Case Study Series

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PROVIDING ACCESS TO WATER IN REMOTE AREAS: TRUNZ WATER SYSTEMS IN INDIA

TEACHING NOTE

Case Synopsis

After the initial success in different countries, TWS Chief Operating Officer (COO), Lars Willi, along with the entire top management team of TWS was thinking about innovative business models that would break the existing market entry barriers for TWS thereby helping to channel the solutions of TWS to reach several other untapped markets in future – especially India was still a white spot on the map. Although Lars and his team were proud about his company's present position in the global market, he felt there is still a long way for TWS's solutions to reach and be recognized in an important emerging market like India. He knew that if he had to enter India successfully with more than a few single business cases, it would be essential to come up with innovative business models.

Target Audience

The target audiences for the case are BSc and MSc as well as MBA students and management trainees who are interested in learning how a small company with a premium product can enter the base-of-the-pyramid market in an emerging economy. Students need to have some basic understanding of the base-of-the-pyramid concept, the sustainable livelihood approach, the challenges of doing business in emerging markets and especially in rural areas (e.g. diversity of business infrastructure, cultural differences, educational voids etc.) as well as access-based business models.

Learning Objectives

The case provides information and data for students to develop innovative and affordable business models that would break the existing market entry barriers for TWS thereby helping to channel the innovative products of TWS to reach untapped markets such as India in future. The case study allows management students to understand the importance of access-based business models as well as the concept of business ecosystems to implement such solutions from a SME perspective at the Base-of-the-Pyramid in an emerging market like India.

Teaching Plan and Case Analysis

The faculty might first introduce/repeat the key concepts including "sustainable livelihood" approach, the "Base-of-the-Pyramid" concept as well as the logic of access-based business models (e.g. car-sharing based on the Service-Dominant Logic) and the purpose of business ecosystems. This can happen prior to the case study session.

In a second step, the faculty might discuss the actual case with the class depending on the way the class is used to prepare/discuss a case study. The faculty might highlight the following characteristics:

- Premium product at high initial investment costs
- Long-term perspective allows to create cost-efficient solutions / offerings with low OPEX (operational expenditure)
- Users mostly not able to finance the required investment costs upfront and directly
- Users often prefer to have access to solution only but not actually own it
- Requirement to develop a business model approach that allows for access-based solutions (e.g. Water shop concept)
- Idea of business ecosystems to allow also SMEs to implement such an approach in foreign markets with their limited resources

Four assignment questions listed below can help in having a defined flow of presentations by different groups of students or discussions in the plenum. Each question can be presented (10 min) and discussed (15 min) thereby allowing the class to complete the case analysis and discussion in approximately 90-120 min.

Assignment questions 1: What market does TWS in India target? What are the key challenges for TWS to enter the Indian market? *(In our experience, this part of the analysis might only take 15-20 min in total)*

Assignment questions 2: How would you structure a water shop concept for TWS in India? Who are the necessary stakeholders and how are they related in the business model? Explain also the benefits and payoffs for motivating and involving the individual stakeholders? How will a business case look like when implemented (you can consider one of the applications listed for TWS)?

Additional: Are there additional income possibilities for cross subsidies since not only water is provided but also energy?

Assignment questions 3: What is necessary for TWS to implement an access-based business model in India? With whom could TWS partner in India resp. Switzerland to minimize the risks for TWS? Which preparation does TWS need to start to implement an access-business model (e.g. a Water Shop Concept) in (rural) India?

Case Analysis Notes

Conceptual Background & Assignment 1

A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for the means of living. A livelihood will be sustainable when it can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, while not undermining the natural resource base (Chambers and Conway 1992). Exhibit 1 provides the key principles of sustainable livelihoods. Exhibit 2 depicts the sustainable livelihood framework.

Prahalad (2002) mentioned that significant economic progress in a wide variety of fields has brought a new sense of optimism in India. He described that two distinct populations were emerging in India: one being enthusiastic, globally competitive and another being very poor and disenfranchised. He presented in this study a perspective on how to bridge the increasing divide by discussing procedures to develop strategies for the bottom of the economic pyramid. He also questioned the possibility of converting insurmountable problems of poverty into a global opportunity to serve 4.5 billion poor around the world, in markets similar to India's who have similar problems. Article also discusses five innovations for bottom of the economic pyramid namely low-cost refrigeration, credit accessibility, low-cost logistics system, rationalizing retail and revolutionizing healthcare.

