

A Drop in the Ocean for Foresight Practitioners: What the Future May Hold for Fresh Water Usage and Availability throughout the Globe

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Abstract

For arguably the first time in the history of humankind, the developed world is facing similar water access problems to those of their less developed counterparts. In this piece we use two new concepts to change our paradigm on water access and use: the "Global Currency Map" that assesses the types of challenges faced and the different societal approaches to dealing with the crisis; and a universal currency unit called "Globals" - the equivalent of 1 litre of fresh water. The author asserts that as water is relied upon in every stage of production, all trade exchanges are simply examples of shifting water in its various end states. In this light we understand that some countries have an abundance of Globals to spend while others have very few and the emerging choice around the world can now be summed up as a choice between "Life versus Lifestyle".

Key words: Globals; Global currency map; Values; Sustainability; GDP; Survival

Introduction

This paper aims to assess aspects of arguably the greatest challenge facing the globe – access, availability and use of fresh water. A topic of this magnitude could easily form a multi volume book. I provide some broad-brush strokes for consideration, with hopefully sufficient detail to enable the reader to discern the potential impacts of the fresh water challenge that faces us.

Two new concepts are introduced – a currency called the "Global" and a metaphor called the "Global Currency Map" (Barber 2002). These concepts are aimed at adding depth to our understanding of what water means to different cultures and to people in differing geographic zones, and

how these zones and cultures may approach the use of water. Causal Layered Analysis [CLA] (Inayatullah 1998) is applied in a general way to assess the "Global Currency Map" and how we may identify the differing approaches of societies around the world. The aim here is to group similar societal "strategies", regardless of cultural types or geographic position, to show that it is identifiable factors within the "strategy" applied or accepted by that society that impact upon how water is used.

By identifying components of a societal strategy, we shift our awareness of that strategy from the level of "Litany", the unquestioned acceptance of how things are, to a conscious level that provides for the possibility of change and effectiveness. We also enable components from one societal strategy to be used as potential methods for another society to move forward, or as warning signs for potential pitfalls.

Finally, I offer questions that may challenge practitioners of foresight to enhance their forward views and those of their clients to consider the potential impacts ahead.

Some Global Facts about Water

Reviewing a few "snapshots" that detail the spread and complexity of the challenge will help us gain an understanding of the significance of the problem. This should provide greater clarity as you work through the paper.

- In the decade from 1991 to 2000, almost 1,720,000,000 people (equivalent to almost a third of the world population) died from drought or flood related causes (WHO 2001a).
- The incidence of flooding is becoming more frequent, almost doubling in the years 1990 to 1999 (WHO 2001a), with serious personal and financial impacts.
- Climate and crop modelling simulations predict agricultural production losses due to flooding, will cost the US\$3 billion per year over the next 30 years (NASA 2002).
- A recent worldwide poll on the environment received more than 25,000 responses from people living in 175 countries. Of all issues, concerns over water supply was rated the number one issue of importance.
- The main cause of cholera epidemics is infected water supplies most often linked to poor sanitation (CDC, DATE).
- Effective management of diarrhoea could save 1.8 million lives a year (The World Bank 1993).

In just 3 districts of Bangladesh alone, arsenicosis kills more than 1 million people a year with many more impacted by related diseases (arsenicosis can be prevented by providing deeper wells and collecting rain water) (WHO 2001b).

In the Gaza Strip, nearly 1 million Palestinian people use 25% of the available local ground water. The remaining 75% is used by Israeli settlers – fewer than 4000 people (Swanson 2001: 125).

On balance, it would be easy to assume that none of the above indicators support, in any way, positive outcomes for the planet, and certainly not for the people affected. However, given the demands of an increasing population on our finite resources, perhaps the human species has discovered its own method of not outgrowing the planet. These points also highlight how impacts in one area may differ from impacts in another.

er and, importantly, show that there may be water related events of which "we" are unaware, and that are significant to others. Finally, what the points all indicate is just how far-reaching the issue of fresh water is. All continents and areas of human activity are affected, from agriculture to health, industry to recreation, from tourism to disease, and more.

Expanding Perspectives on Water

Fresh water is often thought of as drinkable water; the term most often used is "potable". However, we may be better served by consideration of fresh water in terms of its "useability". Useability gives us an application focus – the purpose for usage. The idea of "purpose" expands the standard by which we judge water quality and the potential for use inherent in its availability. This also allows us to assess water quality in light of what it may be suitable for. Hence, water used for drinking must be of higher quality than that used for washing a car (in western worldviews at least), and the water suitable for car washing still has a useful quality.

