

The limits of Web-based empowerment:
Integrated water resource management
case studies

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Abstract

This article is an analysis of the limits of Web-based empowerment of the voiceless, leveraging from five Integrated Water Resource Management (IWRM) case studies, and motivated by several recent Web-based empowerment success stories. For IWRM, the Web picture is of an emerging academic-trained professional community of water professionals, with close ties to national governments, but closer ties to powerful international NGOs and NGOs sponsored by western governments. Nevertheless, no Web evidence was found for the involvement of ordinary citizens in IWRM, despite this being a key theoretical goal, and no Web evidence was found of the emergence of genuine grass-roots pressure groups. A comparison with other high-profile Web-enabled issues, such as the anti-World Trade Organisation protests, indicates that the Internet can be used to help give a voice to the voiceless in many different ways, but that its use at a grassroots level is not automatic.

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Introduction

■

 Governments are increasingly seeking to use the Internet for greater contact between themselves and the citizens they serve; 173 governments already had a Web site in 2003

(United Nations (UN), 2003). Non-Governmental Organisations (NGOs) and pressure groups also need a Web presence because of the Internet's increasing centrality in the modern world [1]. The information provision surge, facilitated by the Internet (*e.g.*, Hine, 2000; Standage, 2001; Nath, 2004), is part of glocalization, a term that originated in marketing discourse and has been adapted by sociologists to explain how the Internet is affecting political networks. "The emerging information and communication technologies are creating a new process of 'glocalization', a hybrid of global and local" (Chaudhary, 2004). The key point is that prior national constraints on organisation and information flow can be bypassed with the help of the Internet (Blatter and Ingram, 2001), creating the possibility for global organisations and issues to interact directly with local individuals, organisations and issues. The term glocalization has also been adopted to describe a wide variety of different phenomena, including regional government (Blatter, 2004; Brenner, 2004; Czarniawska-Joerges, 2002), regional economic governance (Airriess, 2001; Bebbington, 2001; Wang-Bae, 2003), the ability to communicate over both short and long distances (Wellman, 2002; Luke, 2002), and culture, including cultural relationships with marketing (Giulianotti and Robertson, 2004; Kraidy, 1999; Meyer, 2000). In this paper we address the extent to which the Web has enabled glocalization in the sense of enabling communication across state boundaries impacting governmental decision-making, by giving a voice to sections of the community that would otherwise struggle to be heard.

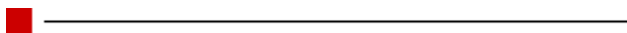
There has been considerable interest in the use of the Web for politics (*e.g.*, Papacharissi, 2004; Foot, *et al.*, 2003) and political activism (McCaughey and Ayers, 2003; Rodgers, 2003; Rogers, 2004). NGOs in particular have taken advantage of the Internet as a communications medium for protest, which may have had an overall affect of increasing their significance for policy-making (Di Pietro, 2000; Rodgers, 2003). As a result, there have been some claims that "classic politics [is] in tatters" (Rogers, 2004). For example, "The protests organised by NGOs against the WTO meeting in Seattle, against the IMF and World Bank in Washington ... are only some examples of their influence in the decision-making process at international level" (Di Pietro, 2000). The Internet has been claimed to be the best arena for ideational challenges to orthodox views (Rogers, 2004). The green movement is a notable example of a pressure group developing significant influence, even to the extent of incorporation within government (Dryzek, *et al.*, 2003), although the Internet probably forms a small part of the reason for this success.

The political issues below are all successful examples of Internet-enabled empowerment, showing that this is a significant and widespread phenomenon [2]. Some initiatives work within the Internet, whereas others use the Internet more directly to facilitate offline activities. The phrase New Social Movements (NSMs) has been coined to describe Internet-enabled groupings (Salter, 2003).

- The Mexican Zapatista revolutionary movement was famous for its use of the Internet to mobilise international recognition and support. Its Web information portal became a focal point for a network of activists and NGOs, detectable by examining the links between the organisations' Web sites (Garrido and Halavais, 2003).

- International anti-toxin activists find the Internet a natural medium through which to organise around this international issue. They see their role as empowering citizens to protest, via international Internet-based communication (Galusky, 2003).
- The anti-globalisation movement is an Internet-based activist organisation, a high-profile example of the potential of the Internet to organise globally but act locally (Vegh, 2003).
- A South Asian women's Web is giving a voice to a traditionally disempowered section of the community (Mitra, 2004).
- Online initiatives make Web publishing accessible to small organisations in poor countries (*e.g.*, Keirstead, 2004).
- Anti-genetically modified crops activists (Rogers, 2004).

