LIFE Integrated Projects 2016
Optimising the implementation of the 2nd RBMP in the Malta River Basin District
LIFE 16 IPE MT 008

Action A.4:
STAKEHOLDER
ASSESSMENT, PERCEPTION AND ATTITUDE FOCUS GROUP STUDY

STAKEHOLDER ASSESSMENT, PERCEPTION AND ATTITUDE FOCUS GROUP STUDY

FINAL~~DRAFT~~ Version 1.0

ARQ Economic & Business Intelligence

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List of Acronyms

ARQ EBI	ARQ Economic & Business Intelligence Ltd.
EWA	Energy and Water Agency
RMBP	River Basin Management Plan
WCMP	Water Catchment Management Plan
NSO	National Statistics Office
NACE	Statistical Classification of Economic Activities in the European Community
RO	Reverse Osmosis
WSC	Water Services Corporation

1.0 Executive Summary

This document sets out the analysis and findings of the stakeholder assessment process undertaken on behalf of the Energy and Water Agency.

This process consisted of a series of focus sessions targeting key stakeholders identified by the Agency, i.e. local residential, foreign residential, agriculture and the services sector. This engagement was designed to elicit feedback on essential aspects of the water resource management framework in Malta, primarily seeking to gain insight into the prevalent levels of awareness on the subject, as well as into the attitudes to key aspects that should be factored into subsequent research, communications and policy implementation.

It is the conclusion of ARQ Economic and Business Intelligence that this engagement process has proved successful in that, particularly for the residential and agriculture groups, a number of key findings were made. ARQ EBI considers these findings to be notable and as such should be factored into any further actions. Relevant feedback was also obtained from the services stakeholder group however, for reasons explained in the relevant section, further engagement can be considered for this group in order to draw deeper conclusions.

The sections below will expand on the key findings for each stakeholder group, presenting relevant observations on themes and patterns that emerged on the various topics discussed.

For the purposes of this summary, we wish to highlight the following conclusions reached in terms of cross-comparative findings across the groups. These findings will be expanded further in the final section of the report.

- As might be expected, given that this is a vital resource in their operations, the agricultural sector was the most aware of the current and future realities impacting Malta's water resources.

- Among the residential group, awareness appears to be affected by age and level of educational attainment as well as by whether the resident was local or foreign. Older residents tended to be more aware of the issues and challenges involved, while younger residents were less informed with some notable exceptions.

- Foreign residents overall were well informed about the global water challenges, mainly due to the fact that they had been exposed to these concerns in other countries of residence before coming to Malta. In discussions it emerged that the majority view in this group was

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that in general the Maltese came across as complacent in their attitude to these challenges and tended to "take water for granted."

- The services group appeared to display similar awareness levels to the residential cohort.

- In terms of water usage, a negative perception of tap water as a potable water source was very evident, with bottled water the clear frontrunner in terms of the drinking water of choice for all stakeholder groups.

- For the agriculture group groundwater is obviously a major concern and, beyond rainwater, the water source in which they are most invested. This group appeared to be well informed about the current challenges and were largely on the defensive in terms of practices which may be having a negative impact on the water table (over-extraction as well as contamination). There also appears to be a lack of awareness of opportunities and possibilities for enhancing rainwater harvesting capacity. The relevant authorities may wish to consider addressing this gap.

- The indications emerging with regards to New Water appear to be positive. The agriculture stakeholders have a positive perception of the resource, even extending to those participants who are actually using it; residential stakeholders appeared to buy into the concept, however as consumers of agricultural products information campaigns designed to reassure any health concerns should be considered.

- In terms of attitudes to water conservation it appears that older residents, foreign residents and younger residents who are either householders or who have environmental concerns are more disposed to taking active measures to conserve water in their homes. A number of participants already do so in various ways with the primary motivation varying between economic or environmental concerns.

- Stakeholders across all groups appear to be more conscious of the need to conserve energy rather than water and this is reflected in their consumption practices. This attitude seems to be derived mainly from a perception of energy as 'more expensive' than water. This is pronounced among the agriculture participants, the majority of whom cited the energy costs associated with pumping water from boreholes as a greater cost concern than the use of the water itself.

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Commented [VN2R1]: ARQ EBI's interpretation of this comment is that this is directed at WSC and does not require any amendments to the text. ARQ EBI stand by this recommendation since this point was a clear finding in the research – better consumer information maybe key to wider acceptance of products irrigated with new water.

Commented [VVMaM&WA3]: National Survey ask in more detail what active measures?

Commented [VN4R3]: Please see Topic 7 below where a number of the active measures reported by stakeholders are listed. ARQ EBI would definitely recommend including this point in a National Survey since findings will continue to highlight the varying 'readiness levels' across different stakeholders to make changes in their household or workplace to conserve water.

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Commented [VVMaM&WA5]: Being water their main resource, How come do they perceive that energy is more expensive than water? What are the products/machinery they use that influences this perception?

Commented [VN6R5]: Please see amended text: ARQ EBI was in fact surprised at this finding since our preconception was that water itself would be perceived as more expensive than energy since this was obviously a much-needed resource. However, this attitude that energy was a greater cost concern than water was very evident across all farmer groups. The main cost area is that of pumping ground water.

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- The perception of Malta's water conservation challenges varies across the groups with some interesting patterns emerging. As referred to above, the agriculture groups were best informed on this topic, and among all the groups was the one to pinpoint climate change most strongly as a key issue. Among the residential groups, population growth (through immigration and tourism) was highlighted.

- A further point related to water resource management that emerged very strongly across all the stakeholder groups, and which elicited the most emotional reaction of all themes discussed, referred to the effects of development and construction in Malta and Gozo.

- Some negative perceptions of the Water Services Corporation were noted: these revolve around water testing in the case of the agriculture stakeholders, and inadequate response to water leakages in the case of the residential stakeholders.

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Commented [VVMaM&WA7]: WSC: What is the reason behind this negative perception? Is it due to lack of information, is the information easily attainable, lack of customer care or a problem with bad service provided.

Commented [VN8R7]: ARQ EBI assumes that this comment is directed at WSC. In the case of residential stakeholders this 'complaint' mainly concerned reported leakages (Southern Malta and Gozo mentioned most frequently in this respect) and the main emotion expressed here was irritation that the WSC continually preached water conservation, yet they responded very inadequately (in the view of the respondents) to the very evident waste in the form of these leakages. In the case of farmers, as reported the main complaint concerned water testing: both in terms of frequency but also in terms of how results were communicated to farmers: the perception that they were 'talked down to' or 'patronised' was reported.

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2.0 Introduction and Background

This document constitutes the Draft Final Report on the project carried out by ARQ Economic & Business Intelligence Ltd. (ARQ EBI) and presents an assessment of the prevalent awareness and perceptions of, and attitudes to, the main issues surrounding water use, conservation and management in the Maltese islands (hereinafter referred to as the 'project'). This assessment focuses on four defined stakeholder groups and forms an integral part of a wider programme co-financed by the LIFE Programme 2014-2020 which focuses on optimising the implementation of the 2nd River Basin Management Plan (RMBP) in the Malta River Basin District. The Energy and Water Agency (EWA) is tasked with leading this programme and, as such, is the Contracting Authority for the project.

As per the requirements defined in paragraph 7.1 of the call for quotations issued by the EWA in connection with the project (EWA 100/2018), this draft final report is designed to provide:

- Key insights into the topics and patterns that emerged during the focus group sessions for each stakeholder group on the different water management topics according to the different participant profiles;
- Capture the observations and emotional reactions exhibited by the participants of the focus group sessions on the different water management topics;
- Undertake a cross analysis of the similarities and differences between the stakeholder groups based on the different participant profiles;

- Propose ways on how to structure prospective telephone surveys based on the results of the focus group sessions.

This section of the report provides the salient background to the project as well as a summary of the main aims and objectives that shaped the assessment process.

2.1 Background: Project Context and Scope

As referred to above, the objectives of the project are related to the implementation of the LIFE integrated project programme. This is an integrated series of actions that links all the funding instruments supporting the implementation of measures under Malta's 2nd Water Catchment Management Plan (WCMP).

It was the understanding of ARQ EBI from the outset of this assignment that this project formed a fundamental part of the WCMP in that it is a key 'preparatory action' aimed at addressing the main horizontal challenges in Malta's water management framework that have been identified to date. The challenges are outlined in the table below together with the main rationale behind each.

Challenge	Rationale
Increase general awareness of the need to conserve and protect water resources.	Wider recognition and acknowledgement that this is a national issue will reinforce public commitment to proposed measures to boost sustainability of water use.
Incentivise/facilitate the initial uptake of measures aimed at introducing more sustainable usage.	Demonstrating the environmental benefit of such measures tied with possible fiscal incentives will build up stakeholder support and buy-in to these actions.
Improve the institutional approach to the implementation of related measures.	Ensuring a joined-up and collaborative approach to measure implementation will increase overall effectiveness; this collaboration should encompass all relevant institutions/authorities as well as stakeholders.
Reduce uncertainty in water body status assessments through improved knowledge on water-related processes, ecosystem and ecosystem services.	Informing stakeholders on the importance, value and nature of such assessments will ensure greater acceptance and cooperation and, ultimately, better consistency and reliability.

Table 1: Key challenges identified in Malta's 2nd Water Management Catchment Plan

A common element of all the above challenges and their proposed solutions is the need to involve water use stakeholders throughout the implementation process – this is one of the success factors determined by the EWA as being critical to ensuring the successful implementation of the Framework's long-term actions. On this basis, the EWA set out to deliver a number of 'Preparatory Actions' aimed at addressing this need. These actions include a formal stakeholder engagement process. It was determined that this process should consist of a series of focus groups with four different stakeholder groups:

- householders/residents;
- foreign residents;
- companies within the tertiary sector; and,
- farmers.

2.2 Background: Project Objectives

The overall objectives for the process are:

- To obtain an initial understanding of the perception and awareness on water resources management in the Maltese islands;
- To obtain primary qualitative data about attitudes and opinions on water resources management issues in the Maltese islands, including water quantity and water quality;
- To gauge the willingness across these stakeholder groups to adopt specific water conservation measures;
- To explore the type of messages that could be used in a national water conservation campaigns among these stakeholder groups;
- To obtain focus group responses that are closer to what the Maltese public is really thinking and feeling on water resources management in the Maltese islands.

It was also determined at the start of the process that the engagement will seek stakeholder input on the following six topics:

- Water use and demand management;
- Management of conventional and Non-conventional water resources;
- Perceived benefits and barriers of water conservation;
- Provision of water services and cost of water;
- Water quality;
- Reuse of water.

With the above background in mind, ARQ EBI entered this assignment with a fundamental objective: to provide an initial yet detailed snapshot of the perception among these four stakeholder groups of the central issues relating to water resource management, as well as of the main attitudes that will affect the implementation of any new measures envisaged under the 2nd RBMP. As outlined in our initial proposal for this project, we felt that "obtaining this initial snapshot is essential groundwork for ensuring that subsequent qualitative and quantitative research is timely, relevant and meaningful." Similarly, having access to this information will ensure effective and targeted research actions as well as communication and educational campaigns at later stages of RBMP implementation that effectively target the concerns of the different groups.

On this basis, we therefore determined that, in terms of each of the four defined groups, we would identify and describe:

- the current level of awareness on water resource management across the Maltese Islands as well as prevalent perceptions of the key issues;
- 'top of mind' and 'gut' responses to these issues, particularly in terms of any new measures and actions that are envisaged, aiming to capture concerns and attitudes that may compromise their implementation.

2.2 Background: Engagement through Focus Groups

In line with the qualitative nature of the stakeholder engagement required, the EWA identified focus groups as being the most effective means of meeting the defined objectives for this project. The advantage of a focus group strategy is the insight it provides into how and what people think about a given range of issues, providing a deeper understanding of how any changes impacting these issues will be perceived by the same stakeholders. This value has been consistently demonstrated by several research studies,[1] while it should also be noted that the European Commission itself regularly employs focus groups as a key element of its general project implementation strategy, particularly when building up to the introduction of any new actions or measures.

ARQ EBI was also aware that wider quantitative surveying may be rolled out at a later stage of the LIFE implementation programme. Given that surveys generally ask close-ended questions that inevitably limit the feedback gained from respondents, using focus groups to obtain in-depth qualitative data on

[1] Smithson, Janet. (2007). Using focus groups in social research.
Bloor, Michael & Frankland, Jane & Thomas, Michelle & Robson, Kate. (2001). Focus groups in social research.

key issues will better direct the design and content of such surveys, ensuring that they are timely and relevant.

Figure 1 below captures the key stages of the focus group implementation process as undertaken by ARQ EBI for this project:

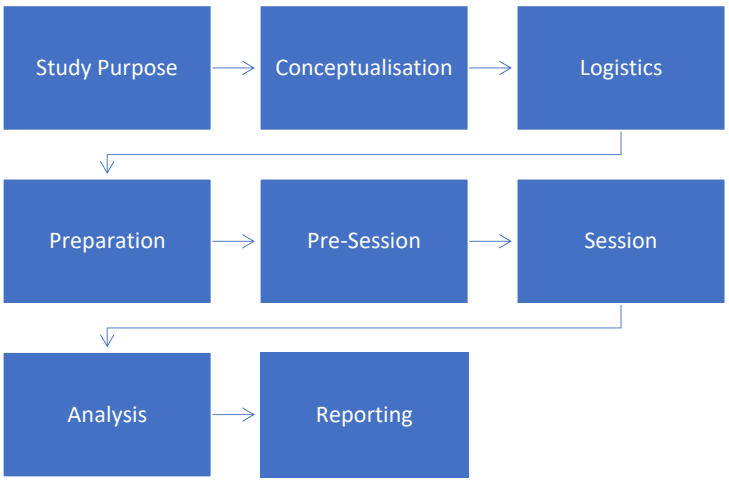

Figure 1: Key stages in focus group process cycle

Section 3.0 below expands on the methodology adopted in this project and briefly describes how the different groups were conducted.

3.0 Overview of Methodology

This project required a total of twelve focus group sessions, each catering for eight participants. The table below sets out how these sessions were divided, as per the requirements specified by the Contracting Authority.

Stakeholder Group	Number of Sessions
Householders/Residents (i.e. mainly domestic water consumption)	4
Companies within the tertiary sector (i.e. mainly commercial water consumption)	3
Agriculture	3

Foreign residents	2

Table 2: Breakdown of focus groups by stakeholder

The sections below outline the methodology adopted in the key stages of the engagement process: recruitment, session implementation and preparations conducted before, during and after the actual engagement. The overarching objective in each stage was to ensure valid, effective and reliable engagement which would elicit meaningful data on the topics established by the Contracting Authority.

3.1 Recruitment of Participants

ARQ EBI initiated the project by identifying participants for each focus group in line with the selection criteria defined by the Contracting Authority. The table below presents the main eligibility criteria applied for the four groups for ease of reference.

Stakeholder Group	**Key election criteria for participant selection**
Householders/Residents	- Age - Gender - Region, as per the classification used by the National Statistics Office (NSO) - Level of Education - Marital Status - Household Size
Companies within the tertiary sector	- Size, determined by number of employees as per the classification used by the NSO - Region, as per the classification used by the NSO - Business type, as per the NACE classification used by the NSO
Agriculture	- Size of agricultural holdings - Employment (full-time or part-time) - Region, as per the classification used by the NSO
Foreign residents	- Age - Gender - Region, as per the classification used by the NSO - Employment sector

Table 3: Key focus group participant selection criteria

3.1.1 Issues that arose in the recruitment process and mitigating action taken

3.1.1.1 Residential

When recruitment for the residential focus groups got underway it became apparent that the strict application of the eligibility criteria applied to this cohort in the call for quotations for this project was creating significant issues in terms of recruitment. Following consultation with the Contracting Authority a compromise was identified whereby the key individual attributes were retained in order to gain the key insights expected. This compromise required a measure of flexibility in terms of applying the criterion relating to marital status in the local residential cohort as well as the criterion related to level of education, in that it proved difficult to recruit individuals with a primary level of education. In the case of the foreign residential cohort, some flexibility was applied in the case of the criterion relating to employment.

On this basis recruitment proceeded smoothly and the actual number of participants exceeded the minimum requirement.

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3.1.1.2 Tertiary Sector

Once recruitment got underway it was evident that ARQ EBI would encounter significant difficulties in bringing together sufficient participants from the tertiary sector. This was primarily due to a timing issue in that company representatives were unwilling to make themselves available during business hours citing pressure of work. Attempts were therefore then made to schedule sessions after business hours and even on Saturdays however this also proved to be an issue, with participants refusing to attend since this would intrude on their personal time.

When this issue was identified, ARQ EBI contacted two leading business organisations (Malta Chamber of SMEs and the Malta Chamber of Commerce, Enterprise and Industry) to seek their collaboration and assistance in organising these sessions. However, after making some enquiries with their members, both organisations informed us that due to the timing difficulty referred to above they were unable to assist.

At this point, having obtained the agreement of the Contracting Authority, the solution identified was to engage with this stakeholder group in a different format. It was therefore decided to hold structured interviews with individual company representatives using a script based on the moderator guide prepared for that group, with a similar mix of probes and open-ended questions on the same six topics to ensure overall consistency.

