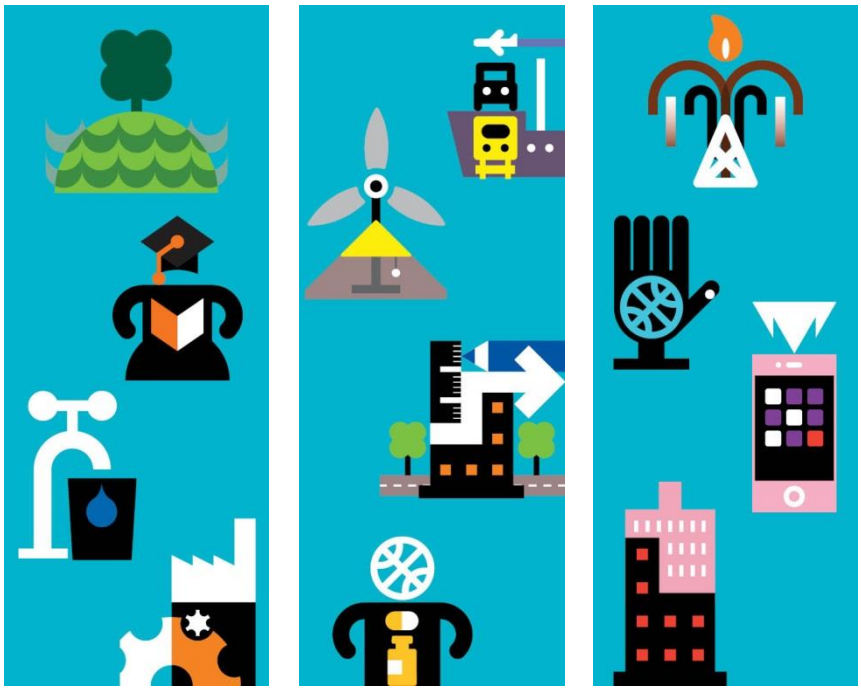

Evaluation of DFID Online Research Portals & Repositories

Inception Phase Substantive Report

March 2015

UKaid
from the British people

The Open University

Mott MacDonald

Evaluation of DFID Online Research Portals & Repositories

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March 2015

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Executive summary

In 2014 DFID commissioned an evaluation of a small sample of the online research portals and repositories which it supports. A consortium of Mott MacDonald and the Open University was awarded the evaluation contract. Following revisions of the evaluation design, in January 2015 a three month Inception phase (Stage 1) began to collate, synthesise and analyse existing evidence and to confirm the purpose and design of the evaluation. The result is this **Substantive Report**.

Four different DFID-funded research portals/repositories were chosen by DFID as the subject of the evaluation: Eldis, GDNet, R4D and SciDev.Net. They all have the same broad purpose of disseminating good quality, relevant research on development issues to a global audience, with the primary target being policy makers in the South. The four portals represent a broad spectrum of 'models' to achieve this, ranging from the basic repository functions of R4D to the science journalism broadcast approach of SciDev.Net. Which of these models are most relevant to the changing internet world in which they operate? Which offer best value for money? These are the key questions for the evaluation. The literature and documentation reviews conducted during the Inception phase were aimed at beginning to answer these questions by establishing what is already known.

There is strong and steady growth in internet availability and access globally. Internet usage is growing much faster amongst users in the South, although internet access still varies greatly within and between countries. How, and on which devices, people are accessing the internet is also changing- with smartphones increasingly being used to access websites and emails. All of these have important implications for how online portals and repositories are accessed and used.

The process of accessing and using online research portals and their content is best understood through information behaviour and sense-making models drawn from the field of information science. We draw from these to create a conceptual framework for our analysis of the literature and the original research in Stage 2. The framework breaks down information behaviour into a series of discrete activities – starting, chaining browsing, extracting, processing, verifying and using –which can be investigated using a range of evaluation methodologies.

A review of the documentation held by the portals shows that most of the evaluation to date by portals and other researchers/evaluators has focussed on current users rather than target users. Yet there are clear differences between the two groups. Current users are predominantly researchers in the North and 'the internet elite' in the South. Furthermore, each of the DFID-funded portals is each found useful by different types of users. There has been some limited user-centred research but a preliminary heuristics evaluation of the portals' interfaces conducted during the Inception Phase highlighted issues with the portals' usability which could be improved.

The four DFID-funded portals have very different logframes against which they report. Consequently, they have very different M&E arrangements, including different degrees of sophistication in how they track and represent their webmetrics. A preliminary analysis of their common metrics, using Google Analytics, showed a wide range of user results, ranging for example from 1.6 million unique visitors for SciDev.Net in 2014 to 220,000 for GDNet in 2013 (its last full year of operation). Most of the 'common' site traffic and user metrics that are easily available are subject to measurement error and are difficult to interpret without

a deeper knowledge of the actual information behaviours they are capturing. This is particularly important for understanding the extent to which the target audience in the South are being reached. The literature suggests that internet availability challenges, as well as different habits of searching and verifying, may result in very different 'digital footprints' and user journeys on the portals. Our original research in Stage 2 is aimed at generating that deeper understanding.

Abbreviations & acronyms

3Es	Economy, Efficiency & Effectiveness
AFCAP	African Community Access Programme
API	Application Programme Interface
BLDS	British Library for Development Studies
CI	Continuance Intention
DFID	Department for International Development
EAP	Emerging Asia Pacific
ESRC	Economic and Social Research Council
GA	Google Analytics
GODI	Ghana Open Data Initiative
GOKH	Global Open Knowledge Hub
HPSR	Health, Policy & Systems Research
HTML	HyperText Markup Language
ICT	Information Communication Technology
IDS	Institute for Development Studies
IP	Internet Protocol
IT	Information Technology
Mbps	Megabits per second
NISER	Nigerian Institute of Social and Economic Research
ODI	Overseas Development Institute
OU	The Open University
PACCIT	People at the Centre of Communication and Information Technologies Programme
PC	Personal Computer
PDF	Portable Document Format
PSPPD	Programme to Support Pro Poor Policy Development
R4D	Research for Development
RSS	Rich Site Summary
SEO	Search Engine Optimisation
SLA	Service Level Agreement
SMS	Short Message Service
SSA	Sub Saharan Africa
ToC	Theory of Change
ToR	Terms of Reference
URC	University Research Co.
USB	Universal Serial Bus
UX	User Experience
VFM	Value for Money
WIR	Web Impact Report

1 Background and objectives

As part of their commitment to ensuring that its policies and programmes are based on evidence, DFID supports the development of high quality research to meet its strategic objectives and benefit the wider development community. Investing in research alone, however, is not sufficient to lead to research uptake and achieve impact on decision-making in policy and practice. The role of intermediaries is critical to extending the reach of research so DFID funds a number of intermediary organisations, including online research portals, to support research communication.

The growth of internet connectivity and the development of social media, offer huge opportunities for research communication, and reflect a change in the way that people can access and use information. A pressing issue is how best these opportunities can be harnessed in order to increase reach and promote use of research in decision-making.

The evidence base on what works to communicate research and achieve uptake is fragmented and often restricted to evaluation of a particular service or programme. The evidence for the effectiveness of online research communication is even weaker. In 2014, as part of their commitment to ensuring that funding decisions are informed by evidence, DFID commissioned an evaluation of online research portals and repositories. The findings of the evaluation will be used by DFID to inform their approach to research communication and uptake. The evaluation will also contribute to the global evidence base on research uptake, and inform the work of other donors, intermediaries and researchers. The scope comprises primarily of four portals and repositories supported by DFID: Eldis, R4D, SciDev.Net and GDNet.

In 2014, a consortium of Mott MacDonald and the Open University was awarded the evaluation contract and in January 2015 began a three month Inception Phase to collate, synthesise and analyse existing evidence and to confirm the purpose and design of the evaluation. The result is this Substantive Report.

The objectives of this evaluation have informed the evidence review during the Inception Phase and have shaped the structure and content of the Substantive Report. The evaluation objectives are:

1. To describe user populations and examine how they interact with online research portals and repositories.
2. To assess the quality and accessibility of online research portals and repositories and to collate and analyse the available evidence on their use.
3. To estimate the impacts of online research portals and repositories on research uptake[1]To assess whether the DFID-funded portals and repositories present value for money, in their own right and in relation to portals and repositories not funded by DFID.
4. To provide recommendations for how the DFID-funded programmes might be improved and better monitored.

[1] This evaluation objective was subsequently amended: 'to draw out and illustrate plausible pathways between portal use and uptake of evidence in policy and practice.

2 Structure of the report

This Substantive Report summarises the results of the rapid literature reviews and project documentation reviews conducted during the three month Inception period of January – March 2015.

In this inception stage we:

1. collated and analysed the available evidence on the use of the DFID-funded and other portals and repositories. This evidence comprises webmetrics, as well as information from DFID's internal annual reviews, previous external reviews and other literature;
2. reviewed the directly relevant literature;
3. conducted a preliminary analysis of the quality, accessibility and ease of use of the DFID funded portals;
4. interrogated and validated recent webmetrics from the DFID-funded portals and the tools to capture these;
5. as a result of all the above, further developed the initial Theory of Change;
6. confirmed proposals for the second phase of the evaluation to be conducted May-December 2015.