This reminds us that oceans also play a part and only "fresh" oceans provide advantages for our future. Fish stocks play a vital role in the supply of food, often commercially in a far cheaper way than other food options. As part of the constant water supply "loop", ocean evaporation leads to cloud formation and then fresh water falls elsewhere. This cycle aids the temperature regulation of the planet, provides food and redistributes fresh water for crops. Considering useability expands our perspectives on fresh water to include such qualities as whether it is potable, recyclable and/or sustaining (various life forms). This, in turn, reminds us that oceans also play a part and only "fresh" oceans (which are, of course, not fresh in the usual understanding of that term) can provide for our future. Later in this paper, discoveries about the differing water quality demands of different plant species and the increasing adoption of second and third use crop systems are discussed.

It is clear, then, that considering water requires a broad perspective. In order to help develop and expand this perspective, this paper proposes a new "currency", a way of valuing water, and a map that helps us to determine the various strategies for water usage around the globe.

Introducing the "Global" Currency Unit (Global)

As I have noted elsewhere, "There already exists a collective 'global currency', we have simply until now, failed to recognise it" (Barber 2002). Within the realm of foresight, our ability to extend our views beyond the paradigm in which we operate gives rise to a richer picture of what the future may hold and this is what the "Global" Currency Unit (Global) attempts to do for the subject of water. Hence, in elaborating the "Global", a multitude of perspectives is combined: salt water and "fresh" water are given equal consideration, as are the individual and industry; and I have established a simple benchmark which applies regardless of physical location.

Elements of this currency include:

- A single "Global" is equivalent to 1 litre of water. This is potable water where the "purpose" requires fresh water, salt water where the purpose requires "salt" water, and so on.
- Because all supply chains use water at some stage, all trade exchanges are merely examples of shifting "fresh" water in its various original and end states.
- All trade exchanges, be they national or as part of the wider global market, vary from high cost trades (high water expenditure in production) to lower cost trades (lower water expenditure in production).
- Establishing a world-wide standard of water currency value, provides a means by which trade activities (water expenditure) can be assessed.
- Establishing a standard value for water usage also changes the paradigm of personal use – personal activities will now be viewed as a form of "trade" – the expenditure of fresh water to achieve an end result. This also places a burden on the individual user; agriculture and manufacturing, whilst high front-end users of water, are ultimately supplying individual needs, meaning that pressure for improvements in industry usage of water cannot be targeted at industry alone.

Trade is a useful concept: just as a country's balance of trade can be ascertained and mapped, water expenditure can also be seen in terms of transactions and balances. Hence:

- Accepted in any country, "Globals" are in abundance in some countries and in short supply in others. What I have established therefore is a trading system that does not shift goods and services, but shifts "Globals".
- Mapping the lack/abundance of useful water access and degree of trade/consumption within a country identifies societal "Global" expenditure and the potential challenges this expenditure creates.
- The GCM helps to identify likely cultural challenges and tactics that may be transportable into other countries and zones.
- The concepts of "globalisation" and "open markets" fail to consider the inherent inequities within the trade system. The GCM is based on world GDP figures, energy consumption, food production and international rainfall estimates.¹
- Sociological, topological and geographical restrictions and limitations of the planet impact the inequities found within the "Global" trading system. Future trade exchanges will need to be far more alert to the expenditure of "Globals" and the impact that expenditure has on the future of our world.

Trade in water in its various forms and end states, extends across the world. Examining the various ways in which water is understood and used internationally - the various national societal strategies for water expenditure - makes it possible to link the "Global" to a Global Currency Map (GCM). The GCM, illustrated in Figure 1, identifies the various ways and locations in which 'Globals' are valued or spent.