3.1.1.3 Gozitan Participants

As soon as the recruitment process started, we encountered difficulties in identifying sufficient Gozitan residents who were prepared to attend focus group sessions in Malta. This same issue arose with regards to farmers resident in Gozo within the agriculture stakeholder group. When this issue persisted despite several attempts, with the approval of the Contracting Authority it was decided to

schedule two sessions in Gozo for residents and farmers respectively. We ensured that the composition of each group sufficiently reflected the established criteria in terms of age, gender, education and size of household (residential) and size of holding as well as type of employment (full or part-time) in the case of farmers. Essentially, this resulted in one further focus group being held for each of these two groups, allowing us to gather additional valuable data beyond the minimum requirements. An additional benefit of this approach allowed us to gather some highly interesting insights and information on water-related issues that appear to be specific to Gozo.

3.2 Approach and Preparation

This section will outline the preparation carried out before, during and after each contact, in line with the requirements specified in the call for quotations.

3.2.1 Moderator Guides

In parallel with participant recruitment, ARQ EBI designed individual moderator guides to be used for the four different stakeholder groups. These guides were structured in line with the six topics identified in section 2.2 above.

In creating these guides due regard was paid to:

- Introducing the aims and objectives of the engagement in order to creating a comfortable and trusting environment from the outset, as well as to encourage participants to feel that their views and insights were important; it was further intended that this element of trust would encourage the more introverted individuals to participate more actively.

- Structuring the engagement into different themes with each covering one or more of the topics referred to above.

- Combining scripted open-ended questions per topic with related activities and probes designed to change the pace of the engagement and keep participants' interest, while at the same time eliciting a snapshot of perceptions and attitudes on key topics.

3.2.2 Session Moderation

3.2.2.1 Focus Groups – Residential, Foreigners, Agriculture

The following elements applied to all the focus groups held:

- Each session was held in a comfortable environment, with refreshments available and with no external distractions;
- The moderator conducted the session in line with the moderator guide, regulating the time applied to each topic and ensuring that each participant had the opportunity to intervene
- Any overt 'over-scripting' was eliminated to ensure dynamic and responsive delivery without compromising the quality and relevance of the feedback obtained.
- The characteristics of each group was evaluated in advance as well as during the greeting and introduction phase in order to calibrate the moderation approach accordingly, without deviating significantly from the moderator guide.
- An observer was present in addition to the moderator who was in a position take notes and observe different verbal and non-verbal reactions to points raised.
- An audio recording was taken of each session.

3.2.2.2 Interviews: Tertiary Sector

As outlined in section 3.1 above, due to the issues encountered in convening focus groups for the tertiary sector focused and individual interviews were held with the required sample of companies.

Each interview was based on the moderator guide approved for this group, covering the same topics and using the same balance of open-ended questions and prompts to ensure consistency with the other groups.

3.2.3 Post-Engagement Action

- A full record was prepared of each session using the notes taken by the observer as well as the audio recording.
- Once this record was complete, the findings of each session were tabulated based on the six key topics defined above.
- Data emerging from the probes and activities was similarly tabulated.
- The qualitative and quantitative data was then analysed in preparation for the final report.

3.3 Engagement Process Implementation

3.3.1 Survey Groups: Residential, Foreigners and Agriculture

The table below presents the schedule of focus group sessions held, indicating the venue, as well as presenting the total number of participants for each stakeholder group.

It should be noted that in the case of residents and farmers, the total number of participants across the relative focus groups exceeded the initial targets.

Residential		
Date	**Venue**	**No of Participants**
01 February 2019	ARQ EBI Offices, Birkirkara	9
05 February 2019	ARQ EBI Offices, Birkirkara	8
06 February 2019	ARQ EBI Offices, Birkirkara	8
13 February 2019	ARQ EBI Offices, Birkirkara	7
09 March 2019	Manresa House, Munxar	12
Total Number of Participants – Residential Stakeholders		**44**
Foreigners		
21 February 2019	ARQ EBI Offices, Birkirkara	10
26 February 2019	ARQ EBI Offices, Birkirkara	6
Total Number of Participants – Foreigners		**16**
Agriculture		
14 February 2019	ARQ EBI Offices, Birkirkara	5
15 February 2019	ARQ EBI Offices, Birkirkara	6
8th March 2019	ARQ EBI Offices, Birkirkara	7
9 March 2019	Manresa House, Munxar	7
Total Number of Participants – Agriculture Stakeholders		**25**

Table 4: Schedule of focus groups held

3.3.2 Interviews: Tertiary Sector

Individual interviews were carried out with the representatives of eighteen companies operating in the services sector between 15 and 20 March 2019. This sample of companies selected were identified in line with the criteria established by the Contracting Authority (size, NACE classification and region).

4.0 Key Findings – Residential Stakeholder Group

This section will present the main outcomes of the residential stakeholder engagement process. For ease of reference findings will be reviewed as follows:

4.1 Qualitative Analysis:

- This section focuses on the main themes arising from the open-ended engagement recorded in the different sessions; this captures the feedback to the prompts and questions posed to the participants in line with the moderator guide.

- The analysis highlights salient information pointing to attitudes, perceptions and awareness, particularly in in terms of relevance to the six topics indicated by the Contracting Authority.

- Points in the discussion which produced significantly emotional reactions are also highlighted.

- Common feedback to particular themes and topics is presented, however individual responses which ARQ EBI felt were significant and which stand out from the norm are also included, often as direct quotes for to faithfully convey the statement made.

4.2 Probes Analysis:

- This section presents the results of the probes applied in the focus group sessions, providing a measure of quantitative analysis.

- This analysis will also consider these results in the context of the qualitative information emerging from the group discussions on related topics.

4.1 Qualitative Analysis: Residential Stakeholder Group

For comparative purposes, the analysis below will be divided in terms of the age profile of the different sub-groups[2] with the feedback from the foreign residents presented separately. This allows for comparison between the older and younger cohorts as well as between the local and foreign residents. In most cases, an introductory table captures the position on each topic emerging from each sub-group within the residential stakeholder group, i.e.:

- Older local residential;
- Younger local residential;
- Older foreign residential;
- Younger foreign residential.

This is followed by an overview of the most salient analytical observations made by ARQ EBI on each topic.

The analysis is organised by key topic or theme. Direct quotes are sometimes used to illustrate a particular point.

Topic 1: What is the most water consuming point in the house[3]

Older Residential	Younger Residential	Older Foreign Residential	Younger Foreign Residential
Washing Machine Drinking Washing dishes (by hand) Baths Flushing	Washing Machine Flushing Dishwasher Washing Dishes (by hand) Showerheads	Bathroom Washing Machine Flushing Laundry	Shower Sinks (bathroom and kitchen) Washing dishes (both by hand and using an appliance)

Table 5: Water consuming points in the household

Observations:

[2] From the five residential focus groups held, two targeted a younger profile (age 16-34) while another two targeted an older profile (age 35-75+); the fifth session, held in Gozo, included a mix of age groups however the session was specifically moderated and recorded to allow ARQ EBI to gauge the different reactions of the two age groups.
[3] Feedback ranked in order of frequency

- Here we can see that in terms of domestic appliances, the washing machine was the most frequent mention for local residents regardless of age profile, followed by dishwashers. Foreign residents did not highlight this point as strongly: although it was the second most frequent mention for the older group, younger foreign residents did not mention this point at all.

- Bathroom use is clearly identified across all cohorts within this stakeholder group as involving a high degree of consumption, however a difference emerges in preferences between the two groups, with the younger cohort referring only to showers while the older local group mentions only baths as opposed to showers.

- An interesting point to note in terms of bathroom consumption is that among the older respondents that mentioned baths, three of these appeared to feel that this high consumption of water was possible because they had a solar system at home and so their costs were reduced ("I prefer using the bath because I have a solar system"). This may indicate a perception that energy costs more than water and, on that basis, for these participants limiting the volume of water used is mainly a financial, as opposed to environmental, consideration. This was substantiated by a wider discussion that ensued where a majority of the older respondents referred to the fact that when they are abroad, they use water far more freely than at home "because the hotel pays for it" – this bears out the interpretation that for a significant number of the local older participants, water conservation is primarily a cost rather than an environmental concern.

- However, there was a frequent reference across all groups (but more strongly in the local groups) to the fact that managing water consumption was a 'win-win' in that "you are doing it for the environment and doing it for yourself" (i.e. keeping your utility costs down).

- Foreign residents emerged as being more motivated by environmental concerns when managing their water concerns:

    - The majority of the older group stated that while they clearly wish to manage their expenditure, they are primarily driven by environmental concerns.

    - The younger group showed a similar pattern, with conservation being the main driver.

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- Particularly in the younger foreign sub-group, reference was made to the fact that water conservation "comes naturally" to them because this was the norm in their own countries. One mentioned frequent advertising on this topic in her home country while another stated "It's in my culture."

- One younger foreign resident had a strong reaction on this point, stating that one aspect that particularly upset her was that drinkable water was used for flushing toilets in Malta: "It is disheartening for me to hear that drinking water is being used to flush. It makes no sense but I cannot change that. These things should be against the law as it makes no sense."

- Toilet flushing was also singled out in most groups, significantly so by younger local residentials and older foreign residentials; a point to note here is that older participants (local and foreign) commented that it was not common practice when they were younger to flush the toilet after each and every use and that this had only become routine in recent years. Older local residents tied this to water shortages in the 1980s and early 1990s in terms of how this affected their behaviour at the time. It would appear that local older residents have now adapted their behaviour and flush the toilet after every use because scarcity is no longer an issue~~,~~; three of the foreign older residents stated that they have retained this practice mainly for environmental concerns.

- Foreign residents showed a stronger appreciation of how lifestyle can affect consumption, mentioning for example willingness to use showering facilities at work and commenting how the season can affect consumption levels.

Topic 2: Attitude to drinking tap water

Older Residential	Younger Residential	Younger Foreign Residential	Older Foreign Residential
A minority of participants stated that they do drink tap water but only using a filter; in most cases participants said that they do not even use it for cooking or tea and coffee-making.	The clear majority do not drink tap water. All confirmed awareness that it is safe to drink but prefer not to do so. Two respondents complained of a salty taste.	The common attitude was that they would use tap water for cooking but only 2 participants would drink it	One participant in this group drinks filtered tap water, a second uses it only for cooking, but the majority do not use it at all

Table 6: Attitude to drinking tap water

Observations:

- Local participants from both age groups did not cite safety concerns for not drinking unfiltered tap water– most stated they were aware that it was safe to drink and knew that it was regularly tested – the main reason was an unpleasant taste (references to a salty and/or chemical taste), smell and in some cases discolouration (rusty or yellow colour). There was only one exception, a Gozitan older resident, who stated that he was not reassured that tap water was safe to drink and cited independent tests that showed that local tap water had a high level of nitrates.

- A significant number of local participants from both age groups did state however that tap water quality could vary according to locality, i.e. in some areas (rural areas were most frequently mentioned) taste and clarity was better.

- An interesting outcome was that foreign residents in the younger groups stated that they did not drink tap water because they had been advised by locals that it was unsuitable and possibly unsafe; they stated that they had been surprised at this given that they were accustomed to routinely drinking tap water abroad, however in all cases they had initially followed this advice.

- A slightly different pattern emerges from the older foreign group in that most participants stated that they were aware that the water was safe to drink but preferred not to do so due to colour, taste and smell.

- Foreign residents from both age groups complained of the hardness of the water compared to abroad.

- When asked if they would consider drinking tap water if the quality improved, most respondents in each sub-group (foreign and local of all age groups) stated that they would be willing to do so.

Topic 3: Perceptions of bottled water

Older Residential	Younger Residential	Older Foreign Residential	Younger Foreign Residential
The majority drink local bottled water and most opt for the 2 litre bottles.	Most use local bottled water for drinking with some also indicating that they use it for cooking	Most use local bottled water for drinking; one participant stated they buy only Italian water but the rest stated that they buy Maltese bottled water.	Most use local bottled water for drinking apart from two participants who drink filtered tap water

Table 7: Perceptions of bottled water

Observations:

- It was clear across all groups that bottled water is the most widely used source of drinking water.

- Apart from the minority of local participants (mainly in the older group) who have a domestic reverse osmosis or filtration system, participants rely on bottled water for day-to-day drinking.

- In all groups, concerns were raised about the safety of bottled water, specifically tied to possible toxins being released when the plastic bottles are left in the sun.

- In all groups (except Gozo), but most prominently in the older groups (local and foreign), the point was made that one aspect that made bottled water so convenient and attractive was the fact that it was 'free,' i.e. that most large supermarkets offered free bottled water when customers spent a certain amount. As one participant put it "everyone is comfortable going to the supermarket, buying water or getting it for free." This factor did not seem to be the case for the Gozitan group.

- When asked about the plastic waste generated by such heavy consumption this seemed to be a stronger consideration for the foreign rather than local residents, although most participants in the local groups acknowledged the fact that waste generation occurred. Participants in the local groups (younger and older) made the point that this was mitigated by the fact that the plastic would be recycled. In this context a significant number stated that they would not opt for the larger reusable bottles of water because they were 'heavy' and 'inconvenient.'

- Foreign respondents were more conscious of the waste aspect, with a number saying that reduction and not recycling was the solution. Older foreign participants said that they opt for glass rather than plastic bottled water whenever possible.

- An interesting point is that participants do not appear to give much thought as to the source of locally bottled water, with most being unaware that it is extracted from the water table (groundwater).

Topic 4: Use of well water

Older Residential	Younger Residential	Older Foreign Residential	Younger Foreign Residential
A significant number have wells and use them: for the majority usage covers routine household tasks except cooking, cleaning and laundry. Two participants use it for washing clothes and will drink it using a jug filter. In a minority of cases it is used for flushing.	Approximately half of the younger participants use well water quite widely. Four participants have set up domestic systems using well water for everything (including shower, washing machine, flushing) and they find this works very well.	Little if no use of well water, mainly due to lack of access to one.	Little if no use of well water, mainly due to lack of access to one.

Table 8: Use of well water

Observations:

- Local participants with access to wells appear to use them quite regularly – in many cases, a number of older respondents restrict use to washing floors and watering plants, with one exception who uses it for "everything," including cooking, cleaning and drinking; they stated that they take every care to keep roofs clean to ensure that water was uncontaminated.

- Younger local respondents also appear to have a positive attitude to using well water, with at least three using this for everything in the household except drinking.

- Foreign participants make negligible use of well water if at all: this does not appear to be based on a negative attitude but is largely due to lack of access (particularly in rented accommodation) and awareness. There is some convergence of this finding with that for the services sector in that many business owners rent office or retail space and appear to conform to this restriction.

- When discussing wells an important point emerged among the local residents across both age groups: this concerned the fact that access to wells was fast decreasing with the rise of apartment living. This lack of access also extended to new build maisonettes and terraced houses, since most participants felt that any regulations that such units must have wells was not enforced.

- When making these points, some participants in each group reacted quite emotionally to this issue, portraying it as a negative impact of the recent increase in development and construction. There was also a sense of regret that wells, once considered an integral part of the traditional Maltese house, were now being 'phased out.' In this context the point was made that this was very short-sighted since wells were a key contributor to rain water harvesting.

- In all local groups, participants said that this issue was one that should be addressed and existing regulations enforced; actions should also be considered to provide communal solutions for apartment buildings.

Topic 5: Use of Bowsers

Older Residential	Younger Residential	Older Foreign Residential	Younger Foreign Residential
A limited number of participants use bowsers semi-regularly mainly for filling wells when rainfall is insufficient; another uses bowser water for irrigation.	Negligible use	Negligible use: perception is that bowsers are used mainly for filling swimming pools	Negligible use

Table 9: Use of bowsers

Observations

- A small number of participants in the local, older group commented that they distrust bowser water because they would not know the source.

- One participant stated that he is concerned with the extensive use of bowsers, saying that he worries about the effect on the water table of so much extraction.

- One older female participant (local) who uses her well extensively said that she will not use bowsers after a negative experience in the recent past – she claimed that she did not like the taste of the water introduced into her well.

Topic 6: Perception of Reverse Osmosis

Older Residential	Younger Residential	Older Foreign Residential	Younger Foreign Residential
All participants were aware of RO and considered this to be the main source of water in the Maltese islands.	All participants were aware of RO and considered this to be the main source of water in the Maltese islands.	All participants were aware of RO and considered this to be the main source of water in the Maltese islands.	All participants were aware of RO and considered this to be the main source of water in the Maltese islands.

Table 10: Perception of Reverse Osmosis

Observations:

- As can be seen in Table 10 all participants across all sub-groups are aware of reverse osmosis and view this as the main source of water on the island.

- They have no negative attitude to it in terms of quality however in local groups concerns were raised regarding the environmental impact of reverse osmosis particularly in terms of energy consumption: one participant said that this reliance on reverse osmosis is a challenge that should be addressed.

- Domestic reverse osmosis systems were mentioned in one of the local older sub-groups and one of the local younger sub-groups in that these produced a significant amount of waste water and as such were not particularly effective in terms of conserving water. The same participant mentioned the value of having a secondary system that would use this waste water for flushing toilets. One participant in the younger sub-group said "I am against those reverse osmosis that basically waste 4 litres of water to give you 1 litre, it is a waste. That was the first question I asked companies that provide such equipment and that is what they told me. I had walked out I remember."

Topic 7: Attitudes to behavioural/lifestyle changes to conserve water

Older Residential	Younger Residential	Older Foreign Residential	Younger Foreign Residential
All participants expressed a willingness to make changes to conserve water to varying degrees; many said they already take active measures to do so.	There was a clear distinction in responses in this sub-group between participants who were householders and those who were still living with their parents. The former age group appeared more willing to take active measures to save water (see Table 8 on the use of well water above)	All participants expressed a strong willingness to make changes to conserve water to varying degrees and all already take active measures to do so.	All participants expressed a strong willingness to make changes to conserve water to varying degrees and all already take active measures to do so.

