ICT-Mediated Adaptive Capacity of Environmental Third Sector in Australia

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INTRODUCTION

With the United Nations' proclamation (2011) that equates prohibiting people's access to the Internet with the violation of universal human rights, the information and communication technologies (ICTs) agenda has truly become globally significant. In Australia, faster Internet connection became a national political priority in 2008, when the then newly elected Labor government announced the Australian Broadband Guarantee initiative focused on providing high speed services to 98% of Australian homes and businesses (Dhakal, 2010a). One of the likely reasons for this push at the time was the OECD (2007) ranking of Australia: 23rd in broadband cost and 31st for download speed. Notwithstanding the political debate over the mode of delivery (optical fibre, fixed wireless or satellite) and the ballooning cost of an ongoing National Broadband Network (NBN) rollout (Johnson, 2011; Beltrán, 2013), Australia has now entered into a hyper-digital era (IBIS World 2012, p.2). The most recent data available from the Australian Bureau of Statistics [ABS] (2011) supports this view, as almost three quarters (73%) of all households in the country already have access to broadband. As the role of ICTs in enabling civil society and improving planning outcomes has been increasingly recognised in Australia and beyond (Foth & Adkinson, 2006; Gordon & Manosevitch, 2010; Schroeter 2012; Fredricks & Foth, 2013) this field note draws on the state of ICT uptake amongst environmental third sector organisations (ETSOs) in Perth, Western Australia (WA).

Identifying as charities in Australia, ETSOs are not-for-profit entities that are part of a broader civil society (Dhakal, 2010b). Based on the description of environmental charities by the Australian Taxation Office (2000, p. 49), formal or informal organisations that operate locally to care for the environment and engage in local environmental planning are referred to as ETSOs for the purpose of this field note. Since the early 1990s these organisations have participated in on-the-ground activities ranging from formulating the management plans for nature reserves to restoring degraded eco-systems through various environmental strategies (Dhakal, 2012). Because of the ongoing contributions of ETSOs in environmental planning and implementing strategies there is an urgent need to

secure the future of these organisations across Australia (Simpson & Clifton, 2010; Tennent & Lockie, 2013). However, although the role of ETSOs has been a subject of interest within policy and planning studies (Alexander, 1998; Moriarty 2002; Thomson & Maggin, 2010) ETSOs have generally been overlooked by ICT-oriented practice such as 'community informatics' (Dhakal 2010a, p. 214) which is described by Gurstein (2000, p.2) as '*an approach concerned with enhancing civil society and strengthening local communities for self-management and for environmental and economically sustainable development, ensuring that many who might otherwise be excluded are able to take advantage of the enormous opportunities the new technologies are presenting*'. This field note responds to this gap and aims to analyse the differences in adaptive capacity between ICT adopter and non-adopter ETSOs in Perth, WA. It begins by briefly introducing the nexus between ETSOs and ICTs. Following this, a framework for exploring the ICT-mediated adaptive capacity of ETSOs is presented. Drawing on a study carried out between 2008 and 2010, the ICT-mediated adaptive capacity of ETSOs in Perth is then assessed. The field note ends with the recommendation that existing environmental strategies that rely on ETSOs need to institutionalise ICT-specific support for these organisations.

ICTS AND ETSOS

ICTs have been playing an instrumental role in enabling aspirations of civil society including various forms of community organising that shape socio-environmental outcomes, ranging from political transformation to local environmental planning across the globe (Hawken, 2007; Dhakal, 2008; Dunn, 2011; Ritter & Trechsel, 2011). Consequently, there is a growing emphasis on ICT-mediated policy and planning engagement at the community level (Dhakal, 2011; Dhakal et al., 2013; Fredricks & Foth, 2013) e.g. community informatics initiatives. The core intention of the practice of community informatics is significant in the hyper-digital era for two reasons. First, ICT priorities need to be inclusive and geared towards enabling diverse actors within the third sector that are often outside, deliberately or otherwise, the formal planning processes. Second, both inequitable access to ICTs and the inability to benefit from them - the digital divide - needs to be addressed if ICTs are to strengthen smaller third sector organisations.