Bardhi and Eckhardt (2012) studied the nature of access business model in contrast to the ownership and sharing model, specifically the consumer-object, consumer-consumer, and consumer-marketer relationships by examining in the context of car sharing via an interpretive study. Study identified six dimensions to distinguish among the range of access-based consumptions capes which temporality, anonymity, market mediation, consumer involvement, the type of accessed object, and political consumerism. Lack of identification, varying significance of use and sign value, negative reciprocity, and a deterrence of brand community were the four dimensions identified in the context of car sharing. Garrette and Karnani (2010) mentioned that only few examples of profitable businesses existed that marketed socially useful goods in low-income markets at a large scale. Combining social virtue with profitability while achieving scale was mentioned to be a major challenge. Their paper discussed three BOP ventures (Essilor and Vision Correction, P&G and Clean Drinking Water, and Grameen-Danone and Child Nutrition) that have underperformed and two success stories (mobile phones industry and Nirma product) to extract conceptual lessons. Their article attributed the underperformance of ventures to an unmet needs trap, affordability trap, overestimating purchasing power, cost-quality trade-off, distribution trap, and multiple objectives trap. They mentioned the biggest difference between BOP and affluent markets to be the obvious but under-emphasized fact that the poor have very low purchasing power and therefore designing the business model to serve BOP markets need to start with this basic insight rather than a minor adaptation of the business model successful in affluent markets. In sum, companies should rather first focus on improving the business infrastructure for the poor to improve their long-term economic development.

The above articles along with Gabel (2004), Subrahmanyan & Gomez-Arias (2008), Prahalad (2012),Weidner et al. (2010) and International Foundation for Science (IFS) Report on *Safe Water for All 2009* can be referred to class as reading material before discussing this case as they showcase the concepts of "bottom-of-the-pyramid", "innovation", "affordability" and "accessibility". Reading/discussing these articles will ensure an efficient discussion of the case in the class. Exhibit 3 provides an example for assets available with rural people in India and exhibit 4 represents an example of transportation and logistics assets in rural India. Exhibit 5 establishes the connection between assets and utilization for rural India.