Table 11: Attitudes to behavioural/lifestyle changes to conserve water

Observations:

- In general terms and across all sub-groups there was a stated willingness to conserve water: motivation varied between cost management and environmental concerns.

- There appears to be a stronger drive to conserve water among the foreign participants (younger and older) compared to the local older participants; this observation is based on the terms in which this was expressed across the sub-groups and the strength of feeling that was conveyed.

- Measures described by participants to conserve water in their day-to-day routines included:
  - Opting for baths not showers and reducing the frequency of same;
  - Not leaving taps running unnecessarily e.g. when washing hands, hair or teeth; washing dishes etc.;
  - Using economic cycles in domestic appliances and only using these appliances when full;
  - Using domestic waste water (such as dehumidifier or air conditioner waste water) toflush toilets or water plants;

- Installing a dual flushing system;
- Using cooking water to water plants;
- Place a bottle in the flushing to reduce water;
- Using the cold water that comes out of the taps before it heats up for showering to fill buckets for flushing and other uses;
- Harvesting rainwater in buckets.

- One older Gozitan resident indicated that his commitment to water conservation had extended to building a reservoir at home at his own expense – this was the most significant measure reported in all the sessions. Again, in this case the individual cited both environmental and financial concerns as his motivation.

- Older local and foreign participants appeared to be the most committed to the above measures and appeared to have adapted their household habits accordingly; as a general rule, although with some notable exceptions (in which level of educational attainment may be a factor) younger local and foreign participants appear to take less active measures

- In the local sub-groups, an interesting conflict emerged between the attitudes to, and motivation for, water conservation between the participants (irrespective of age) who are responsible for managing household expenses and others who are not –this particularly refers to participants in the younger sub-groups who live with their parents. This motivation was not generally seen as conflicting with environmental motivation but complementary (the win/win point referred to under topic 1 above).

- Householders strongly expressed the attitude that a key motivation to control consumption is to manage their water bills and keep costs as low as possible – on this basis all expressed a willingness to take active measures to limit water use, including most of the measures listed above. In this context, and with reference to parents who had older children living at home, they expressed significant frustration with other household members (notably teenage children) who were prone to consuming water excessively (lengthy showers appeared to be the most notable example). One younger participant who lives with his parents said “I try to be careful however many times I leave the water running when brushing my teeth. It just happens.”

- However, it should be noted that even among younger respondents who do not pay household bills there were participants motivated to conserve water for environmental reasons: for example, one young (Maltese) female described how she uses one cup of water to brush her teeth and uses one bowl of water to wash her hair.

Topic 8: Attitudes to Grey Water

Older Residential	Younger Residential	Older Foreign Residential	Younger Foreign Residential
A number of participants informally use recycled domestic water to some degree. The same participants indicated a willingness to explore other ways of using this water including modification of plumbing systems A minority of participants expressed a distrust of using this water, mainly since they perceive it as being 'unhygienic' or contaminated with detergents.	Younger participants appeared to have no strong feelings on this topic; householders in this sub-group take some measures to recycle water already and most indicated a willingness to explore other ways of using this water including modification of plumbing systems	All participants informally use recycled domestic water to some degree. All participants indicated a willingness to explore other ways of using this water however in most cases are limited by the fact that they live in rented accommodation. Many of the participants were familiar with this concept from their experiences living in other countries.	A number of the participants informally use recycled domestic water to some degree. The same participants indicated a willingness to explore other ways of using this water however in most cases are limited by the fact that they live in rented accommodation. Many of the participants were familiar with this concept from their experiences living in other countries.

Table 12: Attitudes to grey water

Observations:

- The actions taken to recycle domestic water included using air conditioner, dehumidifier and washing machine waste water for watering plants or for flushing toilets.

- The only negative perception of grey water emerged among the older local residential group where a small minority expressed a distrust in terms of hygiene or detergent contamination.

- The participants who are already informally using grey water (irrespective of age) expressed a positive attitude to extending this use by modifying plumbing and fixtures accordingly; they demonstrated a positive attitude to using this recycled water for any domestic use except drinking, showering, laundry and cooking; a small minority expressed a willingness to consider

also using it for showering and washing laundry “as long as it is recycled” however there was some general resistance to this.

- Awareness of what the recycling will entail, and the quality of water produced, is poor among local participants – this clearly limited their willingness to consider using such water for washing or laundry.

- In this context it should be noted that those participants who expressed a willingness to carry out modifications in their homes to introduce domestic water recycling strongly stated that they would expect financial incentives to do so – in this context they referred to incentive schemes linked with solar panels or solar water heaters in the past. They clearly stated that without these incentives there was little chance that households would make the necessary changes of their own accord.

- As can be seen under other topics foreign participants were particularly irritated by the limitations imposed by the fact that they lived in rented accommodation and as such could not exert full control on their choices. One younger respondent stated that “it would be my appeal to the government to ensure that properties that are for rent are equipped with the necessary infrastructure to enhance water efficiency.”

Topic 9: Attitudes to water efficiency labels/ratings when buying ~~New Water~~water ~~using~~ consuming appliances

Older Residential	Younger Residential	Older Foreign Residential	Younger Foreign Residential
A minority of participants were unaware that such ratings existed or associated these ratings/labels only with energy and not water; other participants were generally aware and did consider these aspects when making a purchase.	Younger participants who were not householders were generally not as engaged on this topic; in a similar pattern that emerged under other topics, younger householders do look for these labels and seek them out.	All participants demonstrated a strong preference for appliances with such labels/ratings but in the majority of cases were limited by the fact that they lived in rented accommodation and had to make do with the appliances already in place.	All participants demonstrated a strong preference for appliances with such labels/ratings but in the majority of cases were limited by the fact that they lived in rented accommodation and had to make do with the appliances already in place.

Table 13: Attitudes to water efficiency labels/ratings when buying ~~New Water~~~~using~~water consuming appliances

Observations:

- In terms of local participants (irrespective of age) the point was made that grants would incentivise more people to seek out efficient appliances; in the case of those participants who were not as aware of these ratings as others, they expressed the view that only if these grants were available would they consider spending more on such appliances.

- The issue of rental accommodation was strongly made in both foreign sub-groups, in the context that landlords purchased the 'cheapest' possible appliances without any regard for conservation of water or energy and the participants in question expressed frustration at this fact; the point was made that incentives could be considered for landlords to invest in upgrading appliances to meet higher efficiency standards.

Commented [VVMaM&WA11]: Needs amendment as domestic do not have access to New Water

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Topic 10: Attitudes to New Water

Older Residential	Younger Residential	Older Foreign Residential	Younger Foreign Residential
A minority of participants were aware of the New Water initiative and were informed of its use in agriculture: they expressed a generally positive view of this development. Once other participants who were previously unaware of New Water were informed as to its source, a minority of these concluded that they would not consume products irrigated with New Water. A number of participants stated that, when it comes to agricultural products, they are far more concerned with the effect of pesticides and fertilizers than the source of the water used for irrigation.	There was significantly less awareness on this topic among this group and none had actually heard the term before. Once this wasexplained to them, they expressed similar views to the older participants i.e. that provided regular testing was carried out they had no significant issue. A majority stated that, when it comes to agricultural products, they are far more concerned with the effect of pesticides and fertilizers than the source of the water used for irrigation.	The majority of participants were familiar with the term and its use. All expressed a positive view without significant reservations. A majority stated that, when it comes to agricultural products, they are far more concerned with the effect of pesticides and fertilizers than the source of the water used for irrigation.	Some of the participants had not actually heard the term 'New Water' but were generally familiar with the process. Their attitude was positive in the sense that whatever the source, the necessary treatment rendered it safe. A majority stated that, when it comes to agricultural products, they are far more concerned with the effect of pesticides and fertilizers than the source of the water used for irrigation.

Table 14: Attitudes to New Water

Observations:

- Local participants (irrespective of age) were unfamiliar with the concept of New Water, apart from a minority of respondents in the older group who were very well informed.

- Once they understood the concept, and the fact that New Water is being used for crop irrigation, the majority stated that this would not affect their consumption of local products although two participants stated that they might think twice about consuming products that were eaten in an uncooked state. One other participant said that "he would prefer not to know." One other participant viewed this as a wholly positive measure and expressed the view that New Water was probably a safer water source than the alternative currently used (mainly groundwater).

- Three of the older participants referred to an impression they had that fruit and vegetable products watered with New Water did not have as long a shelf-life as those that were not: they stated that they had heard that this was an issue particularly in the Zabbar area. It should be noted that this point converges with feedback obtained from the agriculture stakeholder groups (see section 4.2, topic 14).

- The point was made by a significant number of local participants in both age groups that their acceptance of New Water (as consumers of agricultural products) was dependent on the element of trust, i.e. that they would be reassured knowing that authorities were regularly testing this water to ensure safety levels were met. Two of the participants in the older age group did state however that their choices would not be influenced by any "certificates" issued by the authorities stating that "In Malta we have some trust issues (when it comes to this sort of thing." Again, this point converges with feedback obtained from the agriculture stakeholder groups (see section 4.2, topic 14).

- Younger local respondents stressed that this use of New Water should be "normalised" through public education; they stated that certification and testing would help n this process, but the agreed view was that they should have the peace of mind that the authorities are managing the process and "checking it"; they stated that it is "not up to the citizen" to be concerned with this.

- In general terms, however, the overall attitude of local participants to New Water was positive and it was perceived as a positive measure that would boost agriculture ("help the farmers") and further conserve water in Malta and Gozo.

- This need for reassurance through testing was not evident in the foreign groups where they seemed to place full confidence in the fact that the water was being treated before use. One participant stated: "As long as it's processed it's just water."

- Younger local participants demonstrated a poor awareness of the fact that sewage is now being treated in Malta and Gozo and a significant number were not even aware that sewage treatment plants were now in operation.

Topic 11: Attitude to the Water Services Corporation (WSC)

Older Residential	Younger Residential	Older Foreign Residential	Younger Foreign Residential
Main association is with billing and this is perceived rather negatively. There was some criticism about services related to the fixing of leakages in public areas, with complaints that response was slow and that the result was the loss of large amounts of valuable water. This complaint was voiced strongly by Gozitan residents as well as a participant from the Southern region.	Poor awareness of WSC services beyond the association with billing seen with the older local participants.	These participants had little to no awareness of WSC services beyond billing – which they perceived rather negatively. A majority stated that they would be very interested in learning more about WSC and its services.	These participants had little to no awareness of WSC services beyond billing – which they perceived rather negatively.

Table 15: Attitudes to the Water Services Corporation

Observations:

- With the exception of the older local participants, there seems to be a widespread association of the Water Services Corporation purely with the billing process, with very little awareness of its role beyond that.

- There would appear to be little or no perception of the Corporation as a 'guardian' of the island's water resources or of it having a strategic or policy-making role in terms of water resource planning and management.

- Among the older participants, their knowledge of WSC services extends to that of monitoring and fixing water leakages; in this context, the perception was negative based on personal experiences where responsiveness was inadequate; on this basis the majority view was that the Corporation was itself responsible for wasting water resources since it failed to act in a timely manner to stop leakages. The underlying sentiment in this context appeared to be that it was hypocritical of the WSC to continually ask the public to conserve water when through its own inefficiency it was responsible for more water being wasted through leakages than necessary.

- Foreign participants had very low levels of awareness of the services offered by the Corporation. For example, when it was explained to them that the Corporation offered advice on water conservation in the household, including site visits where appropriate, they expressed great surprise. It should be noted that the majority of local participants, particularly in the younger groups, were similarly surprised.

- In this context some of the foreign participants stated that it would be very helpful to be given further information on these services as well as on water-related issues particular to Malta: they stated that this information should be given to foreign residents upon arrival.

Topic 12: Identification of Main Water Challenges

Older Residential	Younger Residential	Older Foreign Residential	Younger Foreign Residential
- Population increase due to tourism and rapid immigration; - Depleted water table; - No rainwater harvesting; - Overdevelopment which is reducing the amount of rainwater that can be absorbed through the soil to the water table.	- Climate change; - Energy cost of reverse osmosis; - Unnecessary stigma about tap water; - Lack of infrastructure.	- Not enough infrastructure to harvest rainwater; - Population growth; - No rainwater harvesting.	- Climate change; - Pollution; - Lack of sustainability.

Table 16: Identification of water challenges

Observations:

- It was noted that climate change was a reference across all the sub-groups, specifically linked to drought and the effects of that on the water table.

- Older residents were quick to pick out population growth (attributed to mass tourism and legal immigration) as being a very current challenge in terms of sudden increased demand on water resources. The sub-text in this matter seemed to be that whereas Malta had adapted to some extent to seasonal shifts in population caused by tourism, the recent upsurge in legal immigration ("foreign workers") was stretching water resources and infrastructure. It was interesting to note that older foreign residents also identified population growth as a challenge.

- One point we wish to highlight that emerged in the sessions for foreigners that was perhaps hard to pin down under one of the main topics was a running commentary that Maltese residents take water for granted and that there seems to be a lack of appreciation for its scarcity – they compare this to higher levels of awareness they have experienced in their home countries and elsewhere. In this context they presented it as a key challenge to improving the situation in the future.

- To a certain extent this sentiment was also echoed by the older local participants who referred to their memories dating back to previous decades when water was scarce and water-cuts were common. Their attitude was that this experience had instilled a readiness on their part to conserve water and not to waste unnecessarily – in this context they claimed that while their motivation now may be more concerned with keeping their bills as low as possible, their commitment not to waste water remained unchanged (the win/win argument).

- In this context they pointed to a different attitude among younger generations, which they attributed to never having experienced water scarcity leading to a casual attitude to it as a resource. A majority view was that the onset of reverse osmosis had been the game-changer, in that the sudden availability of an 'infinite' water source had led to complacency.

- A final observation concerns another aspect that emerged strongly across all sessions and was probably the point that elicited the most emotional reaction among the local cohort and, notably, long-term expatriate residents in the older foreign cohort: this concerned the impact of intensive construction and development across Malta and Gozo that was having major effects on quality of life. In this context, the impact on water conservation was referred to in that this development, due to lack of planning and enforcement, was not catering in any way for rainwater harvesting and this would have serious repercussions in the future.

- A secondary but associated point was that Maltese dwellings were changing: the traditional house was giving way to apartments leading to changes in lifestyles and habits. In terms of water, this was a challenge because access to wells, a traditional aspect of water management, was now being denied.

4.2 Probes Analysis: Residential Stakeholder Group

4.2.1 Probe 1 – Word Association

The first probe was given to the participants after a short discussion in the beginning of the session on the different types of water with clarifications provided on the different terms. Each participant was given a printed table of adjectives and list of three types of water: bottled, grey and tap water. They were asked to mark three adjectives for each type of water that they feel describes it the most accurately. The adjectives included both negative and positive expressions, and they were in alphabetic order to pre-empt automatic selection.

The overall results show that for bottled water the most common words were all positive, with 30.56% of responses identifying 'Clear' to describe this form of water, this was followed by 'Pure', 'Fresh' and 'Valuable'. Although the discussions following this exercise brought out that many people are concerned about the plastic waste generated by the consumption of bottled water (see section 4.1, topic 3), during this probe only 1.39% associated 'Waste' as an adjective with this type.

Grey water was described with a combination of negative and positive words, and there were no significant standouts. 'Cloudy', 'Impure', 'Reusable', 'Sustainable' and 'Unhygienic' were all chosen with percentages between 11% and 16%.

Tap water, even though not seen as a popular source for most of the participants, received only positive words, such as 'Clear', 'Valuable' and 'Reusable'.

Comparison of Maltese and foreign residents

When comparing the results of the word association between the Maltese and the foreign residents or between the younger and older cohort, there are a number of differences that highlight the different perceptions of these groups. For example, 'Cool' for bottled water and 'Cloudy' for grey water were chosen by almost no one within the foreign groups, while the same words were selected by 10.64% and 13.89% within the Maltese groups. This suggests that bottled water is slightly less favoured in the eyes of the foreigners, and grey water is perceived with less negativity. This converges with the observations noted in the qualitative analysis of the wider discussions on these topics.

Tap water, on the other hand, was described as 'Clear' only by 11.76% of foreigners, while 20.59% of Maltese participants opted for this word, and was seen as 'Reusable' by 17.65% of foreigners and only 8.82% of Maltese.

Comparison of younger and older participants

The only significant difference between the impression of the younger and older groups was noted in the description of grey water, where 20.73% of the older participants used 'Reusable', while the same adjective was used by only 10.26% of the younger participants.

4.2.2 Probe 2 – Water sources in Malta

For the second probe the participants were asked to try to estimate the percentage of the different water sources in Malta, choosing between ground water, reverse osmosis (RO) and rain water harvesting. The average response was that:

- the reverse osmosis system is the highest contributor to the residential use of water, providing an average of 63.15% to all water resources consumed in Malta and Gozo;
- Ground water was estimated to be the source of 21.76% of the water;
- the average guess for rainwater harvesting was at 15.09%.