Attempts to enable Australia's third sector through the access and uptake of ICTs date back to the 1990s and ETSOs were the first third sector organisations to experiment with their uptake (Dhakal, 2011). The National Landcare Program, a landmark environmental strategy of the late 1990s, and the University of Melbourne jointly experimented with 'LandcareNet' in the early 1990s (Hawkins et al., 1992). This networking project was instigated when the need for better communication channels was realised amongst ETSOs in order to coordinate environmental activities. However, the lack of funds as well as skills within ETSOs led to the demise of LandcareNet (Curnow, 1996). The Department of Environment, Sports and Territories (DEST) initiated the development of an e-

network called 'CoastNet' in the mid-1990s. CoastNet aimed to enable ETSOs to exchange information and share expertise with other organisations involved in environmental planning and management of coastal areas (Dhakal, 2011). While the network eventually provided a number of separate online discussion forums related to environmental issues (Local Environs, 1998) it never really took-off because of obstacles such as cost, time and the workload involved in accessing online services during that era (Minter, 1995).

The difficulties ETSOs had with LandcareNet and CoastNet did not necessarily come as a surprise. A survey of 209 community organisations conducted by the Australian Council of Social Service (ACOSS) in 1996 found that most of the organisations surveyed were not in a position to take advantage of the benefits of ICT due to a lack of access and poor skills (ACOSS, 1996). The 2002 Centre for Community Networking Research (CCNR) survey on ICT adoption amongst 923 community organisations revealed that nearly 90% of ETSOs had access to the Internet and around 61% of organisations were hosting websites (Denison, 2003). The CCNR findings indicated a significant positive change when compared to the findings of the 1996 ACOSS survey, in which only 38% of organisations reported having access to the Internet with 14% hosting websites. The most recent community sector report (ACOSS, 2013) no longer captures the trend of access to the Internet and instead largely focuses on the uptake of social media. The report states that '*the high levels of need reported for information technology support and assistance with marketing and communications, use of social media and online campaigning reflects the sector's increasing use of the internet and social media as fundraising, communications and campaigning tools'* (ACOSS, 2013, p. 46). Nevertheless, what other contemporary reports reveal is that smaller third sector organisations in Australia are still vulnerable because they are struggling to access and effectively utilise available ICT opportunities (The NOUS Group, 2010; Notara, 2011).

ADAPTIVE CAPACITY FRAMEWORK AND DATA COLLECTION

The central aim of this field note is to analyse the differences in adaptive capacity between ICT adopter and non-adopter ETSOs in Perth, WA. Although different disciplines differ in terms of identifying what constitutes adaptive capacity, common to most is the idea of the capacity of a system to overcome vulnerability (Folke, 2006; Strichman *et al,*. 2008; Dhakal, 2013). According to Florin et al. (1992), the systems approach views the organisation as a system with incoming inputs and outgoing outputs. Inputs refer to the resources that organisations acquire and outputs refer to the products, which in the case of ETSOs are the benefits associated with environmental outcomes resulting from the utilisation of acquired resources. Adaptive capacity therefore relates to the system's ability to overcome resource scarcities with minimal disruption by coping with changing organisational circumstances (Staber & Sydow, 2002; McManus, 2008). On the one hand, organisations can be vulnerable when the inputs of financial resources are

disrupted through government budget cuts or as a result of other reasons. On the other hand, organisations can overcome vulnerability by influencing the flow of volunteers in order to accomplish organisational goals during financial hardship. However, it is the positive outlook that has been identified as a valuable resource for the viability of organisations and has been linked with an improved adaptive capacity (Colussi, 2000; Hegney et al., 2008; Molyneaux et al., 2012). It is in this context that this field note proposes a framework in which ICTs play a central role in building the adaptive capacity of ETSOs (Figure 1). Since community informatics is not about techno-centric solutions to societal problems (McIver, 2002; Gurstein, 2007) by putting the needs of ETSOs at the centre, the framework repudiates technological deterministic stances on ICT.
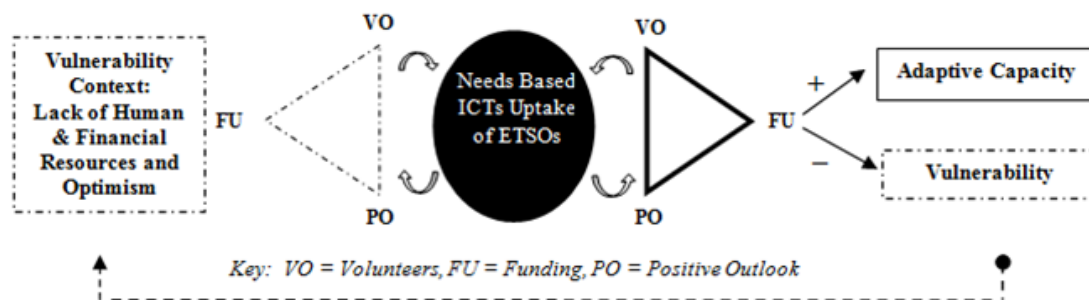

