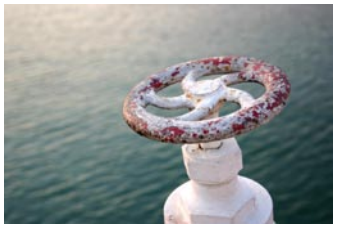
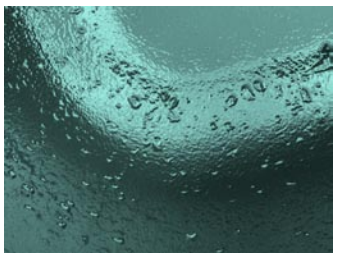
waterwise

Water Neutrality

Discussion Paper





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Waterwise

I. The Importance of Environmental Terms

In the efforts of environmentalism, having concrete definitions is of the utmost importance. Clear and concise word choice allows the general population to understand environmental issues. The media can spread the message of sustainability easily and explain the efforts of leading specialists to Joe Public. With greater societal understanding comes and more environmentally conscious world.

Recent environmental efforts have oftentimes stemmed from the simple ideas of 'organic' or 'carbon neutral.' With carbon neutrality, for instance, carbon dioxide emissions are reduced, via curbing emissions or buying carbon offsets. Music concert tours, apparel, award shows, ice cream, taxi service, car insurance, airlines, hotels, drinks, office buildings, movies, the Vatican, housing, individuals, websites, rental cars, and many more have all become carbon neutral; 'carbon neutral' has become an inspiration for the environmental cause.

II. What is Carbon Neutrality?

In 2006, the phrase was adopted into the New Oxford American Dictionary as Word of the Year[1]. But, what is carbon neutrality?

- *Carbon neutrality* involves calculating carbon dioxide emissions, reducing, and offsetting those emissions. The goal is to curb carbon dioxide emissions in the environment by achieving a net zero carbon footprint, ultimately reducing deleterious contributions to climate.

Yet, even with popular use and knowledge of carbon neutrality, its definition can be ambiguous. Energy sources under the carbon neutral umbrella include: solar, wind, tidal, wave, geothermal, nuclear, and hydrological power. But *carbon neutrality does not necessarily imply emitting zero carbon dioxide to the environment* (that is more specifically termed "carbon zero"). Carbon neutral practices include burning carbon sinks, like fuel wood or corn ethanol.

A carbon neutral act is really an issue of offsetting (if the action contributes carbon dioxide in the first place), in a sense. Burning fuel wood is a carbon neutral act because under the photosynthetic process, carbon dioxide is essentially held within the plant matter instead of the atmosphere. In this case, the offsetting was the growth of the tree before being burnt. Petrol can also be offset in a similar manner with additional carbon sinks to counteract the carbon dioxide released.

[1] "Carbon Neutral: Oxford Word of the Year." *OUPblog: Oxford University Press USA*. 13 Nov. 2006. Oxford University Press. 28 Mar. 2008 <http://blog.oup.com/2006/11/carbon_neutral_/>.

Even if the definition is a bit misleading (reasons include: differentiation with carbon zero, the fact that burning biological matter is carbon neutral, or its actual implication of carbon dioxide not carbon), the word 'neutral' sounds bold. Carbon neutral is still an effective mantra for environmental stewardship efforts. But is the definition perfect? There is clearly room for improvement.

Carbon neutrality decreases carbon dioxide emissions. But, the definition does not necessarily entail carbon dioxide equivalency (including other important greenhouse gases), long-term reductions in CO_2 (carbon offsetting plants often die shortly), stopping business as usual (offsets are much more convenient than direct emissions reductions), or even environmentally conscious offsetting. For example, invasive species can be planted, detrimental to the native soil, species, and long-term carbon fixation[2]. Carbon neutral practices are a step in the right direction, but are not the definitive answer for our environment or even climate change.

- Could the term 'carbon neutral' be more environmentally effective if there was an attempt to make the definition more comprehensive?