Comparison of younger and older participants

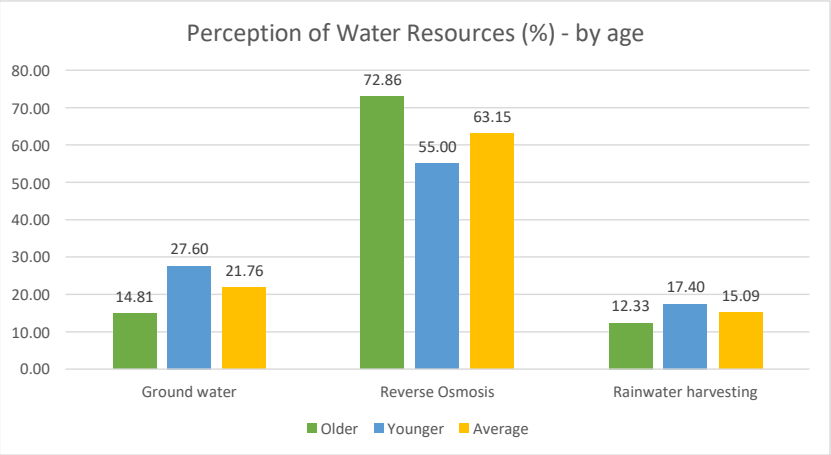

Figure 2: Perception of water resources by age

On average the older participants thought that Reverse Osmosis accounts for over two-thirds of the water provided by Water Services Corporation (WSC), the same source was estimated at only 55% by

the younger participants. The difference is then also reflected on the estimates of ground water, where we can see a reversed discrepancy – an average of 14.81% indicated by the older groups compared to the 27.60% by the younger ones.

It was a common theme amongst all groups, regardless of their age or nationality, that they expected rainwater harvesting to be much more significant in in terms of its contribution to the national water resources than it actually is. The average guess was between 12% and 18% for this type of water collection.

Comparison of Maltese and foreign residents

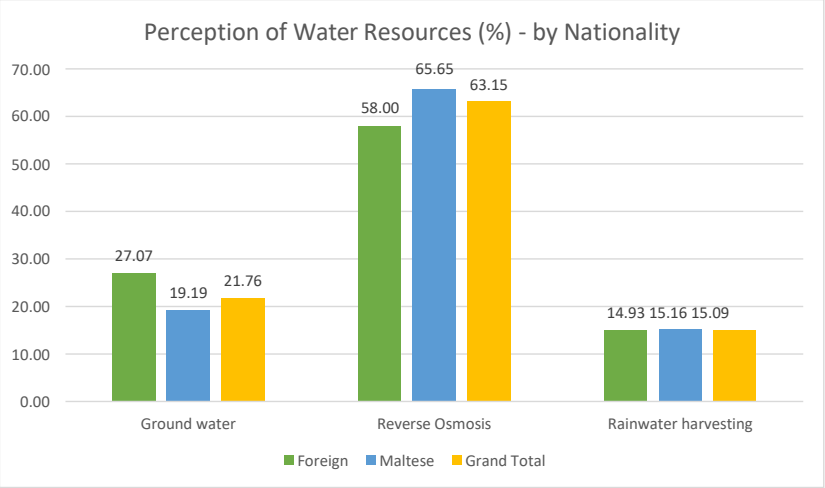

Figure 3: Perception of water resources by nationality

There was also a small gap between the assumptions made by local and foreign participants on the current 'water mix', where foreigners thought that the country relies more on ground water than Maltese participants did. Possibly this can be traced back to the fact that many other European countries can rely on their natural fresh water sources and are not in need of desalination systems.

4.2.3 Probe 3 – Sight test

For this probe, four types of water were collected prior to the focus group sessions – New Water from a treatment plan, ground water from a borehole, tap water from the Birkirkara office of ARQ EBI, and

bottled water from the water dispenser from the same office (San Michel, 18.9L bottle). The different kinds of water were presented to the participants in identical glasses with a coloured sticker marking them for the moderator, and each glass had an additional cup in front them to collect the participants votes for each type.

At the same time, the people were given a sheet of paper with all four types of water written on it, and they could just tear off these and drop them into the empty cups in front of the water-filled glasses.

The groups were advised that they could go near the samples, lift the glasses to look at them against the light, smell them, but were warned not to taste the water. Most people expressed their indecisiveness, as they could not tell the difference immediately between the sampled – in this context they explained that this was unexpected since they had expected that the New Water would be smelly or cloudy.

The overall results show that 75.00% of the guesses for all types of water were incorrect. In general, the younger participants performed slightly better, as in their case they guessed correctly in 31.00% of the time, compared to the 17.11% of the older groups.

Only tap water seemed to be recognised in a relatively high number of cases, where on average 40.00% of the participants could identify it correctly. In the case of younger groups, it even reached 52.00% percent. During the discussion they highlighted that only the sample of tap water had a strong smell, which many of them thought to be of chlorine, therefore they submitted their guess correctly as tap water.

There were only two other similarly concentrated cases, one of them being the sample of bottled water which was commonly identified as ground water in 44.68% of cases, reaching even 50.00% amongst foreigners.

The other incorrect assumption was that many of the participants thought that the sample taken from the treatment plan was, in fact, bottled water. Based on their mainly sensory reactions to the four types of water placed before them, 40.91% of participants classified New Water as bottled water. The ratio was even higher with the older participants, with 47.37% incorrectly identifying the New Water as bottled water and even reached 56.25% with foreigners.

Even though most of them did not claim that learning the real source of the samples would change their attitude towards New Water, partially the reason being that some of them did not have a negative opinion of it to start with, there were still a few people who were visibly positively surprised about the end product of the treatment plants.

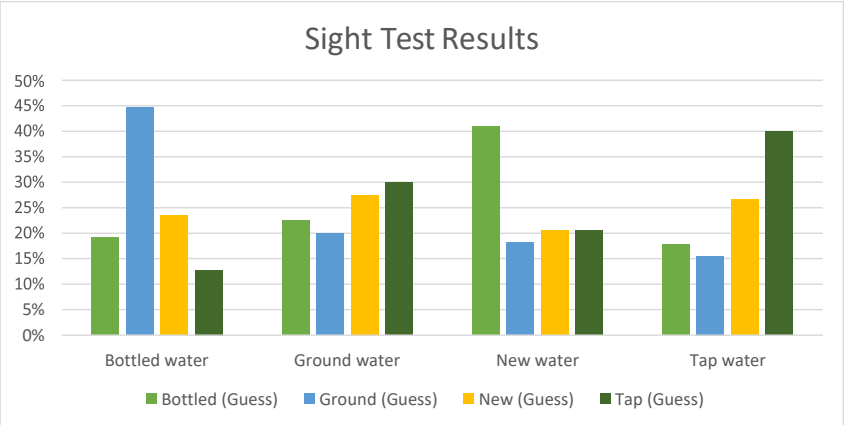

Figure 4: Sight test results

4.2.4 Probe 4 – Matrix of activities

The participants were given a matrix or table that displayed six types of activities on one axis, namely cooking, flushing, showering, washing clothes, washing your hair and water plants; with different types of water on the other axis (bottled water, grey water, ground water, rain water, New Water[1] and tap water). For each activity, they were asked to choose the types of water that they would be willing to use, assuming that they had access to all the different sources. They could choose more than one type of water for one activity.

Commented [VVMaM&WA15]: Kindly add a footnote to "New Water" to explain that whilst New Water will not be available for domestic use the probe test sought to understand the levels of confidence or adversity in the possibility if they were given the chance to use this resource in Malta. All sources of water here were made available to try and reduce the impact of the moderators opinion on the respondents.

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[1] Whilst New Water will not be available for domestic use, the probe test sought to understand the levels of confidence or adversity ~~in the~~to the concept among stakeholders ~~possibility~~ were they ever to be given the possibility of using ~~if they were given the chance to use~~ this resource in Malta. All sources of water ~~here~~ were made available during the test to ~~try and~~ reduce the impact of the moderator's opinion on the respondents.

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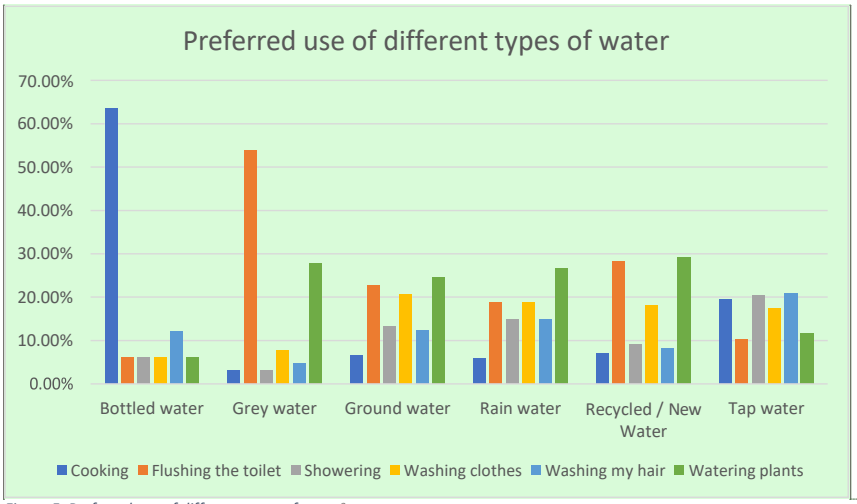

Figure 5: Preferred use of different types of water[2]

When analysing the data from the perspective of how participants would use each type of water, there are two remarkable outliers – that the main use of bottled water, apart from drinking, is for cooking, and that the majority of people would use, and might already be using, grey water to flush the toilet. These findings converge with the feedback obtained in the wider discussions on these topics as recorded in section 4.1 – one example mentioned repeatedly by participants who are already informally using grey water in their household refers to using waste water from washing machines, air conditioning units or dehumidifiers to flush toilets. The point of using bottled water for cooking, due mainly to a dislike for the taste of tap water, was also evident.

Comparison of Maltese and foreign residents

Some notable differences appear when studying the Maltese and the foreign groups. Looking at grey water, 60.61% of Maltese people chose 'Flushing the toilet' and 30.30% marked 'Watering plants', which leaves less than 10% of Maltese who would consider using this type of water for any other activity.

With foreigners the same water would be used for flushing in 46.88% of the time, for watering plants in 25.00% of the cases, which leaves almost one third of choices to be used for other causes, for example 9.38% would also use it to wash their clothes.

~~A similar trend is visible with New Water and tap water. Whereas no Maltese participants chose~~

[2] [2] Whilst New Water will not be available for domestic use, the probe test sought to understand the levels of confidence or adversity to the concept among stakeholders were they ever to be given the possibility of using this resource in Malta. All sources of water were made available during the test to reduce the impact of the moderator's opinion on the respondents.

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‘Cooking’ as an option for New Water, and 35.29% would use it for ‘Flushing’, the same activities were given 14.58% and 20.83% respectively, showing a higher ratio of trust in the process of filtering new

~~water, and a more diverse use for this type. Since in many other countries the treatment of sewage is normalised and is not a new method of creating higher class water, foreigners seem to have a positive perception in usage from this water source.~~

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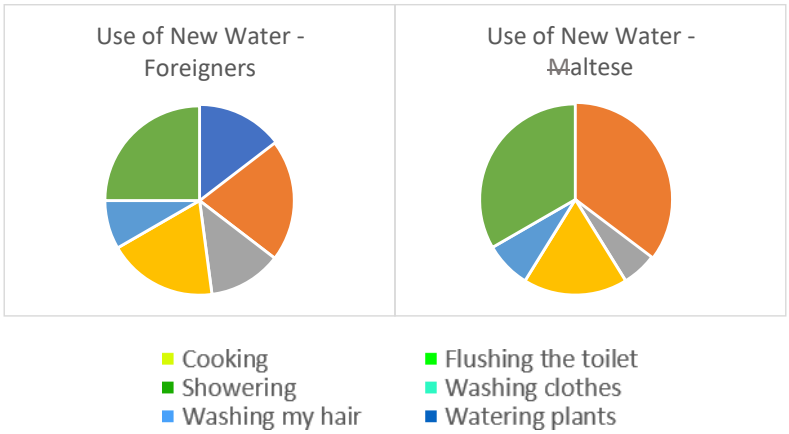

~~*Figure 6: Use of New Water*~~

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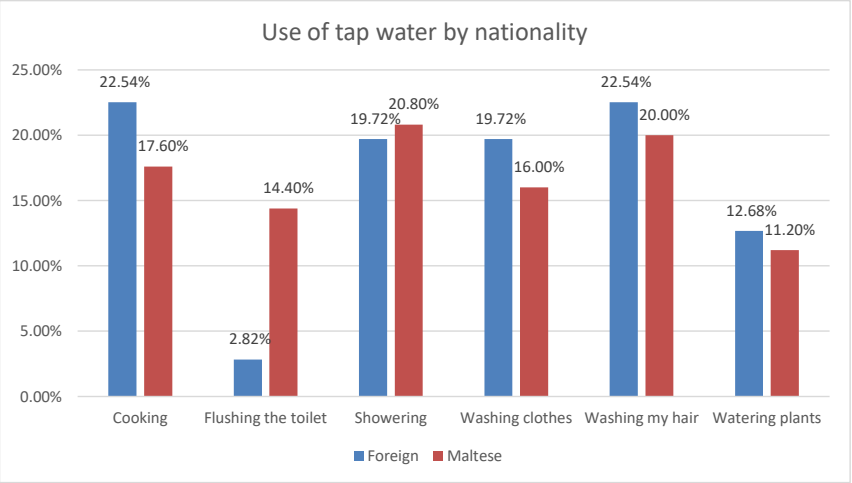
When it comes to tap water, foreigners selected it for use in all activities relatively equally with the exception of flushing, which was chosen only in 2.82% of cases: for this activity they preferred alternative types of water. Even with the scenario given, that all types of water are available, Maltese residents still chose tap water for flushing in 14.40% of the time.

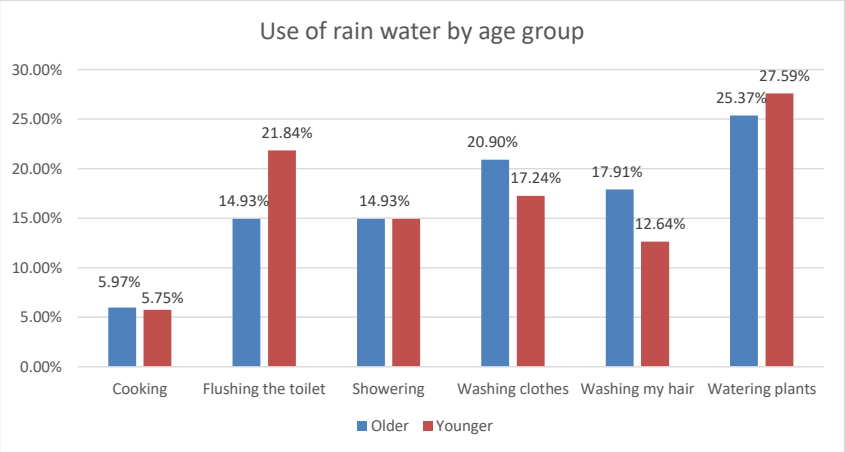


For the use of rain-water similar trends were seen between the local and foreign participants, for example both groups chose the activity of watering plants most frequently for this type of water – 29.09% of foreigners and 25.25% of Maltese participants - whereas the activity~~,~~ for which they would choose rain-water least often~~,~~ was cooking. For Maltese it was 4.04% and for foreigners it was 9.09%, which ~~is~~ although more than double of the ratio of Maltese people, is still ~~still~~ is the lowest number of mentions for the rain-water using activities.

Comparison of younger and older participants

A number of discrepancies were also identified when reviewing the data separated by age groups. Bottled water would be used in 72.73% of the time for cooking according to the older age group, while younger people seemed to utilise this type for other activities as well with cooking at only 59.09% for this cohort. The ratios of 'Flushing' with grey water was almost identical in how it was represented between the locals and non-locals, but in this case the older group had it at a lower share, at 48.15%, and the younger participants would use it for the same purpose in 57.89% of the time.

When it comes to ~~rain water~~rainwater, the younger participants would use it mainly for secondary and tertiary usage, such as watering plants and flushing the toilet. The older participants seemed to be more comfortable ~~to use~~with using rain-water ~~on~~in a wider spectrum of activities. For example, ~~, and~~ they showed higher willingness to wash clothes or wash their hair ~~through~~using this source.



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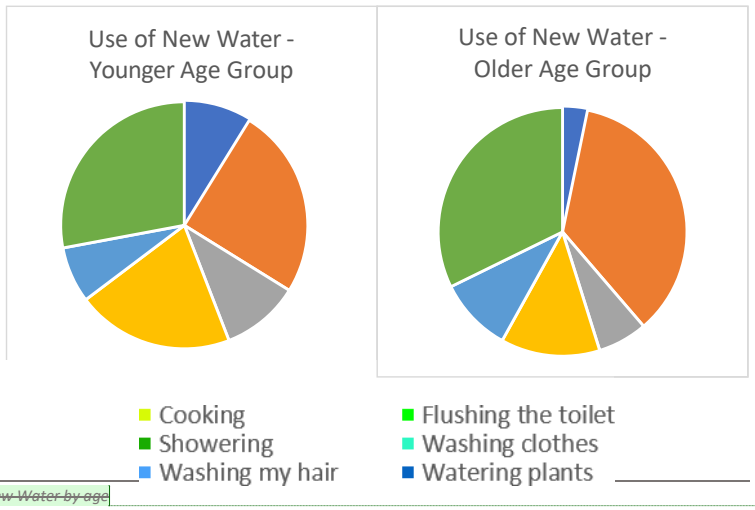

Figure 7: Use of New Water by age

Perceptions of New Water and how it would be used was divided between age groups too. The older participants in approximately one third of the time would use it for watering plants, in another third for flushing, and the rest is shared between cooking, showering, washing clothes and washing hair. On the other hand, younger people expressed that they would be willing to use New Water for 'Washing my clothes' also in a higher percentage, following the same leading activities as the older groups pointed out.