Internet technologies clearly can sometimes allow groups to pool resources and present campaigns directly to affected people (Levesque, 2001). The examples noted earlier show that the Internet can give a voice to traditionally voiceless segments of the population. Does this herald a new era of democracy, or are these relatively isolated incidents or special cases? One comparative study of market glocalization has found large differences in outcomes between similar communities (for Andes localities), suggesting that glocalization is a complex phenomenon (Bebbington, 2001). Also, the network competency of citizens, even in developed nations, is highly variable, which influences capacities for "autonomous and participatory citizenship" (Jääskeläinen and Savolainen, 2003). From a different angle, since many activists see Web-based publication as an end in itself (Rodgers, 2003), is the importance of Web publication sometimes overstated? In this paper, we look at Integrated Water Resources Management (IWRM) case studies. IWRM is a likely candidate for glocalization, because of its stated aim to include the traditionally powerless in decision-making processes (Calder, 1999), including through the Internet (Waterweb, 2003). This is an attempt to cast light on the circumstances in which the Web can be effectively used to influence decision-making in this way: the limits of Web-based glocalization.



IWRM overview

IWRM is a water management paradigm based upon scientific principles, aiming to combine the interests of different stakeholders for mutual benefit (Thomas and Durham, 2003). According to proponents, IWRM helps protect the world's environment, fosters economic growth and agricultural development, promotes democratic participation, and improves human health. The ultimate goal of IWRM is to optimise the supply of water, whilst managing demand between different groups (Cap-Net, 2004). IWRM originated in the 1992 United Nations Conference on Environment and Development (UNCED) Dublin-Rio Conference on Water, which stated that a "blueprint of sustainability" should

be paramount in allocating the use of this finite resource [3]. The bodies behind IWRM maintain that it is an utterly vital change, and will be beneficial to the world's poor.

The practice of IWRM depends on involving communities and their chosen representatives, using the catchment area of each river basin as the logical unit for water resources management. In practice, this might include local residents, local businesses, economic partners, experts, and other interested parties. In an ideal situation, institutional committees or working parties are set up within a democratic framework to take account of each party's wishes and concerns. This reflects the United Nations Development Programme (UNDP) claims that IWRM

"seeks to introduce an element of decentralised democracy into how water is managed, with its emphasis on stakeholder participation and decision making at the lowest appropriate level" (Cap-Net, 2004).

It is through local decision-making that IWRM projects deal and manage local conditions, such as the cultural and symbolic meanings of water in ritualistic practice, and putting new water-saving methods in place, while respecting tradition.

There are several major NGOs involved with IWRM projects around the world. Some, such as the Global Water Partnership (GWP), primarily promote IWRM, whereas other environmental NGOs, including the World Wide Fund for Nature (WWF), promote IWRM as part of a wider 'Green' remit. At an NGO level, then, IWRM seems to have significant international backing, and appears to have little real opposition (Vann, 2004).



Methods

This paper surveys current IWRM Web resources through five case studies of the implementation of IWRM within developing nations, examining whether there is any evidence of Web-based empowerment.

A sample of the top hundred Web sites in IWRM was secured via Google, using the search string "Integrated Water Resource Management." These 100 sites were divided into categories according to their origin — Government, NGO, Educational, Newspaper, Consultancy — and the listed NGO sites were examined for content. There were 34 NGO sites in the top hundred results, and in terms of content, there were only five main NGO pages identified by Google which directly focused on current and forthcoming IWRM projects. These were selected as the case studies for this paper. Note that this selection is explicitly biased in favour of case studies that have some form of Web representation.

- Kafue Flats, Zambia
- Laos PDR

- The Philippines
- Thailand
- Trinidad and Tobago

The five projects were queried using Google to see what information was easily accessible about them in the public domain, and whether any of the projects had a substantive Web presence. Google uses the PageRank system (Brin and Page, 1998; Google, 2004), meaning that sites are assessed on relevance, authoritativeness, and number of links, and its large database (by search engine standards) makes an effective sample of relevant IWRM sites. The decision to use a search engine as a tool, and selecting only the top sites, replicates how most users of the Internet find relevant sites for their interests (de Jong, *et al.*, 2003).

