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REPORT ON ISRAEL'S EXPERTISE IN WATER MANAGEMENT TECHNOLOGY (RELEVANT TO LODHA's SUSTAINABILITY ASPIRATIONS)

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Introduction

Israel, as a nation (government authorities, water boards) and through its various companies (corporate, private and start up enterprises) is one of the best source of strategic thinking on water sources, treatment, distribution and management. Israel also has a water respecting culture, which further adds to their overall water efficiency.

This report is basically prepared to understand Israel's approach and technology which can provide learning and partnership opportunities for water sustainability and long term resilience at Palava and our other projects.

Some insights will also help us orient our designs and policies with their well thought through practices.

The sources referred for the report are mentioned in the references section, same can be researched by the reader for deeper insights.

Most of the subsequent sections are presented in bulleted or tabulated forms for quick reading and comprehension.

Culture and History

- Climatic conditions and very limited natural water resources have always pushed Israeli government to undertake innovative plans, initiatives, and policy-regulations for efficient water use in all sectors (domestic, agriculture, industry).
- Israelis have a water respecting culture, based on their scriptures, folklore and history.
- Children are taught about water conservation from a very early age at homes and schools.
- Israel's transformative water laws made during the 1950s, give all water ownership rights to the government, which then is supposed to act on behalf of the people as a whole. These laws include:
    - No one can drill for and draw any ground water without a license (1955)
    - Distribution of water is prohibited if the supply is unmetered (1955) - water use in most of the Israeli houses is metered since 1955
    - Water sources other than ground (i.e. Rivers, Sea, Rain Water, Household Sewage) are also fully owned by the government (1957)
- Israel is the only country in the world which has less area covered by desert today than 50 years ago
- No reports of any corruption in any wing of the national water management system have been reported since inception

Approach (items relevant to us are highlighted green – current best practices are highlighted in blue)

- Cost of reduction in loss of water is always compared with the cost of building new desalination plants (as they are expensive), this has resulted in a very advanced water metering, analytics and management industry in Israel. Water loss is addressed under:
    - **Pressure Management – PRVs to restrict pressure upto 3bars**
    - **Automatic Leak detection**
    - **Fast repairs**
    - **Automatic metering infrastructure and analytics**
- Israel's sources of water are:
    - Desalination
    - **Sewage Treatment – Already using MBR**
    - Rivers (Jordan River, and others) and Lakes (Sea of Galilee)
    - **Rain – Not harvesting meaningfully in Palava, shall undertake a detailed review**
- Water supply, for any usage type, in Israel is not free. The water authorities charge the 'real price' of water to all users.

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    - **Flow restrictors** are obliged to be placed on each faucet, it is a norm in Israel to install hyper efficient water fixtures **(blue mark)** **(we are also using aerators across projects).**
    - Almost all **water supplies are metered**, with a demand based dual tariff system for water.
    - Penalty on irrigating parks and homes with domestic water
- They have very effective awareness raising **media campaigns on water conservation.**
- Israel has put efforts in repairing and restoring all rivers over the years, the contamination due to sewage is now close to non-existent as most of the sewage is treated
- **Agriculture**
    - **Drip irrigation** is predominantly used for irrigation, thereby reducing the irrigation water need significantly. Saved water is used to transform and irrigate more arid/desert land for agriculture.
    - Agricultural engineering to develop:
        - water efficient varieties
        - varieties which can be irrigated by brackish water
- **Rain water harvesting** is done in Israel but it is not used for primary purposes, due to following considerations:
    - uncertainty of rain vs. certainty of domestic water demand
    - additional cost of **treatment of rain water**

  However the rain water is still **harvested into aquifers.** Israel's national water company Mekorot, has 'storm water collection factories' where it collects the water and pumps it to aquifers and agriculture.
- **Treated Sewage Effluents,** Close to 90% of Israeli homes are connected to sewage treatment plants. Treated water is used in secondary uses like agriculture/irrigation, industries, flushing, etc. Israel is not using the **treated water for potable uses** yet, due to their fears of hormones and pharmaceutical residue in such water. They are tackling it by research and they plan to use it for potable purposes in their 2050 plan. **(We are considering implementation of Black and Grey water in Palava Sector (Riverfront onwards))**
- National goal of redundant, overlapping water supplies. Have a well-defined plan (published) till 2050 (see references for details)

Parametric view

1. Domestic water targets in Israel:
    a. Household water consumption per capita: 60cum/person/year (160lpcd)
    b. Municipal water consumption per capita: 100cum/person/year (270lpcd)

Note: Our current targets for Casa/Aspi sector in policy are 155lpcd, however actual measurement data is higher (at Palava) and crosses 200lpcd at most instances.

