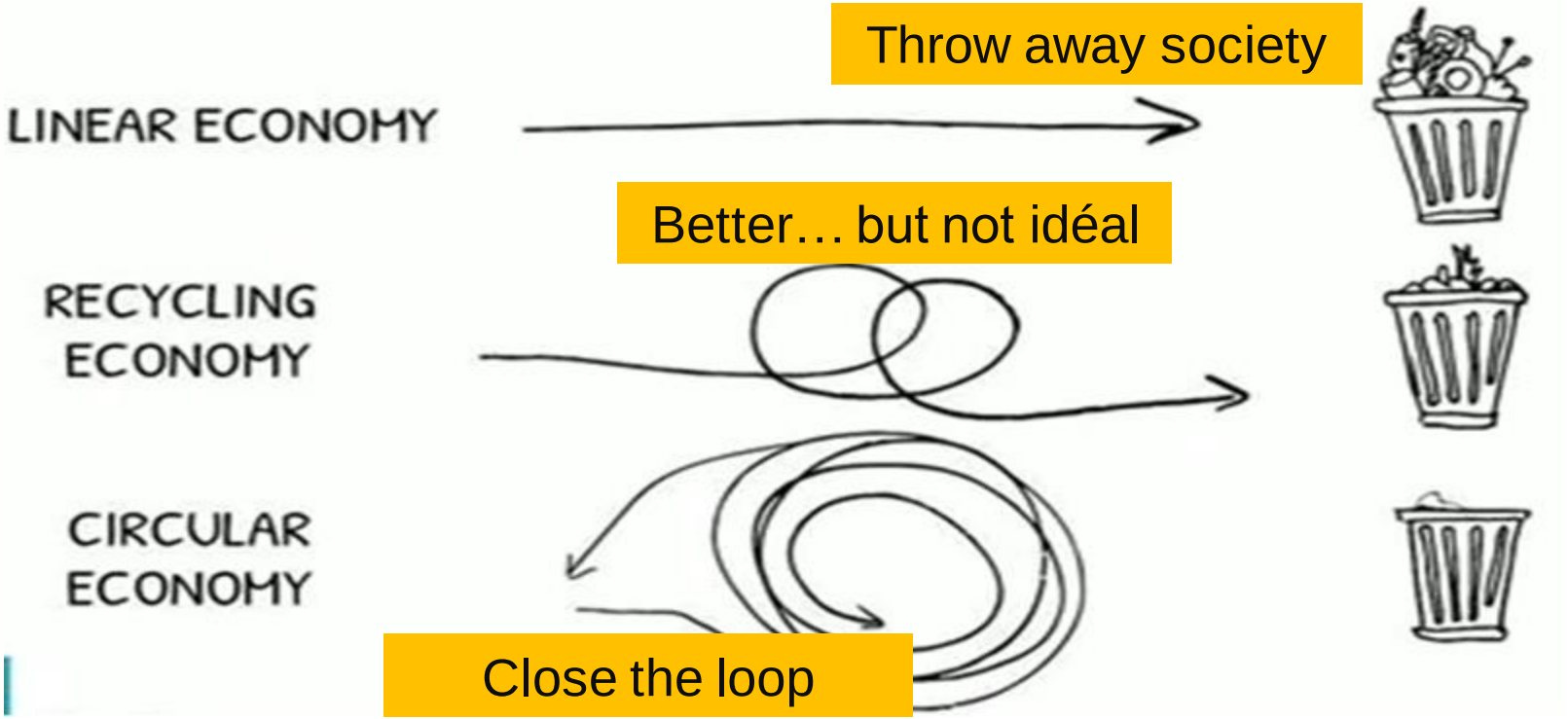
“Concepts of Circular Economy in Water”
A new development paradigm

