Gurteen Agricultural College

Environmental and Sustainable Farming

Level 6 Certificate

In association with

Susliving

Module 8

Evaluation of Energy and Resource Usage, Efficiency and Conservation on Farms

8.9 Water Usage

Water Usage
Unit 8.9

This session aims to provide the learner with the knowledge to:

Appreciate water as a finite and essential resource

Appreciate the level of usage associated with agriculture

Develop practices to ensure water quality and quantity

Water Usage

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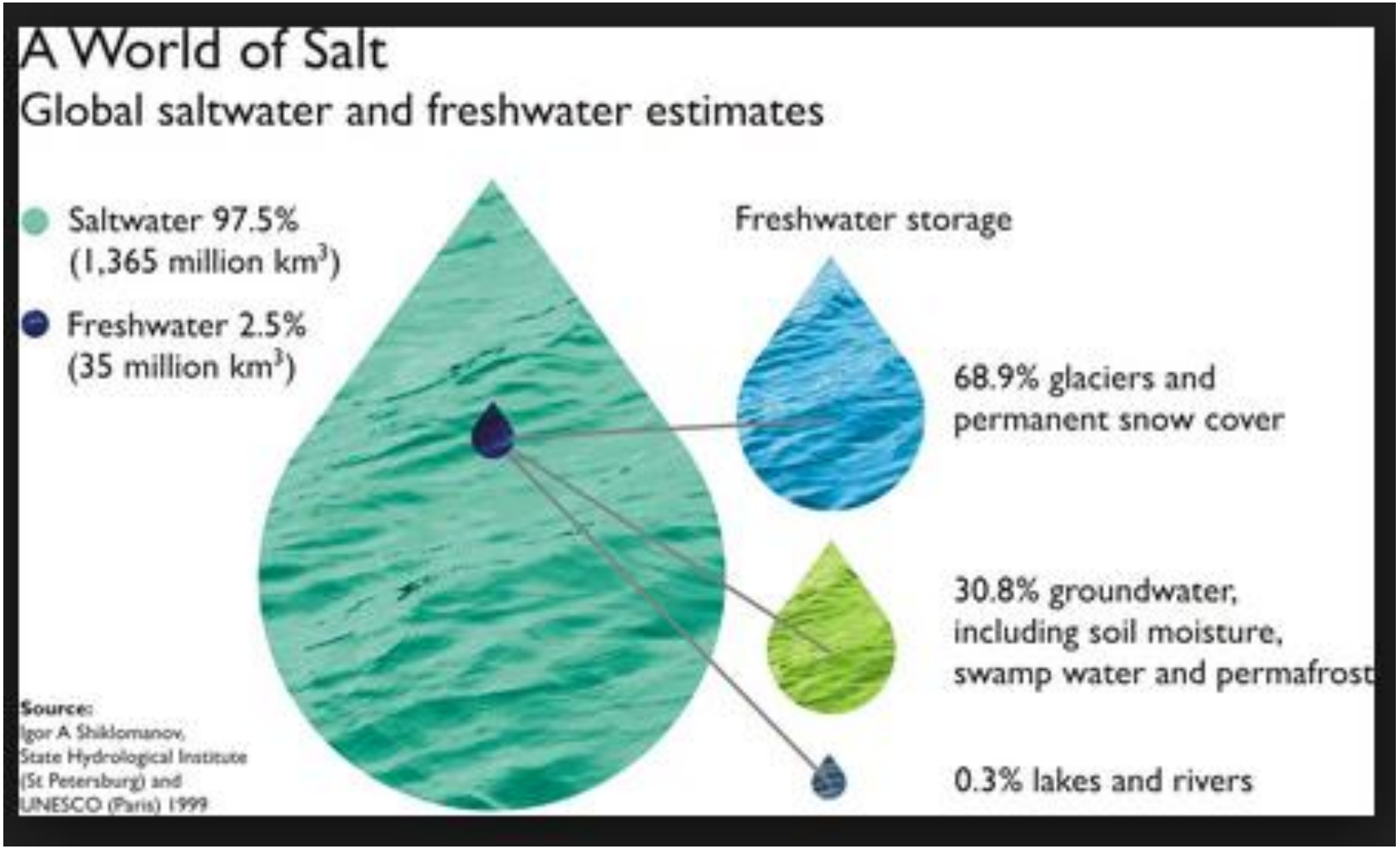

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Agriculture is the largest user of water, consuming 70% of global water.

It has unique properties making it essential to supporting life on earth.

Increases in population and the resultant increase in food, energy and consumption demands make water the most valuable and constrained resources on the planet.