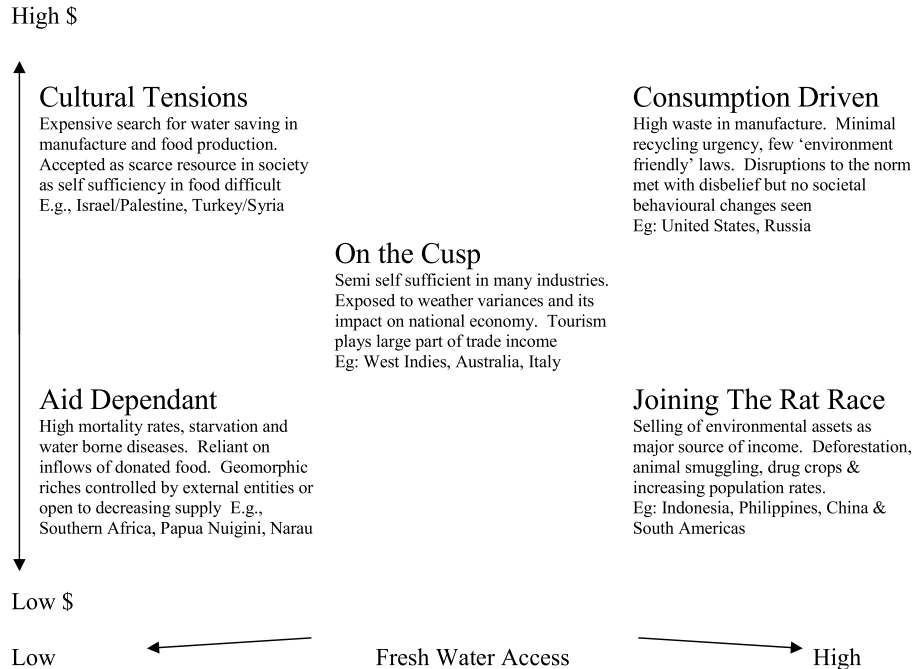


Figure 1: The Global Currency Map (GCP)

The Global Currency Map attempts to combine a series of factors that provide distinguishable characteristics of a particular approach to water. The currency in this instance is the "Global", equivalent to 1litre of usable water.

Variables are ranked along two axes. The vertical axis assesses the dollar value available to the population (estimated from GDP figures), and the horizontal axis assesses fresh water access. It is important to note the use of the word "access", as many of the countries perceived as drought ravaged often have sufficient rainfall throughout the year to make droughts more manageable. Systems to store water for later use and to direct that water to sites where it is most needed are lacking.

The GCM also maps five identifiable societal zones made up of countries that apply similar strategies to the use of water. Called "Aid Dependant", "Joining the Rat Race", "On the Cusp", "Cultural Tensions" and "Consumption Driven", each of the five strategies has definable characteristics that separate it from the others.

Methodology – Applying Causal Layered Analysis to Water Futures

Causal layered analysis [CLA] (Inayatullah 1998) enables the identification of the differing approaches to water taken by societies around the world. CLA is a four-tiered methodology for assessing the depth of information on a topic. These four tiers are - Litany (an unquestioned, "popular" acceptance of stated "facts" or perspectives), Social Causes (often the accepted approach to "how things are done" within the society), Worldviews (the perspective that a particular "class" of society shares as common

ground, i.e. "western", "3rd world", "banking", "environmental") and Myths and Metaphor (the unconscious drivers of the psyche of how a society sees its self).

Using CLA deepens our awareness of various strategies and approaches from the level of "Litany" to a conscious level that provides for the possibility of change and effectiveness. It also enables components from one societal strategy to be used as potential methods for another society to move forward, or as warning signs for potential pitfalls. By assessing how a particular society uses water and applying causal layered analysis (CLA) to that method of use, insights into the limitations of the various "models" of water use may be gained, and useful ways forward be found to address the impacts of water shortages.

The elements of the layers are first outlined, then considered in terms of the five zones (or groups of strategies) of the Global Currency Map, in Tables 1 to 5.

Litany

The first stage of applying causal layered analysis to the GCM begins by identifying how Litany "occurs" in each of the five societal zones. The unquestioned "givens" for each zone have a distinct feel dependant upon the elements that make up that society. The quality of infrastructure for effective water storage and use has a major role to play, as it may be argued that the level and quality of the water-based infrastructure is a critical determinant in what strategies are available for a society.

Social Causes

How do social causes manifest themselves within each of the five zones? Each strategy has a social cause and some national "priorities" are in fact self-interested "causes". As such the water approach within each strategy is stretched between the "what we stand for" cause and "why this happened" cause. Decisions about using water for power supply or agriculture, for sanitation or recreation, may generate clashes within each society or trans-currency clashes between differing social strategies.

