu campus	Kisumu	Meeting	Kisumu	Get a sense for entrepreneurship in Kisumu, and Kenya in general	Over the course of email and phone contact it became apparent that Boniface is primarily in getting some kind of business opportunity for himself
	Jessica Vernon	IPA- Kisumu	Kisumu	Meeting	Kisumu	Get a sense for the types of programs IPA is involved in and around Kisumu as well as differences in water provision around the town	
	N/A	Kisumu town	Kisumu	Observation	Kisumu	Understand how water is consumed within the centre of Kisumu	
	Job Kwanya	Kisumu Water Company	Kisumu	Meeting	Kisumu	Understand current state of Kisumu Water company	
	N/A	N/A	Middle class areas of Kisumu	Observation	Kisumu	Went to the areas suggested by the Kisumu water company and Jessica from IPA as being middle class, but underserved areas of the town	
	Anthony Ngondi	Macadamia Fans	Nairobi	Meeting	Nairobi	<i>Perspective of a local entrepreneur and connections with other local entrepreneurs</i>	He can connect us with other entrepreneurs interested in water business. We will schedule another meeting for that.
<b>15. Sep 11</b>							
	Wykliffe Kokonya Apia Plus Director	USAID	Narok	Meeting	Narok	Understand what kinds of programs USAID is implementing in Narok, determine what type of water problems the area has.	
	N/A	N/A	Narok	Observation	Narok	Understand how water is consumed in and around Narok, especially the areas suggested by USAID	

<b>16. Sep 11</b>							
	Adam Jilio	Nature Expeditions	Talek Village (Masai Mara)	meeting	Nairobi	Meeting with the MD of Nature expeditions and also owner of a lodge in Masai Mara. Discussing possibility of an Ecolodge Watershop Model	Very interested in the concept. Would like to hear prices from Tomas Planka; want advice from us concerning the concept.
<b>17. Sep 11</b>							
	N/A	N/A	Thika-Juja	Observation	Thika	Observing water consumption in Thika and Juja (small skirts in the outskirts of Nairobi)	Water supply in Thika town is better than in Nairobi. There are water vendors in slums (getting water from municipal supply). Juja is an emerging town, increasing water demand, there are 3 water companies
<b>19. Sep 11</b>							
	(1)George Masaba Technical Manager (2)Manager Kisochi Mwanyange Business Development Manager	Grundfos Lifelink	Nairobi	Meeting	Nairobi	Technical questions about grundfos; payment system and financials	Meeting with the business development manager and technical manager of Grundfos Lifelink: operational and technical questions as well as their experience with M-Pesa
<b>20. Sep 11</b>							
	M-PESA TEAM	M-PESA	Nairobi	Meeting	Nairobi	Cooperation with M-pesa within watershop concept - financial aspects	Meeting with Client Service Manager and M-Pesa product representative. Talked about several solutions to be used within watershop concept. We will follow up with Digital inclusion Manager to discuss partnership possibilities
	Lawrance Mwangi	Losai Management	Nairobi	Meeting	Nairobi	WSPs and their limitations; legal procedures for small scale provosion	Meeting with Lawrance Mwangi. He is offering consultancy services for water utilities. He has been mainly working with WSPs.
	Daniel Olego	University of Nairobi	Nairobi	Meeting	Nairobi	Experiences in water sector and with other initiatives in water provision as well as technical questions about boreholes and water quality	He is expert in geochemistry; especially groundwater.

21. Sep 11							
	David Kuria	Ecotact	Nairobi	Meeting	Nairobi	Talking more precisely about collaboration possibilities	Collaboration possibilities between Eco Maji and Trunz Watershop Project were discussed.
	Programme manager infrastructure water and energy facility: Sanne Willems	EU Delegation to Kenya	Nairobi	Meeting	Nairobi	EU Water projects in slums; projects selection procedures	EU projects and fundings for water projects in Kenya.
	Martine Kappel	True North College	Nairobi	Meeting	Nairobi	Partnership possibilities for education: training of entrepreneurs.	Meeting with Martine Kappel and her colleagues. We will discuss further for trainings of entrepreneurs
22. Sep 11							
	Felix Gichaga	Stanbic	Nairobi	Meeting	Nairobi	Information about financial possibilities	
	Anthony's friends	Local entrepreneurs	Nairobi town	Meeting	Nairobi	Local entrepreneurs' expectations for starting/running a business	Meeting with entrepreneurs: Peter Wangara has 2 water tankers in Nairobi, selling water; they usually get water from the river and it is not clean.
	Kariuki Mugo	WSUP	Nairobi	Meeting	Nairobi	Learning about WSUP experiences in Naivasha and Nairobi	Meeting with the programme manager and the project officer of WSUP: Experiences in business modeling for water supply in slums.
23. Sep 11							
	Chief Public Health Officer: Dr. Kepha Ombacho	Ministry of Public Health and Sanitation	Nairobi	Meeting	Nairobi	Role of Ministry of Public Health and Sanitation for safe water projects - water quality and water borne diseases data	KO was not there at the scheduled time; Ministry will provide us the data of water borne diseases within the country.

**Appendix G**  
REPIC Interim Report

Disclaimer: This project update contains preliminary personal perceptions and subjective opinions. It is a confidential document aimed at informing the Trunz WaterShop project partners only, i.e. Trunz Water Systems AG, University St.Gallen, Tomash International Ltd., and REPIC, respectively.

### Review of field preparation phase: June – July 2011

- Understanding political, social and economic factors which are relevant for the creation of a profitable, entrepreneurship-driven WaterShop concept
- Becoming familiar with all agents and actors involved in the water market in Kenya, including political institutions, private companies and providers from NGO sphere
- Reviewing existing water kiosk concepts in Kenya and other developing countries in order to have a clear picture of the good practices and the problems confronted within these practices
- Developing an understanding of best practices of water delivery at the BOP around the world and examining how these might be applied in Kenya
- Examining how the Trunz technology can fill this market, and developing an idea of where and how the technology could best be used as the basis for a WaterShop

### Key findings from the field preparation phase:

- While the technology is best suited for locations which do not have reliable access to the electrical grid, all locations must have a large enough market to warrant the use of a machine producing such large quantities of water: estimated size of 10-15,000 people within 7km radius.
- The technology is best suited for regions of very turbid surface water, where alternatives such as chlorine and boiling are not as effective. Additionally the comparatively high cost of ground water makes it a less attractive option. Nevertheless desalination of groundwater which is salted (i.e., brackish water) might be also a feasible option where fresh water is not available.
- Depending on the technology used the retail prices needed for a for-profit model can be as high as 16 KES per jerry can. While selling water at this price to low-income Kenyans may be unrealistic in many locations, using price differentiation with tourists or higher-income local consumers to offset this gap may be feasible.
- The motivations and incentives used in Kenyan business planning are not always the same as in Europe. These differences must be acknowledged when developing a business model that should generate reliable access to clean drinking water in the long run. Using an automated payment system will help the operator to focus on quality of the water and expanding his customer base. It will also make monitoring of the outcome much easier.
- To be successful the business model must include a clear and consistent plan for avoiding problems associated with recontamination. Currently, water from kiosks tends to have very poor quality because of poor hygiene within the kiosk and unsafe jerry can use. The operator will play a critical role in this strategy, and hence, education and training of the operator will be imperative.