The use of commercial search engines is accepted in information science research, despite their limitations (Bar-Ilan, 2004). Search engines attempt to index a large proportion of the Web, although they only find a proportion of it, perhaps less than 17 percent of all pages (Lawrence and Giles, 1999; Thelwall, 2000). The pages indexed by search engines are found by link crawlers, which can fail to find pages because there are no links to them from other pages (Broder, *et al.*, 2000), or because they run out of time or storage space [4]. An important consequence of the strategy used by link crawlers is that there are national biases against countries that are relatively new Internet adopters, as well as against newer and less popular Web sites (Vaughan and Thelwall, 2004). These are factors that must be taken into consideration when interpreting the results of search engines: in particular they are nationally biased and may fail to reflect the most recent developments.



Results

Kafue Flats, Zambia

The first selected case study is a World Wildlife Fund (WWF) project in Zambia in the Kafue Flats region, and the relevant results of the Google search "IWRM Kafue Flats" are shown in Table 1, summarised by site. Of these results, three were research papers, one of which was a WWF summary of the environmental situation in Zambia. The WWF sites contained many copies of a press release celebrating the signing of an agreement to restore the Kafue Flats water supply in Zambia between the WWF and the Zambian Government. Furthermore, the International Institute for Sustainable Development site copies the WWF press releases exactly. The only government-level Web site was a research paper from the year 2000, co-authored by the Head of Water Affairs and the Head of Hydrological Services in Zambia, tentatively proposing a pilot IWRM scheme, after previous attempts to control demand management had failed.

Table 1: Web sites for *IWRM Kafue Flats*

<i>Organisation</i>	<i>Type</i>
Times of Zambia Newspaper	Zambian news agency
Institute of Water Sanitation And Development	Zimbabwe-based NGO
The Water Page, an information initiative associated with a South African and a U.K. company	U.K. company
International Institute for Sustainable Development	Canadian/international NGO
AFROL News Agency	African news agency
Copernicus Online Service + Information System (Europe-based research information service for natural sciences)	European academic information resource
International Hydropower Association	International NGO
International Network of Basin Organisations (INBO)	International NGO
Ramsar Convention on Wetlands (1971 Intergovernmental treaty) secretariat Web site	International NGO
United Nations Development Programme	International NGO
World Water Council	International NGO
WWF Panda.org	International NGO
WWF Partners For Wetlands	International NGO
International Water Management Institute (IWMI), a research organisation, mainly funded by the Consultative Group on International Agricultural Research	International NGO

Laos PDR

The second case study is an IWRM project in Laos PDR in South-East Asia. As Laos PDR is still Communist, it is interesting to note that foreign NGOs still have a considerable input into IWRM projects, presumably because they have expertise lacking domestically. The relevant sites found from the Google search "IWRM Laos PDR" are summarised in Table 2. Again, the results were primarily from NGO Web sites. The topics reported included: Gender Mainstreaming in IWRM in South-East Asia, ensuring that women were represented on decision-making committees; IWRM conferences in the recent past (2001–2003); and, IWRM workshops. Government results were interesting: the joint paper between the Danish and Vietnamese Governments was a detailed technical and financial proposal for an IWRM project on the Thai Binh River Basin, and the separate Royal Danish Embassy page gave a breakdown of costs for the proposal. This indicates very high-level political contacts. The educational institute papers contained an abstract for a study of the implementation of IWRM in the Tonle Sap region of Laos PDR.

Table 2: Web sites for *IWRM Laos PDR*

<i>Organisation</i>	<i>Type</i>
SWECO International AB, Sweden	Swedish consultancy
Engineering Dept., University of Helsinki	Finnish educational institute
Philippine Centre of Water and Sanitation (PCWS)	International training network, formerly UNDP and Netherlands–financed Philippine NGO
Sustainable Development International Corp (SDIC)	U.S. consultancy
Institute for Global Environmental Strategies	U.S. NGO
Akatu Institute for Conscious Consumption, Brazil	Brazilian NGO
Colombia Development Agency (ACCI)	Colombian NGO
Netherlands Water Partnership	Netherlands NGO
Asian Institute of Technology (AIT)	Thai academic institute
Taylor and Francis Press	U.K. publisher
Royal Danish Embassy, Cambodia	Danish government
Danish and Vietnamese Governmental report	Danish and Vietnamese governments
Asia–Pacific Associations of Agricultural Research Institutes (APAARI)	Asia–Pacific NGO
AlpenForum	Central European NGO
International Institute for Sustainable Development	Canadian/International NGO
Gender And Water Alliance, independent NGO funded by the U.K. and Netherlands	U.K./Netherlands/International NGO
Asian Development Bank; under mixed developed and developing nation control	International bank/NGO
United Nations Environment Programme (UNEP)	International NGO
Water for Food	International NGO
Global Change and Terrestrial Ecosystem (GCTE)	International scientific research project