As Table 2 shows, the level of water availability determines what priorities are paid most heed. As the society meets some of its needs, there is a strong likelihood that the society will change its strategy to encompass other uses for water. For example, the "On The Cusp" strategy shows a community divided between the perceived "promised land" (identifiable with aspects of the Consumption Driven strategy), whilst identifying with the natural resource degradation seen in "Joining the Rat Race".

Each of the strategies has a social cause and some of the "priorities" are in fact self-interested "causes". As such the water approach within each strategy is stretched between the "what we stand for" cause and "why this happened" cause. Decisions over using water for power supply or agriculture, or for sanitation or recreation may generate internal clashes within each society or trans currency clashes between differing social strategies.

The World View

At the third tier of causal layered analysis, we begin to note the perceptions inherent in each of the five strategies: what makes their worlds "real". Importantly, we learn how their view of reality shapes what they believe is a world approach on how to see others and on how they are perceived by others

Aspects of denial and fear are commonplace as the view on water access is "chunked up" to a larger view. Here we have societies beginning to grapple with awareness of changing "realities", and that increasing depth of understanding has shifted from a societal level to an appreciation (perhaps an acceptance) of the true nature of the problem. The drivers for change, innovation, adaptation and preparation are embedded within the particular worldview and how that worldview typically responds. The western worldview turns to science and technology (but not to its own behaviours) to "fix" the problem. The Third World may see tribal elders appeal to the gods for assistance or indicate that it is time for the group to move on. The environmental worldview sees ecology as the provider of a way forward, while the finance worldview may see opportunities for profiteering or the market.

Myth and Metaphor

At the final tier, CLA is applied to the GCM to assess how myth and metaphor influences each of the societal zones approaches to water. Remember that myth and metaphor are deeply embedded within the social psyche and help form patterns of behaviours associated with that psyche. Australia's "fair go, mate" and "laid back larrikin from the bush" are examples of metaphor.

There are readily definable differences in what a metaphor means to societies in each of the zones. Dams, for instance, are a potential "life raft" for the Aid Dependent, whereas for those in Cultural Tension zones dams mean "power". For the Consumption Driven strategy, dams indicate a "civilised society" for they supply clean water and electricity.

Industry methods, health problems and solutions, recreational choices and more, are heavily influenced by water access. Tables 1 through 5 set out each zone's suggested surface level discussion points, activities, thinking and beliefs that we are likely to see in each of the zones within the GCM.

Table 1: CLA and the Global Currency Map – The "Aid Dependent" Zone (Low GDP and Low Fresh Water Access)

Causal Layered Analysis Level	Societal Approach/Thinking
Litany (what we say)	Water provision is seen as the role of women who carry water (often hand pumped) vast distances. Education on disease limited. Water seen as a "sacred" gift. Tainted water is a message from the gods. Oceans and rivers supply food where access is available.
Social Causes (what we do)	Every drop is to be saved. Water quality and access major concerns. Water borne disease has huge impact on survival rates, medical costs and self-sustainability but tools are limited so "we do what we can". Low water access reduces food production and increases reliance on international aid.
World View (how we think)	Birth rates remain high to combat water borne disease-driven mortality rates. Western scientific intervention provided or requested as it is seen as a 'silver bullet'. Education of masses slow and open to cross cultural misinterpretation. Food aid will hopefully come "in time" to save us.
Myth and Metaphor (who we are)	Water means life. And Death. The ancestors and elders hold the key to water access. Every drop is a precious gift from the spirits. Changing of seasons brings hope and despair.

Table 2: CLA and the Global Currency Map – The "Joining the Rat Race" Zone (Low GDP, High Fresh Water Access)

Causal Layered Analysis Level	Societal Approach/Thinking
Litany (what we say)	The rainy season comes one day and then on another it stops. Water is a "road system" for boats as part of a person's daily life and is developing into a major highway for industry. Water will continue to be in abundant supply, as it always has been.
Social Causes (what we do)	Dams to supply power and timber for export lead to loss of natural habitats. Water used as method of waste disposal for all levels of industry and society. Fresh water often bottled or required to be boiled. Most water borne diseases avoidable and precautions not always taken.
World View (how we think)	Rainforest timbers bring instant rewards. Tourist income not yet sufficient to offset impact of extraction of timber. Water degradation seen as minimal due to abundance of supply. Flow-on effects ignored as the 'west' will buy natural assets, feeding many more mouths.
Myth and Metaphor (who we are)	Water helps grow trees that supplied medicinal (healing) qualities. The rainforest and rivers are one. A new 'spirit' has arrived and the ways of the ancients are being overrun as we bow to the god from the west. The "gap" between rich and poor grows vast as the ruling elite pocket the wealth

