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Irrigation for a Growing World

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The Intelligent Use of Water.™

What We'll Cover Today

- **The World's Water Crisis**
- **Options to Address Water Scarcity**
- **Conservation through Efficient Irrigation**
- **Encouraging Water Conservation**

The World's Water Crisis

Chart 1A – The World's Water

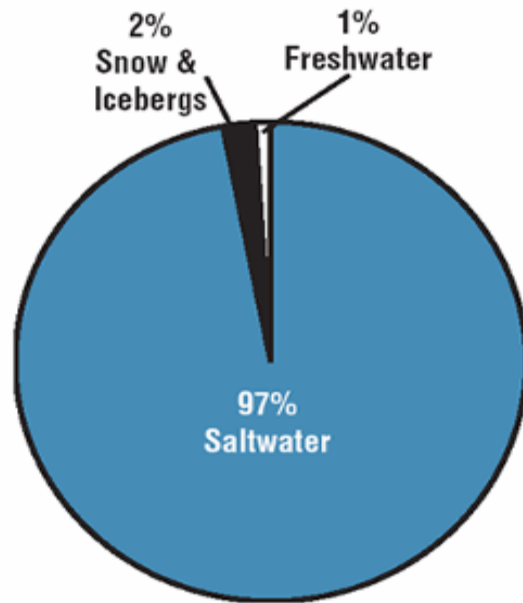
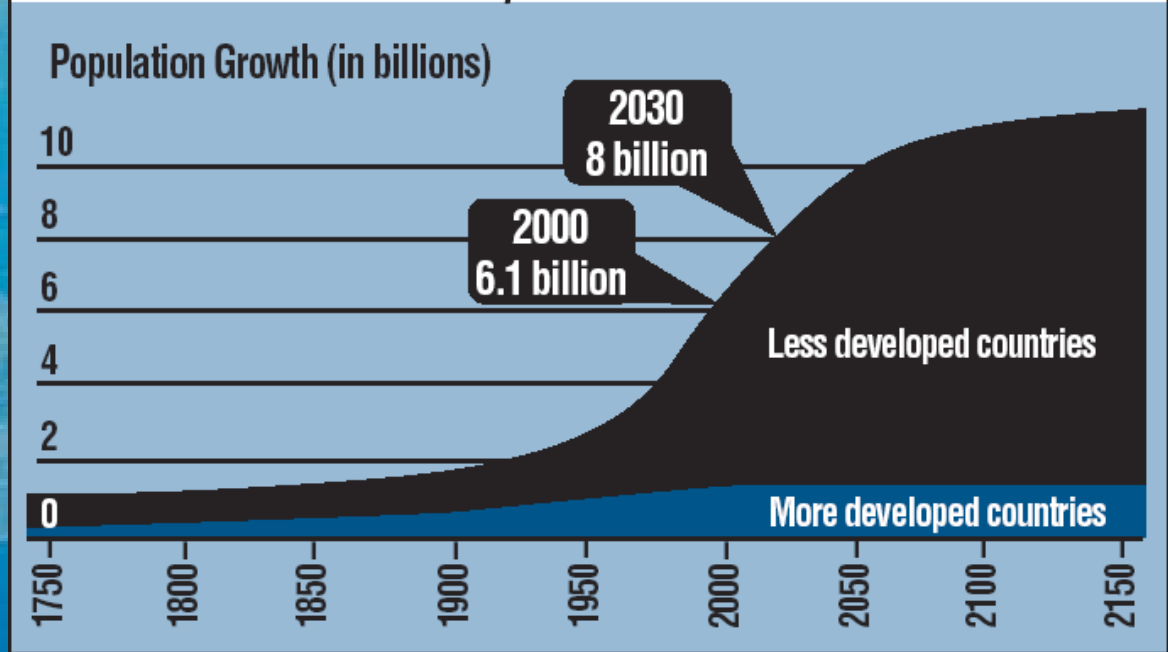
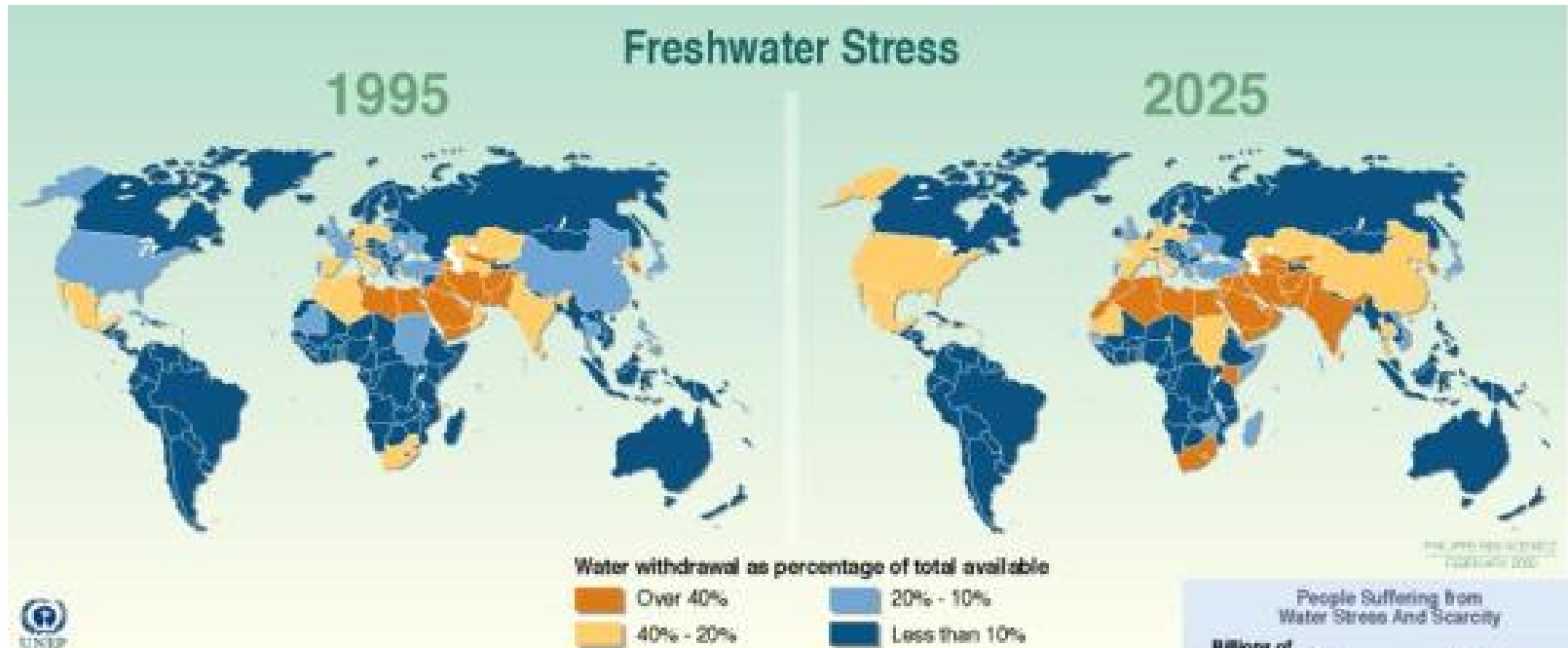