Exhibit 1: Key principles of Sustainable Livelihoods

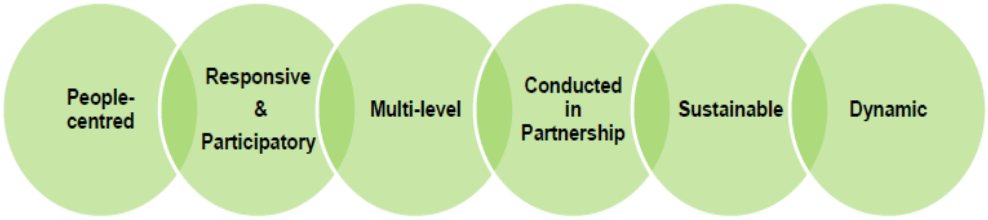


Exhibit 2: Sustainable Livelihood Framework

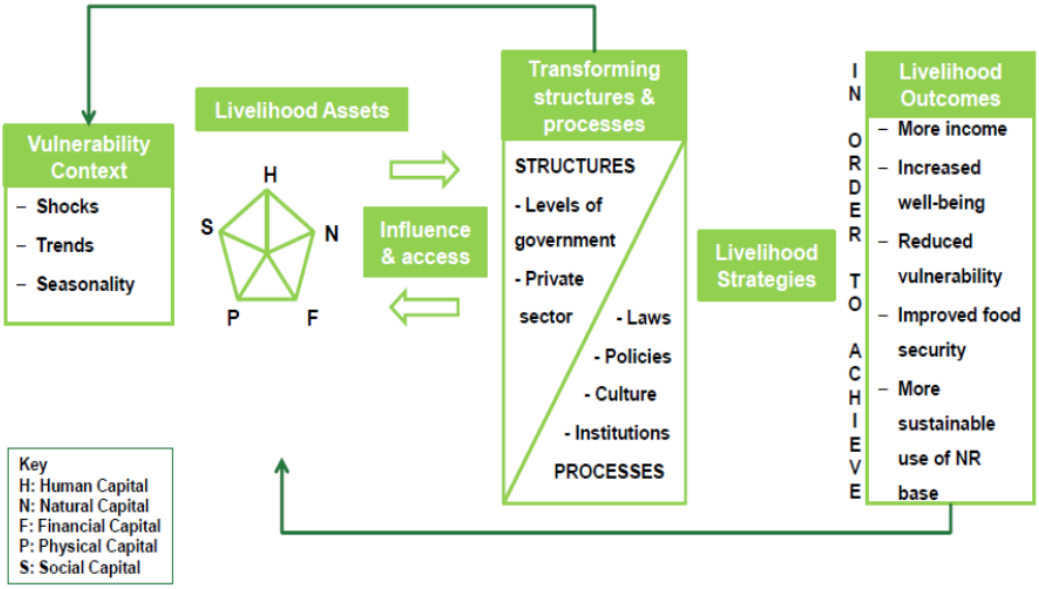


Exhibit 3: Livelihood Assets and their Impact on People

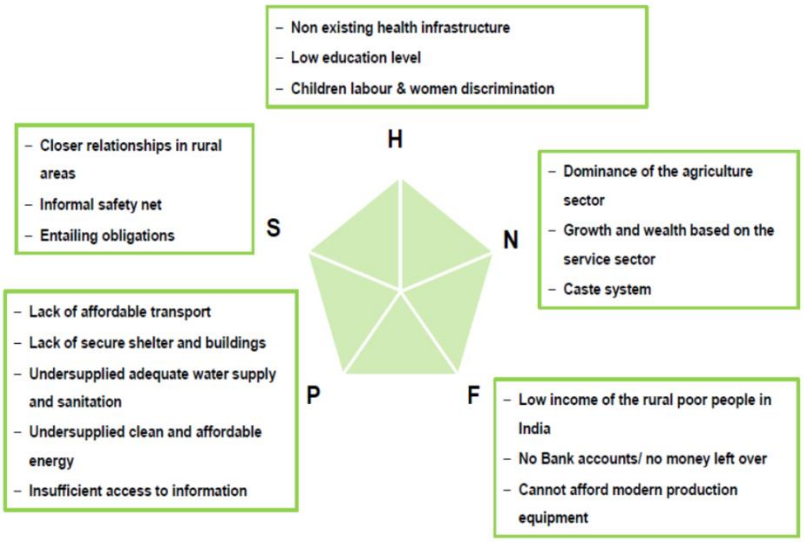


Exhibit 4: Example of Livelihood (Physical) Assets (Lack of Affordable Transportation)

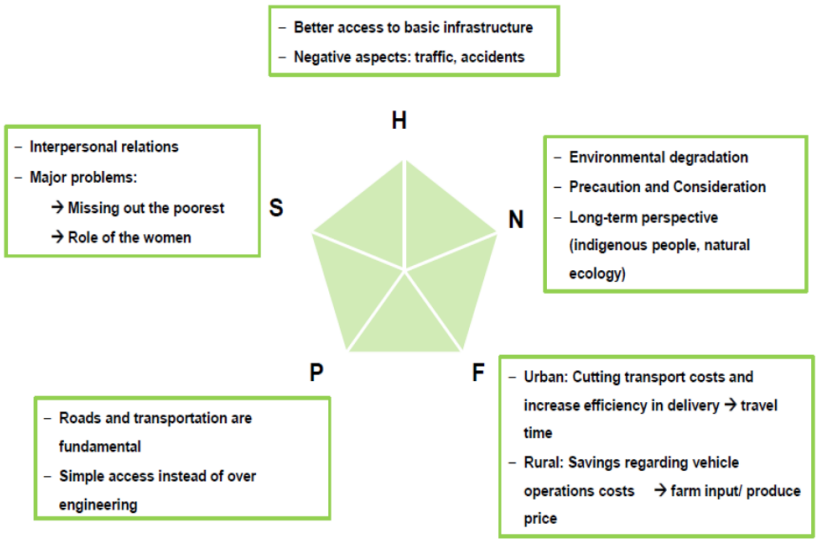
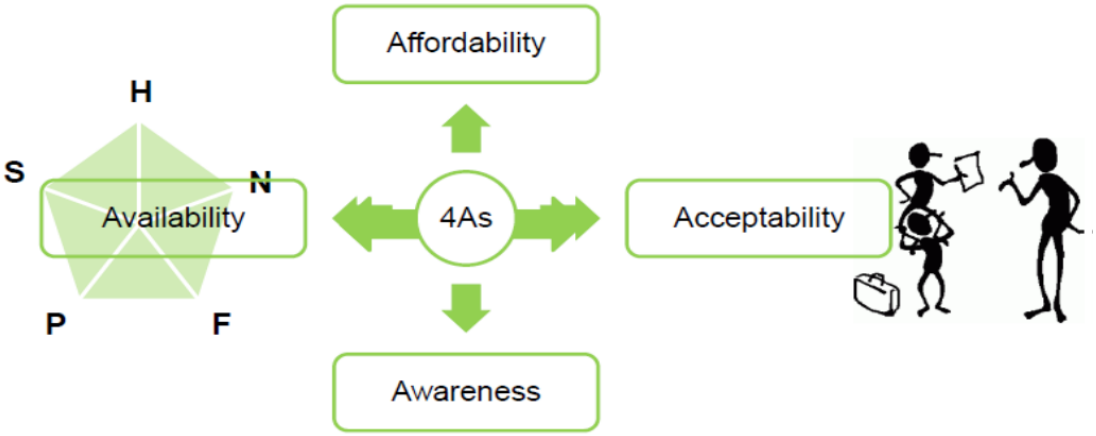