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When studying the results from a different perspective, where we concentrate on which water source is preferred over the other for a certain activity, the outcomes are similarly insightful.

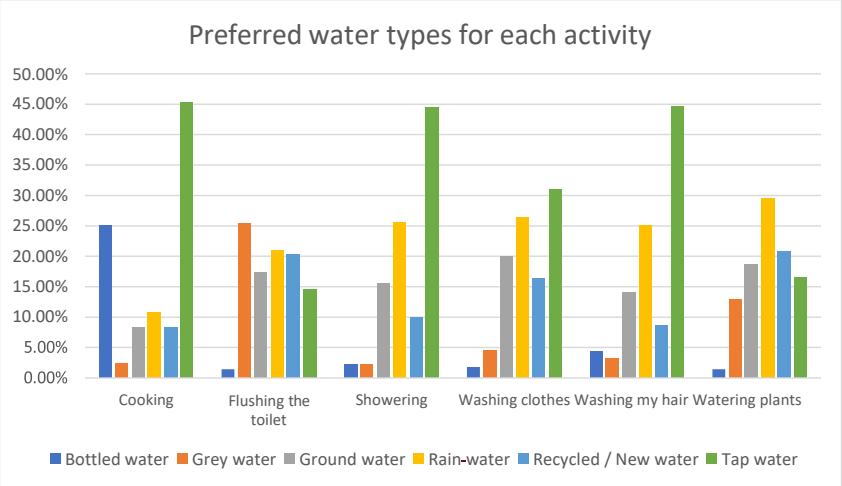

Figure 8: Preferred water types for each activity[3]

The above chart shows that tap water is favoured over all other types of water for most of the activities indicated, except for those that, in fact, do not require first class water, like watering plants and flushing toilets. For cooking, 45.24% of participants would choose tap water, however a quarter of the participants would still opt for bottled water. To shower, likewise, tap water was the choice in 44.44% of the time, but 25.56% would even use rain-water for this purpose. In general, people appear to perceive rain-water as a good alternative for most activities, which is demonstrated through the fact, that with the exception of cooking, rain-water was given a share of more than 20% for all other activities.

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[3] [3] Whilst New Water will not be available for domestic use, the probe test sought to understand the levels of confidence or adversity to the concept among stakeholders were they ever to be given the possibility of using this resource in Malta. All sources of water were made available during the test to reduce the impact of the moderator's opinion on the respondents.

Comparison of Maltese and foreign residents

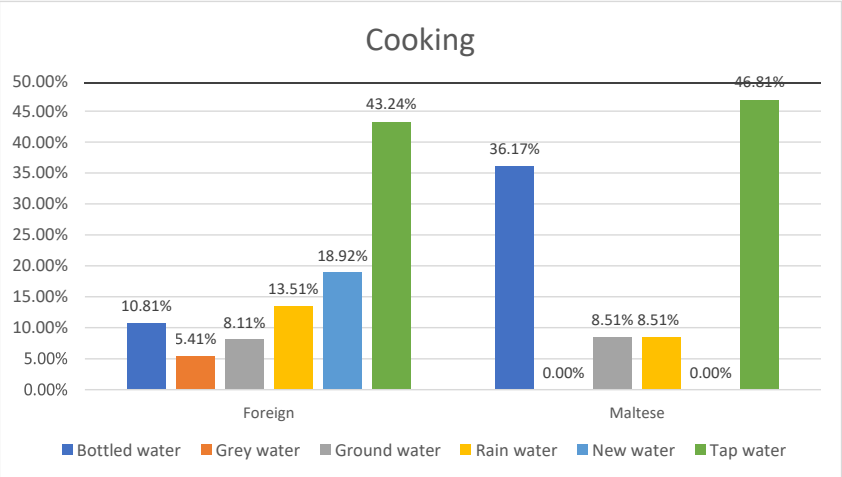

Figure 9: Preferred water type for cooking – local and foreign residents[4]

A substantial difference was recognised when examining the choices of water for cooking purposes. Tap water was the source of choice for both groups, however the second in line for Maltese participants was bottled water with over one third making this selection, while the same place was given to New Water amongst the foreign participants, which was not even considered for this purpose by the locals. With foreigners even rain water received 13.51%, and only the fourth choice would be bottled water with as little as 10.81%.

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[4] [4] Whilst New Water will not be available for domestic use, the probe test sought to understand the levels of confidence or adversity to the concept among stakeholders were they ever to be given the possibility of using this resource in Malta. All sources of water were made available during the test to reduce the impact of the moderator's opinion on the respondents.

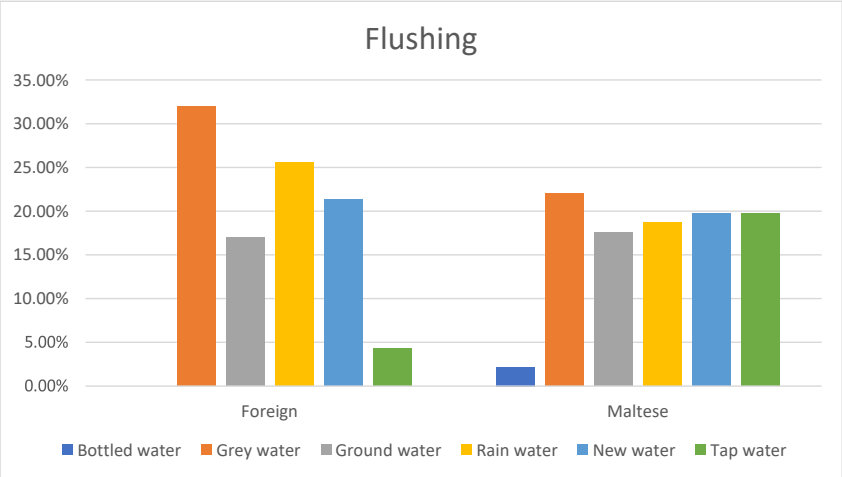

Figure 10: Preferred water type for flushing – local and foreign residents[5]

As mentioned before, the activity of flushing the toilet was one of the only two categories where tap water was not the leading source, however amongst the Maltese residents it was still given more or less the same percentage as the other lower quality water sources, while it reached a significantly lower share with foreign residents, which shows a higher inclination towards switching to other sources among that cohort. In fact, when prompted if they would be willing to use provided grey water to flush the toilet, only the older locals pointed out that they would not necessarily trust it nor would they be willing to change this view due to concerns about possible damage to the toilet apparatus.

In general, the Maltese population appeared to be more in favour of utilising rain-water for more than just flushing, as on average it was given 8-11% higher votes on for showering, washing clothes and even for washing their hair.

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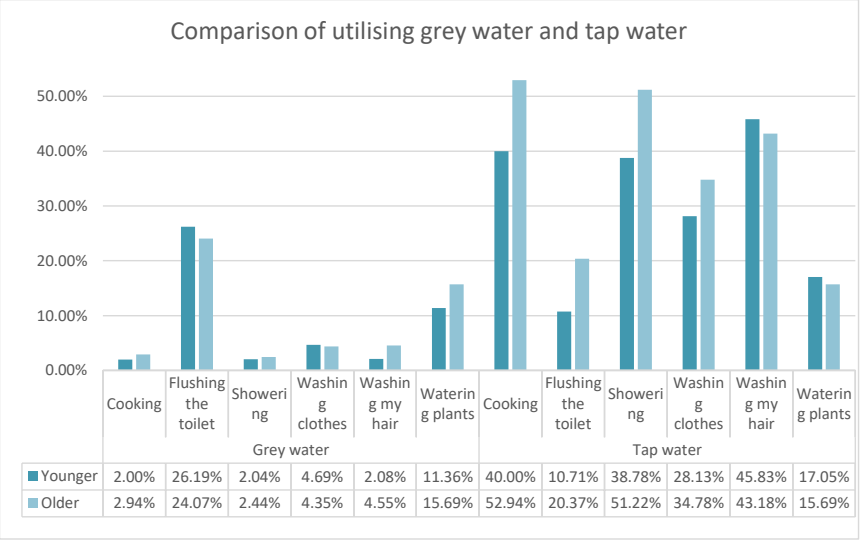
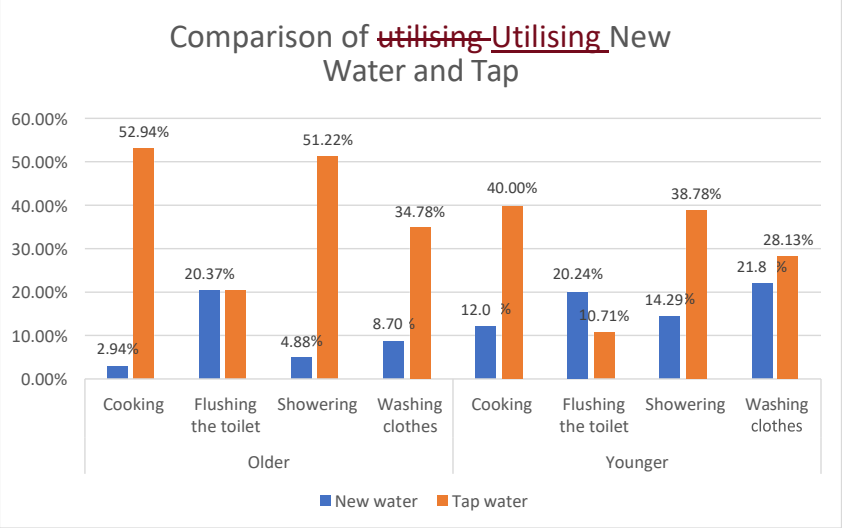
[5] [5] Whilst New Water will not be available for domestic use, the probe test sought to understand the levels of confidence or adversity to the concept among stakeholders were they ever to be given the possibility of using this resource in Malta. All sources of water were made available during the test to reduce the impact of the moderator's opinion on the respondents.

Comparison of younger and older participants





~~*Figure 11: Comparison of utilising New Water and tap water*~~

~~The main differences between the younger and older generations can be discovered in their attitude to New Water and tap water. In four out of six categories there were 9-14% gaps in the chosen usage of these sources. For example, over half of the older participants would opt for tap water when~~

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~~cooking, while it is only 40% with the younger cohort who would do so; similarly, 9.06% more younger participants would consider New Water for this purpose. When flushing the toilet only 10.71% would want to use tap water amongst the younger participants, while with the older cohort tap water and New Water would be considered equally at 20.37%.~~

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The results of this exercise suggest that grey water is not yet accepted as an alternative to tap water. Only 2-5% of the participants would use this source for most of their activities. The only two exceptions were flushing and watering plants, for these activities grey water reached more than 10% with both age groups. The percentage of participants who would choose grey water over tap water, was only higher for the flushing of toilet, where the lower-class water seems to be more accepted. Even though both younger and older participants had higher rates of choosing grey water, with younger participants more then twice as many people chose grey water, whilst with the older generation the difference was less than 4%.

The trend is the same in all categories: the older generation seems to be more reliant on tap water than any other water source, while the younger generation appears to be more open to utilising alternative water resources for most activities.

4.2.5 Probe 5 – Price Awareness

During the discussion on the participants' domestic water use they were asked to give an estimate on what they think the residential water tariffs are. They were told that the two tariffs are based on the amount of consumption, the lower one given to those who use less than 33 cubic metres in a year, and the higher one is for those who use more than 33 cubic metres of water in the same period

Prior to giving their estimation, most of the people expressed that they would not be able to guess the price of one unit, and in fact some people did not give their input for this probe in writing. The general feeling during this topic was that the average person living in Malta does not check the price per unit for water with some of them asking if the information is available on the printed bills.

The result for those who were willing to give their guess in writing illustrated that, in fact, there is very little knowledge on the price per unit.

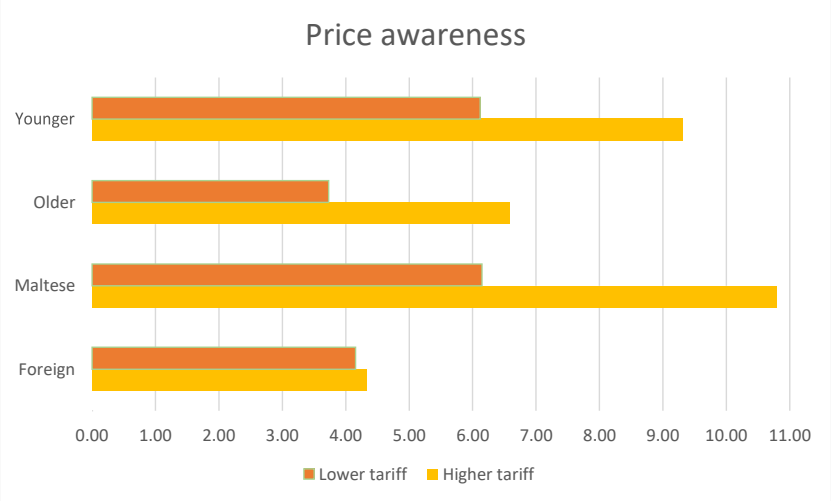

Figure 12: Price awareness

The overall average was €5.46 for the lower tariff, and €8.56 for the higher one, with significant differences between the cohorts. When looking at the younger and older generations a discrepancy of 30-40% in price appeared for both rates. In fact, the older participants frequently referred to the "young ones" as the biggest contributors to high water bills, due to their lack of attention to their own consumption, since they do not have to pay the utility bills (see section 4.1, topic 7). This view seems to be justified based on the data acquired through this probe.

A more surprising difference was identified between the assumptions of prices of Maltese and foreign residents. The Maltese residents guessed on average an additional €2.00 for the lower rate and expected the higher rate to be twice as much as the foreign residents did, with their average guess being around €10.00.

During this exercise the lack of knowledge on the measurement system appeared in most groups, where almost no one could not quantify the unit of one cubic meter, and it was explained to them as 500 two-litre bottles.

Commented [VVMaM&WA33]: Is this the price per unit of cubic metres?

Commented [AM34R33]: Yes, we referred to one cubic metre as the standard unit.

Observations on the wider discussion:

- Even though the average guesses were much higher than the actual rates are, when asked if they consider the price of water provided to them being cheap or expensive, some people perceived the tariffs to be expensive.
- On average the younger participants did not see the rates to be expensive, two groups out of the three younger ones were visibly surprised by the actual rates when they were revealed to them. They felt that the prices are too cheap to encourage even the cost-driven people to save water, while others expressed their realization on how expensive bottled water is when compared to the cost of tap water.
- In general, all the older residents found the higher tariff to be expensive, one group specified that the lower tariff is cheap, but found the higher rate too high. The older group of foreigners at first thought that the water rates are expensive, but one person mentioned that considering the expenses of the maintenance of the Reverse Osmosis system, it actually seems cheap. The other group members were in agreement with this statement.

4.2.6 Probe 6 – Role Play

For this probe two scenarios were given to the participants of each group. In the first one they needed to place themselves in the role of a member of the Water Services Corporation (WSC) team that has been tasked with undertaking a marketing campaign to convince the residential or foreign groups to start using more water efficient technologies and recycled or second-class water at home. They were asked to prepare the main promotional messages and tools that they would recommend using in order to convince their group, and to come up with the channels that should be used to spread these messages. In the second scenario they were requested to think as if they were the representatives for the residential or foreign groups, and they needed to meet WSC to express their opinion and impression on the different technologies and using lower class water. They needed to explain what was holding them back from changing their consumer behavior and how could they be convinced to shift.

The two exercises often were discussed together, and the answers were overlapping for the different questions, therefore the analysis also has some repeated points in the different sections.

Question: What would convince you to make a change in behaviour and equipment?

To answer the question, all groups had agreed that financial reasoning is the only way to reach everyone, however they had very different ways to address this. Most groups mentioned some kinds of incentives and grants to be offered in order to convince people to switch to more water efficient technologies, for example for aerated faucets. One older resident highlighted the fact that it is important that the application process is not long drawn out or overcomplicated, because some people will lose interest. Another person agreed with this point, mentioning that in hindsight, when considering t her experience with the grant for solar panels "I would have just stayed as I am".

Another suggestion made was that there should be reduced prices for technology, like water filters, that can help people to reduce their consumption of bottled water, and the difference in price should be visualised, like one cubic meter of water at the price of €5 is, in terms of the volume of water acquired, equals to 83 six-packs of water, which they would buy at a much higher price.

A third suggestion was that promoting sensor water taps could be an effective way for families to reduce consumption, as many parents explained that they have less control over the children's water use than their electricity. They described that while they can just switch off the light if the kids had left it on, they cannot always be next to them to, for example, close the tap while they are washing their hands or brushing their teeth.

Question: What was holding you back from changing until now, if anything?

A common theme emerged during this conversation in that most people do not feel that they have enough information on the topic, both from a technological point of view, as in not being aware of some of the tools and appliances that could be implemented, and also from a knowledge point of view, where they would not know exactly where they could be saving water, and therefore money. A person from Gozo said that "An issue would be expertise, it's not just a matter of money. I would need expertise to guide me on what technology I should use."