### Focus during field work: August – September 2011

- In assessing the access and reliability of drinking water throughout small towns (approx. 10-15,000 people in 7 km radius) and peri-urban regions. Additionally, we investigate desalination possibilities at the islands at the coast.
- Focus on areas where price differentiation with high-income customers (e.g., tourists) is possible.
- Analyzing business models that are successful at the BOP in Kenya (e.g. M-Pesa mobile banking).
- Examining the best way to partner with existing firms and institutions so the WaterShop concept becomes embedded within established public and private spheres.

### Preliminary findings from first ten days in Kenya:

- Promising Water Kiosk concepts exist, but are extremely challenging as stand-alone businesses, e.g.
    - Ecotact's Eco Maji integrates various revenue generating activities into one shop
    - PureFlow's WaterKiosks and WaterShops are cross-subsidized by technology sales to institutions, organizations and high-income individuals
  - Two-tier WaterShop concept based on premium water for restaurants, hotels, etc. and low price water for poor population could be one approach for a 'water-only' type of shop (i.e., 'stand-alone')
  - Though awareness of clean water and/or willingness and ability to pay for bottled water has increased in the last five to ten years in Kenya, capacity building/ campaigning with e.g. NGOs is critical; the business case does not allow for significant capacity building expenses
  - Existence of minimum market size (i.e., population, in general) is more critical than current conditions with regards to water source
    - First island analysis is less promising (i.e., Funzi Island)
    - Coastal towns are still an option if sufficient people within 7km radius (e.g., Ukunda)
    - Remote villages seem difficult for their lack of population density and economic potential (e.g., Kinango)
  - Business planning in Kenya is challenging due to lack of reliable data; business making in Kenya is difficult due to exceptionally high corruption, even as compared to other (East) African countries
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Borehole on Funzi Island, Kenya Coast



Trunz Water Systems at Diani Childrens Village



Umande Trust Waterkiosk, Kibera, Nairobi



Water testing at Funzi Island borehole



Water tank in Kibera, Nairobi



Trunz Water Systems TDS tester in use in the field



Remote borehole near Kinango, Kwale District

**Contact Details of Companies & Organizations (Visited by the Watershop Team)  
with Innovative Business Models in Water and Sanitation Sector**

**Ecotact Limited**

David Kuria, CEO

Eco House, Menelik Road off Ngong Road  
P.O. BOX 24045-00100, Nairobi, Kenya  
Tel: +254 20 245 913  
Nairobi, Kenya 00100

<http://www.ecotact.org/>

**Grundfos Lifelink Kenya (East Africa)**

Kisochi Mwamyange, Business Development Manager  
George Masaba, Technical Manager  
Louise Koch, Programme Manager

Cape office Park, 4<sup>th</sup> Floor  
Kilimani King Road  
Nairobi, Kenya 00100  
Tel: +254 20 251 7650

Mail: [sochieng@grundfos.com](mailto:sochieng@grundfos.com)  
<http://www.grundfoslifelink.com/>

**Pureflow Water Solutions**

David Maina, Managing Director

2<sup>nd</sup> Floor AutoLitho Building Off Enterprise Road  
P.O. BOX 8526, Nairobi, Kenya 00100  
Tel: +254 20 2367055-6

Mail: [info@pureflow.co.ke](mailto:info@pureflow.co.ke)  
<http://www.pureflow.co.ke/>

**Water and Sanitation for Urban Poor (WSUP)**

Kariuki Mugo, Kenya Programme Manager

Machera Court, Suite A4  
Komo Lane Off Wood Avenue, Kilimani  
P.O. BOX 24642, Nairobi, Kenya 00100  
Landline (office): +254 53 800 9995  
Mobile (office): +254 711 654 008

Mail: [kmugo@wsup.com](mailto:kmugo@wsup.com)  
<http://www.wsup.com/>

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## Workshop Invitation – Trunz Water Shop: (Eco) Tourism Model

How Hotels can gain global competitive advantage, save costs and gain local acceptance through their own locally produced drinking water and water sales activities

reduce costs for drinking water  
gain competitive advantage for putting the role of water and corporate responsibility on the top of your agenda  
save money through own energy production  
provide clean water to your local communities and foster the reputation of your hotel in your local area  
protect the environment through saving transportation emissions

### Workshop concept

- Vision and operations of a water shop operated by your hotel: (1) producing top quality drinking water from any kind of water source; (2) decentralised water bottling as an alternative to bottled water purchases; (3) sell clean water to your local communities through subsidising prices for low income people
- Business planning: our business model experts will illustrate your (1) cost savings, (2) investment cycles, and (3) competitive advantage in the changing international tourist market towards responsible clients

### Targeted workshop participant

- You are a managing director or management executive of an (eco) lodge or hotel and you strive for increasing your competitive advantage, interested in reducing energy and water costs, and keen to serve your local population.

### Workshop dates

- Malindi: 24<sup>th</sup> of August, venue to be announced
  - Lamu: 26<sup>th</sup> of August, venue to be announced
  - Mombasa: 29<sup>th</sup> of August, venue to be announced
- (feel free to contact us if you wish to host the workshop in your venue)

### Who we are

- Trunz Water Systems is a Swiss based global technology provider in the field of decentralised water purification and decentralised renewable energy solutions. For more information visit our websites at <http://www.trunzwatersystems.com/>

### Our contact details

- The workshop is facilitated by a business development team from the University of St Gallen, Switzerland and our permanent Trunz staff representative in Kenya

If you have any questions or wish to discuss an individual workshop for your hotel do not hesitate to contact us:

Mr Tim Lehmann  
tim.lehmann@unisg.ch  
Mobile: +254 (0) 705440282  
Switzerland: +41 (0) 486661043

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### Dutch Water Limited (DWL):

DWL is a for profit company from Netherlands which has a water desalination facility in Mtwapa, Mombasa. The company's mission is producing the best possible quality water for an affordable price, selling as much water as possible while generating turnover for continuity, expansion and support of local projects also making DWL brand as well known as possible.<sup>1</sup> The price of water at DWL facility in Mtwapa is 50 KES (0,45 CHF) for 10 liters. Consumers pay a deposit of 100 KES for the refillable jerrycans which are replaced with filled ones each time after use, while empty ones are sterilized and filled with safe water.

Jerrycans are branded with the name of the company on white background. The company also has a distribution system where they deliver water to the neighborhood using distribution staff with branded t-shirts and trolleys as well as to small shops via vans. Branding of jerrycans with the white image symbolizing the cleanness of water creates the brand value for the company which results is the recognition of the company and adding a positive value to the sales.