Exhibit 5: Establishing a Connection between Assets and Utilization.



Several key challenges exist for TWS to enter the Indian rural market are shown in exhibit 2 and 3. The low education level of rural residents and the absence of training on water and sanitation issues are some of the key challenges for companies like TWS to enter and install their solutions in the Indian market – besides the financing challenge for people from the Base-of-the-Pyramid. The lack of proper water infrastructure, lack of transport facilities, lack of access to information, women discrimination, caste system, low income, absence of bank accounts and debt providers, etc. act as some of the key challenges for the rural market entry of firms like TWS. Caste system and women discrimination responses by the class participants can also be taken by the teacher as a challenge as they lead to discrimination within community thereby reducing the market potential and utilization of the TWS solutions to be installed. Poor income and inability to arrange for one time funds to purchase the equipment also act as predominant barrier for TWS's solution installations. The above mentioned challenges lead to two predominant issues of affordability and accessibility (Exhibit 5). Shah & van Koppen (2006) have mentioned that by 2025, much of India is expected to be part of the one-third of the world destined to face absolute water scarcity. Studies also imply that there will be severe "water poverty" - a phrase which is used to indicate the difficulty that people face in securing adequate and reliable access to water for productive and consumptive uses. India's Tenth Five-Year Plan document claimed that protected water supply (water supply through a local community-based or municipal

body which is responsible for quality) covered 95 per cent of the country's rural habitations but a large nationwide survey in 1998 revealed that almost 80 per cent of India's rural households self-supply their domestic water requirements from wells, tanks, ponds, streams, etc. and no service provider or public or community agency in the formal sector had catered to the same [NSSO 1999a: report 449].Another survey showed that in urban areas over 75 per cent of the households were connected to the formal sector of water supply. The IWMI-Tata studies in six Indian cities during 2003 showed that economically strong households were much more likely to be connected to public water supply systems and poorer ones either self-supply or rely on informal sector service providers [Londhe et al 2004]. However, these challenges prevailing in the rural Indian market can be converted into significant competitive advantage for solutions of TWS when properly tackled. Some of the solutions implemented by TWS in these markets are also discussed below which address the issues of accessibility and affordability.

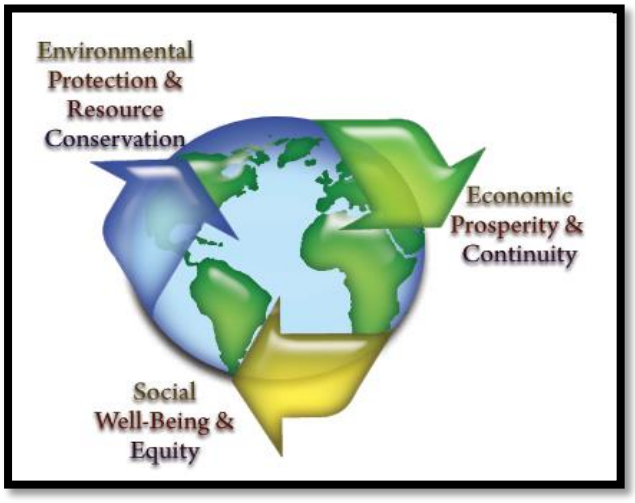
Assignment 2 & 3

Insights into possible Trunz Business Models in India

The Water Shop Concept: A socially responsible, environmentally sound and economically profitable business model?

TWS provided not only modern and high quality technical solutions but developed also innovative business models. Its goal was not only to secure a sustainable operation for its systems but also a sustainable supply of safe water to its customers. In order to cater to this goal TWS adopted the triple bottom line approach as shown in exhibit 6.