2. Water tariffs (domestic) in Israel is between Rs.0.1-0.2/liter (Rs.0.025/litre in Palava + pumping)
3. Water loss due to leaks in Israel is too low:
    - London 30%
    - Chicago 25%
    - Thane 37%
    - Palava 16%
    - Israel 7%
    - Singapore 5%
    - Tokyo 3% (uses stainless steel pipes)

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4. Israel also has a very well defined water demand profile, which they use to identify the sizing of the overall desalination/artificial potable generation capacity needed by their country. They also have defined performance metrics for their water supply system, all covered within their 2050 masterplan.

Product Companies

Following is a list of a few Israeli product companies with whom some discussions can be started about:

1. Metering and Analytics
2. Efficient fixtures
3. Water treatment
4. Drip Irrigation
5. Valves and controls

Company	Expertise	Indian presence	Email	Telephone	Office address	Internet
ARI valves	Valves and Controls	Partial	ami@ari.co.il			https://www.arivalves.com/
Bermad	Valves and Controls	Yes	India@bermad.com	9987076165	Hinjewadi, Pune	http://www.bermad.com/
Arad Group	Water Metering	Yes	praveena@aradindia.com	022-48800766	BKC, Mumbai	http://arad.co.il/
Miltel	AMI (Advanced Metering Infrastructure)	No	info@miltelcom.com			http://miltelcom.com/index.php?page=home
MTR Wireless	AMI	No	info@mtr-wireless.com			http://mtr-wireless.com/
Aqwise	Water and Sewage Treatment	Yes	suneet@aqwise.com	120-4748000	Noida, India	http://www.aqwise.com/
Amiad Water Systems	Water Treatment	Yes	info-india@amiad.com	022-27787813	Mhape, Navi Mumbai	http://www.amiadindia.com/default.asp
Netafim	Irrigation	Yes		0266-7264601	Vadodara, Gujarat	http://netafimindia.com/
Huliot	Piping Systems	Yes	info@huliot.in	0265-2330673	Vadodara, Gujarat	https://www.huliot.in/

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Company	Expertise	Indian presence	Email	Telephone	Office address	Internet
Fluence Corp	Water and Sewage Treatment	No	info@fluencecorp.com			https://www.fluencecorp.com/
Tahal Group	Water Supply - Masterplanning	Yes	tahal@tahal.com			https://www.tahal.com/about/
Takadu	Water management, analytics	No				http://www.takadu.com/company
Memtech	Water and Sewage Treatment	No	info@memtech-water.com			http://memtech-water.com/about/
Hamat	Water efficient toilet fixtures	No				http://hamat.co.il/en/
Falcon Waterfree	Water efficient toilet fixtures	No	PLiang@falconwaterfree.com			http://falconwaterfree.com/

Highlighted already in our make lists

Our actions, targets

1. Define measurement targets of water consumed, distributed at Palava (update Plumbing policy)
2. Establish metering (water supply) strategy (update policy), to address leakage issues
3. Standardize AMR protocol, user interfaces
4. Apartment level metering to be evaluated (feasibility, costs)
5. Engage with vendors as noted above
6. Ascertain aquifers in the larger masterplan of Palava and see how to recharge
7. Update irrigation water distribution policy
8. Inform residents at Palava about their actual consumption vs. norms (on a regular basis)

References

http://www.water.gov.il/Hebrew/ProfessionalInfoAndData/2012/

http://www.water.gov.il/Hebrew/Pages/Water-Authority-Info.aspx

http://www.mekorot.co.il/Eng/newsite/Pages/default.aspx

http://www.sethmsiegel.com/

https://timesofindia.indiatimes.com/city/thane/37-of-thanes-potable-water-is-wasted-daily/articleshow/63116499.cms

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Additional Reads

https://www.haaretz.com/science-and-health/how-israel-can-help-a-thirsty-world-1.5392651

https://en.wikipedia.org/wiki/Water_supply_and_sanitation_in_Israel