A few surprising points were mentioned in the younger foreign group, where they felt that there was not enough stress on the water scarcity of the country. In this context they recommended a two-pronged approach:

- Increase the price of water; and,
- Reduce the price of the technology that could be deployed in the household to manage consumption.

This indicates that, while they were also looking at the financial side, their point of view was not only trying to save money for the residents, but to drive people to save water if they want to avoid spending more on bills. One of them felt that currently water is too cheap to care about saving it.

An issue that is specific to those who are renting accommodation, a situation which understandably affects a higher proportion of foreigners, is that often they are held back from changing their practices because they do not have control over the appliances that they use. Many of the younger foreigners mentioned that most of the appliances had already been installed in the flats when they moved in, and that the landlords are not incentivised to invest in modern technology, as they are not the ones paying the bills. A young woman felt very strongly about this topic, mentioning that there should be standards implemented, and the government should be asked to ensure that properties that are for rent are equipped with the necessary infrastructure to enhance water efficiency. A similar measure could be enforcing that the rent can be increased only for those properties where some of the funds received are re-invested in the same building to make it more energy and water efficient. This could benefit all parties.

Question: What messages and tools would you use to reach the local and foreign residents?

An interesting parallel was drawn between the recycling campaign and the potential campaign for water efficiency. It was mentioned that many participants were encouraged by the checklists that were created to guide people on recycling, and the basket that was handed out for organic waste. They expressed that a similar gesture, for example giving a bucket to every household to collect the cold water before showers and use that water for irrigation or cleaning. While it cannot be ensured the bucket is going to be used for this purpose, it could act as a constant reminder to make some effort to save water.

Some fixtures could be even handed out as a trial, so that people could actually experience the difference on their water bill. Once they know that it is effective and they can save money, they would be more willing to invest in it themselves. This could also create a chain affect where the experience is shared even with those who were not part of the trial group, who by learning about the gadgets and their effects through their peers' or family members, would be motivated to seek these options.

During one of the sessions for the younger groups of Maltese residents, the participants were visibly shocked by the fact that every flushing uses 20 litres of water. This gave them the idea that such strong facts with numbers should be communicated more often, because it is a great eyeopener. An older residential group also reached a similar conclusion that numbers and values need to be highlighted, where they suggested that there should be a campaign that puts a price on every water using activity, for example every time you shower it costs you 50 cents, or you are flushing down €2 every day in your home.

They also maintained that visualisation is very important, because being told about your consumption for a whole month in cubic meters is not something that people can imagine, while the image of seeing

10 two-litre bottles for one flushing is something that will stay with you. This point was also illustrated in the wider discussion on water tariffs since all participants across all residential groups were once again very visibly surprised when informed that one cubic metre of water was equivalent to five hundred two-litre bottles of water – they visualized this as being "a vanload of water."

Participants suggested that some kind of technology should be implemented that helps the consumers monitor their usage, for instance abroad there are mobile apps that are linked to sensors in the drainage system, and the users receive a signal is the consumption seems to be abnormal.

While discussing the quality of tap water some foreigners brought up that they were discouraged by locals to drink from tap water, so they recommended informing foreigners that regardless of the potential smell of tap water, it is still safe to drink. It was suggested that a booklet with information on basic knowledge about life in Malta should be handed out to everyone who is registering for residency, so that they would learn from facts rather than being misinformed through peers. This booklet could be a summary on water, tariffs, giving tips how to save water, how to recycle, together with other non-water related information.

Feeding into the same point would be promoting educational messages to locals so that they do not discourage other Maltese or foreigners to drink tap water. It was also mentioned that water testing kits could be distributed, so that people would be able to learn exactly the quality of water that is coming out of their own faucet. Another way of proving the safety of the water would be to publish a weekly chemical analysis published on an official website, presented in such a way that it is immediately understandable and bearing the endorsement of a trusted body (possibly external to the WSC).

An average household consumption by family size could be communicated to the public, so that everyone can compare their own bills, ascertain if their consumption seems to be normal or abnormal, with the possibility of requesting an audit in order to check the reason for such high-water usage.

Question: What channels would you use to reach locals and foreigners?

Apart from the mainstream and traditional print, broadcasting and social media channels, the most commonly mentioned channel was education. The majority of the participants had some kind of experience in which children with access to water education campaigns at school were influencing the behavior of other family members. A significant number across all sub-groups mentioned instances where children return from school and enthusiastically explain to parents and grandparents what they have learnt. They often then proceed to remind adult relatives to incorporate water and energy saving habits in their daily lives.

A valid point was brought up in a younger residential group in that such education should be carried beyond primary level and should also target secondary and post-secondary students as well, since they are going to be the ones who may soon shift to independent living and as such can be informed about choosing more water efficient technologies. They stated this in the context that it was far easier to convince people to introduce new appliances when they are purchasing or doing up a new home rather than persuading householders to modify or replace existing facilities.

The most common media channels mentioned were advertisements on television, radio and social media, with the exception of foreigners who do not watch Maltese channels for the obvious reasons related to language barriers. While the above-mentioned media outlets were advised in every group, an interesting aspect to it was raised by a young, local resident. He said that "You have to teach people by 'accident', in a joke or you put messages in a movie. It's much better than a documentary, very few people watch documentaries." His explained his point further, that while some science-minded people would be happy to watch an official documentary about water and its scarcity in the country, it would be much easier to reach a wider group by combining it with entertainment. His example was to teach kids, through a movie and a story, like Nemo getting lost in New Water, but he actually survives, because it's perfectly safe. The message is still passed on to the viewers, but they do not lose interest due to the added story dimension.

5.0 Agriculture Stakeholders

In the course of the first session held for farmers on 14 February 2019, it was immediately evident that this stakeholder group required a different moderation style to that employed for the residential group. In that first session and subsequent sessions for this stakeholder group we therefore recalibrated the moderation style to ensure that participants felt at ease and spoke their minds freely. As indicated in the analysis below this was done without compromising the quantity and quality of the feedback obtained, with the result the key topics identified in the moderator guide were adequately covered. However, for the reasons referred to above it was decided not to apply the probes used for the residential group. As will be brought out in the analysis below, however, the key topics upon which the probes are based were still covered.

One point to highlight before entering the analysis is that it was immediately clear that this stakeholder group is currently facing several challenges directly affecting their sector. It is in fact very telling that in the weeks during which the sessions were held, the national media carried headlines such as "Farmers giving up because they feel cheated, not because of hard work - Local agriculture is facing a slow, agonising death,"[4] and "Farming Sales down by 9% Last Year."[5] The major damage caused by the storm of 3 March 2019 was also a factor for the last two sessions (8 and 9 March) in that it was a very recent event that had a direct and negative impact on this sector.

Most of the participants felt very strongly about these wider issues and this came across throughout the sessions. This created a somewhat emotional context to the discussions which had to be handled very carefully. At points in the discussion therefore dialogue did divert to non-water issues however with careful moderation this was brought back 'on topic' so that the most salient feedback was collected.

For this reason, it was decided not to apply the probes, due to the risk of alienating this particular group's attention, but to focus more on prompted yet open-ended discussion on the key topics.

For the purposes of analysis, unlike the residential category we have dealt with these stakeholders as a homogenous group, although certain differences between full and part-time farmers, as well as issues that appear to be specific to Gozo, are indicated.

[4] 'The Times of Malta'. 18 March 2019.
[5] 'The Times of Malta. 1 February 2019

The analysis below identifies the topics raised, records the feedback obtained, and outlines the most salient observations on this feedback.

Topic 1: General awareness of water sources

- All the participants with one exception appeared to be well informed about water sources in Malta and Gozo, correctly identifying ground water and desalinated water as the two main sources, with largely correct assumptions on what percentage each of the two contributed to overall usage.
- Perception of water derived from reverse osmosis for agricultural purposes is overwhelmingly negative and none of the participants considered it as suitable.
- All participants confirmed awareness that rain water forms a negligible component of our water sources ("All our rainwater goes into the sea").
- For this stakeholder group ground water is immediately associated with borehole extraction.
- When it comes to reverse osmosis, participants in each session commented on the associated energy consumption ("I was told that 20% of the energy from the power station goes for the reverse osmosis").
- When referring to groundwater, the point was strongly made at each and every session that reduced rainfall as a result of climate change is affecting the quality and supply of ground water ("If it doesn't rain ground water is going to be reduced").
- When asked specifically about water sources for agriculture, participants identified ground water and New Water as the two main sources at the current time.

Topic 2: Groundwater

- Declining groundwater reserves due to poor rainfall seemed to be the main concern across all four sessions and there was frequent reference to the below average rainfall in the last four years (although this was generally in the context that this year's rainfall was better).

- Declining groundwater reserves leading to a greater concentration of salt is a second concern: One participant stated that he had been informed by a water expert that his soil was being "ruined" with the water he was using i.e. groundwater.

- A further concern is contamination with sewage: a number of participants revealed a perception that sewage overflows and leakages are widespread and that these are contaminating the water table ('*il-pjan tal-ilma*'): participants referred to areas such as Mellieha, Mgarr and Mizieb where drainage overflows are contaminating the water.

- One participant felt that bacterial contamination was an issue ("There are people in Mgarr who tested the water and they were told that ground water is contaminated with bacteria") – when this was voiced all participants forcefully agreed; a similar concern was raised (unprompted by the moderator) at the session in Gozo.

- Opinions were divided as to whether ground water or New Water was the best option after rainwater for irrigation. One full-time farmer with 60 *tumoli* of land said that he avoids using groundwater extracted through boreholes as much as possible and only as a last resort: he cited the reason as being that this is too salty ("what you water with it you kill it").

- One participant stated that the government always hides problems with contaminated groundwater, preferring to blame farmers for this contamination (e.g. reference was made in this context to the issue with nitrates that has been blamed on the use of animal manure) rather than admitting to sewage outflows. As he put it "It is always the farmer that takes the blame".

- Although the majority of the participants, especially the full-time farmers, appeared to be aware that groundwater was fast depleting and needed to be conserved, at least two participants indicated that this was not an issue for them and their attitude appeared to be that since there was no cost attached to the actual water usage they did not see the need to minimise use or seek alternative sources from a water conservation perspective ("Since we only pay for the electricity and not for the water, we are not concerned.") In this context they stated that if they had to pay for using ground water by volume it would not be worth it.

Two further points on this topic were raised exclusively among the Gozitan group.

- Inappropriate extraction of groundwater:

  - All present complained very strongly that they have a persistent problem with other users (ascertained to be registered farmers, hence their access to the boreholes) over-extracting ground water from boreholes to fill swimming pools for the many farmhouses in rural areas. Reference was also made at this point to similar extraction by bowsers for construction purposes. They complained that this 'over-usage' means that farmers are not finding enough water to use, complicated by the fact that this situation is making the water too salty for many farming uses;

  - In addition, they argued that these other users are extracting the best quality water at the higher levels of the water table, stating such high quality is wasted when one considers what it is ultimately used for (i.e. pools and construction) whereas it would contribute to better quality crops if it was used in agriculture. In fact, all present agreed that certain more delicate crops (e.g. strawberries, broad beans, many herbs) cannot currently be watered only with groundwater since this is too salty and has to be mixed with other sources preferably rain water.

  - They argued that this use of the groundwater for non-agricultural purpose on such a wide and persistent scale is damaging their livelihood. They envisage that this practice will increase however unless something is done by the authorities. One suggestion they made is that for these non-agricultural purposes (construction/filling of pools), New Water could also be used rather than ground water.

    They described their situation as follows:

    "The problem is that he is not even a real farmer. He has given up all his fields for wheat and he is selling the water we need. He is selling more than 70,000 euros worth of water each Summer. And he has dried us out in the process."

    Another Gozitan farmer said:

    "The best water in Gozo is going into all the swimming pools. So what if they have permits. It is such a problem"

It should be highlighted that this particular issue appeared to resonate strongly with all the other farmers present, particularly the full-time operators, and the tone in which it was discussed was heated and emotional.

Nitrates' contamination of groundwater:

- The full-time farmers present referred to the ongoing debate regarding nitrates in groundwater, in the context that this was alleged to be caused by the use of manure and slurry by farmers. They disputed very strongly that this was credible and maintained that if applied correctly, the use of slurry would not contaminate groundwater. One continued:

  "Since farmers cannot use the slurry, the government is taking it. It is ending up at the recycling plant as well. And now this plant has an even greater problem because it is not coping with the amounts going into it."

Topic 3: Perceptions of Boreholes

The majority of the participants, with particular reference to the full-time farmers, voiced significant concerns on the use of boreholes even though the majority used them on their own land; their perception was that the number of boreholes was now excessive, and extraction was uncontrolled ("everyone is taking water from them without any control"). From ensuing discussions, the following points emerged on this topic:

- One key reason for this concern was that this over-extraction through boreholes was clearly leading to further depletion of groundwater and, as such, increasing issues in terms of the quality of that water (salinity, nitrates etc.).

- The activity involved in extraction through boreholes was also stirring up the water excessively, leading to further quality issues ("I have three boreholes but if I draw water from it for three days then I leave it idle for at least six days to let it settle again")

- Two full-time farmers complained about the meters on boreholes and said that the water should be extracted for free, however the majority of participants did not appear to have an issue with the meters.

- One farmer stated "It's all from boreholes now I think. Since they started in the 1990's they increased and now there are so many of them. It's all we rely on really. Who doesn't use boreholes?" He made this point quite strongly and emotionally, stating that all other sources have been depleted mainly due to over-development:

  > "What do you want to do? Collect water from the roads like my friend her does and poison everybody? Our valleys? Our valleys are finished. So where else do you want us to get our water?"

Topic 3 Participants' general practices in terms of water sources used

- All participants without exception perceive rainwater as being the preferred water source – this did not come across in terms of cost savings (i.e. rainwater as a free resource) but more in terms of the benefit to their product: the target appears to be in all cases to have sufficient wells on their property and for these to collect as much of the natural rainfall as possible.

- All participants, with the exception of one part-time farmer, had wells or reservoirs ('*giebja*') on their property, some of which were old and pre-existing, while a minority of the full-time farmers across all for sessions have recently invested in constructing new ones.

- In all cases however it emerged clearly that, with a few exceptions discussed under topic 2 above, rainwater needs to be supplemented in the dry months by other sources of water: in the majority of cases this is with groundwater, or New Water if that has become available in their area.

- One participant stated that his main source of water is a reverse osmosis system which he had installed having obtained the necessary funding.

Topic 4 Irrigation methods

- All participants except for two part-time farmers with smallholdings use drip irrigation systems in their fields. This is seen as the most efficient means of conserving and managing consumption.

- Irrigation systems are adapted to the product – e.g. micro systems are used for more delicate plants and seedlings (there was one full-time farmer specialising in herbs who used this system); at least five other participants also use sprinklers for certain crops which tend to require more water, particularly potatoes.

- Two participants use 'rain guns' in addition to their drip irrigation system.

- Coping with irrigation in the dry seasons are obviously a major concern (and cost) to the participants and frequent reference was made to this becoming an increased challenge due to reduced rainfall.

- The wind is also identified as a climate challenge in that it dries crops so that more irrigation is required.

- Differences were pointed out in terms of irrigation requirements based on locality and type of soil: one participant said that his fields are in Dingli where the soil is drier; one other participant states that the key difference is white vs red soil: white soil has less organic matter and contains more clay - it therefore "doesn't keep a lot of water," - while red soil "stores more water."

- The full-time farmers tend to use computer technology to regulate their irrigation systems, controlling frequency and duration; in other cases, flow meters are used.

Topic 5: Rainwater harvesting

- The majority of participants appear to place high importance on having water storage facilities such as wells or reservoirs (they refer to these collectively as 'giebja') with the aim of keeping these as full as possible particularly to meet their needs in the Summer months (see topic 3).

- In terms of taking active measures to harvest rainwater for these facilities, these appeared to be mainly opportunistic and reactive: two participants stated that they had made arrangements with "the Minister" to harvest rainwater draining from nearby roads ("I arranged with the Minister so that the water from the road goes into my cisterns."); in the case of the other participants harvesting seemed to be limited to maintaining roofs and draining the run-off from these roofs to the wells or reservoirs.

- The point was made that in the case of rainwater collected from roads, the "first rain " ('l'ewwel xita') cannot be used due to pollution and it is pumped out and presumably wasted; participants who collected rainwater on roofs as opposed to roads said that this was not an issue for them and all the water collected could be used.

- One full-time farmer, from the Rabat area, said that he had a number of cisterns spread across 60 *tumoli* of land. He claimed that the rainwater captured in these sustained his operations for six months each year, including when he owned 400 heads of livestock. He has now sold his livestock, and this has resulted in surplus rainwater which he gives to another farmer. He did not appear to have any significant harvesting equipment or techniques in place but attributed this volume to the fact that his land was situated on soil with a high clay content – he stated that this facilitated the draining of rainwater into the cisterns.

- If the distribution of cisterns is a key contributor to more rainwater being harvested an interesting point emerged regarding the funding assistance sought by farmers who wish to construct new cisterns on their property: three farmers complained that they had sought funds to do so however had been turned away for what they perceived to be "unfair" reasons: one complained that he was told that funds were only available to rehabilitate old cisterns and not for constructing new ones; another complained that his application was refused due to the proposed shape and design of the cistern.

- Farmers were asked by the moderator whether they would be interested in exploring other means of rainwater harvesting on their farms, investing in modifications and equipment if required. The general reaction was rather neutral and not indicative of a strong appetite for this: it was in this context that the subject of subsidies and grants came up (a frequent topic raised by the participants) and one viewed collectively in a somewhat negative light (see topic below).