Table 3: CLA and the Global Currency Map – The "On the Cusp" Zone (Variable GDP, Variable Fresh Water Access)

Causal Layered Analysis Level	Societal Approach/Thinking
Litany (what we say)	“There’s drought and then there’s flood”. Face the challenges of each of the others – consumerism, harvesting natural assets, the pain of ‘lack’ and seeking methods for effective use. Oceans are to be respected. Each sector of society’s own beliefs go unquestioned.
Social Causes (what we do)	Society segregated by understanding of water’s importance. Farming districts reliant on, cities ignorant of consumption. Connection with tourism needs is strong and anything that threatens industry receives attention. Planning for future needs lacks scope and urgency beyond “el Niño” time scales.
World View (how we think)	Society is split as to how or when to tackle problem. Industry denying the problem looks for quick fix. Lured by consumption driven “benefits of globalisation”, parts of society want to reach levels of leading consumer societies. Repeating mistakes made by other nations.
Myth and Metaphor (who we are)	It’s a harsh land battered by “mother nature”. The world sees our clean oceans but we hide our dying rivers. Success means a green lawn and a washed car in the driveway. As people of the land we have to put up with the challenges presented to us — she’ll be right!

Table 4: CLA and the Global Currency Map – The "Cultural Tensions" Zone (High GDP, Low Fresh Water Access)

Causal Layered Analysis Level	Societal Approach/Thinking
Litany (what we say)	Water viewed as an expensive commodity. Fresh water used in recreation is for the ‘rich’. Strong connection between water use and sustenance
Social Causes (what we do)	Society accepts need to conserve water. Industry leads the way as water costs are prohibitive to profit. New dams and de-salination structures are proposed to supply population’s drinking and or power needs with minimal consideration for cross border or environmental impacts.
World View (how we think)	We are in a race to establish more water reserves before nearby neighbours and to increase “living standards” (consumption). Downstream impacts of dams ignored or denied in order to preserve self benefit and potential.
Myth and Metaphor (who we are)	Dams mean power. Water abundance indicates wealth and control. Civilisations evolve around mighty rivers and ownership and control of water resources is a right assigned by god(s).

Table 5: CLA and the Global Currency Map – The "Consumption Driven" Zone (High GDP, High Fresh Water Access)

Causal Layered Analysis Level	Societal Approach/Thinking
Litany (what we say)	Water is viewed as a "given" with a strong link to "recreation". Advertising images for hair products, bathroom products and cars involve images of an abundance of water. The "kitchen tap will always work".
Social Causes (what we do)	Water a "right" for agriculture and domestic use. Disposal seen as governments' problem. Natural flood outlets levied to protect homes, causing problems downstream. Redirection of rivers for electricity, oceans used as waste disposal and as an asset to be plundered. More technology will fix all ills.

Alarm Bells and Trouble Spots

Now that we have mapped the existence of different strategies around the globe for how water is consumed and for what purpose, and the various layers of thinking that drive the different strategies, individual signals arising from within those various strategies can be examined.

Six key trends are already emerging, or have the potential to demand society focus. Figure 2: The Whirlpools of "Global" Impacts gives an overview of many inter-connecting factors that make up the key segments determining the development of a society: Food, Sanitation and Manufacturing, The whirlpools are a metaphor for the various trends coming together and causing a form of societal turbulence that may dissipate with minimal effect or increase from a small eddy into a significant whirlpool, sucking energy and resources into its depths.

These six trends help form the three major whirlpools in Figure 2 and provide clear warning signs and calls to action for major parts of society.

1. **Disease** – Gastro enteritis, malaria, Ross River fever and Murray Valley encephalitis, diarrhoea/dysentery, cholera. Impacts on health costs and expenses, death and burden of care, potential epidemics and control.
2. **Access and Usage** – Civil and industrial. Supply, quality and costs. Preferences for "high value" trade commodities and activities. Interest group influence on crop growth and political favouritism.
3. **Threats** – Transnational (Turkey and Syria, Israel and Palestine). Dams, waste disposal, trade competition, deliberate and incidental poisoning of supplies through terrorist activities.
4. **Ownership** – Rainfall catchment and run off areas, "Public Domain versus self-interest". Who "owns" water? Considerations of rights of supply and use for farming and industry.
5. **Consumption** – Domestic, Industrial, Agriculture: "True Cost" water accounting.
6. **Location and Creation** – "Global Domain" concept: Rainforests currently produce two thirds of the world's rainfall (NASA, Oct 2002) iceberg "farming and mining", storage facilitation for times of limited supply, environmental variances.