This **Substantive Report** draws together the results of the first five steps of the inception phase. It is intended to be read as a self-standing document.

Table 2.1: Structure of this report

Section 3 *Methods and data sources used in the Inception Stage*	An overview of the research methods and the data sources used to conduct the review of the evidence used in this report.
Section 4 *Overview of the portals under investigation*	A table giving a broad overview of the 4 portals under investigation, highlighting their purpose, editorial approach, delivery method, sector coverage and other features.
Section 5 *The Context*	Summarises the context in which the portals operate focusing on trends in internet availability and usage.
Section 6 *How do different development actors search for and access development research online?*	Highlights the main findings from the rapid literature review on how different development actors search for and access development research online (information behaviour).
Section 7 *Assessing the quality and accessibility of online portals and repositories*	Covers how to assess quality and accessibility, methods for assessing the DFID portals and includes a preliminary assessment of the four portals' quality and accessibility.
Section 8 *Evaluating the impact of evidence and research online*	Explores what is meant by "impact" for research communication and example definitions of "use" and "uptake". This section also explores both the conceptual challenges to evaluating impact and the methodological and software challenges to evaluating research

	dissemination and the use of research portals.
Section 9 *Preliminary webmetrics analysis*	Provides an overview of the results of a preliminary webmetrics analysis.
Section 10 *Preliminary value for money assessment*	Explores the challenges of assessing VFM.
Section 11 *Conclusions and Implications for Stage 2*	A summary of key findings from the literature reviews and preliminary assessments and the implications for the original research to be conducted Stage 2
Section 12 *Revised Theory of Change*	Presents a revised theory of change in the light of findings from the literature reviews.
Appendix A *Glossary & Definitions*	A glossary of the key terms used in the report.
Appendix B *Rapid Literature Review- DFID portals' target and user populations: what we know about how they interact with research online*	In tabular format, summarises the findings from the rapid literature review on the DFID portals' target user populations and how they interact with research online.
Appendix C *Rapid Literature Review- Assessing Quality & Accessibility*	In tabular format, summarises the from the rapid literature review on assessing quality and accessibility.
Appendix D *Webmetrics literature review*	In tabular format, summarises the findings from the rapid literature review on the use of webmetrics.
Appendix E *Preliminary webmetrics analysis of the 4 DFID portals*	The full record of the webmetrics analysis undertaken in the inception phase for each of the four portals. This section also includes a brief history and critique of the Rapid Rise Of Webmetrics in evaluating the impact of evidence and research online.
Appendix F *Heuristic evaluation of the portals*	The results of a heuristic evaluation on SciDev.Net, Eldis and R4D.
Appendix G *People consulted*	A table of the stakeholders consulted during the inception phase.
Appendix H *Bibliography*	A bibliography of all the sources cited in this report.

3 Methods and data sources used in the Inception Stage

Methods and data sources used in the production of this substantive report were:

- A detailed review of DFID project documentation made available on DFID's Development Tracker and R4D websites. This included primarily DFID annual reviews, the portals' own annual reports, mid-term reviews, annual monitoring and evaluation reports, other ad hoc evaluation reports and occasional papers. Attention focussed on reporting for the last three years, but older papers were referred to where these were relevant and available;
- A review of supplementary project reports supplied by the DFID-funded portal managers;
- Interviews with the DFID-funded portal management teams, including finance managers, web managers, M&E managers and others;
- Rapid literature reviews conducted in a number of fields, namely: research dissemination, research impact evaluation, website accessibility analysis, bibliometrics/ altmetrics and commercial webmetrics analysis;
- Preliminary analysis of the DFID-funded portals web logs through direct access to their Google Analytics accounts;
- Consultation with the Evaluation Advisory Group via a dedicated DGroup online discussion group;
- Ad hoc consultations with external experts and key informants, primarily in connection with the literature review process. A list of individuals consulted and the literature reviewed are included as Appendices at the end of the report.

The team would like to thank all those who assisted with our inception phase, especially those involved in providing us with access to, and understanding of, the data.

4 Overview of the portals/repositories under investigation

Table 4.1: Portal/Repository functions[2]

PURPOSE						
Portal/Repository	Generating new information content (i.e. research products and news items)	Making information available from multiple sources	Helping people make sense of, and apply, information	Actively supporting knowledge sharing, debate and building connections	Strengthening capacity of researchers as providers	Promoting and strengthening a southern voice
Eldis		x	x			x
SciDev.net	x	x	x	x		
R4D		x	x			
GDNet		x	x	x	x	x

[22] As identified by the evaluation team in consultation with the portal managers.

Table 4.2: Overview of the Portals

	Eldis	R4D	SciDev.net	GDNet
Management Arrangements	Managed by IDS through its Open Knowledge and Digital Services Unit	Managed by CABI. Currently the focus is on maintenance and updating until the end of the contract in March 2015	Is a company limited by guarantee and a registered charity in England and Wales	A key component of GDN's capacity building and networking activities. Closed in 2014
Content Type	Summaries and links to research products including research reports, working papers, discussion papers, conference papers, case studies and policy briefings	DFID-funded research and outputs from the 1990s to the present day	Primarily unique content. Multimedia (including podcasts, photo galleries, videos, infographics, and audio interviews), news, data visualisation, practical guides and editorials	GDNet provided free access to over 1,000 online journals, key datasets and information on funding. It also produced summaries of southern research and profiled southern researchers
Subject Focus	Resource Guides cover 9 thematic areas: agriculture and food, climate change, conflict and security, gender, global health, governance, ICTs for development, nutrition, and rising powers in development	10 themes: Agriculture, Climate & Environment, Education, Economic Growth, Research Communication & Uptake, Infrastructure, Social Change, Governance & conflict, Water & Sanitation, Humanitarian Disasters & Emergencies, and Food & Nutrition	Science-based topics for global development. It is broadly split into the following topics: agriculture, environment, health, governance, enterprise, and communication	All sectors
Audience	Development practitioners, policy-makers and researchers	Those in the North or South, who want to access DFID research information	Development professionals, policymakers, researchers, journalists and the informed public	The target contributors for GDNet content were researchers in the South
Editorial Approach	Eldis' editorial team locates content from a variety of sources incl. submissions from users. Prioritises profiling research from organisations in the South. Content is licensed under Creative Commons and available to re-use through the IDS Open API and the okhub.org API plus various tools for developers and website managers	CABI upload outputs to the database and search and locate DFID research material on the web to add to the database, adding content through production of summaries and improved metadata	SciDev.Net has regional teams which produce content and a network of freelance journalists. All content is under creative commons license	GDNet was a partnership with regional networks and leading experts in the field. Produced summaries of research. Focus on Southern Research
Delivery	Content can be browsed through resource guides and a search function. Users can subscribe to updates via RSS, social media and e-newsletters called "Reporters". Eldis offers theme-based and general Reporters	Primarily a repository. Has a search function using filters, keywords and refiners. Browsing by country or region or theme. Research products have social bookmarking links and it's possible to subscribe to automated email updates. Content is selectively promoted by DFID social media	Users can subscribe to updates through social media, e-newsletters and RSS. Users can also browse and refine for content by thematic area, region, type and year published and search. Users can interact with by leaving comments on articles	GDNet was membership based – researchers could create online profiles and depending on eligibility would have free access to certain journals and data. Ran training workshops. Had social media- integrated towards the end
Funding	Mainly funded by DFID through GOKH programme.	DFID is the sole funder.	Funding from multiple sources.	Funding from DFID, the World Bank and the Netherlands.

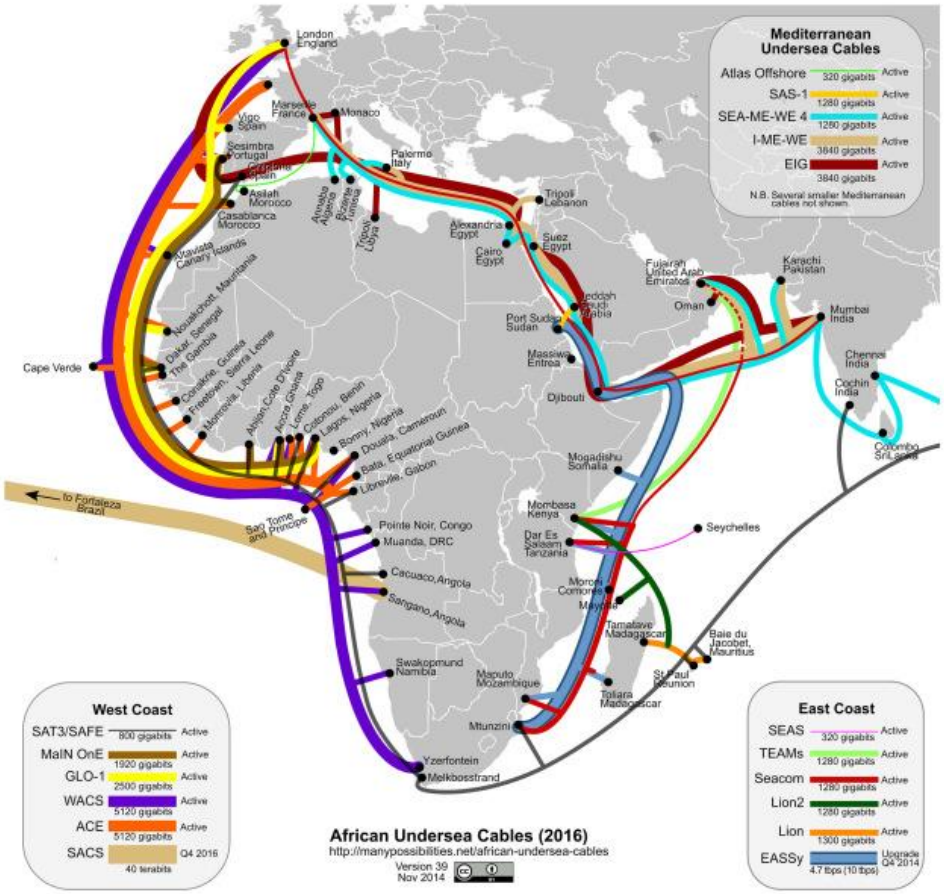
5 The context: trends in internet availability and usage