Figure 1: A framework for assessing the ICT-mediated adaptive capacity of ETSOs

The field note makes use of an exploratory research approach to answer the central question. Firstly, an exploratory approach is particularly useful in order to clarify emergent issues. Bhattacherjee (2012) suggests that: '*exploratory studies are often conducted in new areas of inquiry, where the goals of the research are to scope out the magnitude or extent of a particular trend, challenge, or norm; to generate some preliminary ideas or "hunches" about that phenomenon; or to test the feasibility of undertaking a more extensive study*' (p. 6). While the outcomes of exploratory studies may not always influence policy and planning immediately they do have the potential to provide significant insights into future interventions. Secondly, the field note draws on quantitative and qualitative data of a PhD research study - *Strengthening environmental stewardship in Perth, Western Australia: An investigation of linkages between organisational social capital and information and communication technologies in environmental community organisations* (Dhakal, 2010a).

The research relied on a survey of 81 ETSOs, 14 interviews with leaders, and the content analysis of their organisational online presence carried out between 2008 and 2010. In addition, this field note incorporates post-PhD consultations with the leaders for an up-to-date assessment of the state of ICT uptake. For the purpose of analysis, self-reported responses on the likelihood of the organisation to keep going recorded on a Likert scale - unlikely (1), unsure (2), or likely (3) - are used as indicators of a positive outlook (PO). In addition, the self-reported number of funding sources (FU) and affiliated volunteers (VO) are used as indicators of

organisational capacity to acquire financial and human resources. In order to protect the privacy of the respondents and organisations findings are presented using respondent designations and organisational IDs without specifically naming the leaders or the organisations.

FINDINGS

The average age of responding ETSOs was 14.2 years. Nearly two-thirds (65%) of responding leaders were female and the majority (84%) were aged between 41 and 70 years of age. A total of 2,907 volunteers were affiliated with the 81 responding organisations. On average ETSOs had 37.1 (median 15) volunteers. The survey responses indicated that governmental support (local, state and federal), private sector grants, and membership fees and donations were the main sources of funding. The average number of funding sources stood at 2.44 (median of 3) per organisation. The majority (70%) indicated they were 'likely' to keep going until their organisational objectives were fulfilled.

The State of ICT Uptake

Firstly, the majority of organisations (88%) had Internet access and used email. This finding is nevertheless discouraging when compared to the findings of Denison (2003) which indicated nearly 90% of community organisations had access to the Internet nearly a decade earlier. While the lack of email usage amongst 12% of ETSOs is clearly an indicator of the digital divide, there are other multifaceted causes as to why some of these organisations do not use email. The comments of leaders provide some insights. For instance, ETSO #36's coordinator indicated that most of the interactions happen face-to-face and there was no need to use email despite having a computer for word processing. Similarly, ETSO #59's president concisely commented that: a) older/senior volunteers affiliated with the organisation don't use email/websites, b) it is necessary to try to reduce the number of emails and the length of e-mails otherwise it just becomes 'noise', and c) excessive adoption of ICTs can overload volunteers who are involved in multiple causes. In addition, ETSO #38's coordinator commented on the reluctance of volunteers to trust email because of a concern about being forwarded unwanted emails. These accounts suggest that issues such as need, age, information overload ('noise'), and trust could be responsible for resistance towards ICT adoption in some ETSOs. This might be due to the lack of perceived or demonstrated benefits associated with ICT use in an organisational context.