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Some consumption facts:

1. **It takes about 170 litres of water to grow the coffee beans and process them to make one cup of coffee.**
2. **More than 5900 litres is required to produce a 12 oz. Steak**
3. **About 30,900 litres of water is required to grow a day's food for a family of four.**
4. **It takes 236 litres of water to produce one glass of pasteurized milk. The ratio is 1,000:1 so to produce 1 gallon of milk in the fridge takes 1,000 gallons out in the fields.**
5. **It takes more than 45 litres of water to produce one slice of wheat bread. If you eat the bread with a slice of cheese then you add another 59 litres.**

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Some consumption facts cont'd:

1. **Using a low-flow faucet can save you 16 litres per minute.**

2. **Using a low-flow toilet can save nearly 23 litres per flush.**

3. **Brushing your teeth requires around 9 litres of water. Shut off the water while you brush.**

4. **A five-minute shower can use 115-230 litres . A low-flow showerhead can help reduce water usage by about 40 percent.**

5. **Fix your leaky faucet; left alone it can waste up to 100 gallons of water a day.**

6. **An automatic dishwasher uses approximately 40 to 50 litres of water while hand washing dishes can use up to 90 litres**

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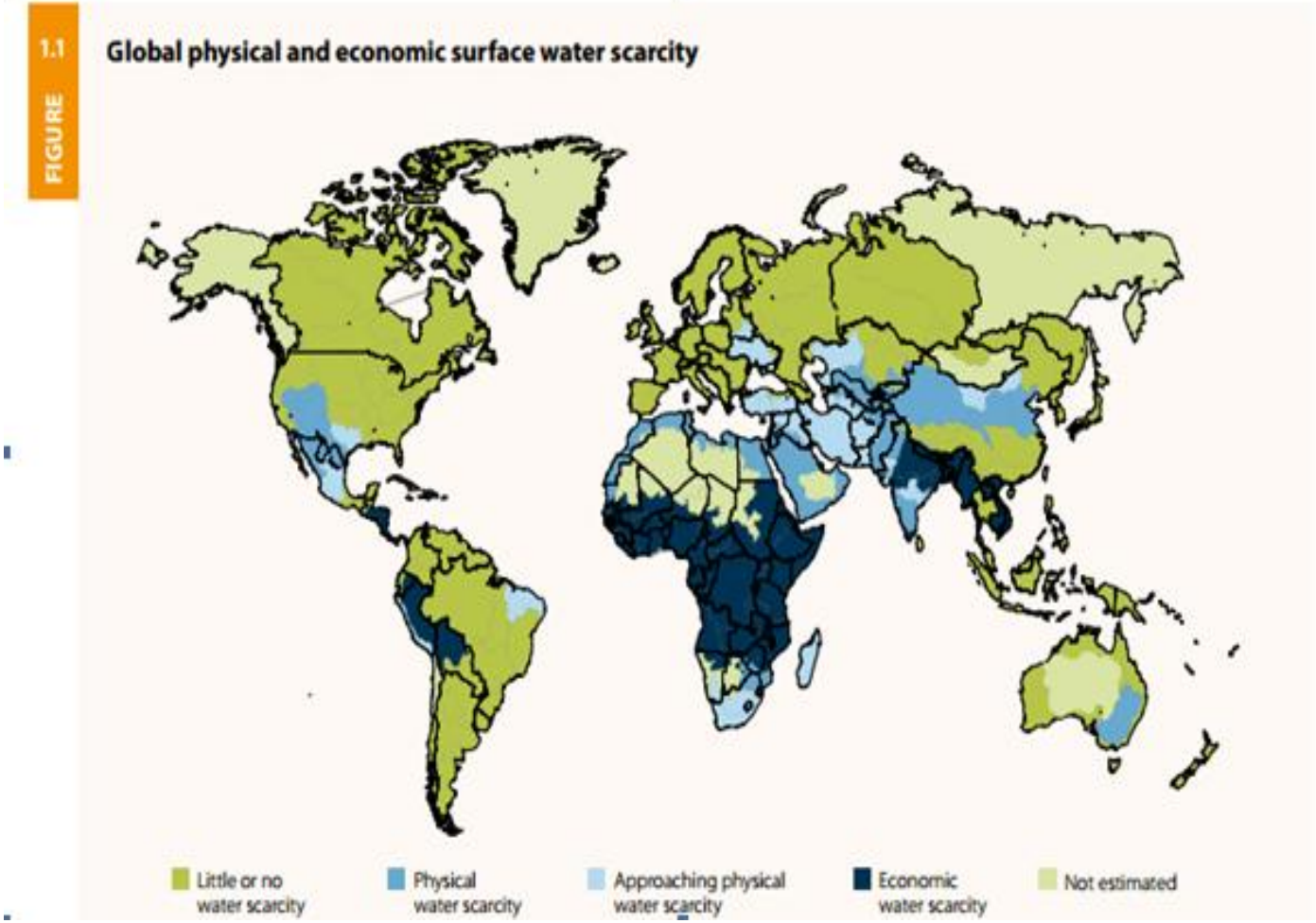