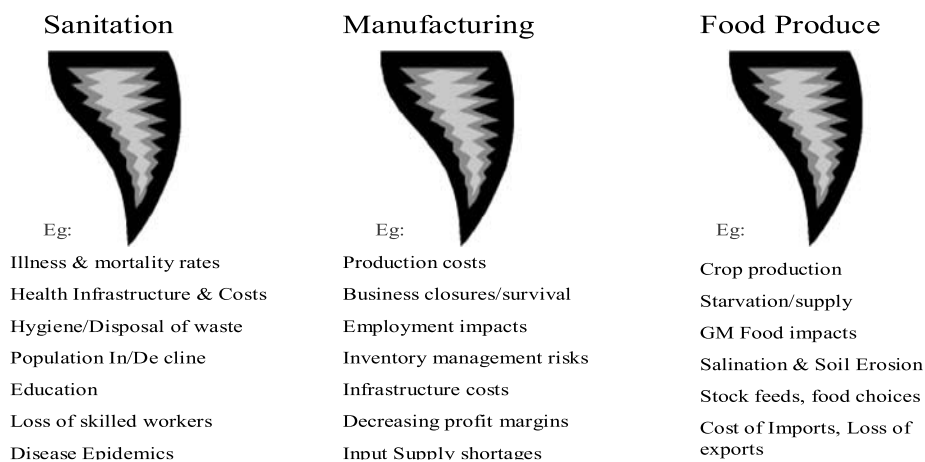


Figure 2: The Whirlpools of "Global" Impacts

Expanding the "Whirlpools of Global Impacts"

The three key "whirlpools", Sanitation, Manufacturing and Food, each appear as an isolated eddy, fully self-contained. As practitioners of foresight, however, we understand that such a simple belief is rarely "true", and that there are potential "knock on" effects for every factor, connecting it to other factors in the other whirlpools.

At the same time, the effect of seemingly isolated factors can be expanded upon. For example, "disposal of waste" is a clear sanitation issue reliant upon water supply. If we ask the question, "What happens if we lack effective sanitation methods?", we can identify that Manufacturing may also be impacted both through a loss of skilled workers due to disease and also by loss of potential customers. We could also say that Sanitation has an impact on food production, both for fresh water supplies to grow crops and also for soil quality.

Tying It All Together

What the Global Currency Map indicates is that different societies treat the concept of water differently. This also means that their expectations of water availability are different, that their strategies for conservation are different, and that their priorities regarding usage of water are also different.

As someone who has grown up in a western worldview society, I bring particular biases, beliefs and understandings to any assessment of a topic. In order to consider more fully the widespread nature of the problem, I have used CLA to add depth to my interpretation.

The western worldview is rarely questioned. It takes water supply for granted, and assumes an unabated continuation of its own worldview. Our typical western worldview approach means that even domestic consumption has a high degree of waste

based on a taken for granted view of water availability. Considering two elements of consumption, commercial and domestic, Table 6 sets out usage behaviours and impacts.