III. From Carbon Neutrality to Water Neutrality

Carbon dioxide emissions are not the only environmental issue to ponder; water has increasingly become an important environmental issue in terms of quality and quantity available. Therefore, a similar term for water problems has been created: "water neutrality." The concept is considerably newer and less well-known, first used in a speech in 2002[3] (carbon neutral is 11 years older[4]). Most worldwide Press coverage on the subject revolves around the efforts of Coca-Cola and the World Wildlife Fund[5 6 7 8].

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[2] Granda, Patricia. *Carbon Sink Plantations in Ecuadorian Andes: Impacts of the Dutch FACE-PROFAFOR Monoculture Tree Plantations' Project on Indigenous and Peasant Communities*. Acción Ecológica. Quito, Ecuador: Acción Ecológica, 2005. 54. 28 Mar. 2008 <http://www.wrm.org.uy/countries/Ecuador/face.pdf>.

[3] "Water Neutral - At the WSSD." *Water Neutral*. Water Neutral. 28 Mar. 2008 <http://www.waterneutral.org/atwssd.htm>.

[4] "carbon neutral." *Webster's New Millennium™ Dictionary of English, Preview Edition (v 0.9.7)*. Lexico Publishing Group, LLC. 28 Mar. 2008. <Dictionary.com http://dictionary.reference.com/browse/carbon neutral>.

[5] Alter, Lloyd. "Coca-Cola and WWF Conserving Water (?)." *Treehugger*. 5 June 2007. 28 Mar. 2008 <http://www.treehugger.com/files/2007/06/coca_cola_and_w.php>.

[6] "Coca-Cola to Become 'Water Neutral'" *Environmental Finance*. 7 June 2007. 28 Mar. 2008 <http://www.environmental-finance.com/onlinews/0607coc.htm>.

[7] "Coca-Cola Aims for 'Water Neutrality'" *Greenbiz.Com*. 24 Mar. 2008. 28 Mar. 2008 <http://www.greenbiz.com/news/news_third.cfm?NewsID=55786&CFID=14470606&CFTOKEN=50597287>.

[8] Olesen, Alexa. "Coca-Cola Launches Water Conservation Campaign with World Wildlife Foundation." *SignOnSanDiego.Com*. 5 June 2007. Associated Press. 28 Mar. 2008 <http://www.signonsandiego.com/news/world/20070605-0240-china-coca-cola.html>.

There has even been a report by the Business for Social Responsibility organization regarding Coca-Cola's efforts[9]. Consequently, PepsiCo launched its own initiative called "positive water balance," similar to that of water neutrality[10]. These terms are becoming powerful business tools. As with carbon neutrality, an organization or person proactive in water conservation could be 'water neutral,' a laudable goal.

In the UK, there have been water neutrality implementation efforts. The South East England Regional Assembly[11]; Environment Agency; Department for Environment, Food, and Rural Affairs; Communities and Local Government (UK); Thames Gateway[12]; Eaga[13]; and Entech[14] all have projects regarding water neutral development. These are not simply company strategies but residential plans. If they are carried out, water neutrality could occur on a much larger scale, ultimately increasing the knowledge base of the term and improving environmental quality.

Water neutrality does have one relatively large problem: there is no general consensus on a definition. For example: the UK version of water neutrality (as used by the organizations listed above) prescribes different water conservation efforts than the Coca-Cola business plan. Sadly, there is no easy fix to this ambiguity. Water neutrality cannot be defined by replacing the word 'carbon' with 'water'. For instance, water cannot be offset in the same way as carbon dioxide or not used (emitted, in carbon dioxide's case) at all. The definition needs to be tweaked.

The most in-depth work on the definition has come from the 2007 "Water Neutrality: a concept paper" by collective efforts (including: Twente University, WWF, The Coca-Cola Company, World Businesses Council for Sustainable Development, Water Neutral/Emvelo Group, and UNESCO Institute of Water Education)[15]. Little else has been published on refining the definition of water neutrality; the wording can often be seen pasted into

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[9] *Drinking It in: the Evolution of a Global Water Stewardship Program At the Coca-Cola Company.* Business for Social Responsibility. 2008. 17 Apr. 2008 <http://www.bsr.org/reports/Coke_Water_Study_March_2008.pdf>.