Chart 1B – The World's Population ⁶



There is no new water.

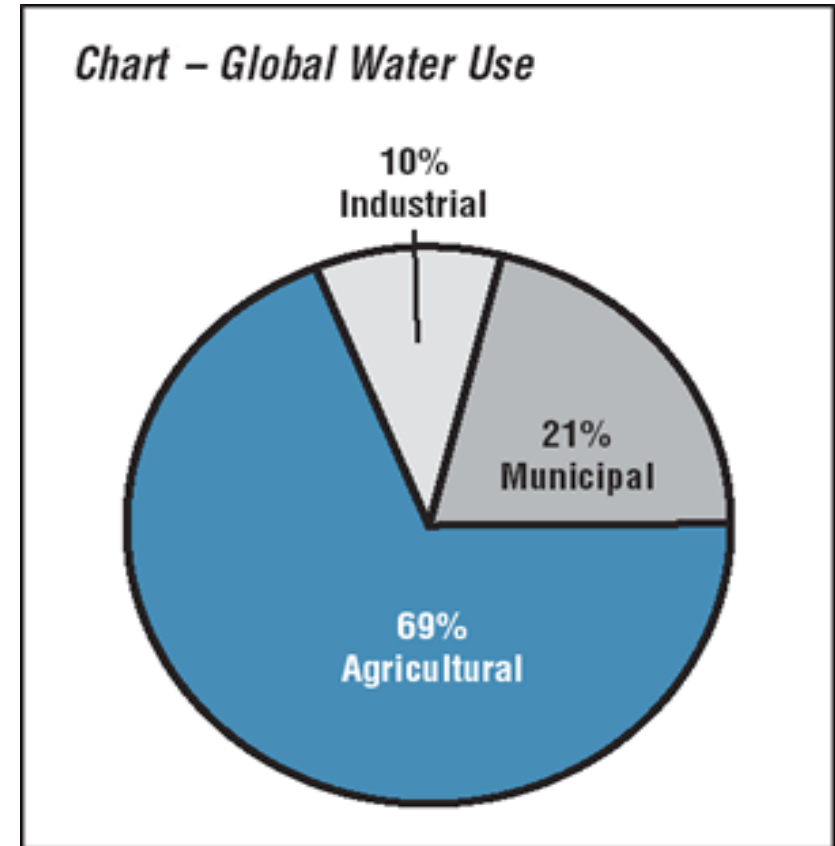


Source: World Meteorological Organization (WMO), Geneva, 1996; Global Environment Outlook 2000 (GEO), UNEP, Earthscan, London, 1999.



Outlook for the Future

- **69% of water used in Agriculture**
- **More efficient use can have significant impact on available supply**
- **Increasing number of international and regional summits**
- **Working together to find a solution**



Options to Address Water Scarcity

The Options

OPTION 1:
Water
Re-Pricing

OPTION 2:
Water
Re-Use

OPTION 3:
Desalination

OPTION 4:
Water Transfers &
Improvements to
Water Delivery
Systems

OPTION 5:
Alternate
Plant
Selection

OPTION 6:
Conservation
Through
Water-Efficient
Irrigation

1. Water Re-Pricing

- **Government subsidized**
- **Set artificially low to promote development**
- **Low water prices encourage wastefulness**
- **Re-pricing impact can be immediate**
- **Lengthy process to get buy-in from all groups**



2. Water Re-Use

- **Water recycling can reduce fresh water consumption by up to 80%**
- **Power-plant cooling, construction, manufacturing, golf course irrigation**
- **Expensive, high capital costs, not available in all areas**



3. Desalination

- Tap into the 97% supply of ocean water
- Technology improving
- Costs coming down
- **Negative impact on environment, high capital start up costs, high water cost**



4. Transfers & Delivery Systems

- Transfers from agricultural to urban use
- Satisfies immediate need
- Improved delivery systems prevent water lost in transit
- **Transfers only reallocate, infrastructure improvements can be expensive**



5. Alternative Plant Selection

- Use native plants that can thrive on natural levels of rainfall
- Can reduce irrigation and watering needs
- **Restricted plant selection; some people mix native and non-native plants**
- **Irrigation design and scheduling are very important**



6. Water-Efficient Irrigation

- Can be implemented immediately and in stages
- Significant savings opportunity in Agriculture
- Benefits can be reaped immediately
- **Requires 4 important components:**
 - Proper system design, products, installation and usage/maintenance



Water Conservation through Efficient Irrigation

History of Irrigation

- **Earliest irrigation followed river flooding**
- **Channels dug to move river water to crops**
- **Still the most common method of agricultural irrigation used today**
- **Only about 15% of crops worldwide grown with more efficient irrigation**



Illustration by Mark Peppe, © 2002 World Book, Inc

History of Irrigation

- **December 1933, Orton Englehart filed patent for “spring-activated horizontal arm driven sprinkler”**
- **Durable, distributed water farther and more evenly and efficiently**
- **Foundation that evolved into modern sprinkler irrigation**