Exhibit 6: The triple bottom line approach adopted by TWS



Sustainable concept to secure health and economic growth was planned to be achieved by TWS by selling clean and safe drinking water at an affordable price to low income population using environmental friendly technology. TWS Water Shop Concept operate with goals to include local opinion leaders & population, reduce health problems (water borne diseases), create local job opportunities, increase economic growth, reduce poverty, support through know-how transfer and

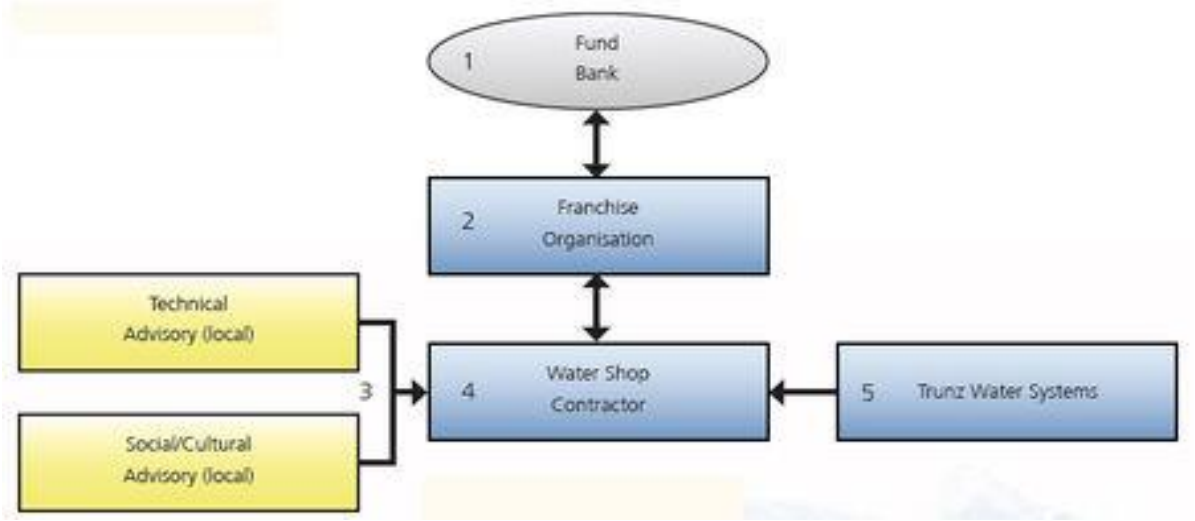
thereby achieve profitable business model. The operation of Water Shops was already established in some regions and remarkable success had been achieved.

The Water Shop Concept was seen by TWS as far more than a technical solution as it synchronized with its vision to achieve maximum impact by: providing access to clean drinking water and energy for an affordable price, establishing sanitary installations in order to improve health conditions, reducing poverty by establishing micro-entrepreneurship and small-scale trade, producing green energy to operate the water shop sustainably and to raise awareness for topics related to water, sanitation and health.

Water Shop Model Structure

In order to achieve maximum support the concept involved all stakeholders. The Water Shop Concept acted as a catalyst for low-income population and had positive impact for small-scale trade possibilities. The concept provided relieve to the people who did not have access to safe water in the past as through this concept the people were served with affordable and reliable water. The Water Shop model was focusing on selling drinking water and/or energy directly to the end customers mainly in rural environment. Water Shop Concept was financially self-sustainable by charging the end customers a fair price for the service rendered and it was noticed that to be financially viable, the operation of more than one Water Shop was in most cases a central requirement. Exhibit 7 explains the Water Shop Model concept and depicts the partners and stakeholders involved in the model.

Exhibit 7: Basic Water Shop Model



1. Financing Partners/Bank (Credit grants)

Who: Social Investors, Funds, Foundations, Micro-Credit Organisations, Governments, Private and Public Companies
What: Provide funds to finance the project; Act as controlling and supervision partner within the concept; Provide strategic support
How: Long-term loans or credits with affordable interest rates
Profit: They can expect at least a sustainable investment or a socially responsible profit
Description: Financial institutes, funds, development organisations etc. were granting a credit to the Franchise Organisation. Similar to microcredit foundations, they provide pro-poor financing and act as supervisor to the Franchise Organisation. The investment has to be profit orientated yet socially responsible and sustainable.