Dr. Shrikar Dole

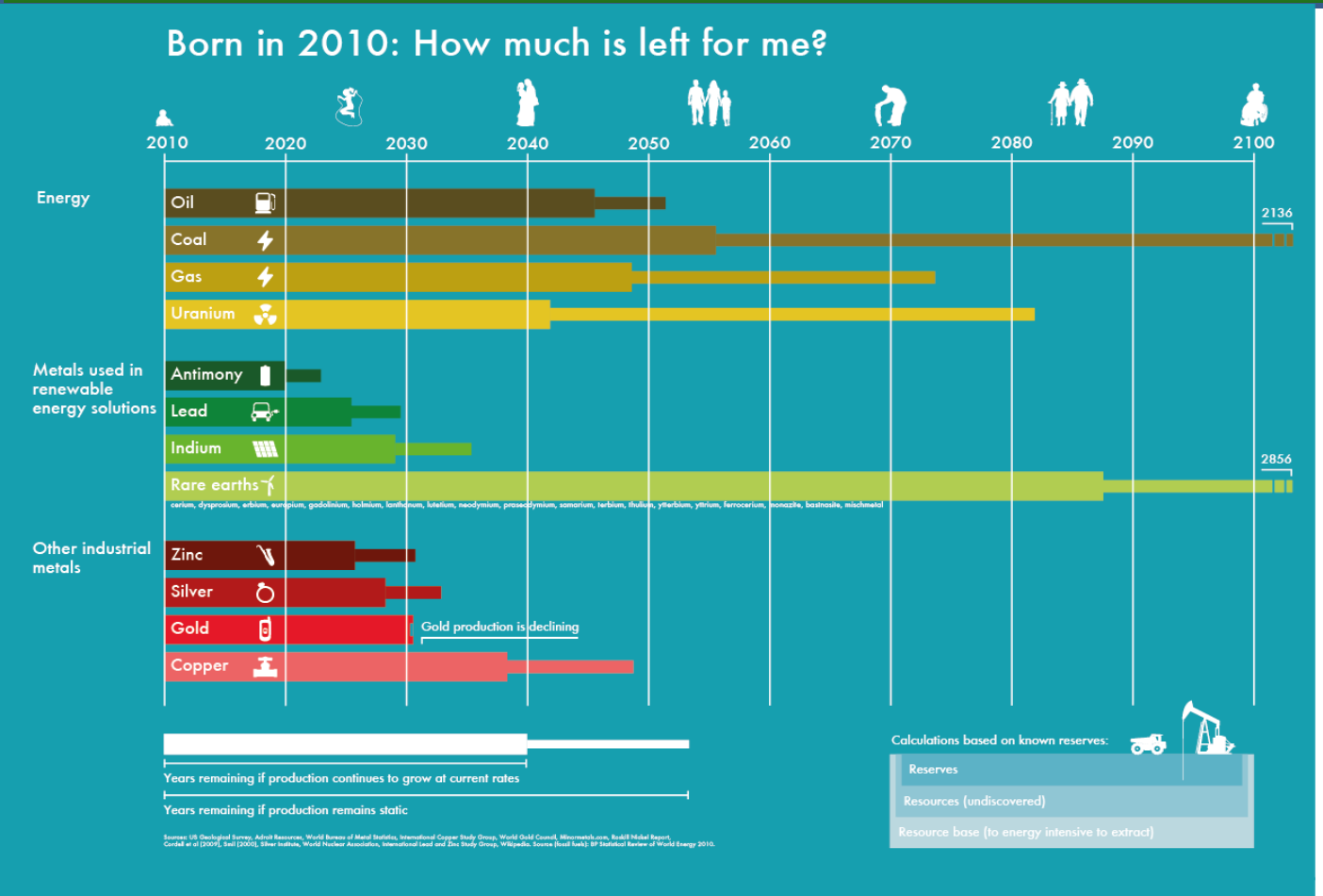
shrikardole@sdg-foundation.org

What is Circular Economy



At its core, circular economy means that products/services no longer have a life cycle with a beginning, middle, and end. But contributing less waste and adding value to their ecosystem.

Why Circularity ?



- Rising growth and economic prosperity
- Rising population
- Rapid urbanization

coupled with

- environmental degradation

leading to Resource Scarcity across the globe

Water Reality

- **World Economic Forum:** cites "water crisis" as the biggest threat facing mankind in next century.

  Water scarcity and declining quality have become the No. 1 global security issue, water being the key driver in the water, food and energy nexus.

- **California,USA Apr, 2017:** After Five years of relentless drought, water emergency is over, but the next drought could be around the Corner. Conservation must remain a way of life

- **South Africa, Jul, 2018:** The Cape Town city was set to run dry on 12 April (Day Zero), leaving its 3.7m residents without tap water

- **Dec 25, 2017:** Bicholim reels under acute water scarcity

- Every year, parts of Mormugao, Sanvordem, Sanguem, Quepem, Salcette and Bicholim reel under acute water shortage, forcing people to depend on tankers for supply.