Dutch Ware delivery service with branded trolleys



Dutch Water branded Jerrycans

<sup>1</sup> Dutch Water Limited Website: [http://www.dwlwater.com/index\\_en.html](http://www.dwlwater.com/index_en.html)

[Gongoni]	Indicators / Comments	Source (perceived from observation, actual data, internal, external source)
<b>(1) Demographics</b>		
a. Administrative county & district	Kilifi county, Magarini district	1999 Census
b. Administrative division	Gongoni	1999 Census
c. Size of population (town)	15198	Open data: 2009 Census
d. Size of population (7km radius)	7'786	external source: <a href="http://www.fallingrain.com/world/KE/02/Gongoni.html">http://www.fallingrain.com/world/KE/02/Gongoni.html</a>
e. Population density (location level; if not available: district level)	252	Open data: 2009 Census
f. Poverty rate (county level)	67%	Open data: KIHBS data for Constituencies in 2005/6
g. Main economic activities	Sisal plantations, salt farm, small holder farming	Observation
h. Water-borne diseases (e.g. cholera outbreak in previous 3 years)	Cholera outbreak 2 years ago, but now they do not have chlorine, so it could come back again	Conversation with health officer
<b>(2) Market</b>		
a. Current water source	Water comes from Ngomeni via trucks	Observation, conversation with local people
b. Municipal water supply (specify percentage of municipal water coverage and frequency of supply)	No municipal system, have a borehole, but it is very salty, and the pump is broken	Conversation with health officer
c. Current water access (e.g. fetching from the source)	Water for drinking comes from Ngomeni using trucks, there are boreholes in Gongoni as well, however, these are too salty	Observation, conversation with health officer
d. Current price of drinking water including seasonal variation, and variation based on different sources	Price varies between 3 and 10KES/20 litres depending on source, and is sometimes more expensive during dry times	Observation, conversation with local people
e. Current price of water for other purposes such as washing, cleaning (price for 20 liters)	Some water from boreholes can also be taken for free, however, this is not for drinking	Observation, conversation with local people
f. Pricing influencing factors (e.g. water is transported from another town)	Water is transported from Ngomeni using trucks, and the price is 1'000 KES for 10'000 liter	Observation, conversation with local people

g. TDS of current water supply (e.g. 500 PPM)	Borehole water is very salty (unknown TDS)	Observation, conversation with health officer
h. Contamination in the water (based on observation; if possible specify contaminants)	There was a large cholera outbreak in the area two years ago, now they use chlorine more regularly and it isn't a problem. Many people suffer from stomach problems, eye infections, malaria.	Observation, conversation with health officer
i. Treatment methods used in the source of water (e.g. chlorination)	Chlorine	Observation, conversation with health officer
j. Household treatment of drinking water (e.g. boiling)	Some residents use chlorine	Observation, conversation with health officer
k. Water quality perception	People know that there are some health problems associated with water	Observation, conversation with health officer
l. Market price of other expenditures (mobile charging, beverages etc. )	Mobile phone charging: 20KES	Observation, conversation with local people
<b>(3) Location Characteristics</b>		
a. Location (e.g. transport node; connecting x-y towns)	Directly on the Malindi - Lamu highway	Observation
b. Access to the location (e.g. high quality road, path etc.)	Moderately high quality highway	Observation
c. Electricity Infrastructure (e.g. grid connection available)	No grid connection, but do have some generators	Conversation with health officer
d. Existing facilities (health centre, banks etc. )	There is a health centre with 3 large buildings (1 maternity ward, 1 HIV, and 1 general)	Observation
e. Possible water source for the treatment unit	There is a borehole on site of the health centre that could be used, as well as several other boreholes that have been abandoned as a result of salinity	Observation
f. Water quality of possible source (e.g. brackish, fresh contaminated etc.)	Brackish borehole water	Observation
<b>(4) Potential Partners</b>		
a. Community mobilization	Health centre	Observation, conversation with health officer
b. Delivery system	Established cart pushing delivery system - relatively small area, so tuk tuk not imperative	Observation, conversation with local people
<b>(5) Ownership Possibilities</b>		
a. Potential local entrepreneurs, NGOs or institutions	Health centre	Observation, conversation with health officer

[Lunga Lunga]	Indicators / Comments	Source (perceived from observation, actual data, internal, external source)
<b>(1) Demographics</b>		
a. Administrative county & district	Kwale County, Msambweni District	Census 1999
b. Administrative division	Lunga Lunga Division, Lunga Lunga Location	Census 1999
c. Size of population (town)	22'114	Census 1999
d. Size of population (7km radius)	11'956	External source: <a href="http://www.fallingrain.com/world/KE/02/LungaLunga.html">http://www.fallingrain.com/world/KE/02/LungaLunga.html</a>
e. Population density (location level; if not available: district level)	50	Census 1999
f. Poverty rate (county level)	74,9% ; according to KWAHO Worker Caro, poverty level is quite high is Lunga Lunga, much higher than Ukunda	External source: <a href="http://www.opendata.co.ke">www.opendata.co.ke</a>
g. Main economic activities	Market activities where livestock and various goods are sold - many tanzanians come to Lunga Lunga for markets. Livestock production is common	<a href="http://www.aridland.go.ke/semi_profiles/kwale_profile.pdf">http://www.aridland.go.ke/semi_profiles/kwale_profile.pdf</a>
h. Water-borne diseases (e.g. cholera outbreak in previous 3 years)	Cholera is one of the most common water-borne diseases in the region.	Meeting protocol with Public Health Officer
<b>(2) Market</b>		
a. Current water source	No information (municipal piped water supply) Rainwater (individual rooftop harvesting) Groundwater (boreholes)	Observation and meeting protocols: Lunga Lunga
b. Municipal water supply (specify percentage of municipal water coverage and frequency of supply)	Piped water in the town: Water from the tap is not drinkable, and only for 2 times in a week (6-7 hours)	Observation and meeting protocols: Lunga Lunga
c. Current water access (e.g. fetching from the source)	Some houses in the town are connected to piped water. People harvest rainwater in rainy season. There is a serious problem when there is no rain. Between march and may: Long rains; btw September and December: Short rains. There is a water vendor, transporting jerrycansfilled with fresh water from Kimandu – on the way to Shimoni - 3 times a day (each time 100 jerrycans)	Observation and meeting protocols: Lunga Lunga
d. Current price of drinking water including seasonal variation, and variation based on different sources	Water which is transpoeted from Kimando is sold for 35 KES / 20 liters. Cost for harvested rainwater: No information	Observation and meeting protocols: Lunga Lunga
e. Current price of water for other purposes such as washing, cleaning (price for 20 liters)	Costs for connecting to water pipeline is around 4'000 KES ( around 300-400 KES monthly payment depending on the water consumed); also see: Current price of drining water	Observation and meeting Protocols: Lunga Lunga