Irrigation Applications



Agriculture



Golf Courses



Landscapes

The Value of Landscaping

- **Provides safe, high-quality play and exercise areas**
- **Increases real estate market values**
- **Beauty and relaxation for family, employees and visitors**







The Value of Landscaping

- **Eight average front lawns have the cooling effect of 70 tons of air conditioning**
- **Turf, shrubs and trees reduce noise pollution by up to 50%**
- **One tree removes 26 pounds of carbon dioxide and produces 13 pounds of oxygen annually - enough to support a family of four**

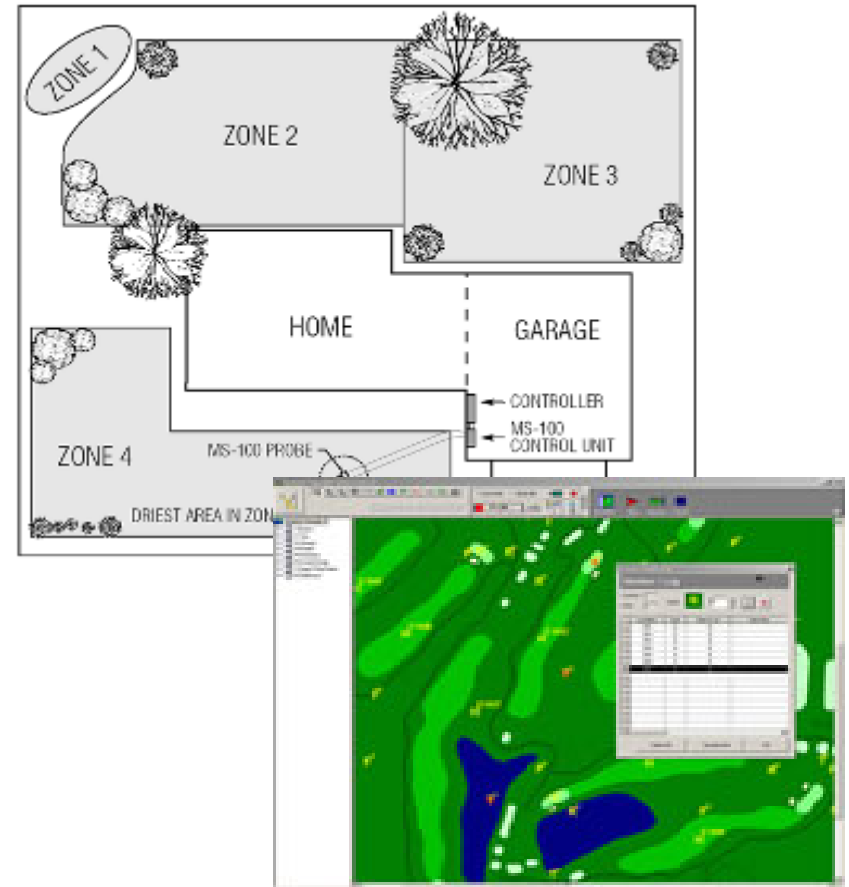


Key Steps to Implement Water-Efficient Irrigation

-  **Proper irrigation system design**
-  **Use the most water-conserving products**
-  **Proper system installation**
-  **Proper maintenance and usage**