2. Franchise Organisation

Who: Local companies with good access to remote areas
What: Set up of the project plan; Installation of the units; Education and training of the involved people; Technical service and maintenance of the units; Administrative support (financial, organisation, HR etc.).
How: Staff, Contacts, etc.
Profit: They will be operating as a service provider and will be paid accordingly
Description: The shop infrastructure will be owned by a Franchise Organisation who will be established for this purpose. The Franchise Organisation may be the local water authority or another organisation. They will be responsible to search for water shop operators and issue franchise contracts. The Franchise Organisation takes care of installation, maintenance and training of new shop operators. Franchise Organisation has to appoint one person who will undertake the responsibility of visiting each water shop operator every two weeks in order to collect earnings and provide assistance for sales or technical issues.

3. Advisory

Who: Independent organisation consisting of community leaders, development committees, experts etc.
What: Ensure that the project will be independent from economical, religious and political influence; Help to establish the awareness of the importance of clean drinking water in the rural community; Recommendations to social, cultural and technical issues.
How: They support the projects with their network of contacts and their influence
Profit: In best case, they should support the project without commercial interest.
Description: The Advisory Board will act as the independent organisation for recommendations to social, cultural and technical issues. The Advisory Board secures regular controlling of rules and regulations. Their goal was to assure independence and ensure for ongoing operation of the water shops to be free from any political, religious or other circumstances.

4. Water Shop Operators

Who: Individuals living in the remote communities
What: Operation of the Water Shops as a daily business; Basic technical maintenance; Selling of additional goods to the villagers (electricity, commodities as soap etc.)

How: Selling Water to other villagers/customers;
Profit: They were hired as a franchisee and will have their share of the profit
Description: The Operator sells safe drinking water for an affordable price. The price will be set in advance in each country by the water sector regulation organisation. All cash which he/she has collected will be deposited with the operator until the Franchise Organisation collects it. The Operator has to pay the Franchise Organisation each month according to the water meter and receives a commission for every liter of water sold. The Operator may sell other goods related to sanitary/hygiene and healthcare which could be financed by a preliminary micro-credit. Further, the Operator will be responsible to keep the shop clean and has to report any technical or other problems to the franchise organisation. The shop should have regular opening hours and have to operate without any breaks.

5. Provider of Technical Equipment

Who: Trunz Water Systems and others
What: Technical Equipment; Support for installation; Technical support; Preliminary technical training of local partner and end users
Profit: They will be involved as an OEM and will get paid for the equipment provided.
Description: Trunz Water Systems will be the technical partner providing the water treatment and solar equipment.

Results and Findings from the implementations of a Water Shop Model

- Ongoing, reliable clean water supply improves health and economic impact
- Easy operation of system and low maintenance requirements motivate local operators (create ownership)
- Concept generates income possibilities for people living in remote regions (local entrepreneurship)
- Environmental friendly and independent operation corresponds with UN goals
- Value for safe water, yet fair pricing

Key issues to make a Water Shop Model successful

- An affordable sales price
- The demand needs to be high enough to break even
- A local partner with good contacts and good knowledge (technical and economic)
- Reliable technology
- A financing partner who will not be looking for a high profitability
- Government agreement
- End users need to support the concept. They need to understand the importance of clean water and why they have to pay for it. They need to see the obvious benefits for their health, their social life but also for their economic situation.

Exhibit 8: Return on Investment Calculations for the Water Shop Model

General Information			
Site	Gandinaghar, India	Solar radiation	5 hours per day
Application	Drinking water for remote village	Equipment	Water: TWB 002
Installation	Fixed installation		Solar: TSPC 700 4/8
Water source	River water/well water	Salinity	none
		Contamination	organic (e.g. bacteria, virus, spore)

Technical Data			
Capacity of the unit		900.0	l/h
Power Requirement		350.0	Wh
Provided Solar Power		1,480.0	Wp
Energy by radiation	5 kW/m²/day	7,400.0	Wp
Power loss (cabling etc.)	20%	-1,480.0	Wp
Average energy supply		5,920.0	Wp/day
Runtime of the unit		**16.9**	**h/day**
Total capacity		**15,222.9**	**l/day**

Drinking water costs			
Investment costs consisting of:		60,000.00	US$
Water and Solar Equipment		*50,000.00*	*US$*
Water source development		*5,000.00*	*US$*
Infrastructure Water Shop		*5,000.00*	*US$*
Annual amortisation	5 years	12,000.00	US$
Annual interest rate	10%	3,000.00	US$
Annual maintenance costs (estimation)		600.00	US$
Total costs per year		15,600.00	US$
Total amount of water production per year		5,556,342.9	l/year
Amount of water sold per year	50%	2,778,171.4	l/year
Price per litre of drinking water		**0.0056**	**US$**
Price per m³ drinking water		**5.6152**	**US$**