- In the coastal belt of Canacona, new hotels have been constructed, increasing water demand

- The Paradox is that - Goa recieves heavy rainfall, but it has one of the lowest per capita fresh water availability

- **Herald – 16 Aug, 2018: Drinking water crisis worldwide, is Goa prepared to handle it?**

Circular Water in Hotel

- Of the water resources on earth 97% is in the oceans, only 3% is freshwater
  - ✓ two-thirds of which is tied up as ice in glaciers and at the poles.
  - ✓ This leaves only 1% as freshwater in rivers, lakes, the atmosphere and in groundwater.
- With demand rising rapidly and resource-intensive economy that 1% is under threat
- Water plays a decisive part in Hospitality industry in operations and growth.

Hotels have strong commercial and moral imperative for managing water.

- Cost is a clear factor but the issue of availability of safe drinking water is more significant.
- Most hotels pay twice for the water– first by purchasing fresh water and then for disposal of it as waste water.
- Hotels require risk analysis of water issues – such as Cost, Quality, Social & Regulatory implications
- Control of water pollution is the key challenge
- Climate change, causing Extreme weather like prolonged drought or the heavy rains, does not allow replenishment of groundwater stock.

Circular Economy in Water

- Less than 5% of all water used is reused globally, i.e. 95% is released as waste
- Recycled wastewater is the only resource that grows with the needs.
- The circular economy consciously emulates natural processes of bio-degradation.
- **Water is at the heart of the Circular Economy**
- Circular Economy practices offer a framework that is both resilient and restorative
- It is a mechanism for sustainable growth in the economy, environment and the society.
- It turns today's one-way water traffic into an endless, profitable and sustainable loop
- In this model, water is reused time and again, retaining full value.
- **Reduce, Re-use and Recycle is the Mantra**

Circular Economy in Water

- Circular Economy practices allow hotels to measure water footprint (water consumption).
  - ✓ Hotel Water Measurement Initiative can be applied by any hotel anywhere in the world - www.tourismpartnership.org/water-stewardship/
- Find out the areas of maximum usage and focus most of your efforts in those areas.
  - ✓ Compare it with industry benchmarks to determine the potential for savings www.greenhotelier.org/know-how-guides/water-management-and-responsibility-in-hotels/attachment/figure-2-water-benchmark-for-luxury-fully-serviced-hotels/ & https://greenview.sg/chsb-index/
- Work out the potential for cost saving and the payback period for investment to be made.
- Establish a water plan by using innovation guides –
  - ✓ Business guide to circular water management (http://docs.wbcsd.org/2017/06/WBCSD_Business_Guide_Circular_Water_Management.pdf)
- Check funding available for investment in new technology or water reduction schemes
- Partner with others to pool expertise to help reduce the water consumption
- Ensure that any actions taken do not compromise health or safety of guest & Staff.

Water Management in Hotels

To change operational water use in hotel review areas where water consumption is likely to be highest

Bathrooms

- Low flow – High pressure shower heads & Flow regulators on taps
- Low flow or dual flush toilets.

  If it is not feasible to change toilets flush you can reduce the water used by placing a bricks or full water bottle in the cistern (effectively displacing some of the water)

Laundry

- Consider the reuse of water from previous rinse cycles for the first wash of the next cycle
- Installing a continuous batch washer (CBW), will use all the rinse water for pre-washing and main suds operation
- When buying washing machines, look out for a good water consumption rating as in case of Electrical rating
- Consider using ozone laundry systems to provide a more efficient wash
- Use polymer beads as active cleaning medium in washing system to reduce the amount of water used up to 80%. (www.xeroscleaning.com)

Swimming pool

- Conduct regular maintenance to prevent leaks.
- Backwash the swimming pool every two to three days rather than daily.
- Always cover or drain swimming pools when not in use
- Installing push-button showers by the pool will reduce water use

Water Management in Hotels

Grounds/ Landscaping

- Train gardening staff to reduce water over-use. As far as possible avoid using automated watering systems.
- Moisture sensors in gardens and grounds should be used to avoid over-watering
- Use rainwater harvesting techniques to save rainwater. Plants actually prefer rainwater over water from a tap
- Placing wood chips (Mulch) on top of soil helps to reduce evaporation
- Native species of plant often need less water so design and landscape your grounds accordingly

Kitchens

- Flow regulators on taps in kitchens
- Use dishwashers only on full load
- use green cleaning products
- Avoid thawing refrigerated food under running water
- Minimize the use of ice machines and adjust settings to dispense less ice

Housekeeping

- Put procedures in place (SoPs)and train the staff on how to reduce water use.
- Implement a linen reuse program resulting in less wear on fabrics, prolonging their life.