5.1 The Supply Side: Trends in Availability

Networks

Internet access of any type (fixed line or mobile) in the South is increasingly widespread. By 2012, one third of people in sub-Saharan Africa (SSA) and one fifth in Emerging Asia-Pacific (EAP)[3], for example had access to the internet (The Internet Society, 2014). Many recent substantial undersea cable projects are further transforming internet access by delivering much greater bandwidth and improving connection speeds between Africa and the rest of the world (see Figure 1).

Figure 1: African undersea cables 2016 (Song, 2014)



[3] This category includes the Indian sub-continent countries.

As a region, South East Asia has good networks, but access at individual country level varies starkly e.g. average internet speed in the Philippines was 3.6 Megabits per second (Mbps) in 2014, Cambodia 5.7 Mbps, but Singapore 61 Mbps (NetIndex, 2014).

Inevitably, access varies greatly within and between countries as the table below shows: in 2013 (the most recent year that statistics are available from ITU) fewer than 2% of people in Ethiopia were considered internet users, for example, compared with 4.4%% in Tanzania, 6.5% in Bangladesh, 12.3% in Ghana, and nearly 50% in South Africa[4] (Crow, et al., 2012).

Table 5.1: Percentage of Individuals using the Internet in selected countries (The Internet Society, 2014)

	2000	2007	2013
Bangladesh	0.07	1.80	6.50
Ethiopia	0.02	0.37	1.90
Ghana	0.15	3.85	12.30
Kenya	0.32	7.95	39.00
South Africa	5.35	8.07	48.90
Tanzania	0.12	1.60	4.40
United Kingdom	26.82	75.09	89.84

Coverage

People living in densely populated urban areas have better access to any form of broadband access including mobile, than those in rural areas - this is also true among development actors (Starkey, 2013). Where content is hosted also makes a difference: Africa has just 0.16 per cent of all servers worldwide (ITU, 2013) and local content is generally hosted outside the continent. The Internet Society (2014) reports that the five largest Kenyan websites, for example, are all hosted in Europe, and warns that this could severely affect Kenyans' ability to access the content.

Services

There are patterns of difference in services across the South. For example the proportion of fixed internet subscriptions that are broadband are as high as 90% in Emerging Asia-Pacific, while only 54% in SSA in 2012 (The Internet Society, 2014). In Africa, in particular, fixed line and PC access to the internet is beset by power and equipment problems. As a result there is a lot of change and churn: the 'typical server' [in Africa] is online only about six hours per day and has frequent disconnects lasting days or weeks (Crow,

[4] South Africa leads Africa in internet use and infrastructure as well as mobile use. Prevalence and usage patterns of doctors in South Africa are equivalent to international averages (Crow, et al., 2012).

2012). However, mobile broadband access is seen to be becoming increasingly important relative to all other forms of Internet access everywhere (The Internet Society, 2014).

In response to power cuts (a major issue in Africa) there has been much local ingenuity in developing new technology (Manyika, et al., 2013). For example, BRCK is a portable router that provides web access in disconnected areas. It seamlessly switches between Ethernet, Wi-Fi and cellular networks to provide internet access for up to 20 devices. The router, which was developed by software engineers in Nairobi, Kenya, works for more than 8 hours without electricity (Veselinovic & Clements, 2015). Crow (2012) details a number of other work-arounds that are being used to extend availability. Adaptive file transfers protocols such as BitTorrent have some success dealing with unreliable Internet connectivity, while tele-centres, small scale, private sector enterprises are an option for internet access especially in rural areas. Also local caching system synchronized with network servers can be used to address the bandwidth and connectivity issues in low-ICT areas.

Despite these innovations, research suggests that internet access through mobile broadband (this includes for wireless Internet access through a portable modem, mobile phone, USB wireless modem, tablet or other mobile devices) is a better option: mobile broadband, can be rolled out faster and at lower cost than fixed broadband (The Internet Society, 2014) while mobile networks stay up during power cuts because providers often have their own generators e.g. MTN, Africa's biggest mobile phone firm, has a private 2 MW power plant at its Johannesburg headquarters with 1.5 million litres of diesel reserves - enough, it says, to keep its core operations going for a month (Govender, 2015).

Speed

Africa's mobile broadband growth is increasing at a rate of more than 40% - twice the global average (Veselinovic & Clements, 2015) with the result that it is expected that mobile broadband connections will dominate, with 703 million 3G and 4G connections forecast for sub-Saharan Africa in 2018 compared to 11.9 million fixed connections (The Internet Society, 2014). With increasing infrastructure comes increasing human technical resource. Ghana has been particularly proactive, for example. Its Open Government Action Plan (Ghana Open Government Partnership Initiative, 2012) commits to the full implementation of the Ghana Open Data Initiative (GODI) and the opening of two portals to facilitate the collection and dissemination of data to serve citizens

5.2 The Demand Side: Trends in Usage

Price

Access is not just about ICT infrastructure; it is also about cost: while our literature review suggests that many of the target groups in which DFID is particularly interested will be among the “internet elite” who enjoy better internet access (Batchelor, 2012), using the internet can be extremely expensive. As an indicator of the contrast between the South and North, people earning the minimum wage in Ghana would need to spend more than half their salary to get a wired internet broadband connection while in the United States, minimum wage earners would pay just over 1% of their salary (ITU, 2013). Some universities in

Africa are spending 'as much as the equivalent of 20 full-time faculty salaries for a 2-megabit Internet connection' that is then distributed to 500 to 600 computers, resulting in a costly and slow connection for everyone" (Crow, 2012).

Smartphones need to be charged more frequently than simpler mobile phones (and laptops use a lot of energy) which adds to the costs. One study (Nielson, 2013) found that in India, half of smartphone owners did not have active data allowances (i.e. they were not paying to use their smartphones to search the internet). In the South, in general, a mobile Internet subscription costs up to seven times more than a mobile telephone subscription (ITU, 2013). That said, some smartphone customers in the South have recently been given free access to key websites. Internet.org is partnering with network operators to offer an app to their subscribers, giving them free use of several websites e.g. in Ghana this includes BBC News, Facebook, GhanaWeb, Wikipedia and Ebola Information (Internet.org, 2015).

User Needs

With mobile phones increasingly widespread in the South - by the end of 2012, developing countries had more than 50% of the world's mobile broadband subscribers (The Internet Society, 2014) - emails and websites are increasingly accessed through mobile phones. In 2013, only 800 million out of 3.8 billion people were connected to the internet but for most of these people, mobile was the primary means of internet access, even though fewer than 1 in 4 mobile connections in the South were internet-enabled (Deloitte, 2013). Around 70% of mobile users browse the internet on their devices. However, mobile phones have evident drawbacks for carrying out internet-based research. Phones have too limited processor speed, memory, screen size, and functionality for widespread accessing of online research portals and repositories. Computers, laptops, tablets with wireless connectivity, however, could get round all these problems (Jackson, 2009).

Our literature review suggests that the unique IT challenges of the South in accessing research evidence online are not well anticipated by web designers in the North: bandwidth in most parts of Africa was estimated at 1/100th of the typical UK home in 2009 (although this has changed over the intervening years[5]) (Crow, et al., 2012). An average web page from a publisher at that time would take over 1.5 minutes to load. In developing country universities, it is estimated that the bandwidth available to an individual user will have increased by only 20 - 60% over the past 5 years (Jackson, 2009). Meanwhile, the average web page has increased by 300% in size and websites have become more complex. While PDF files represent valuable content for the user, the many web pages the user must navigate to gain access to the PDF usually represent little value: 'An African researcher may be prepared to start a PDF download that will take a long time but they should not be expected to navigate through a dozen pages each of which may take several minutes to load' (Jackson, 2009). People using small screens prefer to access shorter documents, while SMS messaging and small screens on telephones are not suitable for high quality digital images which occur on many portals and in research documents (Crow, 2012).