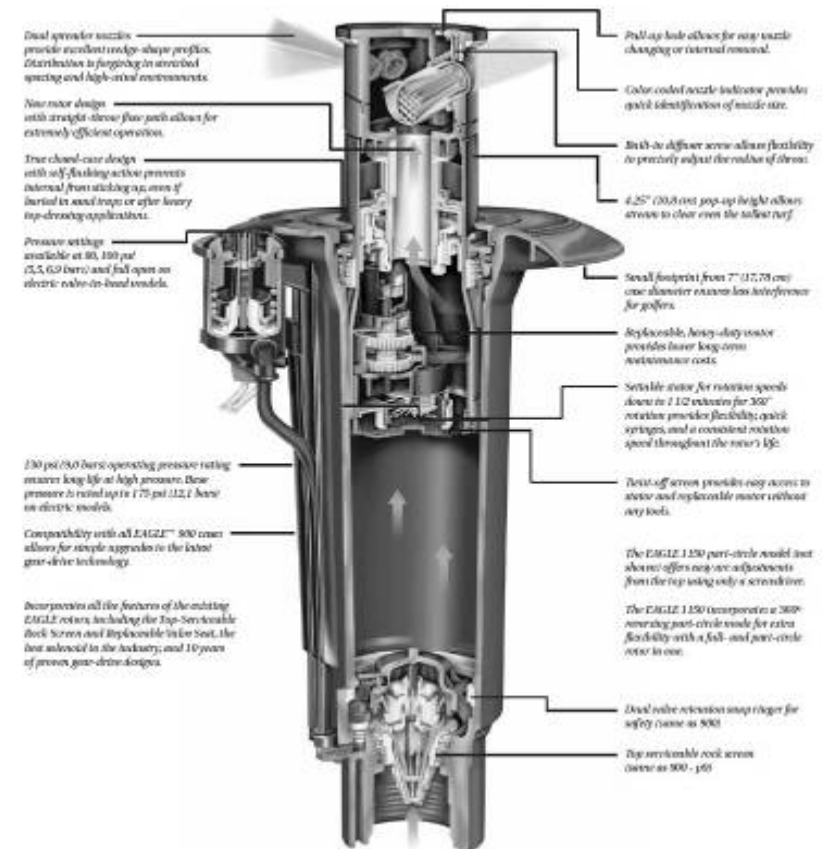
Proper Irrigation Design

- Different plants require different amounts of water
- Understand exactly what will be irrigated
- Divide by zones
- Use the right products for the right applications
- Consult a licensed professional



Use of Water Conserving Products

- Significant recent advances in irrigation technology
- Automated systems can be more efficient than hand watering
- Can be set to deliver exactly the amount of water needed



Automatic Controllers with Water Conserving Features

- Multiple start times and multiple independent programs
- Cycle+Soak™
- Water budget
- ET Programming
- Rain Delay



Add an Automatic Shut-Off Device

- Rain and moisture sensors automatically suspend watering
- 15-20% or more in water savings
- Some cities considering or passing legislation



Use Low Volume Irrigation

- **Very efficient for non-turf applications**
- **Apply precise amounts of water slowly and evenly at the root**
- **Helps reduce weeds and plant disease**
- **Helps eliminate runoff**
- **Helps plants thrive**



Provide Optimum Water Pressure

- **Use pressure regulating devices in high pressure situations**
- **Every 5 psi reduction results in 6-8% lower water usage**
- **Prevent misting & fogging**
- **Use booster pumps in low pressure environment**



Use High Efficiency Nozzles

- Provides uniform coverage
- Can reduce water usage by up to 30%
- Provides even watering at close-in, medium and far distances
- Without uniform coverage, some areas get overwatered to compensate for dry spots



Proper Installation

- **Systems must be properly installed and configured to achieve the most efficient use of water**
- **Use Certified Irrigation Contractors (WaterSense program)**



Proper Maintenance and Operation

- **Set systems to operate in early morning**
- **Periodic monitoring is important**
- **Routine inspections to discover problems**
- **Adjust schedules when the seasons change**
- **Adjust schedules when plants change**



Encouraging Water Conservation

Encouraging Water Conservation

- **Essential to ensure adequate water for future generations**
- **First reactions tend to be “shut off the taps”**
- **Creates confusion**
- **Leads to increased water consumption when bans are lifted**
- **Doesn't change long term behavior**