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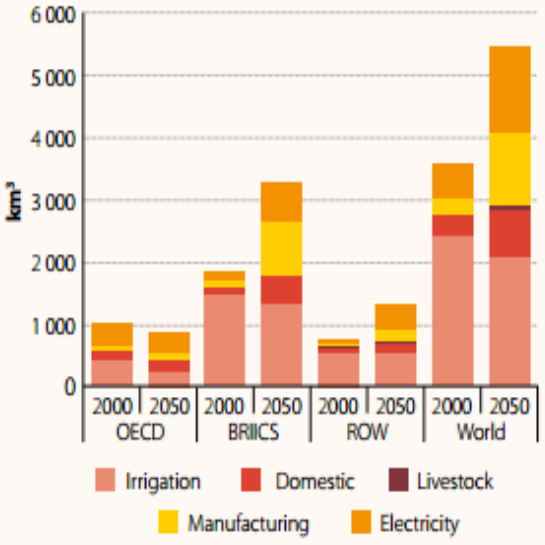
FIGURE 2.1

Global water demand (freshwater withdrawals): Baseline Scenario, 2000 and 2050

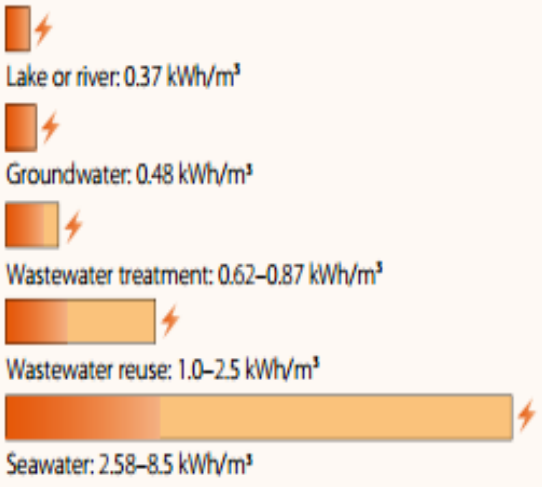


Note: BRIICS, Brazil, Russia, India, Indonesia, China, South Africa; OECD, Organisation for Economic Co-operation and Development; ROW, rest of the world. This graph only measures 'blue water' demand and does not consider rainfed agriculture.

Source: OECD (2012a, fig. 5.4, p. 217, output from IMAGE). OECD Environmental Outlook to 2050 © OECD.

FIGURE 2.2

Amount of energy required to provide 1 m³ water safe for human consumption from various water sources



Note: This diagram does not incorporate critical elements such as the distance the water is transported or the level of efficiency, which vary greatly from site to site.

Source: WBSCD (2009, fig. 5, p. 14, based on source cited therein).

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Farm water Management

The Nitrate Regulations deal with three main areas of farmyard management:

- Keeping soiled water to a minimum
- Collecting effluents, organic fertilisers etc
- Storing effluents and organic fertilisers properly

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Keep soiled water to a minimum

- Divert all clean water to a clean water outfall

- Prevent clean water from becoming soiled

- Keep the amount of soiled water that is produced on your holding to a minimum

- If soiled water is stored together with slurry, or if it becomes mixed with slurry, then as far as the Nitrates Regulations are concerned it is slurry and is subject to the same rules as slurry

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Collecting effluents and organic fertilisers

Organic fertiliser means slurry, farmyard manure, sewage sludge, industrial sludges etc.

Until you are ready to apply them to land, you must collect all organic fertilisers, effluents and soiled waters in a way that will prevent runoff or seepage, directly or indirectly, into groundwaters or surface water.

Maximising Storage Capacity

Constructing storage facilities for organic fertilisers on the farm is an option that cannot be taken likely. There are a number of other options which should be explored before deciding to invest.

Managing organic fertilisers on the farm is essentially about effective recycling. If we can minimise volumes to be stored then we reduce the capacity of storage required and also the volumes to be spread.

One of the best ways to ensure that you maximise storage capacity on your farm is by eliminating clean water entering storage tanks.

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Storing Slurry

Storage facilities are required for:

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- **livestock manure**
- **dairy washings**
- **soiled water***
- **effluents from dungsteads**
- **effluents from farmyard manure pits**
- **effluents from silage pits**

All storage facilities for organic fertilisers must now comply with construction specifications from the Department of Agriculture and Food.

They must be designed and constructed to prevent runoff and seepage directly or indirectly, into groundwater or surface water.

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Rainwater harvesting; Agricultural applications