[5] On-the-ground descriptions of the rapid growth of mobile device usage indicate that it may have outpaced the statistics (Crow, 2012)

Portals and databases not being designed for users in the South may be a common problem. For example "HINARI and PERI[6] databases are primarily designed with the technological capabilities of more developed areas in mind" (Crow, 2012).

Online Visibility

The literature has shown concern about "portal proliferation" for many years (Rao, 2001). At the same time, the means by which websites can reach out to their target audiences have also grown, ranging from search engine optimisation, newsfeeds, blogging, Facebook[7] and Twitter to a presence on YouTube. To date, the former has been most used by online research portals, although there is evidence amongst academics in the North of an increasing use of Twitter to share citations: a recent study (Adams & Loach, 2015) found that the share of peer reviewed articles published online which also were mentioned in a tweet and other social media rose from less than 5% in 2009 to 25% in 2013.[8]

Google is responding to users' demand for more efficient searching for good quality information with a new emphasis on authority of content (Miller, 2014) which it has refined in recent months. With its new Panda updates[9], Google is now scanning websites for content originality and relevance to determine whether its top ranking sites are displaying real authority. The aim is to ensure that all highly ranking content on its pages is worth the ranking by testing if their content is original, plagiarised or simply there because other websites are back linking to it. Good quality metadata and titles that are located through keyword searches are still necessary, but increasingly the key to good organic[10] traffic is relevant, original content.

[6] HINAR (Access to Research in Health Programme) provides free or very low cost online access to the major journals in biomedical and related social sciences to local, not-for-profit institutions in developing countries http://www.who.int/hinari/en/. PERI worked to strengthen research and knowledge systems in developing countries with the aim of having research information inform social and economic development in the south. http://www.inasp.info/en/work/what-we-do/programmes/peri/

[7] Including a growing service in falsification of 'likes' e.g. www.likefake.com

8 Based on research publications indexed in Reuters Web of Science

9 Google Panda. Google Panda is a change to Google's search results ranking algorithm that was first released in February 2011. The change aimed to lower the rank of "low-quality sites" or "thin sites", and return higher-quality sites near the top of the search results.

[10] Through searches rather than advertising links.

6 How do different development actors search for and access research online?

This section summarises the key findings from a rapid literature review of open access publications from the last five years (the full literature review is at Appendix B). We discuss the different definitions of target and user groups. Then we consider how these findings relate to the findings of surveys of the portals' users, including how target and user populations have been defined.

6.1 Defining 'information behaviour'

How are the activities of becoming aware of, accessing, assessing and using research evidence defined in the literature?

The literature on the use and uptake of research evidence in international development is characterised by considerable fluidity in its use of terminology. Key terms such as 'use' and 'uptake' are often defined in different and often contradictory ways, variously including any or all of the processes of accessing, becoming aware of, using, quoting and implementing research findings. Models of information behaviour taken from the field of information science can help to resolve these contradictions and contribute to a clearer understanding of them – in the online context at least - by breaking the processes of use into aspects of *information seeking and searching activities* that include encountering, seeking, choosing, sharing and using information.

A framework for understanding 'information seeking' and 'information behaviour' in relation to online research portals and repositories

Some of the literature on research portal use and understanding demand for research among policy-makers does make use of information behaviour concepts: Pujar and Fisher (2011), for example, draw attention to the concept of information behaviours and Hammill et al. (Hammill, et al., 2013) differentiate between information-seeking and knowledge-sharing behaviours. In their study of Nigerian researchers, Folorunso (2014) cites Al-Suqri's synthesised model of social science information-seeking behaviour which has eight generic components: initiation, exploration, monitoring, categorization, sifting, selecting resources, collecting, and ending. To date, however, we have not seen any examples of established information behaviour models (such as Wilson's Revised General Model of Information Behaviour, or Choo et al.'s Integrated Model of Browsing and Searching (Wilson, 1999) (Choo, et al., 2000) being applied to the planning or evaluation of development research portals and repositories.

Despite their vintage, they still have relevance. Wilson's review of the literature of information behaviour in particular (Wilson, 1997), raises a number of issues of relevance to managers of development research portals. This includes the need to understand the potential impediments or "intervening variables" between a person recognising they have a need to be informed and commencing a search for information; or between the information being acquired and it being used. The "cost" of search is another consideration raised by Wilson, which relates to perceptions of information quality, as discussed below.

We have brought elements of these together into a framework of online information behaviour (see Figure 2) with which to organise our findings from the literature review and to structure our evaluation in Stage 2. Our framework draws mainly on Ellis's model of information seeking behaviour which uses generic

information patterns of starting, chaining, browsing, differentiating, monitoring, extracting, verifying and ending. Although the different patterns of behaviour may occur in sequence (starting could lead to browsing, for example) Ellis is clear that this is not a process model.

Figure 2: 'Online information behaviour' a draft framework

'Online information behaviour' a draft framework
Starting – identifying where and how to begin a search (to meet a specific information need) e.g. search engines, abstract databases, homepages, etc. and the devices or channels to use.
Chaining – following links to access more information on the same website or on related websites.
Browsing – scanning headings, sitemaps, lists, etc. on a website
Differentiating – bookmarking webpages, printing or downloading material, based on evaluation criteria
Monitoring - Keeping abreast of what's new in an area e.g. by revisiting bookmarked sites or receiving email alerts
Extracting – using search engines and site searches to systematically extract information
Processing, Verifying & Using - deciding what to do with information once it has been found e.g. sharing, citing, etc.
Adapted from Ellis; Wilson; Aguilar; Choo et al.

6.2 Summary findings from the literature review

Most of the studies we found in our rapid literature review looked at people who had some form of influence on policy making[11] ('policy actors' rather than 'development actors'). Our analysis of these suggests that:

[11] We discuss the different intended target and user groups for the portals, and their definitions, further below.

Starting and Chaining

How potential users start their search and find their way to the portal is a key question for the evaluation. For those who seek evidence online, search engines are often used and frequently more often for initial searches than going directly to named websites (De Satge, 2011; Bayliss et al., 2012; Intermedia 2010b; Prakash, 2013). On this basis, one would expect content from portals and repositories to be accessed largely via its appearance in search engine results than from people visiting the portals directly that they are familiar with. While Google is popular, it is worth noting that it is not the only search engine that they use e.g. Rediff is popular in India (Prakesh, 2013).

Whether people arrive at portals directly or through a search engine, how the portal supports chaining (clicking on links to other resources) is an important design decision. Starkey (Starkey, 2013) highlights the weakness of the practice used by many research portals of linking to full text documents hosted elsewhere (which can lead to broken links), rather than hosting them on the portal itself. Starkey also observes that the problem of sustainability affects the role research portals play in policy actors' searches for information.

Although "portal proliferation" has been a concern for several years (Barnard, 2013) with more and more research portals competing for attention among policy actors, a larger problem from the perspective of the information-seekers is the many examples of research portals either disappearing or going out-of-date when the initial funding ends.

Some of DFID's target groups of interest – i.e. those based in rural areas where connectivity and power supply will be an issue - will be excluded from accessing research evidence if it is only made available online e.g. (Starkey, 2013; Kapadia-Kundu et al., 2012). Print, or print-friendly information products are still important (Sylla, A. H. et al., 2012; Globescan, 2013b; Intermedia, 2010b).

Although some studies show that a large proportion (40%) of policy actors in the South have smartphones (Batchelor, 2013), one should not assume this automatically means they will be accessing the internet through their mobile phones (Intermedia, 2010a); some are using their mobiles in this way but, for others, data costs are a barrier to use e.g. policy actors within the health sector in Senegal (Sylla et al, 2012). However, access to the internet through mobiles is one area in particular where studies can quickly go out of date; since the start of this Inception Period for example, Internet.org (from Facebook) has partnered with network providers in India, Ghana and Colombia to offer free mobile internet access to certain websites (Internet.org, 2015). These initiatives can rapidly and dramatically alter the information environment in developing countries.

Browsing and Extracting

For those who do seek evidence online, search engines are often used. They are frequently preferred to going directly to named websites (De Satge, 2011; Bayliss et al., 2012; Intermedia 2010b; Prakash, 2013). Evidence suggests that many people rely on general search engines, while Starkey (2013) found that search engines can indeed be more effective for searching some research portals than the website's own

search box. While Google is popular, it is worth noting that it is not the only popular search engine. For example Rediff is popular in India (Prakesh, 2013)[12].

Findings on the information needs of policy actors (Intermedia, 2010a) supports the approach that (some) portals take of summarizing, synthesizing, pulling out recommendations, and making practical material available (manuals, guidelines, etc.). A review by Starkey (Starkey, 2013) of portals found that one reason why policy actors can struggle to find grey literature online is poor website design; publications on some research portals being easier to find using Google, rather than the website's own search box.

