RWH Presentation

Dynamics of Rainwater Harvesting (RWH) in Botswana: Understanding the Socio-economic Aspects for Effective Implementation of Programmes and Policies
Profile on Botswana

- Location: Botswana is located in the Southern part of Africa; just above South Africa
- Size: 600,370 km²
- Population: 1.7 million
- Climatic conditions: Semi-arid
- Water: only 2.5% of the land is covered by surface water
Profile on Botswana Cont’d:
Economics

- Currency: BWP
- Total GDP: US$18.72 billion
- Per-Capita GDP: US$11,400
- Main revenue export earner: Diamonds
- Foreign exchange reserves: US$7 billion
- Main spender and consumer: Government
Water situation in Botswana

- Water is sourced mainly from the following: dams; wells and boreholes
- Rain-water is only harvested on low scales
- The following government institutions and parastals are tasked with providing portable water from these sources to different market segments; Water Utilities Corporation (supplies urban areas); Water Affairs (supplies rural and major villages); councils (supply settlements).
Water situation in Botswana—Cont’d

- According to recent government statistics, 97.7% of the population of Botswana have access to safe drinking water.
- GOB is currently subsidising the operating costs of water delivery by more than 40%.
- Annual water demand for urban and major villages stands at 77ML.
Examples of some of the common water collection and reticulating systems used in Botswana
Rainfall related issues

- Botswana is a semi-arid country
- Annual rainfall: 250-650 mm
- The Northern part of the country experiences more rainfall than the rest of the country
- Evaporation rate: 2000 mm
- 60% of the population uses ground water sources for water supply
Overview of the paper

- The paper formed a sub-set of the RWH project
- It therefore used primary data that was collected for the RWH Feasibility Project
- Its main focus however was on bringing across the socio-dynamics of RWH in Botswana- a sub-set of different disciplines investigated during the survey
Objectives

The paper aims to bring to light aspects regarding the following parameters;

- Trends in RWH practices
- Cost of such systems for those with systems
- Sources used to fund the systems
- Affordability of the systems
Objectives Cont’d

- Opinions of those without RWH systems
- General sentiments on practicing RWH by those with and without the systems
- NB. The survey covered the following market segments: Domestic; Agriculture; Commercial/industrial enterprises and Institutions
Sampling Method

- The survey adopted the Convenience Sampling Method.
- This was the ideal method given the nature of the research.
- The 2001 Population Census of Botswana was used to determine the sample size for each area.
Questionnaire designing

- SNAP software was used for designing the questionnaire
- The questionnaire contained both open-ended and closed questions
- The questionnaire was administered by our researchers to achieve the highest rate of response
Data Analysis Process

- The SNAP software was also used for data processing and analysis.
- Tables depicted on the paper are derived directly from the SNAP software program.
- Some of the tables are however simplified into graphs for purposes of this presentation.
Data Discussions

- It is divided into the following segments;
  1. Sentiments of respondents with RWH systems are presented firstly
  2. Sentiments of respondents without such systems then follow
  3. Lastly we look at sentiments of all respondents irregardless of whether they harvest or not.
Population dynamics

- Sample size consisted of participants from rural and urban areas, and settlements
- Effectively the survey captured views of individuals and institutions with different socio-economic backgrounds
- Total sample size stood at 1273
Respondents with or without RWH systems

- 88.3% of the total sample did not have RWH systems
- 11.5% had RWH systems while 0.2% of the sample did not respond to the question
1. Respondents with RWH systems
Cost of RWH systems

- Most respondents were not aware of the cost of their systems.
- Another significant number maintained that their systems had a “price tag” of P1000 (US$160) to P5000 (US$809).
- Subsequently most of the respondents felt their systems were affordable.
Most of the systems were funded from government schemes with a few using own savings to set-up system.
8.3% said their systems were affordable
2.4% said their were not affordable
100% of respondents whose system cost below >P10000 said it was affordable
50% of respondents with systems costing between P10 000 said theirs was also affordable and 50% equally said it was not affordable
2
Respondents without RWH systems
Reasons for not having RWH systems

- Most of respondents without RWH systems did not have them because they could not afford them.
- A good number of respondents also argued that they were not knowledgeable.
3
General sentiments about RWH
All respondents
Opinions on harvested RW

- Most respondents argued that harvested rainwater was clean enough to be used – 35%
- A good number of respondents also argued that respondents felt that it was tastier than conventional water – 22.2%