The Philippines

The third case study is the Philippine Department of the Interior and Local Government's set of water projects in the Philippines. Unusually, almost all of the IWRM schemes were contracted out to a German consultancy firm, Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ). The relevant sites found with the Google search "IWRM DILG-GTZ" are summarised in Table 3. GTZ were the research institute cited on the initial Google search as being responsible for IWRM projects in the country. The IFAP site carries a PowerPoint presentation on women in agriculture. The GTZ site contains information about their IWRM project in the Philippines, a mission statement, information on the duration of the project, a list of regional bodies to be set up, and overall objectives and contact details of the relevant organisers. The Government site includes a one-paragraph summary of the scheme and the objectives, complete with funding details. The ADB site has a list of high-level participants from a conference in Manila in early 2004 entitled "Water for the Poor."

Table 3: Web sites for *IWRM DILG-GTZ*

<i>Organisation</i>	<i>Type</i>
Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ)	German consultancy
Philippines government	Philippines government
Asian Development Bank (ADB)	International bank/NGO
International Federation of Agricultural Producers (IFAP)	International NGO

Thailand

The fourth case study is a set of water projects in Thailand. The Google search "IWRM Thailand" in produced 3,130 results, of which sites identified for the first 50 were tabulated (Table 4). By far the largest proportion of the results from the entire search was 27 pages from various workshops, conferences and forums on IWRM taking place in Thailand, which is only very tangentially linked to the Internet dissemination of IWRM in practice. Of the other results, nine results were from indigenous Thai sites, which should have been fruitful at first glance, but these were mostly doctoral theses and academic reports on IWRM, rather than sites designed for practitioners. The Thailand IWRM Project site concentrated on the technical, analytical side of IWRM and the modelling tools for predictions on water levels, rather than the political involvement side of IWRM. There were three case studies from the GWP Web site, using Thai experiences as an evaluative tool for other practitioners, but these studies focused on decreasing political obstacles for IWRM, not on using IWRM itself — an important distinction. As with Laos PDR, the Danish Government has a cross-sectoral partnership, in the form of UCC Water, an IWRM group funded by the UNEP, Danish Government, and DHI Water and Environment. This is evidence of a NGO, government, and consultancy working in conjunction with each other.

Table 4: Web sites for *IWRM Thailand*

<i>Organisation</i>	<i>Type</i>
Heinrich Boll Foundation, affiliated with Alliance90/The Greens German	NGO
DHI Software: Danish multinational	Danish company
http://www.kellnielsen.dk/ (Water resources management advisor personal site)	Danish individual
National Information Technology Committee, Thailand	Thai government
Thailand IWRM Project	Thai NGO & government
Asian Institute of Technology (AIT)	Thai academic institute
DBR, Chinese Geographic Services	U.S. company
BOSS International: resources for civil and environmental engineering professionals	U.S. company
Kevin S. Amaratunga, MIT	U.S. academic
ARCADIS (Environmental engineering consultancy)	U.K. consultancy
International Water and Sanitation Centre (IRC) online water portal	http://www.irc.nl (Netherlands NGO)
Gender And Water Alliance	U.K./Netherlands/International NGO
International Institute for Sustainable Development	Canadian/International NGO
Saciwaters.org (South Asian Consortium for Interdisciplinary Water Resource Studies)	South Asian NGO
Network of Asian River Basin Organisations (NARBO)	Asian NGO
CITYNET, Local Authority Network	Asia–Pacific governmental network
International Water Management Institute (IWMI)	International research organisation
The Resource Alliance	International NGO
WaterYear2003.org (UNESCO initiative)	International NGO
IUCN Water And Nature Initiative (World Conservation Union)	International NGO
Global Water Partnership (GWP) Forum	International NGO
Third World Centre For Water Management, Mexico	International NGO
UNEP Collaborating Centre on Water and Environment (funded by UNEP, Danish Government, and DHI Water and Environment)	International NGO
International Network on Participatory Irrigation Management	International NGO
River Basin Initiative, part of the Ramsar Convention	International NGO

on Wetlands	
UN Educational, Scientific and Cultural Organization (UNESCO)	International NGO
UN Food And Agriculture Organisation	International NGO
Portfolio of Water Actions (PWA)	International NGO
Capacity Network (Cap-Net) online water portal	International NGO
Asian Development Bank; under mixed developed and developing nation control	International bank/NGO