Secondly, less than one-tenth (7%) of organisations posted blogs and nearly 14% used social media. A recent community sector report (ACOSS, 2013) notes that 24% of community organisations did not use any form of social media and only 4% posted blogs. While the rate of blogging by ETSOs is slightly higher than the national trend, social media use is clearly well below the average. Nonetheless, some leaders have clearly realised the value of social media. For instance, ETSO

#58's convenor indicated that most of the volunteers were over the age of 65 and do not use social media. The organisation only recently began to use social media in order to inform younger, ICT-savvy community members. Whereas ETSO #66's secretary (who was clearly concerned about being 'liked' or 'tagged' in the photos) felt that blogs were a better option for smaller ETSO like hers because it is much easier to upload and manage the content when compared to websites. These findings are consistent with the observations of Merkel et al. (2007) that the complex and evolving nature of ICTs can be barriers for organisations that are not necessarily tech-savvy.

Thirdly, more than one-third (41%) of ETSOs had websites. This is not particularly encouraging when compared to the 2002 CCNR survey which indicated over 61% of community organisations across Australia were already hosting websites (Denison, 2003). Qualitative observations in part help explain the under-utilisation of websites by ETSOs. For example, ETSO #80's executive director remarked that the organisation had been able to establish a web/email presence only through sponsorship and grant support and that ongoing maintenance/technical support is quite expensive and is an issue for the organisation. Similarly, a volunteer responsible for designing and maintaining ETSO #58's website commented:

'As this site is geared towards promoting habitat conservation, some basic information with a proactive stance should infuse the content, or document events, or invite people to join. The goal all along has been to bring information to life within the site - but getting contributions to build the content has been difficult.'

In addition, a 'wetlands officer' of ETSO #64 stated that the constant need to update the website as well as cater to email requests generated a bigger workload for an organisation run primarily by unpaid volunteers. While Dutton (1999) argued that putting information on websites will ultimately save time required to organise collective action, the case of ETSO #64 suggests: a) counterproductive effects of ICT or the 'rebound effect' (Hilty et al., 2006, p. 19), and b) the lack of a demonstrated increase in productivity despite investment in ICTs or the 'productivity paradox' (Macdonald, 2002, p.1). Furthermore, interviews with leaders of ETSO #58 and #66 (both female and over 70) indicated that their organisations' websites were designed by kin of affiliated members/volunteers. However, the websites are not updated regularly because of the lack of necessary skills to do so. These results are consistent with the observations of age and gender divide in Australia; that is, female senior citizens are particularly vulnerable to being left out of the rapidly evolving social media landscape (Dhakal, 2010b; Palmer, 2011) and perhaps demonstrate the utility of action research-based medium- to long-term ICT-related capacity building instead of shorter-term financial assistance.

ICT-mediated Adaptive Capacity

In order to explore the ICT-mediated adaptive capacity of ETSOs the survey data was used to construct two-by-two cross-tabulations (Table 1) between websites (yes and no)/social media (yes and no) and a dichotomised count of volunteers (up to 15 and 16 or more)/funding sources (up to 3 and 4 or more), and positive outlook (likely to keep going or otherwise).

Table 1: Significance of websites and social media

Variables		ETSOs have website?			ETSOs use social media?		
		No	Yes	Total	No	Yes	Total
Number of Volunteers (Median 15)	Up to 15	39 (97.5%)	18 (43.9%)	57 (70.4%)	54 (77.1%)	3 (27.3%)	57 (70.4%)
	16 or more	1 (2.5%)	23 (56.1%)	24 (29.6%)	16 (22.9%)	8 (72.7%)	24 (29.6%)
	Total	40 (100%)	41 (100%)	81 (100%)	70 (100%)	11 (100%)	81 (100%)
		x^2 (n=81): 27.895, df=1, p=0.000**			x^2 (n=81): 11.339, df=1, p = 0.001*		
Number of Funding Sources (Median 3)	Up to 3	39 (97.5%)	31 (75.6%)	70 (86.4%)	66 (94.3%)	4 (36.4%)	70 (86.4%)
	4 or more	1 (2.5%)	10 (24.4%)	11 (13.6%)	4 (5.7%)	7 (63.6%)	11 (13.6%)
	Total	40 (100%)	41 (100%)	81 (100%)	70 (100%)	11 (100%)	81 (100%)
		x^2 (n=81): 8.267, df=1, p=0.004*			x^2 (n=81): 27.175, df=1, p=0.000*		
Likely to Keep Going	No	17 (42.5%)	7 (17.1%)	24 (29.6%)	24 (34.3%)	0	24 (29.6%)
	Yes	23 (57.5%)	34 (82.9%)	57 (70.4%)	46 (65.7%)	11 (100%)	57 (70.4%)
	Total	40 (100%)	41 (100%)	81 (100%)	70 (100%)	11 (100%)	81 (100%)
		x^2 (n=81): 6.278, df=1, p=0.012*			x^2 (n=81): 5.359, df=1, p=0.021*		