Policy actors in Latin America, Asia and Africa all report that it is of some importance to have information on the environment but that they have difficulty in accessing it. Other topics that are generally considered important but on which it is hard to find information are natural resources, education and poverty alleviation. There is some evidence (Intermedia, 2010a) to support the service that some portals provide of summarizing, synthesizing, pulling out recommendations, and making practical material available (manuals, guidelines, etc.) is valued.

Differentiating and Monitoring

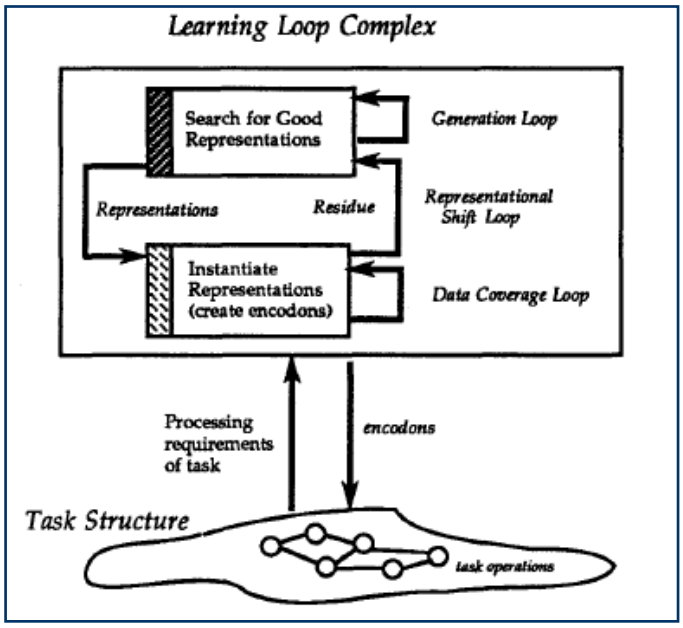
A couple of studies look at awareness of Eldis and R4D and find evidence of it (DFID, 2013; De Satge. 2011), however, measures of awareness should be used with care – 13% of DFID staff said they had not heard of R4D; it is possible that they have used R4D but do not recall it. The portals' own M&E reports sometimes assume a direct relationship between awareness and use, i.e. that increasing awareness of a service or produce will lead to adoption of it by more people, but this is not necessarily true.

Processing, Verifying and Using

The literature around 'sense making' sheds light on the 'uptake' decision in information behaviour, indicating that it is more complex than it may at first appear. The model by Wang (1998) suggested three stages of document use: selection, reading and use. Later models, based on empirical studies, have expanded on this basic view and recognised the time-consuming nature of extracting and transforming the information found (Russell et al., 1993, 2008), and the fact that sense making involves searching, representing, comparing with task requirements and so on (see Figure 3 below). In later work, the significance of experience in sense making was also recognised, e.g. by Pirolli et al. (2005). More recently the complexity of extracting, representing and synthesising information has been recognised and been the subject of more detailed studies.

[12] It is not clear whether this is due to the effectiveness of Rediff in identifying research results or other reasons. Search engines have different algorithms, give different weight to various signals and thus can generate quite different search results. If you rank at position five in Google, for example, you may not even be within the top three hundred in Bing (Ahmed, 2013).

Figure 3: The 'Learning Loop Complex' model (Russell et al. 1993 pg 271)



Another element of the verification process involves 'external' checking and validating. Personal contacts are used by some policymakers to check the reliability of information found online (Intermedia, 2010a; Debeljak 2010); from this one might assume that portals that have been recommended by a policy actor's key contacts, will be trusted. There is also some evidence of the increased use and effectiveness of 'elite bloggers' (rather than portals) to identify and recommend high quality new research (McKenzie & Ozler, 2014). Their research was able to show that not only were leading academics (in the field of economics) drawing a strong following to their blogs but that their blog postings caused a significant increase in the number of abstract views and downloads of linked papers. One study found that, apart from researchers, users of evidence are more concerned with the information being free, easy to access and to read, and practical (recommendations, based on experience, etc.) than being peer-reviewed (Bayliss et al., 2012), usability of information (simplicity, timeliness, quantity, etc.) being considered more important than research rigour.

When considering target groups for portals (in terms of promotion, design or content selection) trade unions may be an overlooked group, and think tanks/research institutes that are used by governments for consultancy. In general, portals need to consider which people or organisations are "influentials" and seen as reliable sources of information or ways to check research reliability for the target groups they are trying to reach. Portals could be assessed in terms of the value they add in making information more actionable. Suggested parameters (and associated barriers) of actionable information are: language, timeliness, simplicity, quantity and access. There are different views on how relevant research is to a country if it is about another country.

Categories and definitions of target and user groups for online research portals in the literature

A further note on the looseness of the terminology in the literature reviewed is important here, since it relates to the important question of exactly who is the target audience for the portals. The term "development actor" is occasionally used to describe users of research evidence in developing countries, but more frequently the subjects are labelled as "policy actors" or "policy stakeholders". The definitions used are often very broad and inconsistent. In these cases the studies typically used local survey managers to identify potential survey participants based on their interpretation of definition and their knowledge of the local policy making environment (Batchelor, 2012) (Uneke et al., 2011).

The subjects of the studies are also defined based on an assumed relationship to policymaking (in or out of government, having direct or indirect influence, etc.), or according to their position in a system or organisation (community or national, senior or lower grade, etc.). The result of this segmentation seems to vary by country or region, for example, trade unions may be considered important target groups in some cases and not in others (Globescan, 2014, 2013a and 2013b). In segmentation terms, geography and demographics (occupation) tend to be used as segmentation bases, sometimes in combination, on the assumption that the groups are sufficiently homogeneous to have similar information needs, motivations, opportunities and constraints.

Some of the specific ways that target groups have been labelled or segmented include:

- Policy actors or policy implementers (Debeljak, 2010).
- Government or non-government actors working in the poverty arena in South Africa (Satge, 2011).
- Having direct or indirect influence on the health policy-making process in Nigeria, based on job specifications (Uneke et al., 2011). Indirect influence, for example is defined as "individuals who are mainly involved in the generation, collection and assembling of relevant information, and processing of data and reports on health-related issues from the different sectors of the health system and prepare them into forms that can be submitted for the drafting of policy documents. They may make inputs during the production of policy briefs and policy drafts but do not participate in the writing of the main/final policy documents."
- Practitioners, policymakers and researchers (Bayliss et al., 2012).
- Categorised according to their position in the country's health system e.g. community, district, national, etc. (Sylla et al., 2012), (Kapadia-Kundu et al., 2012).
- Type of organisation and levels of staffing within them e.g. media: editors or journalists who report on public policy, finance, economics, international affairs, and/or development, who are knowledgeable about national policy issues (Globescan 2013a, 2013b, 2014), or government staff by cadre and grade (DFID, 2013).

6.3 Findings from the user research of the DFID portals and repositories

Several surveys have been carried out by the portals and repositories under investigation. The majority of these have been surveys of registered users and are similar to customer feedback surveys in the commercial sector: seeking to establish levels of satisfaction and awareness of the services being offered and identifying how the services might be improved. For the managers of the websites, they are also an important means of learning who the users are given that little, if any, data may be held about them (email subscribers, for example, may only have to provide a name and email address).

The bias in the results of opt-in online surveys[13] of this nature are well-established (Savage & Davine, 2013). However, we agree with the view in the SciDev.Net report 'Mapping the Impact of Science Journalism' (2013), that by acknowledging the bias we can still draw useful insights from the survey findings: if an opt-in survey tends to represent the views of users who are particularly engaged with a portal, then the findings tell us which type of person the portal is most effective at engaging and what they like about it.

From our reading of the analysis made by the authors of the survey reports we can see that **different research portals and repositories are found useful by different types of audience**:

- SciDev.Net's largest category of users is academic/researcher but appears also to be particularly valued by media professionals;
- GDNet was mostly used by Southern researchers;
- Eldis is especially effective at reaching NGO and INGO staff;
- R4D's largest group of users are based at research institutes, universities and think-tanks.

This is unsurprising when one looks at the different content of the four portals, their purposes and their services (see Section 4). This variety of experience illustrates an important pitfall in market research around this subject: views about the general value of portals or repositories will be influenced by the particular portals that the respondents have experienced. While this is in the nature of perceptions surveys, there is evidence to suggest that the perceptions of the target audience in the South may be particularly unreliable in this regard. Harle's survey of four national research universities in east and southern Africa (Harle, 2010) found researchers' awareness of the resources available to them is often low while Hepworth and Duvigneau in their study of three other African national universities (Hepworth, M. & Duvigneau, S. 2012) found many graduates currently lack the information literacy required to actively and successfully seek out information resources.

The user surveys also support findings from the literature review about the **types of content that DFID's target groups want**:

- The Eldis Review report (2010) found that the environment is a topic that DFID's target groups want more information on;

[13] The limitations of opt-in surveys are discussed in more detail in the accompanying Inception Report in relation to the design of the proposed online market research.

- GDNet's survey data from the 2014 M&E Report (Gregorowski, et al., 2014) adds weight to the findings that researchers are particularly interested in accessing peer-reviewed research;
- Surveys by SciDev.Net and Eldis found that policy makers in certain countries are keen to obtain case studies and evidence on policy effectiveness from other countries.