Trinidad and Tobago

The fifth case study is a set of IWRM projects in Trinidad and Tobago. There was more evidence for independent knowledge networks being formed in this area than several of the preceding studies. The Google search "IWRM Trinidad and Tobago" in produced 264 results, of which sites extracted from the first 50 results are tabulated in Table 5. Again, NGO content predominated over all others. There were five IWRM conferences mentioned in the overall results, and one post-graduate certificate in IWRM being developed. The significant difference between this country search and previous ones, however, is that there was evidence of professional organisations using the Internet for collaboration, because there were several workshops organised by local discussion groups, such as the Commonwealth Knowledge Network (CKN), a separate online forum, and several online committees for co-ordination between different water communities — the Caribbean Council for Science and Technology (CCST), Inter-American Water Resources Network, Summit of the Americas Information Network. All of these aim to link professionals in Central and South America together, rather than to connect with the local population. Online water portals were mentioned three times, following on from their two mentions in the Thailand search. There were also several collaborative university projects between Trinidadian universities and those in neighbouring countries, the U.S. and Mexico especially. Civil society seems comparatively more advanced here than in either Africa or Asia.

Table 5: Web sites for *IWRM Trinidad and Tobago*

<i>Organisation</i>	<i>Type</i>
TORAY Science Foundation	Indonesian consultancy
National University of Mexico	Mexican university
<i>Desalination & Water Reuse Magazine</i>	U.K. science journal
Harvard University	U.S. university
National Oceanic and Atmospheric Administration	U.S. government
World Food Prize Foundation	U.S. NGO
Netherlands Water Partnership	Netherlands NGO

National Institute of HE, Trinidad and Tobago	Trinidad and Tobago educational institute
Commonwealth Knowledge Network (CKN)	Commonwealth NGO
White Water To Blue Water Initiative (WW2BW.org)	Caribbean NGO
Caribbean Water Forum	Caribbean NGO/conference
Caribbean Council for Science and Technology	Caribbean government
Caribbean Environmental Health Institute	Caribbean NGO
Gender and Water Alliance	UK/Netherlands/International NGO
South Pacific Applied Geoscience Committee	South Pacific NGO
Inter-American Water Resources Network	U.S. NGO
Summit of the Americas Information Network	U.S. NGO
Organisation of American States	U.S. NGO
Inter-American Development Bank (IMF)	International bank/NGO
DG Market, a World Bank initiative	International NGO
International Network of Basin Organisations (INBO)	International NGO
Global Environmental Facility (GEF)	International NGO
WaterYear2003.org (UNESCO initiative)	International NGO
UNEP	International NGO
UNDP	International NGO
World Meteorological Organisation	International NGO
UNESCO	International NGO
Ramsar Convention on Wetlands	International NGO
Development Gateway (World Bank)	International NGO
Disaster Info	International NGO
Cap-Net	International NGO
World Bank	International NGO/bank
International Institute for Applied Systems Analysis	International research institute

Discussion

Resource types

There seem to be three types of IWRM resources on the Web, though most major IWRM sites combine all three aspects into their Web presence. The first type gives reference information for practitioners, either practical advice or announcements of the progress of current projects. One of the most notable examples is the GWP Toolbox (GWP, 2004), containing guidelines, case studies, and background information on IWRM. The second type of resource is the moderated group or discussion forum, an online sub-network. An example is the e-group devoted to the topic of IWRM Stakeholder Participation, featuring member contributions from diverse groups (CKN, 2003). This functions as a page with e-mail addresses and lists of participants, and this dialogue group is a tangible way that the Internet may influence IWRM practice. Third, there are worldwide umbrella portals that aim to collate the activities of interested parties, making knowledge networks more easily accessible to professionals and academics. One instance of this is UNESCO's PoWER (UNESCO, 2003). Similarly, Cap-Net (2004), another site run by the UNDP, aims to co-ordinate IWRM projects around the world through a single Web site, enabling the swapping of information about capacity building in the water sector.