f. Pricing influencing factors (e.g. water is transported from another town)	Price of water in jerrycans is quite high because of transportation costs. When there is no rain, no alternative available. Groundwater is not fresh.	Observation and meeting protocols: Lunga Lunga
g. TDS of current water supply (e.g. 500 PPM)	Measured TDS from the sample from private borehole owner is 3400 PPM	Measurement with Trunz TDS device
h. Contamination in the water (based on observation; if possible specify contaminants)	According to the public health officer, piped water is not drinkable. We could request for chemical analysis of water. Groundwater is brackish (3400 PPM: it is not suitable for drinking purposes)	Observation and meeting protocols: Lunga Lunga
i. Treatment methods used in the source of water (e.g. chlorination)	No information available	Observation and meeting protocols: Lunga Lunga
j. Household treatment of drinking water (e.g. boiling)	Some people use waterguard: they can buy from shops and sometimes public health center distributes them for free. KWAHO is also working in Lunga Lunga to educate people to use Solar Distillation.	Observation and meeting protocols: Lunga Lunga
k. Water quality perception	People are aware of the fact that groundwater is brackish.	Observation and meeting protocols: Lunga Lunga
l. Market price of other expenditures (mobile charging, beverages etc. )	Parafine (100 KES per liter) ; bottled water for 40 KES for 1 liter bottles and 20 KES for 0,5 liter bottles - not much demand for bottled water; Patients should pay 20 KES consultation fee each time they come to the health center.	Observation and meeting protocols: Lunga Lunga
<b>(3) Location Characteristics</b>		
a. Location (e.g. transport node; connecting x-y towns)	Lunga Lunga is on the border with Tanzania. Shop and the borehole from the public health officer (see: meeting protocol) is directly near the border.	Observation and meeting protocols: Lunga Lunga
b. Access to the location (e.g. high quality road, path etc.)	Paved Road	Observation and meeting protocols: Lunga Lunga
c. Electricity Infrastructure (e.g. grid connection available)	Electricity supply is not reliable, power outage is quite often.	Observation and meeting protocols: Lunga Lunga
d. Existing facilities (health centre, banks etc. )	There is a hospital (visited) and a market.	observation and meeting protocols: Lunga Lunga
e. Possible water source for the treatment unit	Groundwater	Observation and meeting protocols: Lunga Lunga
f. Water quality of possible source (e.g. brackish , fresh contaminated etc.)	Brackish	Observation and meeting protocols: Lunga Lunga
<b>(4) Potential Partners</b>		
a. Community mobilization	KWAHO	N/A
b. Delivery system	N/A	N/A
<b>(5) Ownership Possibilities</b>		
a. Potential local entrepreneurs, NGOs or institutions	Local entrepreneur (Public Health Officer) - He has infrastructure ready for a watershop	Observation and meeting protocols: Lunga Lunga

[Nakuru]	Indicators / Comments	Source (perceived from observation, actual data, internal, external source)
<b>(1) Demographics</b>		
a. Administrative county & district	Nakuru county, Nakuru district	1999 Census
b. Administrative division	Nakuru municipality	1999 Census
c. Size of population (town)	Entire Nakuru town: 394'424	2009 Census Vol 1 B Table 1 Population and Density by Constituency
d. Size of population (7km radius)	241'569	External source: <a href="http://www.fallingrain.com/world/KE/08/Nakuru.html">http://www.fallingrain.com/world/KE/08/Nakuru.html</a>
e. Population density (location level; if not available: district level)	1'041	2009 Census Vol 1 B Table 1 Population and Density by Constituency
f. Poverty rate (county level)	42%	Open data: KIHBS data for Constituencies in 2005/6
g. Main economic activities	Tourism, flower industry	Observation
h. Water-borne diseases (e.g. cholera outbreak in previous 3 years)	Dental and skeletal fluorosis	Observation, Nakuru fluoridation company
<b>(2) Market</b>		
a. Current water source	Water comes from a combination of surface and ground water sources. 30% surface water is purified at municipal plant and mixed with ground water. This combination reduces fluoride level.	Protocol: Nakuru water company
b. Municipal water supply (specify percentage of municipal water coverage and frequency of supply)	Municipal water kiosks are operated throughout the Shabab neighborhood. Some houses have piped connections, however, water service is very irregular (approximately 2/week).	Observation, conversation with local people
c. Current water access (e.g. fetching from the source)	The majority of families get water from the municipal water kiosks and cart pushers which vend the water from these kiosks. When municipality is pumping water taped water is used. Some small kiosks sell bottled water, however, most people drink tap water.	Observation, conversation with local people
d. Current price of drinking water including seasonal variation, and variation based on different sources	3KES/20 litres, or 20KES including delivery. This price does not really fluctuate based on season or between kiosks.	Observation, conversation with local people, kiosk operator
e. Current price of water for other purposes such as washing, cleaning (price for 20 liters)	Residents use the same municipal water for all purposes, including washing, eating, cooking, drinking. They occasionally buy bottled water, especially for children, but primarily rely on municipal water for all purpose.	Observation, conversation with local people
f. Pricing influencing factors (e.g. water is transported from another town)	Delivery costs 17KES.	Observation

g. TDS of current water supply (e.g. 500 PPM)	618	Observation
h. Contamination in the water (based on observation; if possible specify contaminants)	Very dirty jerrycans	Observation
i. Treatment methods used in the source of water (e.g. chlorination)	The municipality mixes river water with ground water in order to reduce Fluoride content of the water. Additionally they treat the water with chlorine.	Conversation at Nakuru Fluoridation Company
j. Household treatment of drinking water (e.g. boiling)	Most residents do not believe that treatment is necessary as the municipality treats the water already. Some may choose to buy treated water for children	Observation, conversation with local people
k. Water quality perception	People believe that the water from the municipality is clean and safe	Observation, conversation with local people
l. Market price of other expenditures (mobile charging, beverages etc. )	The very active market seems to have prices that mirror prices elsewhere in Kenya, notably, however, the market is much busier with people buying many more items than in other areas of Kenya.	Observation, conversation with local people
<b>(3) Location Characteristics</b>		
a. Location (e.g. transport node; connecting x-y towns)	Directly off of the Kisumu - Naivasha - Nairobi highway	Observation
b. Access to the location (e.g. high quality road, path etc.)	Very high quality highway leads to Nakuru and high quality roads exist throughout the neighbourhood.	Observation
c. Electricity Infrastructure (e.g. grid connection available)	Grid connection is available, although occasionally unreliable	Observation, conversation with local people
d. Existing facilities (health centre, banks etc. )	The Shabab neighbourhood has many small banks, shops, pharmacies and clinics	Observation
e. Possible water source for the treatment unit	Ground water or municipal water	Observation
f. Water quality of possible source (e.g. brackish , fresh contaminated etc.)	Groundwater or municipal water- both are contaminated with fluoride	Observation
<b>(4) Potential Partners</b>		
a. Community mobilization	CBO, Kenya Water for Health Organization (KWAHO), Nakuru Fluoridation Company	Observation
b. Delivery system	There is a highly complex pusher cart system which seems to be working quite well, therefore delivery using push carts and tuk tuk is recommended	Observation
<b>(5) Ownership Possibilities</b>		
a. Potential local entrepreneurs, NGOs or institutions	Nakuru Fluoridation Company	Observation