GDNet's 2011 survey data of its registered members was analysed by **gender** as part of the creation of a gender audit for the portal (Brown, 2013). Although limited to those GDNet users who opted in to take part in the survey, the analysis suggests there are differences in information behaviour between male and female GDNet members including:

- the email newsletters provided by GDNet were particularly valued by women and they were less likely to have used GDNet's social media channels, than men;
- male GDNet members were nearly twice as likely to visit the GDNet website on a weekly basis than female members;
- the practices of uploading research onto the GDNet portal and sharing research they found on GDNet was more common among men than women.

7 Assessing the quality and accessibility of online research portals and repositories

7.1 How to assess quality and accessibility

This section summarises the key findings from a rapid literature review of research publications from the last five years exploring findings from digital information systems and their evaluation approaches with particular reference to examples in the South (the full literature review is at Appendix C). We discuss the conceptual frameworks, the methods and the key findings. We propose a framework for assessing the DFID-funded portals and their comparators in Stage 2. We investigate the extent to which the DFID-funded portals have employed user evaluation research to design their portals and we conduct a preliminary heuristic evaluation of the portals.

In general, research portals are not widely studied in terms of their quality and accessibility. For this element of the literature review, we therefore broadened the coverage to include systems that might be deemed to be 'like' our portals, e.g. digital libraries, web portals, university portals, and e-government portals. Even then, case studies or empirical research studies that focus on portals are rare.

One clutch of studies used DeLone and McLean's model for successful information systems to determine the characteristics of "successful" university portals. They found that user satisfaction is determined by quality of service, quality of information and quality of system as well as usability of the interface (Lwoga, 2013; Masrek et al., 2010; Shaltoni et al., 2015). Lwoga studied undergraduate students in Tanzania, Masrek et al. studied students in Malaysia and Shaltoni et al. studied students in Jordan. Lwoga states that "system quality, service quality and information quality positively influence intention to use, actual system usage and user satisfaction while intention to use, actual use and user satisfaction influence net benefit".

We have used this three dimensional definition of portal quality and accessibility as a simple structuring framework for summarising the findings of our rapid literature review and defining our approach for the evaluations in Stage 2, with "system quality" being particularly important.

Figure 4: Simple Conceptual Framework for assessing portal quality and accessibility

Service Quality	The overall support delivered by the service provider, including support before and after the product's use. This refers to the overall service that is offered, as perceived by the user. This may mean that issues outside the control of the service provider impact detrimentally on the perceived service quality.
System Quality	The desirable characteristics of the portal. They may be defined through usability and user experience goals such as effectiveness, learnability and memorability (usability goals) and motivating, rewarding and helpful (user experience goals) (Preece et al, 2015). In addition, widely-accepted design principles for a quality product include consistency, visibility, feedback, suitable constraints and affordance.

	A different conception of system quality is its usefulness which combines utility (it fulfils what the user needs) with user experience (it is a pleasure to use).
Information Quality	The desirable characteristics of the information held by the system, such as accuracy, meaningfulness, timeliness and trustworthiness.

1. Service quality

Characteristics of the environment outside the portals' control may impact on the perceived service quality from the user's perspective. For example, cost of internet access and infrastructure is key to users' perceptions (Crow et al., 2012). Infrastructure 'quality' varies across the South (The Internet Society, 2014), printing is expensive and so not necessarily a realistic option. While these characteristics may be outside the portals' control, the portal developers can moderate its impact through design, e.g. enhancing the system quality for its intended context, providing smaller PDFs (designing for low bandwidth like Aptivate), or presenting the research in a different format/medium. Accessibility as defined earlier is one aspect of service quality.

2. System quality

The importance of a good user experience (UX) in all interactive products including websites and web portals, has been recognised for many years and underpins the UK government's online development policy[14]. A good user experience results in improved user satisfaction and hence increased motivation to return and re-use the portal[15]. In the specific case of DFID online research portals, this means that users are more likely to access the portal and make use of the research they find.

Better user experiences (and online products) are generated from a good understanding of the user (usability.gov) based on detailed user research (Preece et al., 2015). This includes cultural background, information and digital literacy, as well as how the user works, what are their goals and demographic information. For example, Aptivate company's website describes a range of products and projects they have undertaken for the South. The 'process' undertaken in Aptivate's example projects show that many product developments include a period of user research: looking at what users do, interviewing them, and studying their context.

Local culture affects the design and the use of interactive and online products. Based on years of experience of designing for southern users, including in India, Chavan et al. (2009) states that local

[14] e.g. see usability.gov and https://www.gov.uk/service-manual/digital-by-default).

[15] In the revision of DFID's theory of change for portals and repositories (see section 12) we distinguish 'motivation to seek research evidence' as one of the four key functions of the DFID portals.

knowledge is crucial for designing successful products. She developed the 'Bollywood' approach (Chavan, 2004) to involve Southern users in evaluation activities: this involves ensuring that any tasks the users are asked to complete during an evaluation session are part of a wider scenario that they can relate to their normal lives[16]. In some circumstances, these scenarios may be woven into entire story lines around using the websites. Moalosi et al. (2007)'s study in Botswana aimed to understand whether and how local socio-cultural factors can be designed into a product. They borrowed design features from traditional symbols, forms, motifs, paradigms and ecosystems to produce novel design concepts on traditional artefacts, e.g. a thumb piano. They found that the designs were original and innovative within the local socio-cultural context and that including these factors added value in a way that made the products more acceptable to local people.

Website localisation requires more than just translation and re-purposing of content (Payne, 2004; Singh et al., 2005; Shneor, 2012). Pictures, layouts, colours and other interaction design aspects can affect the success of localisation. The cultural dimensions of Geert Hofstede (2005) are frequently used to express the elements of culture that are applicable to website design, and may provide a useful vocabulary[17]. It has also been claimed that some systematic variation between websites based on these dimensions can be tracked, but the dimensions are controversial and the effects have not been replicable. Looking at large commercial ventures that span geographical locations and cultures, some companies' websites are tailored for local audiences more than others, e.g. Coca-Cola and Pepsi have different sites for some countries (e.g. cocacolaindia.com for US vs coca-cola.com.gh for Ghana; pepsi.ua for Ukraine looks quite different from pepsi.com for the UK), while Amazon websites look surprisingly similar across a number of countries (e.g. amazon.jp, amazon.com, amazon.in).

In addition, design by locals is more successful. Summarising many years of work in Southern Africa, Bidwell and Winschiers-Theophilus (2010) conclude that design by Africans in Africa for African situations is preferred. In terms of service, system and information quality, this may appear to focus on system quality alone but in fact they are calling for a local perspective to be taken on the design of the whole user experience, i.e. all three aspects. Faiola and Matei (2005) found that website users performed better on tasks when the website was designed by people from the same culture.

Abdelnour-Nocera et al. (2007) point out that perceptions of an interactive system's usefulness are culture-based, e.g. a system to support an organisation's billing that allows discounts to be applied to bulk ordering may be regarded as a positive feature in one country but an error in another. This refers to both national

[16] For example, when evaluating a cinema ticket booking website, rather than ask users simply to "book 4 tickets to see the latest Bond movie", generate a scenario around the reasons for going to the cinema, e.g. a birthday, who is going with you, why the latest Bond movie is a favourite, and so on

[17] For example: **Power Distance** is the extent to which the less powerful members of organisations and institutions (like the family) accept and expect that power is distributed unequally. **Uncertainty Avoidance** deals with a society's tolerance for uncertainty and ambiguity. It indicates to what extent a culture programs its members to feel either uncomfortable or comfortable in unstructured situations. **Individualism** on the one side versus its opposite, **Collectivism**, is the degree to which individuals are integrated into groups. Masculinity versus its opposite, **femininity**, refers to the distribution of emotional roles between the genders. **Long-Term Orientation**. Long- term oriented societies foster pragmatic virtues oriented towards future rewards, in particular saving, persistence, and adapting to changing circumstances. Short-term oriented societies foster virtues related to the past and present such as national pride, respect for tradition, preservation of "face", and fulfilling social obligations. **Indulgence** stands for a society that allows relatively free gratification of basic and natural human drives related to enjoying life and having fun. **Restrain**t stands for a society that suppresses gratification of needs and regulates it by means of strict social norms.

culture but also the culture of the organization and the job being done. To apply the concept of usefulness requires an understanding of how policymakers operate.

Bowen (2010) reports on an interview study of Ghanaian senior policy actors, and highlights the importance of local radio and local contacts. They also note “Most important was to understand the political culture, notably the important role of personal contacts as opposed to formal networks, and the oft-expressed need to cross-check and verify information”. The results also highlight the need for help with filtering for relevant information, the importance of the views that are backed by well-represented national organizations (of citizens, businesses, local citizens, etc.). A systematic literature review of studies of policymakers (Oliver et al., 2014) covered a range of sectors including health (primarily), criminal justice and traffic policy. The authors conclude that researchers are beginning to recognize that research evidence is only one source of information for policymakers. They found that studies of policymaking are mainly written by and for researchers, with “a lack of attention given to the policy process or policymakers’ priorities”. They also note that very few observational studies of policymaking are undertaken, without which it is difficult to draw clear conclusions.