[10] "PepsiCo: Positive Water Balance." *World Business Council for Sustainable Development.* 2 Jan. 2008. 28 Mar. 2008 <http://www.wbcsd.org/plugins/DocSearch/details.asp?type=DocDet&ObjectId=Mjc4ODc>.

[11] Therivel, Riki, Christine Drury, and Ian Hepburn, comps. *Achieving Water Neutrality in the South East Region Discussion Paper*: Oct. 2006. Sustainability Appraisal Sounding Board. 28 Mar. 2008 <www.eipsoutheast.co.uk/downloads/documents/20061113133605.doc>.

[12] *Towards Water Neutrality in the Thames Gateway.* Environment Agency. Bristol, UK: Environment Agency, 2007. iv-iv. 28 Mar. 2008 <http://publications.environment-agency.gov.uk/pdf/SCHO1107BNMC-e-e.pdf?lang=_e>.

[13] *Balance Trading – delivering carbon and water neutral development today.* 2006. Unpublished.

[14] "Entec to Study Feasibility of Water Neutrality in the Thames Gateway." *Entec UK.* 28 Mar. 2008 <http://www.entecuk.com/news05_75_f.html>.

[15] Gerbens-Leenes, Winnie, Arjen Hoekstra, Richard Holland, Greg Koch, Jack Moss, Pancho Ndebele, Stuart Orr, Mariska Ronteltap, and Eric De Ruyter Van Stevenink, comps. *Water Neutrality: a Concept Paper*: 20 Nov. 2007. Twente University, World Wildlife Fund, the Coca-Cola Company, World Businesses Council for Sustainable Development, Water Neutral/Emvelo Group, UNESCO IHE. 28 Mar. 2008 <http://www.epfl-das-stratenv.ch/spec/sba/download/e-library/Water%20neutrality.pdf>.

newspaper stories with quotation marks[16]. But, the original concept paper emphasizes a continuing discussion on the meaning of water neutrality and its implications. And thus, the discussion is not over.

IV. Carbon Neutrality vs. Water Neutrality

In the available literature on water neutrality, the term usually involves offsetting new housing's water demand via water efficient retrofits as well as ensuring that new homes are water efficient. The main goal is to keep water demand stable even with new constructions and increased living population. Considering housing developments will inevitably increase in the future, this definition seems to be a relatively good at first glance:

Water neutrality is:

- For every new development, total water use in the region after the development must be equal to or less than total water use in the region before the development.[17]

So, what are the major differences between the carbon neutrality and water neutrality?

Carbon Neutrality	Water Neutrality
▪Offsetting of consumption by-product	▪Offsetting of consumption
▪Emission location unimportant	▪Water use location of utmost importance
▪As if no additional carbon dioxide emitted	▪ As if there is no additional water demand

Carbon neutrality and water neutrality are not as similar as one may believe. But more importantly, water neutrality in its current state, is ambiguous. A more comprehensive definition is needed for water neutrality; otherwise, the term may lose effectiveness and general understanding.

- What is the "region" considered for neutrality?
- What is a "development"?
- What if the water demanded in an area is already unsustainable? Would the current definition of water neutrality be effective enough for water conservation?

[16] Batson, Andrew. "Coca-Cola Sets Goal to Be 'Water Neutral'" *YTL Community*. 28 Mar. 2008 <http://www.ytlcommunity.com/commnews/shownews.asp?newsid=29903>.

[17] Therivel, Riki, Christine Drury, and Ian Hepburn, comps. *Achieving Water Neutrality in the South East Region Discussion Paper*. Oct. 2006. Sustainability Appraisal Sounding Board. 28 Mar. 2008 <www.eipsoutheast.co.uk/downloads/documents/20061113133605.doc>.