Table 6: Commercial and Domestic Water Usage and Its Impacts

Commercial		Domestic	
<i>Usage</i>	<i>Impacts</i>	<i>Usage</i>	<i>Impacts</i>
A typical paper mill uses up to 350,000 litres of water to make just 1 ton of paper (Swanson, 2001, p. 90)	Decreasing supply will lead to increased costs of manufacture and in some cases, business collapse. Companies with inadequate foresight will struggle	Non-smart toilets use up to 11 litres of fresh water per flush and the domestic toilet is the largest household consumer of fresh water (ATA 2002)	Societal — Welfare agencies, employment agencies and health are all likely to be affected by decreases in water supply as job contraction leads to income loss and financial strain and water related illnesses increase
The Murray Darling Basin Irrigated Agriculture accounts for 70% of all water used in Australia (ABARE 2001). Approximately 25% of that consumption is used solely for the production of one crop, cotton	Building and Construction — timber, concrete, glass and steel all heavily reliant on fresh water for production, sanitation and cleaning	Modern Composting toilets produce no odours, use no water, are virtually maintenance free and look just like the ‘normal’ system (ATA 2002)	Crop growth (food shortages) for stock and human consumption can be severely impacted by drought or water contamination. Grain and pasture fed livestock likely to be slaughtered with water shortages. Floods wipe out whole plantings. Prices for meat products jump. Staples like bread, pasta, rice, vegetables and fruits also hit
Typical breweries use 10 litres of water to make just 1 litre of beer (Swanson 2001: 93)	Mining — used to cool machinery, dampen coal dust, tailings dams, wash raw ores	“Concrete doesn’t grow, so why water it?” (Advertising on community bus, San Diego 2001)	Poverty entrapment and wealth reduction are potential outcomes as industries reliant upon access to water collapse, leading to job losses. Some industries could take years to recover. Gambling and crime related flow on effects potentially increase
Every year between 50% and 75% of resource inputs to industrial countries are returned as waste flows to the environment (World Resource Institute 2002)	Agriculture — growth and quality, soil erosion and salinity, greater seasonal variances	An average hose consumes 40 litres of water a minute (ATA_2002)	Irrigation techniques force changes in crop rotation leading to changes in supply.

<p>Scenario modelling predicts that within the next 15 years, water shortages will cause the price of rice to increase by 40%, wheat by 80% and corn by 120% (IMWI 2002)</p>	<p>Fisheries — stocks are impacted by ocean pollution and pesticide “run-off”, water is also needed for cleaning, freezing and cooking</p>	<p>On the first day of Level 1 water restrictions in 2002, Melbourne used almost 1,000,000 litres less water than it did on the previous day (Melbourne Water 2002)</p>	<p>Damage occurs as houses begin to shift and walls crack due to footings drying out</p>
	<p>Automotive — one of the highest commercial uses of fresh water is in new car manufacture along with petroleum production and tyre manufacture</p>	<p>“One of the more common causes of domestic shrubs and plants dying is root rot caused by over-watering” (Hinze 2002)</p>	<p>Sporting clubs see increase in injury due to hardness of grounds.</p>
	<p>Textiles – dyes, paints, fabrics and paper all produced with fresh water inputs</p>		

Having broadly described some existing worldviews and their crises, large and small, I leave it up to the reader to determine whether the western world's usage statistics are justifiable in view of overall world need.

Plans in Action

Luckily all is not lost. Action is being taken and initiatives are underway. Many of the ideas have already demonstrated their worth; for others, the longer-term impacts have yet to be felt. Judgement of the overall benefits of their implementation is left to the reader, who may care to consider whether they are in a position to influence a wider understanding of these techniques and whether, if the ideas are a valuable alternative to standard practises, they may be implemented in the reader's own sphere of influence. A fuller list of initiatives is available via www.lookingupfeelinggood.com.

International Initiatives

Include and are not restricted to: the UV Water Works, a low maintenance Infection Removal system for water supplies invented by Professor Ashok Gadgil (UV Water Works 2002); the International Water Management Institute's *Water and Climate Atlas* provides data to farmers for timing and quantity of irrigation, based on evapotranspiration levels of local area in the US (IWMI, n.d.) and CSIRO's dry root technique, used in grape crops around the world as a precise tool for root watering that decreases evapotranspiration of vines and decreases water needs by up to 50% (Adams 2000).

National Initiatives

At the national level: Water Trading enables irrigators who have not used their allocated entitlement to shift (sell) the remainder of their entitlement to those that need it (Heaney & Beare 2001); urban grey water reuse for vine crops irrigation (Courtney 2002), and the Wentworth Group's Five Point Plan (<http://www.wentworthgroup.org/>) emerging from a group of environmental scientists so alarmed at the "pop futurist" approach suggested by broadcaster Alan Jones, they quickly convened a meeting to discuss ways forward that met Australian conditions. The group's name was derived from them having met at the Wentworth Hotel in Melbourne.

Local Initiatives and Suggestions

At a local level, some of the suggestions and efforts include: grey water flush toilets using shower, bath and laundry water; minimal flush toilets; no flush toilets (sometimes called trees); suburban rain capture in tanks (2000lt min., 5000 max. capacity per household) to store run-off for later use on gardens, to wash cars, windows or for flushing toilets, etc; a boycott of high usage products and manufacturers whose techniques are consumption excessive (certain beverage, automotive and paper manufacturers) and of products made from rainforest timbers; maintaining a small vegetable garden that can be hand watered so that there is less reliance on irrigation-fed agriculture; and using a broom on driveways plus legislating against hosing down driveways at any stage.