Global linkages

In terms of the proliferation of knowledge between different countries there is evidence of global linkages taking place, in the sense of agencies from different countries being involved in IWRM projects. From the 50 results on IWRM in Thailand, for instance, there were results from Thailand, Mexico, China, U.S., Germany, Britain, and Denmark — but it is important to note that these global linkages are on the horizontal level — NGOs disseminating information primarily for the benefit of water sector professionals, a group of roughly equivalent status to themselves. There was little evidence of knowledge being transmitted vertically, percolating downwards to the interested layperson. Additionally, several Web sites, such as Cap-Net, required registration or membership of involved organisations to join their listserves, which discourages a general reader from getting specific information.

The clear presence of information from universities, commercial companies and government bodies, suggests that IWRM is an emerging international profession, albeit a small one, but is very modern in its combination of these three types of influence (Etzkowitz and Leydesdorff, 1997; Gibbons, *et al.*, 1994). In fact, although such influences seem to be common, it appears to be rare to see university-industry-government connections reflected so clearly on the Web (Stuart and Thelwall, unpublished; Thelwall, 2004; *c.f.* Leydesdorff and Curran, 2000).

Target audiences

In general, there were very few pertinent sites of interest for a layperson. The sites were geared toward professionals and academics, and were provided by professionals and academics, within academic, government and commercial settings. Academic theses and briefings were common, especially small ethnographic studies assessing the impact of IWRM in local communities around the world. This has obvious implications for information flow: the restricted nature of academic discourses used in academic and


professional pages, especially if English is not the user's first language, hinders understanding and probably blocks the possibility of dissemination to laypersons. Additionally, the majority of the projects are largely run by outside NGO agencies working in collaboration with governments inside poor countries. There seems to be no evidence of an emergence of any form of civil society, in the sense of strong, prominent local non-government bodies, except in Trinidad and Tobago, through membership of the Commonwealth and several pan-American bodies. Trinidad and Tobago also appeared to have a relatively advanced government infrastructure, but information provision still seemed not to occur at the grassroots level.



Conclusion

Regarding IWRM, the Web currently seems to be used mainly for information exchange within a tier of IWRM experts in academic, commercial and national and international non-governmental organisations. The exchange of information between geographically distant professionals and academics is far from a new phenomenon. For academics, invisible colleges (Crane, 1972) are a centuries-old phenomenon through which researchers organise to exchange information. The incorporation of professional training in academic settings, and the consequent undertaking of profession-related research is more recent (*e.g.*, the university education of librarians), although it is now widespread (Baert and Shipman, 2005; *e.g.*, Perkin, 1989). Hence the IWRM-related academic-professional information sharing must be seen as natural and unsurprising, although the importance of the sponsorship of international NGOs must be unusual compared to other professional activities. Most NGOs involved with IWRM are official or established (*i.e.*, in receipt of UN or governmental funding). They can be expected to have effective offline ways to spread their agenda (Lukes, 1974). Moreover, the Web seems devoid of IWRM grassroots movements, or the representation of local people, despite the centrality of giving a voice to these individuals. The apparent influence of developed nations that this represents is worrying in the context of international power relationships. Historically, the dominance of the West has been justified with convincing rhetoric, irrespective of sad outcomes (Keal, 2003), and so the laudable aims of IWRM are not guarantees of positive outcomes.

In a broader context, why is online grass-roots representation absent from IWRM, when it is clearly present in many other issues? There are several differences of note. For example, the WTO protest Web sites were largely "action mobilizers"; that is, they were "clearly a means of support in the mobilization process for all sorts of 'real' protest actions" [5]. In contrast, IWRM projects are fundamentally long-term, not fast-breaking media events, so the use of the Internet by grass roots pressure groups is bound to vary according to this factor (Van Aelst and Walgrave, 2002). The WTO protests were adversarial, involving grassroots NGOs not in receipt of public funding, and so the Internet was a good way of getting a subversive message to the public at low cost.

Logically, then, the absence of grass-roots IWRM Web presences is either because grass-roots movements have not formed around IWRM or because they are not using the Web. In either case, the Web does not seem to have empowered local individuals. Although the Web can be used for political protest, this is not an inevitable outcome of important decision-making processes, even when they directly affect traditionally voiceless sections of the population. 

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Notes

1. Castells (2001), p. 160.
2. See also Vegh (2003).
3. Newson (1997), p. 351.
4. See Mettrop and Nieuwenhuysen (2001); Thelwall (2001).
5. Van Aelst and Walgrave (2002), pp. 481–482.

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