V. Notes from the Original Source[18]

As the water neutrality concept paper from 2007 is the most prominent source on the definition, many of the points brought up are relevant to its discussion. Nearly all literature is based upon the paper and serves as a basis for discussion on water neutrality as a whole. The following are some notes on the paper and a basic summary of important points:

Water neutrality is trying to solve is long-term water sustainability. Sustainability is achieved via reductions and offsets of a "water footprint".

- Water footprints are defined as the direct and indirect water use of consumers and businesses.

But water footprint offsets are not the same as offsets for carbon footprints. As mentioned before, the location of offsets and timing is highly important. Water abstraction in a drier area or during a dry season has significantly more impact than when/where water is plentiful.

Offsets can include investing in water saving technology, water conservation efforts, general environmental conservation efforts, waste water treatment, or water supply to those who do not have enough. However, offsets are difficult to quantify in real money.

- Would water offsets require an organizational basis like carbon offsets?
- Where should money for offsets go?

There is also the issue of the differences of business and individual water footprints. Businesses require a supply-chain, with the inputs making their own distinct water footprint. Companies cannot directly control this supply-chain's water footprint as opposed to their own operational water footprint. Since water neutrality entails reducing one's water footprint, this can be a dubious point for businesses. Businesses can only choose their supply chain with the smallest water footprint and cannot make active steps in water reduction.

Consumptive use from a company's product is also a major concern for water neutrality. Businesses may produce goods, reducing water footprints to minimum levels but when consumers use these goods, they may not be using water sustainably because the good itself is not efficient.

[18] Gerbens-Leenes, Winnie, Arjen Hoekstra, Richard Holland, Greg Koch, Jack Moss, Pancho Ndebele, Stuart Orr, Mariska Ronteltap, and Eric De Ruyter Van Stevenink, comps. *Water Neutrality: a Concept Paper*. 20 Nov. 2007. Twente University, World Wildlife Fund, the Coca-Cola Company, World Businesses Council for Sustainable Development, Water Neutral/Emvelo Group, UNESCO IHE. 28 Mar. 2008 < http://www.epfl-das-stratenv.ch/spec/sba/download/e-library/Water%20neutrality.pdf >.

- Should water neutrality, in its reduction of water use, require water neutral companies to sell only highly water efficient goods, or at least account for water use post-production?
- Should producers of water consuming good, such as toilets, showerheads, be liable for consumer water use as part of their indirect water footprint?

To become 'water neutral' then, there are some overall requirements regarding water footprints, as stated in the concept paper:

- All that is 'reasonably possible' should have been done to reduce the existing water footprint
- The residual water footprint is offset by making a 'reasonable investment' in establishing or supporting projects that aim at the sustainable and equitable use of water.

VI. Embedded Water

When considering water footprints, embedded water can be easily forgotten. But, embedded water is similar to the indirect, supply chain water spoken of in the water neutrality concept paper.

- Embedded water is water used to produce food and non-food products.[19]

Water is used throughout industrial and production processes. Although some measures vary, embedded water is a large enough factor to impact local water systems. With trade occurring globally, water is essentially traded among countries through goods and services. Conditions and geography vary between these places, allowing efficient or relatively inefficient embedded water trade throughout the world. As an example, it is estimated that 16,000 litres of water are used to produce a kilogram of beef[20].

With regards to water neutrality, embedded water should be an integral part of reducing one's water footprint. If water neutrality truly is the effort to minimise a water footprint, then even indirect water usage such as embedded water may need to be included.

- How should embedded water be a part of water neutrality? Should the concept have any place within water neutrality?
- How much of a differentiation between should there be with embedded water from a relatively arid place and that of a moist place?

[19] "Embedded Water." *Reducing Water Wastage in the UK*. Feb. 2007. Waterwise UK. 28 Mar. 2008 <http://www.waterwise.org.uk/reducing_water_wastage_in_the_uk/the_facts/embedded_water.html>.

[20] "Water Footprint." *Water Footprint*. 2008. University of Twente & UNESCO-IHE. 28 Mar. 2008 <http://www.waterfootprint.org/?page=files/home>.