Waste Water Treatment

Waste water treatment should allow min 50% of wastewater to be returned to the hotel for toilet flushing & irrigation

Maintenance

Maintenance is the key: Regular maintenance will prevent water leakage, saving huge amount of fresh water purchase

Circular Economy in Hotels

The hospitality industry accounts for approximately 5 percent of global CO2 emissions and huge energy consumption. Small actions can make big difference -

- ❑Use Shampoo bottles & toothbrush made of poly-lactic acid (starch - biodegradable material).
- ❑Install low energy light sources or LED lamps in the hotel.
- ❑Use Variable Volume-Variable Temperature (VV-VT) to save energy by air-conditioning
- ❑Purchase locally sourced food, operate a greenhouse that supply as much fresh food as possible
- ❑Clad exterior or use rooftop solar panels to source in-house energy
- ❑Retrofit for responsive building to achieves energy savings by responding to the weather conditions and the presence or absence of guests.
- ❑Use carpets made from 100% recycled yarn previously used in fishing nets, diverting plastic waste

Create loyalty scheme for guests who don't have their room cleaned/Linen changed every day – Offer guest a voucher to spend in the shop / restaurant / bar.

These rewards act as incentive to showcase hotel's environmental policy and remove negative feeling that it is just a money saving scheme

Circular Economy in Hotels

- Create goodwill in the society by collaborating with NGOs in programs like -
  - ✓Food rescue program for food waste
  - ✓Reuse of furniture, bedding, linen, and towels at the end of life
  - ✓Recover used soaps to make new ones
- Showcase your efforts to your guests and earn their goodwill
- Starwood Hotels have committed to reduce water consumption by 20% by 2020.
- Hilton Hotel is following global objectives to -
  - ✓ Reduce CO_2 emissions by 20%
  - ✓ Reduce energy consumption by 20%
  - ✓ Reduce water consumption by 20%
- Holiday Inn in Flinders, Australia, recouped its investment in low flow technology within 18 months and cut water usage by 50%.
- Adopting circular economy practices would give annual benefits of ₹40 lakh crore by 2050. The gains equals to 30% of India's current GDP.

Circular Economy in Action

- Closed loop (Circular) water systems can be full or partial and at all scales. e.g. -
  - 30% of Singapore's water is provided by recycling sewage (known as NEWater) (https://www.pub.gov.sg/watersupply/fournationaltaps/newater)
  - Pearl gas-to-liquid plant in Qatar recycles 450,000m^3 of water a day, equivalent to 50% of the total demand of the country. (https://www.shell.com/about-us/major-projects/pearl-gtl/producing-water-in-the-desert.html)
  - Solaire building in New York recycles 750,000 liters per day of its wastewater, reducing water demand and waste water discharge by 50% (https://www.waterworld.com/articles/wwi/print/volume-21/issue-1/features/nyc-high-rise-reuse-proves-decentralized-system-works.html)
  - Aquafresco, a start-up that has created an attachment for a washing machine that recycles 95% of its water & detergent. Approx.$1.6 billion market for hotels alone. (http://aquafresco.co/)
- Circular economy practices are based on the concept that water, energy and materials are extracted at the beginning, to achieve net material flows, thereby synchronizing with nature's cycles

Circular Economy in Action

- Using nature as a guide, apply circular economy principles of systems thinking, closed loop systems and retention of value to secure a resilient & regenerative future
- The principle of circular economy is zero-waste and is based on three CE Design Principles:
  - ✓ Durables are Reused through Repair, & Refurbishment and only then Recycled
  - ✓ Consumables are used in cascading cycles before safe return into the natural environment, and
  - ✓ All natural capital (including energy) is used only to the extent they can be regenerated by us
- The circular economy practices will improve the alignment between corporate strategy and stakeholder expectations.
- This could catalyze social, economic and political momentum necessary to facilitate broader transitions to circular economy.
- Move beyond traditional silos and develop more partnerships & interactions.

Circular economy is a true nexus approach to water, energy and waste management

Circular Economy and SDGs

Promote inclusive and sustainable economic growth and decent work for all

sustainable consumption and production patterns

Take action to combat climate change & its impacts

Source: UN: https://www.un.org/development/desa/disabilities/envision2030.html

Thank You !

shrikardole@sdg-foundation.org