* Significant at 0.05 probability level, ** Significant at 0.00 probability level

The dichotomy of volunteers and funding sources was based on the median number as reported earlier. In tables such as this the percentages across the columns help to interpret the association between two categories because they provide an estimate of effect (Peat et al., 2008). The cross-tabulation revealed several significant differences between ICT adopters and non-adopters. A significantly greater percentage of ETSOs that have websites and use social media have more volunteers and funding sources, and are optimistic. Although it is necessary to be cautious of a causal link between ICTs and adaptive capacity, these findings do have plausible explanations. Firstly, it can be speculated that organisations with a positive outlook are more interested in exploiting the potential benefits associated with ICTs than those with a negative outlook. Secondly, the link between ICT adoption and the higher number of human and financial resources suggests that some ETSOs are using ICTs as an additional avenue to acquire volunteers and seek additional funding opportunities. Conversely, it might

also be the case that the uptake of ICTs has benefited ETSOs that are already adaptive to a certain extent, rather than serving the needs of organisations that are vulnerable. These statistical findings, however, do not suggest that the ETSOs that are non-adopters are inferior to those of adopters; instead organisations that have adopted ICTs might simply have additional means with which they can overcome resource scarcities. This interpretation is consistent with the 'networked society' stance (Castells, 2000) which associates the lack of ICT utilisation with missed opportunities (Floridi, 2001; Hacker et al., 2009).

CONCLUSION

The aim of this field note was to examine the differences in adaptive capacity between ICT adopter and non-adopter ETSOs in Perth, WA. The findings indicate that the majority of organisations are either overlooking or under-exploiting the potential of ICTs. While it is generally accepted that ETSOs often operate in a turbulent environment (McDonald & Warburton, 2003), the role ETSOs play in environmental planning and implementation in Perth will remain vital for the foreseeable future. ETSOs can build or damage adaptive capacity in multiple ways and this short field note does not aim to underestimate the complexities of vulnerability by equating it with the lack of ICT uptake. In the case of ETSOs in Perth, however, the uptake of ICTs stands out as a distinctive factor associated with enhanced adaptive capacity. This finding resonates with the observation that ICTs have become an essential ingredient of successful environmentally-oriented civil society actors that often have to 'do more with less' (Kutner, 2000; Horton, 2004; Neto, 2008; Dhakal, 2009). On the flip side, these organisations were willingly or unwillingly and/or overlooking or under-exploiting the potential of ICTs in general. This observation is consistent with the low utilisation of ICTs amongst ETSOs elsewhere in Australia (Johanson et al., 2013). Since ETSOs with a higher uptake of ICTs were in a better position to foster adaptive capacity, efforts to strengthen these organisations may benefit from action research-oriented community informatics intervention. Mainly because, although the uptake of ICTs is an insufficient but necessary ingredient of adaptive ETSOs, the community informatics approach as an inclusive approach can engage relevant stakeholders ranging from local educational institutions and internet service providers to environmental planning agencies and peak not-for-profit bodies in order to institutionalise ICT-specific capacity building support. Notwithstanding the limitations of ICTs for smaller civil society organisations (Stewart-Weeks & Barraket, 2002), existing environmental strategies that rely on ETSOs should support ways to exploit the potential of ICTs as a driver of equal opportunities and equity - relative to the larger civil society organisations. With more than 5,000 ETSOs across Australia (Dhakal, 2011), future studies might usefully build on the current analysis and longitudinally investigate the ICT-mediated adaptive capacity of ETSOs in Perth and beyond.

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