Topic 6: Water factored into crop planning

The participants were asked whether they tend to factor the water requirements of different products when planning their crop cycle. The general reaction across all sessions was that this was definitely a factor (one participant commented that "you have to think of your water reserves before you start"), however the impression received by the moderator and the observer was that other issues, such as market prices and competition (local and foreign) as well as soil type, were more decisive. Other points mentioned were:

- Potatoes, watermelons and melons were identified as requiring 'a lot' of water compared to other products.

- This seems to be an issue particularly in Summer, for obvious reasons.

- At least five participants across the sessions stated that they had made a conscious decision in some cases to switch from a 'thirsty' product, such as fruit trees or vines, to a grain such as wheat primarily for the reason that this did not require any irrigation beyond natural rainfall (one famer said he complemented this with a rain gun if rain fall was particularly scarce).

Topic 7: Current levels of water consumption

- This point clearly depended on the area of land and the product.
- One participant referred to using 600 cubic metres of water per day in Summer.
- A second participant gave the following example: "For instance for 3 *tumoli* of land it takes me two hours and I use all the water in a well measuring 25 X 37 X 7 feet."
- There seems to be the practice of identifying certain fields that tend to be drier, probably due to soil type, distance from wells or exposure to wind ("certain fields where we don't have water) and working these fields in Winter rather than Summer ("these fields we only leave for Winter").
- As can be seen under topic 6 above, there also appeared to be the practice of switching to a grain (clover or 'silla' was also mentioned in this context) rather than another crop if the farmer was deliberately seeking to reduce consumption.

Topic 8: Attitude to energy consumption associated with water usage

- The general attitude seemed to be that energy consumption was a greater preoccupation for the participants than water consumption. On this basis, from a cost perspective, their primary concern when evaluating actual or envisaged water consumption (e.g. when planning crop cycles) was the energy cost associated with extraction ("we worry more about energy") – this seemed to apply particularly to the use of pumps.
- In this context, a discussion ensued in one session regarding windmills: it was stated that these had almost disappeared in Maltese fields and that they should be reintroduced to conserve energy.
- In terms of energy most participants appear to use a mix of diesel and electricity: a minority have installed solar panels to alleviate energy costs.

- When asked directly, they confirmed, without exception, that they worried more about the cost of energy than water: one farmer said that extracting water from his borehole cost €35 per day because he is on high ground.

Topic 9: Attitudes to bowsers

There appeared to be a generally negative perception of bowsers mainly on the basis that costs were high – participants seemed to prefer to leave bowsers as a last resort, claiming that the cost was double that of direct borehole extraction.

Topic 10: Water consumption in their households

- Participants with access to wells (the majority) use well water for household tasks such as floor washing, with some also using it for laundry.

- In terms of drinking, most participants reported a mix of domestic reverse osmosis systems and bottled water: only three participants drink unfiltered tap water and will only use it for cooking or for making tea and coffee.

- Their attitudes to tap water for drinking seemed to be very similar to the residential stakeholders with most preferring to drink other sources of water (mainly bottled) due to the taste and smell of tap water.

- It is interesting to note that in general terms the participants in the farmers' group appeared to be less committed to water conservation and recycling in their households when compared to the local and foreign residential group. For example, although most had wells, it would appear that they made less effort to use this as widely as possible when compared to the residential group.

Topic 11: Awareness of New Water

All participants across the sessions except two (part-time farmers with micro smallholdings) had heard the term New Water and understood the source of this correctly.

Topic 12: Participants' actual use and experience of New Water

The majority of participants across all sessions did not yet have access to New Water and were awaiting distribution to their locality. Approximately four participants from Malta and Gozo are currently using it, with at least two who have been using it for over one year.

Topic 13: Attitudes to New Water

- All the participants using New Water except one perceived it positively and stated that their experience so far was "very good." The exception to this was one farmer who stated that he was using New Water for his current crop of tomatoes, but it was still too early to gauge the effect.
- One participant from Mellieha (the same participant who had installed a reverse osmosis system) does have access to New Water indicated a preference for the latter over the former, stating that "New Water is better than my reverse osmosis water"- he stated that this preference was based on tests that he had carried out.
- There were three participants who did not have a positive attitude to New Water:
- One of these would appear that he has access to this but prefers not to use it. This did not appear to be an issue of concerns about its quality but rather down to the fact that he currently has an adequate supply from other sources (this appeared to be a mix of well and groundwater) – "If I need it, I will use it";
- The other two participants do not yet have access to New Water however one stated that he has heard from other farmers who do (in the Manikata area) that this should be mixed with other water for use "since on its own it's not that great".

Commented [VVMaM&WA35]: It is important to change all the words to New Water

Commented [VN36R35]: We are unclear as to what this comment is referring to exactly. This topic covers 'New Water' i.e. filtered drainage - as in the awareness among farmers as to its source and application. Please clarify.

- Participants with a positive attitude to New Water tended to perceive it as being a better option for their needs than groundwater – one participant stated that "The water expert I consulted told me that I am going to ruin the soil with the water I have, as it is very salty."
- Two participants however did not agree with this, stating that ultimately ground water ("ilma tal-pjan") remains the best option. It is interesting to note that one of these participants emerged as the best informed (across all four sessions) about the filtration process involved in New Water production, referring to a four-step process including reverse osmosis, chlorine, ultra-violet treatment and lime. His perception was that on this basis New Water was "cleaner and more filtered" than reverse osmosis but still "does not compare" with groundwater.
- At least two participants who are using the water have sent it for independent testing: one participant stated that he paid €300 euros for testing abroad.
- A significant number of participants across all four sessions stated that New Water was a safer option and better quality than groundwater (in its current state) since this is contaminated by drainage (see topic 2 above)
- In the Gozo session, all the participants were positive about New Water although none was actually using it widely yet. Two of the farmers in the San Lawrenz area complained that they have been told that the New Water will not reach their area and they will remain without it – they clearly felt this was very unfair and left them at a disadvantage compared to other farmers. The only complaint referred to the current distribution system in that the current number of filling stations place was inadequate and needed to be increased as fast as possible – currently there was queueing, and it was time-consuming to obtain the water.

Topic 14 Use of New Water - consumer reaction

- Most participants agreed that negative consumer reactions could be an issue and they confirmed that they have had queries from customers regarding New Water and they have had to defend their decision to use it (which was one of the key reasons behind sending the water for testing). At least two of the participants using New Water stated that they hesitated to admit to this with consumers.

- They put this negative reaction down to a lack of awareness, saying that when they take the time to explain to people what New Water is, the consumer reacts favourably. The participants also see this as a trust issue, i.e. will the consumer trust the farmer to safeguard food safety or not?

- They identify the fact that the original source for New Water is drainage as the primary cause for consumer mistrust. However, they also perceive consumer knowledge of New Water's existence as still low ("not many people know about it.")

- At least three participants (in different sessions) stated that the case of this negative perception among consumers was the water produced in the past at the Sant Antnin water treatment plant. – they stated that this was originally a "poor product" and this had led to a prevalent negative public perception of treated water.

- A similar number stated that, to their knowledge, this negative consumer perception also resulted from a poor initial experience in the Zabbar area, where they stated that products irrigated with New Water had a shorter shelf-life than products that were not. They conceded that this was no longer an issue but felt that this had led to a negative consumer reaction. ("once you get the reputation it sticks").

- To mitigate this, participants stated that it would help if each new batch of water is certified by the Water Services Corporation since this will reassure consumers.

- It is very interesting to note a convergence between the farmers' assessment of the consumer perception of New Water and the attitude noted in the residential group. There the participants who had heard of New Water and were correctly informed as to its source, did not voice any significant concerns on its safety and stated that they would continue to consume local products irrigated with this water. Those that were initially unaware voiced some concerns based on the fact that this water was derived from sewage however once the treatment process was explained to them the majority concluded that this would not affect their consumption. It is also indicative that the residential participants strongly recommended ongoing public information on the subject, based primarily on the fact that the water was subjected to rigorous testing by the relevant authorities (Public Health was the most frequent reference). This tied in with the farmers' perceived solution to consumer mistrust.

Topic 15: Attitudes to the Water Services Corporation (WSC)

The participants across the four sessions did not appear to have any particularly strong negative or positive sentiments on the Corporation except when it comes to water testing, which they appeared to view as the main service they derive from that entity. A few interesting issues emerged in this regard:

- There appears to be a trust issue in that a significant number of farmers who wanted to have their water tested (including New Water when it was first introduced) preferred to pay to have their water tested independently, even abroad, rather than by government entities (WSC or the Ministry for Agriculture)

- In addition to trust, a lack of detailed analysis or information communicated by the WSC appeared to be a main reason for this decision.

- This point was made particularly strongly by the Gozitan farmers: Two participants regularly had the groundwater tested – both by the authorities (WSC as well as the Ministry for Agriculture) and privately. They felt they had to resort to private testing because they were not clearly advised on results by the authorities who were often dismissive when explaining the readings. They complained that the staff concerned were patronising and 'talked down' to the farmers, who explained that even if they were not formally educated, they had a very good understanding of soil chemistry and the implications of different substances in the water for their crops.

- There seems to be an expectation of receiving more help with analysis (soil but also water), with reference to the fact that testing should be carried out more regularly by the Corporation since at the moment it is perceived as being rather sporadic ("meta jfettilhom").

- In terms of testing they referred to the Corporation as being the best placed to test water, particularly New Water: one participant seemed to be particularly well informed on this topic, referring to equipment called 'High Pressure Liquid Chromatography' which in his view is the best equipment locally available for water testing. He concluded by saying that this equipment is "apparently not functioning because it is too costly to use"

- There seemed to be two ideas on testing in general and whether this was beneficial: a number of participants said that they did not bother to do this regularly while others clearly perceived it as being important and sought to have it done regularly – here these seems to be a distinction between part-time and full-time farmers.

Topic 16: Water prices

- In terms of New Water most participants seemed to have no issue with the rates set by the Government on the use of New Water.

- Full-time farmers appear to be more conscious of water-associated costs than their part-time counterparts and appear to be more likely to have installed means of regulating usage (e.g. computers to manage drip irrigation systems; flow meters)

- One participant stated that he was currently exploring "computer equipment" that would regulate water consumption and is benefitting from government funds to do so.

- As indicated in Topic 8 (above), it clearly emerged that the main cost consideration was energy rather than water. All the participants without exception stated that the cost of electricity and diesel used to obtain water through their boreholes or from their cisterns was a greater concern than the cost of the water itself.

- This perception of energy as the more costly resource of the two (energy vs. water) is similar to the pattern emerging from the residential group, where participants also indicated that they are more concerned with controlling their energy consumption than their water consumption.

Topic 17: Attitudes to obtaining financial assistance for water conservation measures

- There was a generally negative perception on this topic mainly due to the bureaucracy involved and such sentiments were voiced strongly and with great emphasis.

- There seems to be an element where this red-tape is not solely due to the process requirements of the funding application itself, but also due to the fact that farmers need to engage with a number of different government entities in this process ("we report to about eight government departments but they do not agree between them") – it is clearly perceived as a highly fragmented process where the odds are stacked against the applicant and the government (or the EU as the case may be) is 'out to be difficult.'

- Other negative aspects referred to were:
  - the time it took for funds to be made available;
  - The perception that any irregularity on the part of the farmer immediately made it impossible to obtain funding (this seemed to be the perception based on actual personal experience or that of friends : "They (farmers) don't apply because then they would come and check them out and find out that they have some irregularities and then they would be worse off.")

Topic 18: Main challenges for water in Malta

Participants in this group identified the following as the main water challenges:

- The wastage of natural rainfall emerged as the primary issue: all participants commented that rainwater harvesting is nil: "Water from the roads is not collected and drains into the sea", this was perceived as a waste considering the severe flooding often experienced.
- Wells are decreasing in number and not being factored into the new development of roads and buildings ("When they constructed the by-pass of Mellieha they built a huge well but in quarter of an hour it gets filled in again"… "In Qormi they built a pjazza with trees and benches. Had they built a well underneath at least they would have watered the trees in the vicinity" … "Under Luqa hill there is a big well but now its abandoned completely and it's wasted")
- There is a severe lack of forward planning and enforcement in water use policy: for example, changing systems to use inferior quality water for flushing
- The lack of water conservation safeguards in large construction projects ("Before in Mellieha there were dams so that the water is fixed there. When the bypass was redone the water was not kept in the dams. Where are the architects and the engineers?"
- The attitude often emerged that practices in the past were better designed for water conservation and efficiency than modern practices, similarly reference was made to better

practices abroad ("The roads built by the military way back all had canals and now we closed them" … "In Malta we don't care).

- There was a similar widespread concern to a key issue raised in the residential group: current building practices at a domestic level do not factor in water conservation as it did in the past. In this context there was repeated reference to the rise of apartment living as opposed to the traditional Maltese house with well.
- A general lack of reservoirs with little indication that there would be greater investment in this area. One participant stated "The water agency told us that they prefer rainwater, which is not as clean, to go to the sea as sooner or later they collect it through the reverse osmosis plans."
- Climate change was identified across all four sessions as a major concern: reference was made at some point in each of the four sessions to recent changes in local climate patterns ("kif qed jaghmel l-ajru"), particularly the reduced rainfall, which was in their view affecting groundwater reserves and causing further pressures on their stretched resources since they had to compensate for this reduction:

  > "This year we had some rain but the other four years it was really bad. We had nothing. It means you have to stay taking on extra expenses and then all for nothing."

Reference was also made to recent extreme winds which, they claimed, dried the soil and crops even further causing a higher demand on their water supply.

6.0 Services sector

6.1 Sample analysis

The contract specified the distribution of respondents according to 3 main dimensions these being:

- Sector by NACE CODE;
- Size of enterprise by number of employees;
- Location of enterprise by NSO regional classification.

The tables below show the distribution for each classification dimension.

G	H	I	J	K	L	M	N
3	3	3	3	3	3	3	3

Table 17: Enterprise distribution by NACE Code

The definition of the above NACE Codes is given below:

G. Wholesale and retail trade

H. Transportation and storage

I. Accommodation and food service activities

J. Information & Communication & Gaming

K. Financial and Insurance activities

L. Real Estate activities

	10-49	50-249	250+
10	6	6	2

Table18: Enterprise distribution by employment size

Whilst in terms of locality, the distribution is given below too:

Southern Harbour	Northern Harbour	South Eastern	Western	Northern	Gozo
6	6	3	3	3	3

Table19: Enterprise distribution by region

Given the size of the sample is rather small, 24 firms, the analysis will not be based on cross-tabulation. Instead, we will be focusing on drawing up the main conclusions from the surveys and interviews conducted. After analysing different sections of the interviews, the main conclusions will be drawn up.

6.2 Analysis of results

Topic 1: Water usage

When analysing water usage, it is evident that the majority of companies (87.5%) mainly use tap water for their needs. However, none of them use tap water for drinking and the main reasons given across all sectors is that they do not trust the source of tap water or the processing facilities of tap water. This is then corroborated by the fact that 50% of respondents mentioned bottled water. However, for drinking purposes most companies mentioned that they use bottled water. Only 33% of those interviewed that they have a reverse osmosis within their office which is a rather lowfigure.

The table below shows the other questions and key points with respect to water usage:

	Absolute		Percentage		Key points
	Yes	No	Yes	No	
Do you drink tap water at your premises?	6	18	25	75	The majority of responses was a clear no and this is a very personal question and the key insights for this are best seen from the residential group.
Do you use bowser water in your premises?	2	23	6	94	The abosulte majority do not use bowser water since the abosulte majoirty do not have access to a cistern in their premises.
Do you have cisterns within your premises?	5	19	19	79	Given that the majority of the responsents do not own the premsies, they do not have access to a cistern. Only the ones who own the property themselves or are the only tenants have access to a
If yes, are these cisterns used?	5	0	19	0	All respondents who have a cistern use the water collected.

Table 20: Key points on water usage by the services sector

Therefore, from the above, the below conclusions can be taken:

- Companies across region, NACE and employment size use mainly tap water for their needs except for drinking
- Bottled water is mainly used for drinking purposes as the use of reverse osmosis is remarkably low in the service sector
- There is a lack of possibilities to use cisterns since the majority of companies do not own their premises but actually rent them out.

Topic 2: Water efficiency

A main theme in the interviews was water efficiency. The responses were mixed although the majority always seemed to gravitate towards one answer. In addition, we believe that sectoral conclusions were difficult to highlight since the sampling distribution does not statistically reflect the true population. As a result, key highlights are being presented in the table below.