Other Ideas

- Iceberg farming and mining – collecting small floating icebergs around the polar caps and drilling icebergs to gather water for cartage back to nation states.
- Introduction of the "Global" as a worldwide currency.
- A 0.02% Freshwater Tax collected on all international trades to enable countries producing high levels of fresh water to retain rainforests and glaciers, etc.
- A 20% tax on imports from countries not signatories to the Kyoto Protocol. A 5% reduction if company from a non-signatory nation producing those goods can show it is using best practise standards for water use and environmental impacts.
- Ban plantations of high water dependant crops (cotton) and farming methods reliant on old world approaches (rice/flood irrigation).
- Genetically modified foods that can cope with smaller amounts of water.
- Eat less meat as meat production requires large volumes of water through grain feeding and water consumption during the animals' growth.
- Specifically for Australia, the creation of a permanent and deeper inland sea (Lake Eyre) to help improve rainfall on the western side of the dividing range (among other benefits).

Summary

The impact of water on our futures is no mere "drop in the ocean". What will benefit the world is a greater understanding of the challenge that exists now, and how parts of that challenge may change in the future.

Concepts such as the "Global" currency unit act as a means to educate parts of the world as to the excessiveness of their usage, while others already understand the preciousness of the commodity and the urgency required to address the challenge.

The Global Currency Map shows how different sectors of the world treat water differently and how lack of quality supply has a flow on effect to other sectors of a society, in particular through starvation, disease and mortality.

Practitioners of foresight may well do a fine job in creating more useful forward views for their clients. However if they fail to include water in their vision to the horizon, they are taking supply and quality for granted. As shown by the listing of some of the initiatives already under way, and of potential questions to consider, this is, quite simply, an assumption without foundation.

A Final Word about This Paper

Earth is often referred to as the "Blue Planet" yet we may be heading towards an environment not unlike another blue planet within our solar system - Neptune. With an atmosphere of methane, hydrogen and helium, Neptune is unfit for human habitation - windswept, lonely and for all intents and purposes, lifeless. Unless we begin to act immediately and decisively, our planet will increasingly resemble Neptune as it, too, will be unfit for human habitation.

Like much that occurs here on earth, many of us tend to be more impressed with how things look, rather than how things are; this is the realm of the pop futurist mantra where surface images and simplistic notions are passed off as "depth and knowledge" by media and parties with limiting self-interest focus. In the "west" our green lawns, clean cars and deep baths ignore the struggle faced by millions every day. It is time to rethink our paradigm.

Questions for Foresight Practitioners

Having provided a few broad-brush strokes as to the variety of areas affected by useable water access, the following questions are aimed at expanding your own understanding of the global challenge.

Water availability is so pervasive and yet so unquestioned. Practitioners of foresight, who overlook the significance of what a lack of supply may mean, leave their analysis at "Pop Futurism" levels. The following questions should help expand your appreciation of just how wide ranging this "drop in the ocean" has become.

Below are a few questions that might provide useful for developing perspectives regarding the existing and developing water challenge and the full list is available at the website <www.lufg.com.au>.

1. During a "useable water" drought and given a choice, which of these three areas would you be willing to by-pass in order to maintain supply to the other

- two areas? – Food Supply, Sanitation, Manufacturing? (See "The Whirlpools of 'Global' Impacts")
2. Given your response to the above question, how would stopping supply to that area impact on the wider community? What flow-on effects are likely?
 3. Who owns the water that falls on your client's factory roof?
 4. If fresh water access was to be stopped within one month, what would your organisation need to do to be able to continue operating?
 5. On a worldwide scale, how does your organisation's "Global" expenditure compare to leaders in your field?
 6. With depleting fish stocks around the world, is the organisation aware of the down stream impacts of waste they produce and are they taking steps to reduce this waste?
 7. What legislative, community or organisational pressures need to be applied to create a shift within your organisation's approach to water consumption?

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Notes

1. Information synthesis for the GCM concept has been sourced from the International Water Management Institute (IWMI), World Trade Organisation, International Food and Policy Institute, World Energy Network, World Resource International and the CSIRO.

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