- Is reducing embedded water a method of water offset?

Embedded water is yet another complication to the achievement of water neutrality, but nevertheless it is an important one. Without accounting for embedded water of all products/services imported and exported, a large part of water usage is unaccounted for, one less step towards sustainable water use.

VII. Water Neutrality Definitions

Listed here are other various water neutrality definitions. Feel free to comment on nuances and wording implications in the space provided:

A.

1. "For every new development, total water use in the region after the development must be equal to or less than total water use in the region before the development."[21] ----------

2. "A way of achieving demand-side reductions, in part through technical measures and in part through behavioural change."[22] ----------

3. "The new demand for water should be offset in the existing community by making existing homes and buildings in the area more water efficient."[23] ----------

4. "Each new residence would be offset by demand management and increased efficiency of our supply system."[24] ----------

5. "Total water use after new development must be equal or less than total water use in the area before the planned development (both domestic and non-domestic)."[25] ----------

[21] Therivel, Riki, Christine Drury, and Ian Hepburn, comps. *Achieving Water Neutrality in the South East Region Discussion Paper*. Oct. 2006. Sustainability Appraisal Sounding Board. 28 Mar. 2008 <www.eipsoutheast.co.uk/downloads/documents/20061113133605.doc>.

[22] Ibid.

[23] Stubbs, Tim. "Water Neutrality." *Environment Agency*. 2008. Environment Agency. 28 Mar. 2008 <http://www.environment-agency.gov.uk/subjects/waterres/287169/1917628/?version=1(=_e>.

[24] Karan, David. "Water Neutrality is Solution." Coloradoan.Com (2008). 28 Mar. 2008 <http://www.coloradoan.com/apps/pbcs.dll/article?AID=/20080219/OPINION04/802190335>.

[25] *Water Matters: the Mayor's Draft Water Strategy*. Greater London Authority. London: Greater London Authority, 2007. 28 Mar. 2008 <http://www.london.gov.uk/mayor/environment/water/docs/la-draft-water-strategy.pdf>.

6. "The water footprint of a business is defined here as 'the total volume of freshwater that is used directly or indirectly to run and support business and that is associated with the use of the business outputs.'"[26]

7. "Water neutrality adopted as an aim, whereby more water supply is made available for new developments by investment in retro-fitting efficiency measures in existing developments and investment in leakage control."[27]

8. "The development will be 100 per cent water neutral, with no demand on mains water supply."[28]

1. "Thus any sensible water policy for the 21st century must include combating climate change. So that in cutting greenhouse gas emissions we not only work towards 'climate neutrality' but also 'water neutrality' and perhaps other forms of neutrality from 'forest neutrality'; 'biodiversity neutrality' and maybe even ' soil and peatland neutrality' too. "[29]

2. "...to make their activity 'water neutral' by investing in water-saving technology, water conservation or environmental protection measures, wastewater treatment and water supply to the poor that do not have proper water supply."[30]

[26] Gerbens-Leenes, Winnie, Arjen Hoekstra, Richard Holland, Greg Koch, Jack Moss, Pancho Ndebele, Stuart Orr, Mariska Ronteltap, and Eric De Ruyter Van Stevenink, comps. Water Neutrality: a Concept Paper. 20 Nov. 2007. Twente University, World Wildlife Fund, the Coca-Cola Company, World Businesses Council for Sustainable Development, Water Neutral/Emvelo Group, UNESCO IHE. 28 Mar. 2008 < http://www.epfl-das-stratenv.ch/spec/sba/download/e-library/Water%20neutrality.pdf >.

[27] Sub-Regional Strategy: Thames Gateway. Royal Society for the Protection of Birds. 2006. 28 Mar. 2008 <http://www.eipsoutheast.co.uk/downloads/documents/20061220111433.doc>.