Business Model			
Sales price per litre		0.015	US$/l
Costs per litre		0.0056	US$/l
Gross Margin		0.0094	US$/l
Gross Earnings		**26,072.57**	**US$/year**
Participation of Watershop Operator	20%	5,214.51	US$
Participation of Franchise Organisation	60%	15,643.54	US$
Misceallaneaus costs (Expenses, Transport)	15%	3,910.89	US$
Net Earnings		**1,303.63**	**US$/year**
Rentability for Fund/Bank			
Number of Water Shops		50	Units
Total Investment	50 x 60,000.00	3,000,000.00	US$
Total Earnings	50 x 1,303.63	65,181.43	US$
Total interest rates for equipment	50 x 3,000.00	150,000.00	US$
Return on Investment		**7.17%**	**per year**

Business Model Approach I: Sale of Equipment

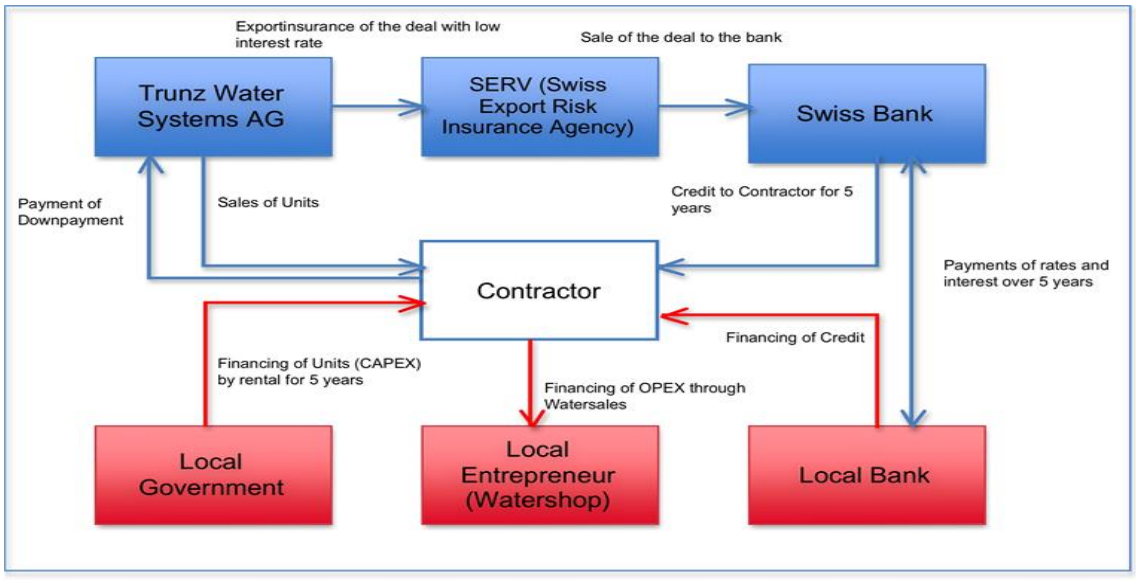
Sale of equipment was the traditional business model which has the goal to sell one or more units to any customer. The required product will be assembled for the individual application and the equipment will be owned by the customer after the sales process is finished. The customer can either use the equipment for his own purpose or he can re-sell it to the final customer. The profits will be generated with the margins on the sales price. The key challenge in this model will be the relatively high upfront investment cost for the customer. This business model used to be the classic approach traditionally utilized to sell the products manufactured for a one-time payment of the price quoted. But to reach to BoP, business model needs to ensure both affordability and accessibility as customers in this customer segment cannot arrange for huge upfront investments and thereby will withdraw from utilizing the product or solution once for all.

Business Model Approach II: Sale of Services

Sale of Services (Water and/or Energy) to a Private Contractor

Business Model: Install, operate and maintain the equipment through TWS's local partners (Build, Own, Operate Model). The end customer will pay per usage of the services. In this case, it is important that the service contract is long enough to generate profits through the regular payments. Normally, a contract period of minimum 5 years will be targeted. TWS or its local partner who will be making the investment to buy the equipment will be amortized through the payments of the customers. The partner has the chance to either charge a higher price to his customers or he will be able to save money compared to other water supply models. Exhibit 9 represents the model of sale of services to a private contractor.