[Ukunda]	Indicators / Comments	Source (perceived from observation, actual data, internal, external source)
<b>(1) Demographics</b>		
a. Administrative county & district	Kwale County, Msambweni district	Actual Census Data
b. Administrative division	Diani division	Actual Census Data
c. Size of population (town)	38629	Actual Census Data
d. Size of population (7km radius)	60'971	External source: <a href="http://www.fallingrain.com/world/KE/02/Ukunda.html">http://www.fallingrain.com/world/KE/02/Ukunda.html</a>
e. Population density (location level; if not available: district level)	1'542 (location level data)	Actual Census Data
f. Poverty rate (county level)	79%	External source: <a href="http://www.opendata.co.ke">www.opendata.co.ke</a>
g. Main economic activities	Most of the people are employed in tourism sector as Ukunda is a growing tourism town.	Observation and information through meeting with the chief
h. Water-borne diseases (e.g. cholera outbreak in previous 3 years)	Cholera (12 months ago), entomeba (2 months ago), respiratory disease is the most common ailment	Conversation with public health officer
<b>(2) Market</b>		
a. Current water source	Mzima Springs (municipal piped water supply) Groundwater (boreholes and wells)	Observation and information from the chief
b. Municipal water supply (specify percentage of municipal water coverage and frequency of supply)	Municipal supply does not cover the whole town, and is not continuous.	Observation
c. Current water access (e.g. fetching from the source)	Some houses are connected to the municipal supply and others get water from wells or boreholes. If they do not have a borehole/well, they buy from private borehole owners. Some boreholes are community owned and managed. Not all the boreholes/wells are protected. Middle income residents are also observed buying Dutch Water from small shops.	Observation and information from the chief
d. Current price of drinking water including seasonal variation, and variation based on different sources	Price of water from boreholes/wells is 3-5 KES / 20 liters. Including delivery, price goes up to 15 KES / 20 liters.	Observation and information from borehole owners and shop
e. Current price of water for other purposes such as washing, cleaning (price for 20 liters)	There is no differentiation between drinking water and water for other purposes for low income consumers: borehole/well water is used also for other purposes and the price remains the same (see. d) Dutch Water is sold in the shops for 100 KES / 10 liters	Observation and information from borehole owners and shop

f. Pricing influencing factors (e.g. water is transported from another town)	There are several boreholes and wells in the town which reduces the price of water	Observation
g. TDS of current water supply (e.g. 500 PPM)	Measured TDS of water from a private borehole owner is 483 PPM	Measurement with Trunz TDS device
h. Contamination in the water (based on observation; if possible specify contaminants)	Water analysis from the municipal tap and boreholes/wells is not available. Contamination is possible through unprotected boreholes/wells and through dirty jerrycans	Observation
i. Treatment methods used in the source of water (e.g. chlorination)	Chlorine is put in most of the boreholes/wells	Information from borehole/well owners
j. Household treatment of drinking water (e.g. boiling)	Some people use waterguard for drinking water but most of the people do not treat water at all.	Information from consumers
k. Water quality perception	People perceive the water from municipal tap as treated and the water from the boreholes/wells are considered clean	Observation
l. Market price of other expenditures (mobile charging, beverages etc. )	There are mobile charging stations where the price is 20 KES per charge. Beverages such as Coca Cola and Fanta is 25 KES.	Shop owners
<b>(3) Location Characteristics</b>		
a. Location (e.g. transport node; connecting x-y towns)	Ukunda is situated on the highway between Msambweni and Mombasa	Observation
b. Access to the location (e.g. high quality road, path etc.)	Paved road	Observation
c. Electricity Infrastructure (e.g. grid connection available)	Grid connection is available but unreliable	Observation and information from the chief
d. Existing facilities (health centre, banks etc. )	There is an airport in Ukunda. There are also several banks. There is a dispensary and private clinics; Closest hospital is in Tiwi and the big district hospital is in Msambweni town	Observation
e. Possible water source for the treatment unit	Groundwater	Observation
f. Water quality of possible source (e.g. brackish , fresh contaminated etc.)	Fresh/Brackish	Observation
<b>(4) Potential Partners</b>		
a. Community mobilization	Community Based Organizations (CBOs), Kenya Water for Health Organization (KWAHO)	N/A
b. Delivery system	Established cart pushing delivery system - relatively large area, so tuk tuk may be useful	Observation
<b>(5) Ownership Possibilities</b>		
a. Potential local entrepreneurs, NGOs or institutions	Abdul Jaffarani: Indian Businessman running a jewellery shop in Diani	N/A

[Talek]	Indicators / Comments	Source (perceived from observation, actual data, internal, external source)
<b>(1) Demographics</b>		
b. Administrative division	Narok division	1999 Census
c. Size of population (town)	Approximately 1'000 in Talek village, 5 lodges with 30 beds each	Meeting protocol: Adam Jilio
d. Size of population (7km radius)	Approximately 1'000 in Talek village, 5 lodges with 30 beds each	Meeting protocol: Adam Jilio
e. Population density (location level; if not available: district level)	Narok south: 30.53	2009 Census Vol 1 B Table 1 Population and Density by Constituency
f. Poverty rate (county level)	27%	1999 Census
g. Main economic activities	Tourism, cattle herding	Meeting protocol: Adam Jilio
h. Water-borne diseases (e.g. cholera outbreak in previous 3 years)	Fluorosis	Meeting protocol: Adam Jilio
<b>(2) Market</b>		
a. Current water source	Surface water, borehole water, tourists in the lodge drink bottled water	Meeting protocol: Adam Jilio
b. Municipal water supply (specify percentage of municipal water coverage and frequency of supply)	none	Meeting protocol: Adam Jilio
c. Current water access (e.g. fetching from the source)	Surface water for the animals, borehole water for people, bottled water for tourists	Meeting protocol: Adam Jilio
d. Current price of drinking water including seasonal variation, and variation based on different sources	Local people do not pay for water, tourists pay 65KES/litre	Meeting protocol: Adam Jilio
e. Current price of water for other purposes such as washing, cleaning (price for 20 liters)	Surface and borehole water is free of charge, the lodge pays for diesel to power the pump	Meeting protocol: Adam Jilio
f. Pricing influencing factors (e.g. water is transported from another town)	The cost of water for tourists is particularly high as a result of transportation from Nairobi	Meeting protocol: Adam Jilio
g. TDS of current water supply (e.g. 500 PPM)	1'394	Water analysis documents from Adam Jilio