While detailed observational studies may be difficult to conduct, indirect observation such as through diaries have been used successfully in a range of settings, e.g. mobile security (Mancini et al, 2009), cross-cultural design (Gillham, 2005) and learning (Roberts, 2011). In a diary study, participants are asked to keep a record of their activities on a regular basis, e.g. what they did, when they did it, what they found hard or easy, and what their reactions were to the situation. While a paper-based diary may be used, it is more common to collect data through mobile or online collection forms.

3. Information quality

One view of information quality for research evidence portals is assured by the underlying rigour of the research and the skill and expertise of the authors/editors. Another view relates to the applicability of the information or evidence, and its perceived relevance to the target user. For the information to be ‘ high quality’ it needs to be seen as useful and useable by the target users, i.e. it must be possible to easily extract and represent the relevant information in the context of the user’s purpose. The ease with which relevant material can be extracted and represented for use in the target task is a reflection of the information quality, from the user’s perspective. The sense making models introduced earlier provide a good framework to investigate this aspect of information quality. They also help us to understand the steps that users go through in order to ‘use’ the evidence they find. We propose to use these models to analyse the results from the user evaluations in Stage 2.

7.2 Methods for evaluating research portals for Southern users

As well as the importance of designing with, and for, Southern users using appropriate techniques, engaging Southern users in evaluation activities also requires modifying techniques commonly used in the North. For example, researchers agree that using verbal protocols (where users think out loud while conducting a task, a common approach in the North) is unlikely to produce good data in the South. Where

user evaluations with set tasks are to be undertaken, Chavan et al (2004) advocates using a “Bollywood” approach to evaluation, which involves setting the evaluation task in a meaningful context.

Constructive interaction, where two people work together on a task is one way to overcome the difficulties of solo working (Clemmensen, et al., 2008). Another approach is to use an apprenticeship model such as Contextual Inquiry (Holzblatt & Jones, 1993), which has been used successfully to design a wide range of products.

Assessing quality using measurement thresholds (such as time to download) that are acceptable in the North may not be suitable in the South. Although policy actors are part of the elite ICT users (Batchelor, 2013), the countries’ infrastructure may not be comparable, and hence key threshold values may be affected. Values used to determine website quality in countries where the service quality is good cannot be used reliably for users in the South because of the different context: low bandwidth and low internet penetration (The Internet Society, 2014), and different expectations.

Heuristics for evaluating websites and other online products are widely used. The approach was originally developed by Jakob Nielsen in the 1990s whose ten heuristics are still in use today, but a heuristic evaluation is often nowadays called an ‘expert review’ (see table below). Although many different sets of heuristics have been devised for specific types of system, none have been devised specifically for portals. In 2010 and 2011 these heuristics were used to review the iPad and a set of apps designed for the iPad, which highlighted several design and usability issues (Budiu and Nielsen, 2010, 2011).

Table 7.1: Neilsen’s 10 heuristics

Neilsen’s 10 heuristics
Visibility of system status The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.
Match between system and the real world The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system-oriented terms. Follow real-world conventions, making information appear in a natural and logical order.
User control and freedom Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Supports undo and redo.
Consistency and standards Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.
Help users recognise, diagnose, and recover from errors Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.
Error prevention Even better than a good error message is a careful design which prevents a problem from occurring in the first place.
Recognition rather than recall Make objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.
Flexibility and efficiency of use Accelerators -- unseen by the novice user – may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.
Aesthetic and minimalist design Dialogues should not contain information, which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.
Help and documentation Even though it is better if the system can be used without documentation, it may be necessary

Neilsen's 10 heuristics
to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large.

7.3 User-centred methods used to evaluate the DFID funded portals and repositories

Given the importance of knowing the specific users and their contexts to portal quality, we wanted to investigate whether and to what degree existing evaluations of the portals had been user-centred, i.e. what were the methods used and what kind of involvement did target or existing users have in them. This section summarises the degree to which evaluations of the portals have taken a user-centred approach. This summary is based on information from various sources:

- publicly available documents on R4D programme pages for each project;
- SciDev.Net and Eldis' own webpages;
- documents sent by portal contacts via email in response to a request for information about their user research for portal design.

All of the target portals have been evaluated with users in some way, and there is some good practice around user-centred approaches. Most of the evaluations have taken the form of surveys, and the respondents have usually been existing users of the portals, rather than target users who don't use them[18]. Surveys have been conducted in a range of ways: online, interviews, in-depth interviews, interviews by phone, interviews face to face, interviews conducted by UK people, interviews conducted by local interviewers. Surveys have been conducted for a range of purposes:

- to investigate how the content has been used by users (portal sustainability, or to justify to funders), asking users about the content, audience and reach, impact, satisfaction, ease of use;
- to find out about methods of working;
- to identify their other sources of information;
- to aid in redesign.

The main focus of the surveys has been content, i.e. they have focused on information quality rather than service or system quality. A lot of feedback has been received through these investigations, including some feedback about service and system quality, but the reports are long, and have not been clear about how this information was used to inform portal improvements.

The questions asked tend not to be focused on improving the portals but on posing general questions such as "Do you like this portal?"; an approach which results in comments providing limited information for improvement such as "It's useful", "Would recommend it" and so on. The MK4D survey report (2009) highlights a different but important challenge with existing surveys: "The challenge for monitoring and evaluating the MK4D programme (of which Eldis was a part) is that these surveys have taken place with little or no standardisation in the questions asked. The quality of analysis has been quite variable and, because there was no central database for survey data, there was little triangulation of data or comparison

[18] See our discussion about the significance of this distinction in the previous section on the portals' own user surveys.

between services, products, or time periods". This underlines one of our findings that there is a lack of evidence that a structured approach to user-based evaluation and portal improvement based on evaluation findings has been implemented.

a) Eldis "Design refresh" in 2012

The evaluation considered all stakeholders including contributing target users, authors, donors and funders of the portal itself. Many surveys investigate the content and how users prefer services to be delivered.

A comprehensive set of 9 personas were produced. Another report containing details of 35 'bios' was produced. The personas represent different user types plus a wider set of stakeholders. This is a powerful approach which aims to keep users in the minds of developers and content providers. There is also mention of a plan to produce templates for 3-4 key pages and for some user-testing to be undertaken, and there is a clear statement about the primary audience for Eldis as "technical and policy advisors in developing countries who are in a position to influence and shape climate compatible development plans. These people may be anywhere in the world, but are primarily located in the southern hemisphere" (Design Brief 26, 2012).

These are all good examples of a user-centred focus, but it is not clear how this information and these personas etc. have been used and whether their use has affected the portal's quality. The user testing mentioned above is not reported in any subsequent documents that have been provided, and it appears that no user evaluation was conducted using realistic tasks.

In the Policy Maker persona it is noted that he has "connectivity issues", and the Bios analysis says that "a point made by several interviewees is that downloading documents can be very costly and time-consuming, and is the main problem they experience with an online service such as Eldis". However, we cannot find where these findings were reflected on and actioned. The findings for some stakeholders are at odds, e.g. one wants 80 page PDFs while others have connectivity issues, but this conflict is not acknowledged or resolved in the documents provided.

b) SciDev .Net

Focus groups, surveys and a global review have been undertaken for SciDev.Net. The feedback from focus groups covers the new versus old website; content; search tools; the mobile site; navigation speed and comparison with competitors. Surveys have been undertaken that focus on: navigation; what users would like; problems; and speed of the site. A major 'Global Review' was undertaken in 2012 that included profiling of sectors and regions and a competitor analysis.

However, no clear identification of target users was found or users doing real tasks although there was self-reporting of searching and web analytics. There seems to be a major focus on content and making it relevant and competitive (e.g. with Nature and BBC).

c) R4D

A series of user tests of R4D were carried out by Fluent Interaction in September 2011. These tests were conducted in a lab setting and were commissioned to evaluate the ideas for integrating the R4D website into the DFID website. Their purpose was to understand the likely usability of the proposed design. Eight participants (a range of specialist users and members of the public with an interest in International Development) were asked to interact with the live R4D website and a functional wireframe prototype that demonstrated how integration might work. They were asked to complete a number of typical user tasks on both the live site and the wireframes and then to compare them.

This has the clearest record of participants interacting with any of the portals that we have found.

7.4 A preliminary assessment of system quality of DFID portals: expert review

All of the target portals have conducted some form of user-based evaluation; evaluations of all portals have identified issues with bandwidth and connectivity. However, the reports lack clarity and tend to be long, making it hard to find the key messages. In order to provide a preliminary assessment we have therefore relied on expert review (also known as heuristic evaluation).