Government Incentives

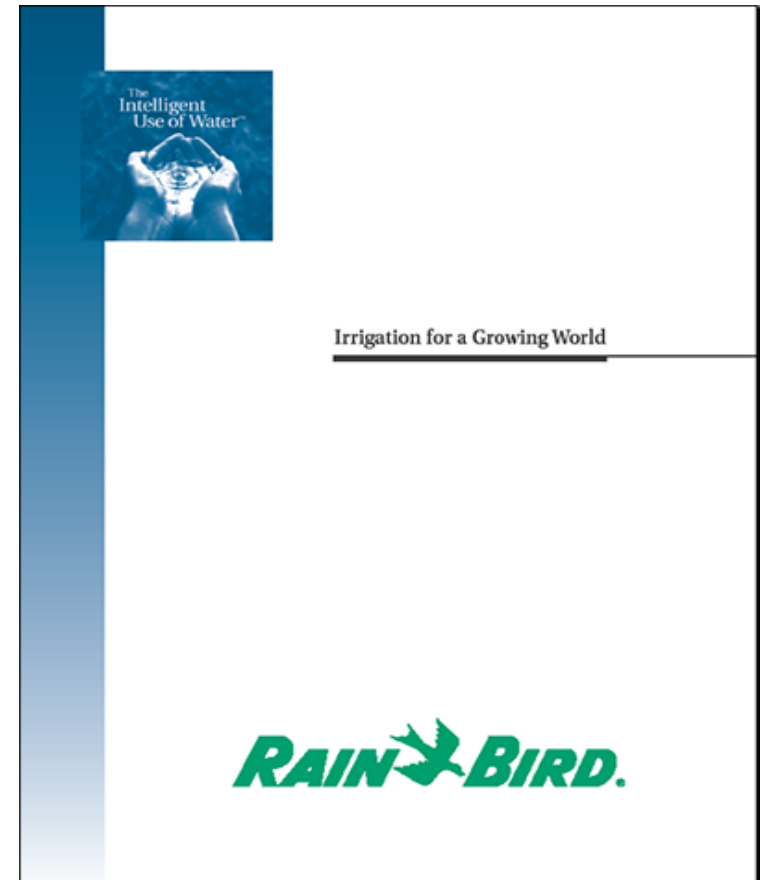
- **Loans, grants, rebates and incentives**
- **Conservation incentives and disincentives can change behavior**

Education and Awareness

- **Change perception of water as an “unlimited commodity”**
- **Professional education programs**
- **Public education and awareness**

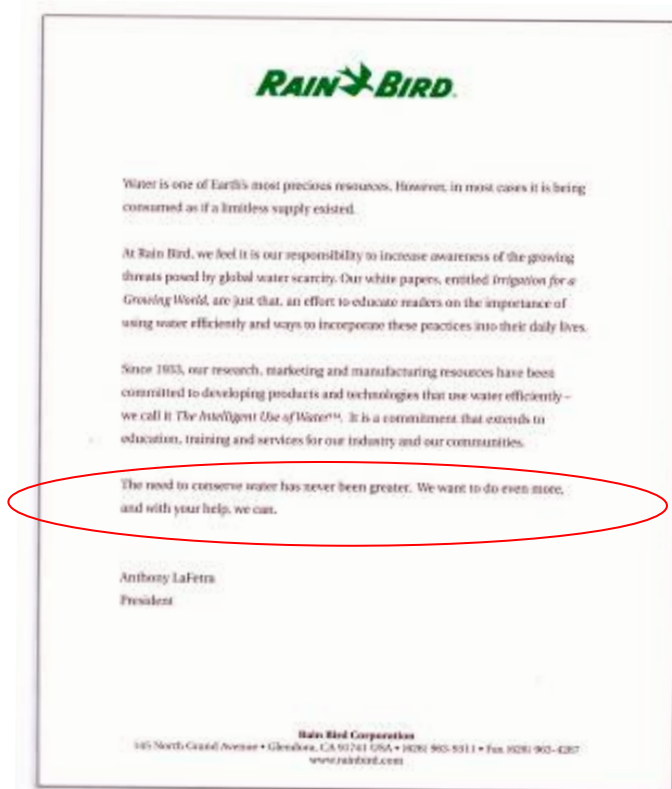
Looking Ahead

- Solving the crisis will take collaboration
- All methods have promise
- Water-efficient irrigation can make a significant impact
- Encourage policymakers to act now
- Let's all work together to be a part of the solution



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Thank You



**“The need to conserve water
has never been greater.
We want to do even more,
and with your help, we can.”**