[28] Owen, Michael. "Drought Buster: Precinct Where No Drop is Wasted." The Advertiser (Australia) 11 Jan. 2008, State ed. Sec. News: 5

[29] Steiner, Achim. "Climate Change and the World's Water, with a Specific Focus on the Sustainable Development, Land Use and Forests." United Nations Environment Programme. 29 Jan. 2008. UNEP. 28 Mar. 2008 <http://new.unep.org/Documents.Multilingual/Default.asp?DocumentID=527&ArticleID=5739&l=en>.

[30] Gerbens-Leenes, Winnie, Arjen Hoekstra, Richard Holland, Greg Koch, Jack Moss, Pancho Ndebele, Stuart Orr, Mariska Ronteltap, and Eric De Ruyter Van Stevenink, comps. Water Neutrality: a Concept Paper. 20 Nov. 2007. Twente University, World Wildlife Fund, the Coca-Cola Company, World Businesses Council for Sustainable Development, Water Neutral/Emvelo Group, UNESCO IHE. 28 Mar. 2008 < http://www.epfl-das-stratenv.ch/spec/sba/download/e-library/Water%20neutrality.pdf >.

3. "...an instrument to raise awareness, stimulate measures that reduce water footprints and generate funds for the sustainable and fair use of freshwater resources."[31]

4. "Water neutrality refers to a minimum availability of land to cope with excessive water (rain, river), a minimum level of subsoil water and finally to look after the minimum quality of water for irrigation (agriculture), human use and nature of development."[32]

5. "Concept of water neutrality could potentially include:
-water supply-demand balance (if balance remains/becomes positive)
-measured in terms of water-into-supply or water abstracted
-no increase in demand
-water discharges – area could be considered water neutral if there is no net increase in discharge rates from the area
-water quality – area could be considered water neutral if there is no significant decline in water quality"[33]

B.

1. "Taking a strict interpretation, no individual or entity that uses water can ever be entirely water neutral, as water cannot be reduced to zero."[34]

2. "In order to be 'water neutral' there are at least two requirements:
1. all that is 'reasonably possible' should have been done to reduce the existing water footprint;
2. the residual water footprint is offset by making a 'reasonable investment' in establishing or

[31] Ibid.

[32] Goetgeluk, Roland, Ad Straub, and Tom Kauko. *Draft: Water Neutrality and Housing in De Dutch Water-Metropolis*. Diss. Utrecht Univ., 2003. 28 Mar. 2008 <http://repository.tudelft.nl/file/729042/MTS_1194033906458439690>.

[33] Butler, David, and Paul Herrington. *Towards Water Neutrality in the Thames Gateway*. Environment Agency. Bristol: Environment Agency, 2007. 28 Mar. 2008 <http://publications.environment-agency.gov.uk/pdf/SCH01107BNMN-e-e.pdf?lang=_e>.

[34] Gerbens-Leenes, Winnie, Arjen Hoekstra, Richard Holland, Greg Koch, Jack Moss, Pancho Ndebele, Stuart Orr, Mariska Ronteltap, and Eric De Ruyter Van Stevenink, comps. *Water Neutrality: a Concept Paper*. 20 Nov. 2007. Twente University, World Wildlife Fund, the Coca-Cola Company, World Businesses Council for Sustainable Development, Water Neutral/Emvelo Group, UNESCO IHE. 28 Mar. 2008 < http://www.epfl-das-stratenv.ch/spec/sba/download/e-library/Water%20neutrality.pdf >.

supporting projects that aim at the sustainable and equitable use of water'

'The goal of water neutrality should be no overall rise in demand for water.'"[35]

3. "...'water neutrality'—that is, that the system will produce all the water that the system requires."[36]

IIX. New Water Neutrality Definition

With so many definitions, there truly is no consensus on the meaning of water neutrality. However, there has been a successful introduction of the word and the term itself is known well by some. In actuality, revamping the 'neutral' wordings may not be helpful. Carbon neutrality is not a completely clear definition, either but the wording has a following. Here are some specifics that should be considered in a new definition of water neutrality, based on those presented:

1. Social Aspects
   - Helping others get access to clean water
   - Making sure water quality is adequate in "area"

2. Climate Change
   - Inclusion of climate change in water neutrality
   - Water availability will change based on climate change

3. Measurements
   - Constant measurement of sustainable water extraction (variable over time)
   - Measure water footprint (possibility of embedded water inclusion)
   - Determine water neutrality costs: greater offset need in different extraction areas

4. Sustainability
   - Being water neutral at a long-term sustainable level, not just keeping water demand at a possibly unsustainable level

[35] Ibid.