h. Contamination in the water (based on observation; if possible specify contaminants)	Fluoride, sulphates	Water analysis documents from Adam Jilio
i. Treatment methods used in the source of water (e.g. chlorination)	None, the local people do not treat the water, the lodges use treated water exclusively	Meeting protocol: Adam Jilio
j. Household treatment of drinking water (e.g. boiling)	None, the local people do not treat the water, the lodges use treated water exclusively	Meeting protocol: Adam Jilio
k. Water quality perception	Masaai people believe that they can drink any kind of water, and that the water is good quality, tourists will only drink sealed water	Meeting protocol: Adam Jilio
l. Market price of other expenditures (mobile charging, beverages etc. )	Generally speaking products that are sold to tourists are fairly expensive, however, local prices remain very low	Meeting protocol: Adam Jilio
<b>(3) Location Characteristics</b>		
a. Location (e.g. transport node; connecting x-y towns)	Village is at the entrance to the Masaai Mara game reserve	Meeting protocol: Adam Jilio
b. Access to the location (e.g. high quality road, path etc.)	Dirt road access only	Meeting protocol: Adam Jilio
c. Electricity Infrastructure (e.g. grid connection available)	No electricity grid connection and the village has no or limited electricity, the lodges use generators and solar panels	Meeting protocol: Adam Jilio
d. Existing facilities (health centre, banks etc. )		N/A
e. Possible water source for the treatment unit	Borehole water from the lodge owned by Adam Jilio	Observation
f. Water quality of possible source (e.g. brackish , fresh contaminated etc.)	Brackish with sulphate and fluoride contamination	Observation
<b>(4) Potential Partners</b>		
a. Community mobilization	N/A	N/A
b. Delivery system	Treated water delivered from the borehole to several lodges as well as watershop in Talek town through car transport	Meeting protocol: Adam Jilio
<b>(5) Ownership Possibilities</b>		
a. Potential local entrepreneurs, NGOs or institutions	Adam Jilio	Meeting protocol: Adam Jilio

### Center for Aviation Competence ausgezeichnet

Der Pro-Aero-Anerkennungspreis 2011 für besondere Leistungen in der Luftfahrt geht an das Center for Aviation Competence (CFAC-HSG) der Universität St.Gallen. Das Kompetenzzentrum für die Schweizer Luftfahrt feierte am 5. Oktober seinen fünften Geburtstag.

«CFAC ist nicht mehr wegzudenken» -In den letzten fünf Jahren hat sich das CFAC-HSG aus dem Nichts zu einem unabhängigen und erfolgreichen Kompetenzzentrum für die Schweizer Luftfahrt entwickelt, das heute nicht mehr wegzudenken ist, begründete Stiftungsratspräsident Hans Rudolf Fehrlin die Wahl. Das CFAC sei zu einem bedeutungsvollen Instrument der Schweizer Luftfahrt geworden. Dies durch Forschung und Dienstleistungen, durch Seminare und Konferenzen auf wissenschaftlicher Basis sowie durch zahlreiche Publikationen und seinem Angebot an Aus- und Weiterbildung. Hans Rudolf Fehrlin überreichte die Anerkennungs-Medaille an den Präsidenten des CFAC-HSG, Prof. Dr. Roland Müller, und an den Geschäftsführer, Dr. Andreas Wittmer.

**Patrouille Suisse, Suter, Nicollier, Rega**  
Die 1935 gegründete Stiftung Pro Aero zeichnet seit 1985 Personen oder Institutionen der Schweizer Aviatik für besondere Leistungen aus. Zu den früheren Preisträgern zählen die Patrouille Suisse, Moritz Suter, Claude Nicollier und die Rega. Das CFAC hat während der vergangenen fünf Jahre über 100 Publikationen im Bereich Luftfahrt für Studierende und Praktiker verfasst. An der HSG bietet das Kompetenzzentrum auf der Master-Stufe eine Vorlesungsreihe in Luftfahrt-Management an. (red.)

www.cfac.unisg.ch

### LEUTE

Prof. Dr. **Renato Martinoni**, Ordinarius für italienische Sprache und Literatur der Universität St.Gallen, hat anlässlich der Feier der italienischen Republik Anfang Juni 2011 in Rom den Verdienstorden «Cavaliere dell'Ordine al Merito della Repubblica Italiana» erhalten. Der Orden, der vom Präsidenten der italienischen Republik verliehen wird, ist zur Belohnung für Verdienste auf dem Gebiet der Wissenschaft, der Literatur, der Künste und der Wirtschaft bestimmt.

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# Sauberes Wasser für Kenia

HSG-Forscherteam entwickelt Geschäftsmodell für solarbetriebene Wasser kiosks in Kenia

*Sauberes Trinkwasser ist in Kenias Dörfern eine Rarität. Ein Forscherteam der HSG entwickelt einen Businessplan für lokale Betreiber von Wasser kiosks, die ein St.Galler KMU initiierte.*

Ein warmer Herbsttag auf dem HSG-Campus. Christoph Birkholz genießt ein Glas frisch gezapftes Leitungswasser. Eine Selbstverständlichkeit in der Schweiz, Luxus in Kenia, woher der St.Galler Doktorand gerade kommt. An vielen Orten in Kenia fehlt der Zugang zu sauberem Trinkwasser. Rund 88 Prozent der Menschen müssen oftmals weite Strecken zur nächsten Wasserstelle zurücklegen oder verschmutztes Wasser trinken. Besonders Kinder leiden unter Krankheiten, die durch dreckiges Wasser ausgelöst werden. Auf die Idee, Wasser mit solarbetriebenen Anlagen zu säubern, kam das 2007 gegründete St.Galler Unternehmen Trunz Water Systems AG. Die mit Solarstrom betriebene mobile Wasseraufbereitungsanlage füllt eine Marktlücke.

### Wasser kiosks für die Landbevölkerung

In Kenia stellte die Firma mit ihrem Vertriebspartner Tomash International Ltd. dem Kinderdorf Diani eine Anlage zur Wasseraufbereitung zur Verfügung. Um der lokalen Bevölkerung den Zugang zu ermöglichen, entstand ein kleiner Kiosk. Die Einheimischen können das Trinkwasser zu einem Preis von zwei kenianischen Schillingen pro Liter kaufen. Dies entspricht rund 1,7 Rappen pro Liter und ist um ein vielfaches günstiger als das Trinkwasser, welches im Laden in einem 20-Liter-Tank gekauft werden kann. Die Wasser kiosks sollen künftig über lokale



Bild: Photocase/Svea Anais Perrine

Sauberes Trinkwasser dank Solarstrom soll auch in Kenia -business as usual- werden.

Partner an Familien vor Ort vermietet werden. Ihre Ausgaben können sie mit dem Wasserverkauf decken. Bei der Entwicklung des Businessplans für ein Geschäftsmodell, das

die lokale Bevölkerung als Unternehmer einbindet, setzt das KMU auf die Expertise des Instituts für Wirtschaft und Ökologie der Universität St.Gallen. Im August und September 2011 reis-

ten Christoph Birkholz, Deniz Köse, Naomi Rosenthal und oikos-Stipendiat Tim Lehmann im Auftrag des IWÖ-HSG nach Ostafrika. Während der Feldforschungsphase untersuchte das Team Süßwasserbedarf und Quellen in abgelegenen Regionen Kenias. Daneben knüpften die Nachwuchsforschenden Kontakt mit möglichen Geschäftspartnern. Dafür verbrachte Birkholz viele Stunden im Stau von Nairobi. «Spannend, ein Netz aufzubauen, das die Dienste von Nichtregierungsorganisationen und Privatwirtschaft verbindet», erzählt er. In seiner Dissertation beschäftigt sich der Bochumer mit der Elektrifizierung ländlicher Gebiete in Schwellen- und Entwicklungsländern. Die Feldarbeit in Kenia war eher ein willkommenes Nebenprodukt.