	Absolute		Percentage		Key points
	Yes	No	Yes	No	
Do you know how water use in your premises can become more efficient?	6	18	25	75	There is a an across the board lack of education or knowledge in the area of water efficiency and management.
Is there any aspect of your operations that is water use intensive?	3	21	13	88	Given that these are all service centric firms, none have water intensity requirements. The 3 that have, in fact are part of a broader Group which has some light manufacturing processes in their companies.
If there is a reduction in operational costs, would the company be willing to change/upgrade its existing processes to conserve water?	16	8	67	31	Cost pressures are commonly felt across industries. The interesting feature is that the companies that will not change their existing processes are all based in the northern harbour and western regions and are more in the professional services and retail. This might mean that water use is linked to service quality, (such as cleanliness) and such firms are not willing to compromise on that and cosnider their cost on water to be contained.
Would the company be willing to change/upgrade its existing processes to conserve water if this contributes to Corporate Social Responsibility?	21	3	88	13	Corporate Social Responsibility is fast-becoming an important cosnideration for businesses and the majority believe that water management and efficient water usage can contribute to such CSR. There is no particular trend in the 'No' responses and therefore one needs to interpret the results with care as they might reflect personal answers and not representing the company's management.
Would the company be willing to change/upgrade its existing processes to conserve water if it's provided with free publicity showcasing the company's contribution towards water saving?	21	3	86	14	Most of the Companies would be willing to contribute to the educational campaigns that might be entertained in the future. The companies that gave a No as an answer were the same as the ones in the previous question and no particular trend can be gauged.
Do you look for water efficiency labels/ratings when buying appliances or plant equipment for your premises that use New Water?	16	8	67	33	The majority of respondents said that they will. The ones that answered 'No' are skewed towards the larger size of the enterprises questionned and this may indicate that the people takiing part of the survey were not directly involved in the procurement exercises conducted by the said enterprise.
Do you consider water consumption to be an important cost factor in the annual costs of the company?	12	12	50	50	There was an exact split between the respondents. Although the majority of those who said 'No' were mainly skewed towards the smaller size of the company, another determining factor is that most of these said that water and electricity is a fixed charge in their monthly rental and they are the most office-based and service centric.
Have you ever heard of green roof technology or sustainable urban drainage systems?	15	9	63	38	Not all of people interviewed knew about such technologies and they were evenly distributed between all dimensions. No meaningful analysis can be made as this is largely dependent on the knowledge of the person being interviewed.
Would you be willing to implement these technologies in your premises?	10	14	40	60	Although the answers were distributed evenely, the barrier mentionned in this case is that such decisions would rest with the landlord and not with the company itself. Therefore, the common thread is that the office was not owned by the company but leased or rented.
Do you encourage your employees to conserve water in your premises?	15	9	63	38	Most of the companies responded positively stating that it is part of the HR function to remind employees of their environmental obligations mainly through the use of company internal communication such as memos and posters in the bathrooms to ensure that water wastage is minimised.
Do you have efficient water devices installed in the bathrooms, toilets, etc?	5	19	20	80	The absolute majority do not have and the common reply was that rests with the landlord and not with the management of the company since the premises are rented out.
Do you use recycled water in your premises?	3	21	13	88	Here again, absolute majoirty do not and the main reason is because water systems fall within the remit of the landlord and not the Company's management.

Table 21: Key highlights on water efficiency from services sector

The main takeaways that stand out from the responses of the services sector can be distilled to the following points:

- The ownership of office space is a main determinant on how companies view their relationship with water;

- Since the majority of companies rent or lease, they perceive the issue of water usage and efficiency to lay solely with the landlord and they do not see how they can influence this;

- Given that those interviewed hail from the services sector, their interaction with water is not much of a core business or cost concern; therefore replies are construed more from an individual basis rather than from a corporate basis that has a high exposure to water usage;

- Even when discussing ways in which the use of water can be made more efficient in the future, all pointed out to the landlord being the main barrier for such firms to become more efficient in their use of water and also in their attempts to store or recycle. They all said that landlords were not interested in such improvement measures;

- There was a marked interest; 78% of respondents, towards the possibility of using recycled water as a building in which all companies can contribute. They mentioned that water which is used for toilets, should come from recycled water wherever possible but the stumbling block on this remained the landlord;

- The majority of respondents, 88%, mentioned the environment as the main reason why water use should be as efficient as possible and only 10% stating financial reasons.

Topic 3: Knowledge on water

This section will analyse a number of questions where the main aim was to highlight the knowledge on water in Malta. The absolute majority of respondents answered that the bulk of water in Malta comes from desalination activities however very few knew what New Water was (only 35% of those interviewed). The people who were aware hailed mainly from areas in the vicinity of the treatment plants (Gozo, Southern Harbour and Northern area). This confirms earlier findings that not many people are aware of the water infrastructure in Malta and also the facts surrounding water as a resource.

It also seems to confirm the notion that in the past a lot of emphasis was given to electricity and its usage to the detriment of water. 99% of all respondents believed that bottled water was the most reliable source of water in Malta. In terms of challenges, the majority, 70% mentioned that wastage was a key issue in Malta with hardly any rain water being collected. They believed that Government should be the main driver of this measure by enforcing building regulations and ensuring that waste rainwater; especially from the roads, is collected whilst apartments and office blocks are forced to build communal cisterns.

6.3 Limitations of cohort

When drawing up conclusions and key highlights from this sector, it is important to remember some limitations that this study has in this respect. To our understanding, the sample size does not accurately reflect the distributional make-up of the Maltese business community. Therefore, such analysis should be made on an aggregate level and not try to draw representative replies for the sector, size or location of enterprise. Also, care must be made on how to interpret the results. Many times, the results are also very susceptible to personal bias of the people answering it. This means that the replies given do not necessarily reflect the company's thoughts. Therefore, in view of this, care must be given when interpreting such results.

6.4 Key highlights

When analysing the services sector the following are the main highlights that we would like to specify:

- The use of water and its management by firms is felt to be restricted given that most of the offices are rented or leased from landlords.
- There seems to be limited scope of increasing water efficiency in the enterprises interviewed, confirming the general thought that service-centric companies are less of a burden on water resources than a manufacturing or production concern.
- Those interviewed believe that they can do little to improve water efficiency as they do not see it or perceive it to be a relevant cost item in their operation or that they can control it since it is in the domain of the landlord.

7.0 Conclusions - Observations on the Key Patterns Emerging Among Different Stakeholder Groups

This report reveals some key incidences of convergence and divergence among the attitudes and perceptions presented in the different stakeholder groups. ARQ EBI considers these findings to be notable and as such should be factored into any further research, communications or policy formulation.

In general terms differences were noted between the groups in terms of the level of awareness displayed:

- As might be expected, given that this is a vital resource in their operations, the agricultural sector was the most aware of the current state of play in Malta's water resources, as well as of the challenges that it faces. This was the stakeholder group that had the most realistic grasp of the situation (for example, the correct conclusion that rainwater harvesting contributed negligibly to current national resources).

- Among the residential group, awareness was affected by age and level of educational attainment as well as whether the resident was local or foreign. Older residents tended to be more aware of the issues and challenges involved, yet overall were still unclear on the actual water resources situation and the main sources of water used in the Maltese islands. Younger residents were less informed with some notable exceptions – reviewing the focus group proceedings there is an indication that the better-informed younger participants tended to have a post-secondary or tertiary level of education. This interpretation can be explored further in the next research phase.

- Foreign residents overall were well informed about the global water challenges, mainly due to the fact that they had been exposed to these concerns in other countries of residence before coming to Malta. In discussions it emerged that the majority view in this group was that in general the Maltese came across as complacent in their attitude to these challenges and tended to "take water for granted."

- The services group appeared to display similar awareness levels to the residential cohort. We feel that this is due mainly to the fact that this sector does not view water as an integral aspect of their operations (unlike, for example, the manufacturing sector) – in this context they differ from the agriculture stakeholders.

In terms of water usage:

- it was immediately clear that the attitude to tap water for drinking purposes is overwhelmingly negative across all the stakeholder groups. It is important to note that with very ~~view~~ few exceptions this resistance is not due to health and safety concerns, but a negative perception based on taste, smell and appearance. In all cases, bottled water is the preferred alternative. The observation made in the residential group that this is currently a cost-efficient and convenient choice due to the practice of large supermarkets to offer 'free' packs of water to customers is an interesting observation and one worth noting.

- For the agriculture group groundwater is the obvious main concern. Here, the assessment of the challenges posed by depleted reserves appeared to be well-informed with a number of participants indicating over-extraction through boreholes to be the major challenge. Attitudes were divided within this group on this point: the Gozitan full-time farmers expressed the view that this over-extraction was down to abuse by other users within and outside the farming sector~~,~~; the Maltese full-time farmers did not complain of this issue and appeared to view groundwater as being a resource that must remain freely available – essentially there did not appear to be any realisation that they, as farmers, also had a role in conserving these water reserves. In this context, however, New Water was perceived positively in the vast majority of cases.

- In terms of New Water it should be noted that the residential group had little awareness of this topic, despite public communications issued over the last months in this regard. Once they were informed during the sessions on what this New Water represents, and its source, it was noted that the reaction in the majority of cases was positive. However, it emerged quite clearly that an element of public reassurance may be required to maintain consumer confidence in local agricultural products; this point was also echoed by the agriculture stakeholders.

- In terms of attitudes to water conservation it appears that older residents, foreign residents and younger residents who are either householders or who have environmental concerns are more disposed to taking active measures to conserve water in their homes. A number of participants already do so in various forms indicated in the relevant analysis, ranging from the use of well water to conscious decisions to opt for short showers rather than baths. The motivation varies between primarily economic or environmental, however the point was

repeatedly made by the participants themselves that conservation was a win/win situation in terms of managing costs and safeguarding the environment.

- The implication is that future public message should consider blending the two aspects. In this context, participants in the majority of cases appeared willing to consider extending their current practices through, for example, use of grey water. The point was strongly made however that the public required information and, importantly, financial incentives, if this was to be tackled seriously. The notion that education in schools also has a wide-ranging positive effect also emerged when this wider topic was discussed, with a number of participants giving anecdotal evidence of water practices in households being changed in response to the influence of children who had been exposed to water conservation messages in schools.

- An interesting element emerged across all groups that shed some light on where water stands in relation to energy in the public mind. Beyond the cost vs environment aspect, older stakeholders across all groups repeated the point that very often the appreciation of water as a resource was shaped to some degree by past experiences of water scarcity. The implication here was that younger individuals who never experienced this scarcity after the onset of reverse osmosis tend to take water for granted ("You turn on the tap and it is there"). In this context, the conclusion was that energy conservation is more 'top of mind' for the stakeholders than water conservation.

- In terms of the agriculture sector and water conservation it was noted that whereas this sector considers water resources to be indispensable to their sector, and as such, give the matter due weight, the attitude to boosting their capacity to harvest rainwater seems largely passive. There do appear to be practices in place to collect as much rainwater as possible in cisterns on their property, however this seems to be confined to collecting rainwater falling on their roofs and, in only one case, on the plastic tunnels protecting their crops ("tined"). In general therefore, there seems to be a lack of awareness of new technologies and practices that could boost their efforts considerably.

- The perception of Malta's water conservation challenges varied across the groups with some interesting patterns emerging. As referred to above, the agriculture groups was best informed on this topic, and among all the groups were the one to pinpoint climate change most strongly as a key issue. Among the residential groups, population growth (through immigration and tourism) was highlighted. In all cases, including the services group, participants repeatedly

stressed the irony that the public was being constantly reminded of the need to conserve water while rainwater was continually being lost through the lack of the necessary infrastructure to harvest it. On this basis, the reference to a 'hypocritical' stance by the state entities concerned was frequently made.

- A further point related to water resource management that emerged very strongly across all the stakeholder groups, and which elicited the most emotional reaction of all themes discussed, referred to the effects of development and construction in Malta and Gozo. The argument was repeatedly made that this development is not taking water conservation into account in two main ways:
  - New construction projects are not factoring in water conservation infrastructure as default: this was pointed out with respect to roads (e.g. lack of culverts) as well as buildings.
  - Construction and development is limiting access to wells and cisterns, as well as reducing the area of natural landscape where rainwater can drain down to the water table.

- In this context local residential participants also referred to the change in housing patterns, stating that apartment living is less conducive to water conservation (mainly through lack of access to wells). This was a point expressed with some emotion, intimating a regret for the phasing out of traditional housing practices that revolved around family homes with access to wells.

- Some negative perceptions of the Water Services Corporation were noted: these revolve around water testing in the case of the agriculture stakeholders, and inadequate response to water leakages in the case of the residential stakeholders. There seems to be an immediate association of the Corporation with billing or service delivery– there appeared to be a lack of engagement with the concept of the Corporation as in any way a 'guardian' of the islands' water resources.

8.0

~~8.0~~Recommendations for Survey Design

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As indicated in the overall objectives defined for this stakeholder engagement process by the Contracting Authority it is envisaged that the insights captured from the assessment carried out may be used as key inputs to a national survey which will be designed with the view of gauging awareness of, as well as the attitudes and perceptions towards, water resources management in the Maltese Islands.

This approach taken by the contractor is commendable in that the survey itself will be designed based on the insight obtained through the focus groups into the key triggers or behavioural attributes towards individual management of water resources. The research process can be illustrated as per below.

Figure 13: National survey research process

We propose that since the survey is mainly aimed at gauging and understanding attitudes and perceptions, the survey design team needs to be a multi-disciplinary team in order to truly understand customer behaviour and be able to cross-tabulate results in order to generate meaningful insight. On this basis we recommend the inclusion of the following individuals or skill-sets:

- An economist/sociologist to support the definition and questions surrounding the socio-economic characteristics and to stratify the individuals in meaningful cohorts for analysis
- A psychologist to determine the habit-forming processes and the individual perceptions towards resource use
- A water expert or representative from water services to identify indicators or water usage measures to use for questions and an eventual gap analysis
- A statistician to determine the sampling pool and its inherent characteristics

~~8.1~~8.0 Survey structure

Following the analysis of the focus groups and the confirmation that water usage is a deeply nested personal and individual matter, we believe that the focus should be on identifying those individual attributes and perceptions. Based on this, we would suggest that the survey questionnaire is the designed in the following manner:

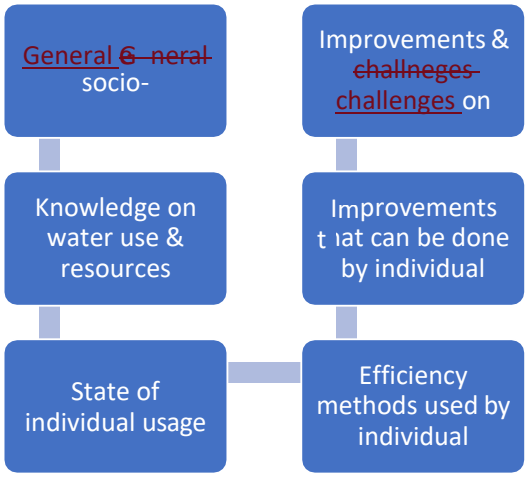

Figure 14: Proposed survey design

General socio-economic profile

It is imperative that a survey includes some assessment of the socio-economic and demographic characteristics of the sample being surveyed. This will allow the cross referencing and tabulation between different replies to provide meaningful insights and allow customer or individual profiling based on a number of attributes. We believe that an economist, sociologist and psychologist can bring immense value when designing this section of the survey.

Knowledge on water use & resources

The aim of this section is to gather and gauge the knowledge on water usage and resources. From the focus groups, it is evident that education in this area is lacking and one of the main conclusions that was drawn out from the respondents and participants was that if they know more about water resources and usage, the would most probably respond more in terms of efficient usage of water. A representative from the Agency or Water Services Corporation would be instrumental in guiding this part of the survey.

State of individual usage of water

Here the interest would be to gauge the level of water usage. The questions would be designed in a way to see how the individual interacts with water usage throughout a typical day and week in order

to assess the habits and the underlying perceptions behind water usage. Here again, a psychologist and water services representative will play a key role in designing the interaction path with water and to try and include questions which look at individual habits or deep-nested practices on the usage of water.

Efficiency methods used by the individual

This is aimed towards getting a detailed and thorough picture of the various water efficiency measures that the individuals use across their daily use of water be it at home or at the office. The idea would be that the questions would be designed in a certain manner so that when analysing them, a gap analysis and assessment report can be conducted on this section alone and cross-tabulated with the socio-economic characteristics. This will allow the Agency to get a proper understanding of which measures work with which cohort and what the state of play is on a national level. The water expert will be needed to give his input and to provide a benchmark.

Improvements that can be done by individual

The idea of this section is to see what improvements individuals are ready to introduce in their daily life and pattern with a view of increasing water efficiency. To this end, the water expert is needed to provide the list of improvements that can be made in an individual and household setting. A psychologist's input can also support the framing and wording of questions.

Improvement & challenges in Malta

The idea of this section is to gauge the broader picture of water resource management in Malta. It is aimed to look at the perceptions of the individual on the macro situation. This is aimed at shedding light on possible policy implications and responses from a user-perspective. Here again, the water expert and the economist can give strategic input to the questions.

~~8.2~~8.1 Question design

In this section, we would like to give some advice on how to actually design the survey questions based on best-practice:

- Use simple, familiar words (avoid technical terms, jargon, and slang);

- Use simple syntax;
- Avoid words with ambiguous meanings, i.e., aim for wording that all respondents will interpret in the same way;
- Strive for wording that is specific and concrete (as opposed to general and abstract);
- Make response options exhaustive and mutually exclusive;
- Avoid leading or loaded questions that push respondents toward an answer;
- Ask about one thing at a time (avoid double-barrelled questions); and
- Avoid questions with single or double negations.

A key element in survey design is also the order of the questions. Best practice suggests the following in this regard:

- Early questions should be easy and pleasant to answer, and should build rapport between the respondent and the researcher;
- Questions at the very beginning of a questionnaire should explicitly address the topic of the survey, as it was described to the respondent prior to the interview;
- Questions on the same topic should be grouped together;
- Questions on the same topic should proceed from general to specific;
- Questions on sensitive topics that might make respondents uncomfortable should be placed at the end of the questionnaire; and
- Filter questions should be included, to avoid asking respondents questions that do not apply to them.