[36] Salvador, John P., William H. Pettit, and James W. Danalides. "Fuel Cell Having Dynamically Regulated Backpressure." Patent Storm. 9 Nov. 2004. General Motors Corporation. 28 Mar. 2008 <http://www.patentstorm.us/patents/6815106-description.html>.

5. Definitions

- Businesses, households, supply chains of businesses, governments as water neutral
- Region of water neutrality defined
- Definition of offsets

Considering these points, a more comprehensive definition may be exceedingly important, especially if water neutrality will become a well-accepted term like 'carbon neutrality.' Here are two examples of new water neutrality definitions, including some of the major points established from the previous list:

Water neutrality is:

- The offsetting of a catchment area's overall, direct/indirect water footprint, as to maintain water quality and abstraction levels sustainably, with no adverse effects on water supply or quality for future generations.

  Qualities of the definition:

  - Establishing catchment as water neutral area
  - Direct/indirect water footprint ('indirect' mostly there to include supply chain of businesses)
  - Water quality maintenance
  - Water abstraction 'sustainable' instead of 'neutral'
  - Emphasis of sustainability meaning

  Problems with definition:

  - Indirect footprint not clearly defined
  - Business, government not strictly included
  - Methods of offset not clear
  - Definition of offset itself unclear

Water neutrality is:

- The communal action to maintain a water catchment's quantity and quality, minimising direct, indirect, and embedded water footprints of all human developments to sustainable levels: household, business, and government.

  Qualities of definition:

- "Communal action"
- Water catchment defined as area
- Sustainable levels
- Household, businesses, and government included

Problems with definition:

- May not be clear that includes business supply chain
- Community could be ambiguous as to what it includes
- Implication that only whole community can be 'water neutral'

IX. Conclusions

Water neutrality is a worthwhile effort for definers and anyone interested in water conservation or environmental issues in general. Popular water consumption reductions and offsetting would decrease environmental degradation. The concept of water neutrality should continue to proliferate and will with a solidified definition and clearer reduction and offsetting choices available.

Water offsets, as a major portion of water neutrality, should also have established methodology. Possible offsetting choices currently available include: donating money to buy water efficient products for others, investing in water efficient technologies, increasing water sanitation in places where there is not enough, or any other way to decrease water consumption. If an institution existed where money could be donated, as with carbon offsets, to reduce all of our water footprints, then the notion of water offsets could be executed on a grander scale. However, such offsets would be much more effective and more accurately exhibit water neutrality if they were done on a more local scale.

Another integral part of water neutrality is measuring water use. Metering water consumption of schools, office buildings, homes, or any other is of the utmost importance. Without knowing water footprints, then water neutrality (as based on many of the definitions) is impossible. Metering has not been done completely in many areas of the UK and otherwise. Water consumption calculators, many of which can be found on the internet, are a good start for quantifying water use, but metering is by far the better answer.

X. Discussion

There are various problems with water neutrality as currently defined. There is still no consensus on the meaning. Any organization is able to use a definition of choice. As mentioned before, such a term needs validity to truly stick and affect the outlook on future water sustainability.

Here are some talking points on water neutrality, hopefully able to close some of the gaps in the concept and establish the boundaries of the definition:

- How should embedded water be integrated into water neutrality in a catchment area? Should embedded water or business supply chains be a concern for those pursuing water neutrality?
- As water abstraction from areas with less water has greater negative impact for the natural and population's local health, how should this be accounted for?
- Will businesses consciously choose to reduce water usage throughout the supply chain? Will companies have an enough incentive, like Coca-Cola or PepsiCo.?
- What other methods are available to increase the knowledge and usage of 'water neutrality'