### Unternehmertum sinnvoll einsetzen

Seit seinem Studium an der Universität Witten-Herdecke beschäftigt Birkholz die Frage, wie man Unternehmertum sinnvoll und nachhaltig einsetzen kann. Für seine Ideen erhielt er 2010 den «Wings of excellence Award» des St.Gallen Symposiums. Im September 2009 gründete er mit drei Studienkollegen den «Hub Zurich». Mit 26 Filialen sind sie Teil eines weltweiten Netzes für «social entrepreneurs» aufgebaut. In den Zürcher Viaduktbögen vermieten sie Arbeitsplätze an Start-ups und erleichtern so anderen Unternehmern den Einstieg in die Selbstständigkeit. Das Netzwerk und die Kontakte von Trunz helfen Birkholz auch bei der Feldarbeit in Kenia: Ein social entrepreneur aus Nairobi hat bereits Interesse an der Zusammenarbeit mit HSG und Trunz bekundet.

Anndkatrin Heidenreich

www.iwoe.unisg.ch / [www.hubzurich.org](http://www.hubzurich.org)  
[www.trunzwatersystems.com](http://www.trunzwatersystems.com)

## Neues aus der Forschung

### Ausschreibungen

Der SNF hat eine vierte Serie von Nationalen Forschungsschwerpunkten (NFS) ohne thematische Vorgaben ausgeschrieben. Die Finanzmittel reichen für fünf bis sechs neue NFS. Eingabefrist für die Skizzen ist der 16. Januar 2012. Der Forschungsbeginn ist für Anfang 2014 geplant. Weitere Informationen unter [www.snf.ch](http://www.snf.ch).

### Projektförderung

Fördernde Institution: SNF; Projekt: Identifying causal mechanisms in empirical economics; Projektleiter: Prof. Dr. Michael Lechner (SEW); Laufzeit: 01.11.2011-30.04.2014; Förderbetrag: 205'541 Franken.

Fördernde Institution: SNF; Projekt: Evaluation of Impacts and Challenges arising from Current Regulatory and Reporting Reforms; Projektleiter: Prof. Dr. Hato Schmeiser (LVW); Laufzeit: 01.11.2011-30.04.2013; Förderbetrag: 79'326 Franken.

Fördernde Institution: SNF-Sinergia; Projekt: Grundlagen guten Justizmanagements in der Schweiz; Hauptgesuchsteller: Prof. Andreas Lienhard (Universität Bern), Mitgesuchsteller HSG: Prof. Dr. Kuno Schedler (IMP),

Dr. Revital Ludewig (IRP), Prof. Dr. Benjamin Schindler (FR); Laufzeit: 01.08.2011-31.07.2014; Förderbetrag an HSG: 600'000 Franken.

Fördernde Institution: KTI; Projekt: Strategic Coordination of Production Excellenceglobal (SCOPEglobal); Projektleiter: Prof. Dr. Thomas Friedli (ITEM); Laufzeit: 01.10.2011-31.03.2013; Förderbetrag: 481'494 Franken (davon 20% an die Universität Zürich).

Fördernde Institution: KTI; Projekt: Swiss Start-up Monitor; Projektleiter: Prof. Dr. Dietmar Gröschnik und Prof. Dr. Elgar Fleisch (ITEM); Laufzeit: 01.07.2011-31.06.2012; Förderbetrag: 200'000 Franken (kofinanziert durch Gebert Rüf-Stiftung und AVINA-Stiftung mit insgesamt 200'000 Franken).

Fördernde Institution: KTI; Projekt: Optimization of the Online Idea-Generation Process for Innovations; Projektleiter: Prof. Dr. Reto Hofstetter (FCI); Laufzeit: 2011-2013; Förderbetrag: 198'391 Franken.

Fördernde Institution: CRUS (Sciex); Projekt: CPF - Commodity Price Factors; Projektleiter: Prof. PhD Paul Söderling (s/bf); Stipendiat: Péter Erdos (Ungarn); Laufzeit: 01.09.2011-

29.02.2013; Förderbetrag: 92'900 Franken.

### Nachwuchs

Sylviane Chassot (IWÖ) hat bei der «Elsevier/IAREP/SABE Best Student Paper Competition 2011» (International Association for Research in Economic Psychology/Society for the Advancement of Behavioral Economics) in Exeter (UK) für das gemeinsam mit Nina Hampl und Prof. Dr. Rolf Wüstenhagen verfasste Paper «Policy Aversion Bias and the Financing of Clean Energy Innovation» den zweiten Preis gewonnen.

### Publikationen

FCI  
Heidbrink, M./Jenewein, W.: High-Performance-Organisationen - Wie Unternehmen eine Hochleistungskultur etablieren, Stuttgart 2011.

FGN  
Keuschnigg, C.: The Design of Capital Income Taxation: Reflections on the Mirrlees Review, in: Fiscal Studies, Vol. 32(3), 2011, 437-452.

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Zemp, A.: Risk comparison of different bonus distribution approaches in participating life insurance, in: Insurance: Mathematics and Economics, Vol. 49(2), 2011, 249-264.

MCM  
Meckel, M.: NEXT - Erinnerungen an eine Zukunft ohne uns, Reinbek bei Hamburg 2011.

s/bf  
Christiansen, C./Rinaldo, A./Söderling, P.: The Time-Varying Systematic Risk of Carry Trade Strategies, in: Journal of Financial and Quantitative Analysis, Vol. 46(4), 2011, 1107-1125.

Söderling, P.: Inflation Risk Premia and Survey Evidence on Macroeconomic Uncertainty, in: International Journal of Central Banking, Vol. 7(2), 2011, 113-133.

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Kirchgässner, G.: Kaderschmieden der Wirtschaft und/oder Universitäten? Der Auftrag der Wirtschaftsuniversitäten und -fakultäten im 21. Jahrhundert, in: Perspektiven der Wirtschaftspolitik, Vol. 12(3), 2011, 317-337.

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# Saubereres Trinkwasser für entlegene Regionen

*Naheliegend, und doch innovativ: Die Steinacher Trunz Water Systems besetzt mit solarbetriebenen Wasseraufbereitungsanlagen eine Marktlücke.*

PETER BRÜHWILER

**STEINACH.** Hersteller von Wasseraufbereitungsanlagen gibt es viele, Produzenten von Solarzellen ebenfalls. Aber kombiniert man die beiden Elemente, dann findet man sich in einer Marktlücke wieder – und gleichzeitig auf der ganzen Welt. So jedenfalls erging es der 2007 gegründeten Trunz Water Systems AG. Bis heute hat sie rund 550 Anlagen in über 30 verschiedenen Ländern installiert, vorwiegend in abgelegenen Gebieten. Weil die mit Solar- oder Windenergie betriebenen Wasseraufbereitungsanlagen von keiner Infrastruktur abhängen, ist ihr Wettbewerbsvorteil dort am grössten.