<table>
<thead>
<tr>
<th>Analysis % Respondents</th>
<th>Base</th>
<th>100.0%</th>
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</thead>
<tbody>
<tr>
<td>Missing</td>
<td></td>
<td></td>
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<tr>
<td>No reply</td>
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<td>37.4%</td>
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<tr>
<td>Variable V7</td>
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<td></td>
</tr>
<tr>
<td>Clean enough</td>
<td></td>
<td>35.0%</td>
</tr>
<tr>
<td>It has no chemicals</td>
<td></td>
<td>5.3%</td>
</tr>
<tr>
<td>It is tastier than</td>
<td></td>
<td></td>
</tr>
<tr>
<td>current source</td>
<td></td>
<td>22.2%</td>
</tr>
<tr>
<td>It is natural</td>
<td></td>
<td>7.4%</td>
</tr>
<tr>
<td>Contains less salts</td>
<td></td>
<td>1.9%</td>
</tr>
<tr>
<td>It is soft</td>
<td></td>
<td>1.4%</td>
</tr>
<tr>
<td>Only safe for irrigation and watering animals</td>
<td></td>
<td>4.2%</td>
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</tbody>
</table>
## Cleaning harvested RW

- Most respondents encourage boiling the harvested rainwater prior to using.
- First flush is significant in ensuring that harvested rainwater is clean.

### Analysis % Respondents

<table>
<thead>
<tr>
<th>Analysis %</th>
<th>Base</th>
<th>Missing</th>
<th>No reply</th>
<th>Variable V8</th>
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<tbody>
<tr>
<td>Base</td>
<td>100.0%</td>
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<td>65.4%</td>
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<tr>
<td>Boil before use</td>
<td>28.6%</td>
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<td></td>
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<tr>
<td>First flush</td>
<td>2.8%</td>
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<td></td>
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<tr>
<td>Filtration</td>
<td>1.6%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use chemicals</td>
<td>0.9%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>It is clean enough</td>
<td>2.4%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clean tanks regularly</td>
<td>2.4%</td>
<td></td>
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</table>
Preferred RWH systems

- Given a choice between communal and private RWH systems, most respondents preferred private RWH systems.
- This is shown by the 80.7%.

<table>
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<th>Base % Respondents</th>
<th>Base</th>
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<th>No reply</th>
<th>Which of the following systems would you prefer?</th>
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<tbody>
<tr>
<td></td>
<td>100.0%</td>
<td>2.6%</td>
<td></td>
<td>Private rainwater harvesting system</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>80.7%</td>
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<tr>
<td></td>
<td></td>
<td></td>
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<td>Private rainwater harvesting system</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>18.3%</td>
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</tbody>
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Potential benefits that could accrue to the economy if RWH is encouraged

- The survey shows that people are quite aware of water scarcity, and would associate RWH with possibility of reducing this scarcity.

- Equally important are the steadily rising costs of reticulated mains water supply.
Initiatives needed to encourage RWH

- Most respondents argued government policies and programmes which encouraged subsidies should continue to be encouraged, a practice which has been in existence in the past.

<table>
<thead>
<tr>
<th>Base % Respondents</th>
<th>Base</th>
<th>Missing</th>
<th>No reply</th>
<th>What initiatives would you like to see in place to encourage...</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100%</td>
<td>2.1%</td>
<td>79.6%</td>
<td>Government subsidies</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>49.9%</td>
<td>Easy access to funds</td>
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<td></td>
<td></td>
<td></td>
<td>14.4%</td>
<td>High piped water bills</td>
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<td></td>
<td></td>
<td></td>
<td>73.0%</td>
<td>More educational materials on RWH</td>
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<td></td>
<td></td>
<td></td>
<td>1.0%</td>
<td>There are enough initiatives</td>
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</tbody>
</table>
Market segments that stand to benefit more from RWH

- Given the rain fed conditions under which agriculture is usually practiced in Botswana, it is not alarming to observe that 87.2% of respondents would like RWH to be encouraged within the agriculture sector, thus boosting efficiency of food production.
Conclusions

- The following conclusions can be drawn:
- RWH is one initiative that can easily be absorbed and practiced by most Batswana.
- The issue of affordability is a major deterrent among those without RWH systems.
- Public education and awareness about RWH in general is essential to motivate and encourage efficient utilisation of the harvested rainwater for greater communal benefit.