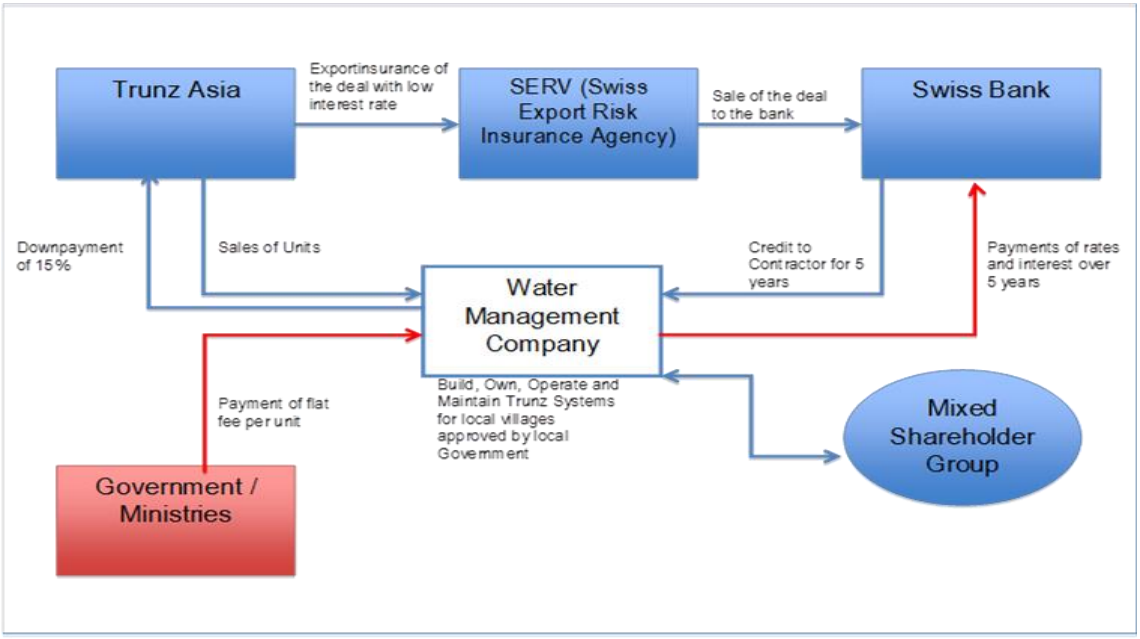
Exhibit 9: Model for Sale of Water Provision Services to a Private Contractor



Sale of Services (Water and/or Energy) to a Public Contractor: PPP (Public-Private-Partnership) model

Business Model: Local partners develop the project, install, operate and maintain the equipment during the agreed contract time. This model will be widely used in urban areas where local governments make long term contracts with various service providers for waste management, drinking water supply, waste water management etc. In rural areas, this model is not widely established yet. In this context, it is also important to target a long service contract period to have enough time to generate the profits. It should also be considered whether the payment has to be on a per use basis or a flat rate payment per installed unit might be possible as well. A flat rate would require much less monitoring and reporting efforts. Exhibit 10 represents the model of Sale of Services to a PPP company.

Exhibit 10: Model of Sale of Services to a PPP consortium



Financing to Trunz through Rental

The concept avoids high investments in advance for equipment bought by the aid organisations or the coordination office. All equipment will be provided on a rental basis. Financial transaction by means of a co-operation with a leasing company can be employed.

Field Service Personnel

Employees from the disaster relief corps or other specialists (e.g. technical operators from Trunz Water Systems) will be working in the disaster area to operate the water units. All aid personnel will be educated within a technical workshop held by Trunz Water Systems in order to make field service personnel capable to install and operate the water units. Co-operation with aid organisations can be established in order to send well prepared personnel in the field.

Insurance

Most often in case of an emergency, personnel and equipment will be working in an area with higher risks. The insurance company shall cover accident and illness of field service personnel, travel of

personnel and insurance for water treatment equipment. Co-operation with an insurance company who covers all the risks for such an operation can be a win-win solution.

Long-term application / Reconstruction Projects

By request, the TWS solutions can be established for long-term after the disaster operation. A sustainable solution such as the “Water Shop Concept” can be employed to extend the project in a self-sustainable manner. TWS submits applications to governments, disaster corporations and relief organisations which looks for innovative solutions for emergency care or decentralized infrastructure in developing countries. Applications were also sent to foundations who invest in long-term projects, companies who would like to support socially and environment-friendly projects in poor regions and local companies/partners who guarantee distribution and on-site service in co-operation with Trunz Water Systems.

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