Der erste Auftrag an das 12köpfige Team aus Steinach ging auf das Wahlversprechen des venezolanischen Präsidenten Hugo Chávez zurück, sauberes Trinkwasser in abgelegene Dörfer zu bringen. Das Verkaufskonzept war damals und ist bis heute dasselbe geblieben: Die Anlagen werden an hier während einer Woche geschulte Partner in den jeweiligen Ländern verkauft, die diese dann über ihre Kontakte an die Regierungen weiterverkaufen.

## 180 000 Dörfer in Indien

Das Marktpotenzial ist laut dem Vertriebsleiter für östliche Märkte, Lars Willi, «gigantisch». Alleine in Indien hätten 180 000 Dörfer keinen Zugang zu sauberem Wasser, habe ihm der indische Entwicklungsminister kürzlich gesagt. Gemäss einer WHO-Schätzung trinken täglich eine Milliarde Menschen mit Krankheitserregern verunreinigtes Wasser, und in den ärmsten Ländern der Erde sterben jeden Tag rund 5000 Kinder unter fünf Jahren an Durchfallerkrankungen. Beispiel Nigeria: Nachdem sich die Regierung zum Ziel gesetzt hatte, bis 2018 allen Landsleuten Zugang zu sauberem Wasser zu verschaffen, wurden die Steinacher ins Boot geholt. Ein Vertrag für die Lieferung von jährlich 370 Anlagen war bereits unterzeichnet. «Aber dann wurde eine neue Regierung gewählt», sagt Willi, und danach herrschte während mehrerer Monate mehr oder weniger Funkstille. Das Beispiel ist exemplarisch für mögliche Probleme mit Regierungsgeschäften.

## Konzept mit drei Gewinnern

Die Steinacher suchten deshalb nach neuen Vertriebswegen und stiessen auf ein «Triple-Win»-Szenario. Die Vision sei, Investoren zu finden, die einem lokalen Partner 50 bis 100 Anlagen finanzierten. Der Partner würde die

Systeme dann an lokale Familien vermieten, welche ihre Ausgaben wiederum durch den Verkauf des Wassers – «für etwa einen Rappen pro Liter» – decken könnten. Die Säuberung eines Liters kostet, je nach Anlage, mit Amortisierung und Unterhalt zwischen 0,2 und 0,6 Rappen. Derzeit weilt eine Delegation mit HSG-Studenten in Kenia, um einen Businessplan auszuarbeiten.

Für eine erhöhte Nachfrage wäre die Trunz Water Systems gerüstet. In Steinach liegt die Kapazität bei monatlich 50 Anlagen, sie könnte aber innert Kürze auf 70 heraufgefahren werden. Zusätzlich eröffnet diesen Herbst in Brasilien der erste Ableger des Unternehmens und weitere Niederlassungen sind, je nach Geschäftsentwicklung, in Afrika oder Asien vorgesehen. Der Hauptsitz mit Forschung und Entwicklung inklusive Produktion werde aber am Bodensee bleiben, so Lars Willi.

Die Marktlücke, in die die Trunz Water Systems 2007 vorsties, besteht auch heute noch. «Wir sind in den Märkten bis jetzt erst auf eine Firma aus Kalifornien gestossen», sagt Willi. Allerdings wäre er gar nicht so unglücklich über etwas mehr Konkurrenz. Diese könnte dann helfen, das System bei den Entscheidungsträgern der UNO und der Weltbank bekanntzumachen, «denn dort weiss man davon noch nichts».

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**TWB 002:** Der Trunz-Best-Seller zur Süßwasseraufbereitung.

## Bis zu 100 000 Liter

Die Anlagen der Trunz Water Systems können je nach Grösse täglich zwischen 3000 und 100 000 Liter Wasser filtern. Vor der Lieferung wird am jeweiligen Ort eine Wasseranalyse gemacht, um die Anlage auf die lokalen Gegebenheiten ausrichten zu können. Gefiltert wird in drei Stufen, unter anderem mit Ultrafiltration oder Umkehrosmose. Zu den gefährlichen Substanzen, die in

den Filtern hängenbleiben, gehören Mangan, Arsen und Fluorid, aber auch sämtliche Viren und Bakterien.

Die Trunz Water Systems liefert auch Lösungen mit eingebauten Entsalzungsanlagen, etwa nach Dubai. Ein weiteres Geschäftsfeld der Steinacher ist die Energieversorgung, so ist sie zum Beispiel an der Planung einer Photovoltaikanlage auf den Malediven beteiligt. (per)



**In unwegsamem Gelände:** Trunz-Lieferung in Venezuela.

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<b>Potential Scaling up Calculations</b>	
Total population of Kenya	40.000.000
Urban Population (22% of total population)*	8.800.000
Unimproved drinking water source (17% of the urban population)**	1.496.000
Rough estimate of the potential effects of governmental services and/or competitors (20%)	299.200
Approximate number of potential watershops (4000 people served with each shop)	300

\*Average annual growth rate of urban population is not considered within these calculations

\*\* (1) Definition of unimproved source of drinking water:

[http://www.who.int/water\\_sanitation\\_health/monitoring/oms\\_brochure\\_core\\_questionsfinal24608.pdf](http://www.who.int/water_sanitation_health/monitoring/oms_brochure_core_questionsfinal24608.pdf)

(2) The data for the percentage of the number of people with unimproved source of drinking water:

<https://www.cia.gov/library/publications/the-world-factbook/geos/ke.html>

<b>CO2 Calculations for the first scaling phase (100 Watershops)</b>	
<b>Baseline Scenario: Boiling water using charcoals</b>	
CO2 equivalent per liter of water boiled (g/ltr)*	100
Amount of water purified daily with one Trunz unit (ltr)	8.000
Amount of water purified with one Trunz unit (ltr)	2.920.000
Amount of CO2 saved yearly (ton)	292
Approximate amount of CO2 saved with 300 watershops (ton)	87.600
<b>CO2 Calculations for the potential scaling in the longer term (300 Watershops)</b>	
CO2 equivalent per liter of water boiled (g/ltr)*	300
Amount of water purified daily with one Trunz unit (ltr)	8.000
Amount of water purified with one Trunz unit (ltr)	2.920.000
Amount of CO2 saved yearly (ton)	876
Approximate amount of CO2 saved with 300 watershops (ton)	262.800

\*Source: [http://www.scscertified.com/lcs/docs/Global\\_warming\\_full\\_9-6-07.pdf](http://www.scscertified.com/lcs/docs/Global_warming_full_9-6-07.pdf)



Introduction of the Trunz Solar Panels in Trunz Facility, Switzerland



Introduction of the Trunz Water Purification Units



Kick-off meeting in Trunz Facility, Switzerland



Water testing with TDS meter in Archers Post



People are fetching water from an unprotected well in Mumbui



Conversation with local people in Shimoni



Conversation with a private borehole owner in Funzi Island



One of the unprotected wells in Funzi Island



Local leader explains the mobile payment to our team in Samburu



Group photo with villagers in Samburu



Villagers show how Grundfos Lifelink System functions in Samburu



Sample water from the water kiosk in Samburu



Water point in Kisumu



Water kiosk on the Mombasa - Kilifi Road



Presentation of the business model and the project methodology to Swiss start-up entrepreneurs at the Hub Zürich