The research team have needed to access the evaluation documents summarised above through the portals. All the portals contain important and very useful material, but while using them to locate reports, some problems were encountered:

- **Downloading**: downloading documents took a long time. There is empirical evidence to suggest that users are prepared to wait about 20 seconds for a download when using an ipad (Budiu and Nieilsen, 2010, 2011). “While an African researcher may be prepared to start a PDF download that will take a long time they should not be expected to navigate through a dozen pages each of which may take several minutes to load. It is this kind of frustrating experience that will drive users from your site.” Google and Amazon have recently found even a delay of half a second can mean a 20% drop in users (Aptivate, 2009).
- **Navigation:** clean and direct access to documents is important for a good user experience. “While the PDF files represent valuable content for the user, the many web pages the user must navigate through to gain access to the PDF usually represent little value. It's important that this path is as direct as possible.” (Aptivate, 2009). Using the portals it took 3 to 5 clicks through 3 to 5 screens to locate the document, which may be several mega-bytes in size. Overall, accessing the documents took longer than the 20 seconds mentioned above.
- **Learnability of the site:** the ease with which information can be found initially, e.g. finding documents we knew existed was hard at times.
- **Broken links**: e.g. the pdf linked from http://www.eldis.org/go/topics/resource-guides/agriculture-and-food&id=36472&type=Document#.VOyXISw2e5J is not available
- **Accessibility**: reports only viewable online from within proprietary software, e.g. http://issuu.com/scidev.net/docs/scidev.net_annual_review_2009

- **Document naming**: document names making it hard to determine the content without reading e.g. “Annual review (3) 114034”.

In order to provide a more rigorous preliminary assessment of the portals, we have undertaken an outline Heuristic evaluation of the three ‘live’ portals. The detailed evaluations are at Appendix F. This evaluation has been done without the usual detailed understanding of the target user population. A second evaluation will be undertaken after the in-country work has been concluded and a better understanding of the users has been reached. This preliminary assessment found that there are several areas for each portal where quality and accessibility could be improved according to these guidelines.

8 Evaluating the impact of evidence and research online

This section summarises the key findings from a rapid literature review of open access research and synthesised research from the last five years (and beyond, for certain key documents) about the evaluation of the impact of research and research dissemination, including the use of bibliometric and webmetrics (the full literature review is at Appendix D). We discuss the different definitions and conceptual frameworks used to debate and evaluate research impacts and the many methodological challenges. We propose definitions for key terms "use" and "uptake" in order to begin to develop a framework and a common set of metrics for assessing the DFID-funded portals and their comparators in Stage 2.

Defining Impact for research dissemination

How does use of research portals and repositories translate into impact in development? This includes considering how "use" is defined and measured, how robustly impact can be attributed to use of research portals and repositories, and how useful and meaningful this can be in informing portal planning and design.

Example definitions of research use and uptake

Debate around research dissemination and the impact of research evidence suffers from a fluidity of terminology: in particular, use and uptake are often used interchangeably. This reflects a difference in emphasis of where attention for assessing impact should lie. Adolph et al. (2010) for example, defines research uptake as 'the *process of becoming aware of and accessing* research outputs' whereas DFID (2014) prefers to define it more stringently as 'research findings *being used in international development decision-making,* such as by policy-makers or practitioners. Other definitions of research use and uptake can be inferred from various evaluations in our literature reviews: Intermedia's research (Intermedia 2010a and 2010b) among policy actors in Zambia, Ghana and Kenya looked at the processes of *gathering, assessing, sharing and disseminating*[19] while another DFID survey of its own staff's use of research (DFID, 2013) employs a variety of terms that suggest different stages *towards use*: finding and appraising research or evaluation evidence and using and interpreting data/statistics.

While the examples above focus on measuring the *processes* of research uptake, other literature exists which attempts to define and identify the (more subtle) changes in *users and institutions:* Early information science literature emphasises the personal domain and explores the distinction between data, information and knowledge (Zins, 2007): information is often more tangible, embodied in more tangible instruments and processes, so relatively easily defined and identified; knowledge, on the other hand, being about conceptual and capacity changes, is not tangible and much more difficult to measure. More recently, Meagher & Lyall (2013) embrace research funders' desire to see evidence impacts of research at the institutional and organisational level and extend their definitional framework to suggest short-term impacts that can be found through changes in institutional cultures and practices (research networks created or extended) as well as individual attitudes and capabilities increased.

[19] The research finds evidence of policy actors using the internet to track down specific information or to cross-check the information they have received from another source, and for collecting background data.

Conceptual challenges to evaluating impact

There is a strong consensus in the research dissemination literature that only rarely will research impacts be direct, instrumental and clearly identifiable, such as when research leads directly to specific policy choices, or when research is neatly captured and codified in tools and instruments such as guidelines, protocols or organisational processes. Rather, important decision-making is often diffuse, gradual and hard to identify, characterised by 'non-decisional processes' or the progressive establishment of new routines (Meagher, 2009). Capturing these subtle and diverse impacts poses considerable conceptual, methodological and practical challenges. Furthermore, uptake of research and evaluation findings has never been a linear process (Shaxon, 2010): 'The field of research communication is moving away from a reliance on the linear model to one which appreciates the contribution made by a wide variety of actors.'

Conventional academic research is usually evaluated using two approaches: academic peer review, and number of citations in peer-reviewed publications. This literature 'forms a network of scholarly articles, connected by citations, each of which [...] reflects the assessment of an individual scholar regarding which papers are interesting and relevant to their work. Thus contained within the vast network of scholarly citations is the collective wisdom of hundreds of thousands of authors (Bergstrom, 2007). With the advent of electronic academic journals over the past 15 years or so, the science of systematically tracking and estimating the impact of published research on this basis – bibliometrics – has developed, with many different metrics to measure the productivity and influence of publications (Roemar & Bornhardt, 2012).

Figure 5: Examples of leading bibliometrics with definitions

Bibliometric	What it measures
h-index	An h-index value of x means that the author has published x items, each of which has been cited at least x times
i10-index	Number of articles with at least 10 citations
Journal impact factor	the number of citations in the current year to any items published in a journal in the previous 2 years divided by the number of substantive articles (source items) published in the same 2 years, normalized to take into account variables such as field, or discipline, and citation practices
Citation density	The mean number of references cited per article
Citation half-life	The number of years, going back from the current year that cover 50% of the citations in the current year to the journal
SCIMago Journal Rank (SJR)	Number of times an article is cited. Uses Scopus data
Source Normalised Impact per Paper (SNIP)	The ratio of a journal's citation count per paper and the citation potential in its subject field. The impact of a single citation is given higher value in subject areas where citations are less likely, and vice versa. It aims to allow direct comparison of sources in different subject fields

These metrics are now in common use by academic journals, research institutes and individuals. They can provide a useful proxy guide to the quality of a research study. However, they have their own measurement challenges and need to be interpreted with care. Furthermore, for policy research programmes, these evaluation tools are too limited. They are not well suited to capture the use of non-peer

reviewed research and evidence, nor are they likely to reflect the practices of development actors and policy makers as well as those of scholars and researchers (Hovland, 2007)[20].

As we have noted in the context chapter for this report, the dissemination and use of all forms of research and evidence, peer reviewed and non-peer reviewed, via the internet and, more recently, social media is increasing rapidly (Adams & Loach, 2015). Even in 2008, according to a survey of Northern academics, two-thirds of the last reading was of an article identified online (Nicholas et al, 2008). The same is happening, though at a slower rate, in the South and amongst policy actors: a recent small survey exploring the value of social media and other web 2.0 tools in encouraging uptake of DFID-funded research material (Euforic Services, n.d.) found preliminary evidence that policy actors are increasingly using the emerging technologies to find their own information.

Combined with the emergence of a variety of software to track the use of these technologies and developments in the methodologies to infer meaning from this information useful for assessing research and portal use, there is now an important opportunity to improve some aspects of monitoring and evaluating online research dissemination. Digital tools do not offer a panacea for the measurement of policy influence - it is unlikely that tools will ever be available to report on exactly who is reading or engaging with particular pieces of content, what their jobs are, their specific role in policy and their intellectual reaction to any content they read – but they do represent a valuable contribution.

Methodological and software challenges to evaluating research dissemination and the use of research portals

It is important first to pin down the different definitions of the key terms 'use' and 'uptake', with *use* referring to the initial engagement by users with the portal, use of its web services, its editorial products as well as the research content which it aims to disseminate and *uptake,* referring, as DFID have also indicated, to being adopted and applied in the decision-making process[21]. Below we set out the key issues arising in the literature around these metrics and their measurement before moving on to apply some of them to the DFID portals under evaluation.

1. **Use**

We propose a working definition of use here as: *utilising the functions or, viewing, saving, sharing or downloading the content, found on the web.* The activities can all be tracked to some degree through a website's transactional log of use by visitors to the site. These logs, the most common of which is Google Analytics, have a wealth of data which can be combined to create a detailed picture of how the user interacts with the site.

[20] Methods to assess uptake in non-academic contexts include: impact logs, new citation analysis, outcome mapping (of changes in the behaviours, relationships, actions or activities of people, groups, and organisations), most significant change (MSC) stories, innovation histories and episode studies

[21] This distinction maps onto the process of transforming research evidence into impact as set out in the original DFID Theory of Change for research portals and repositories, as well as our proposed revision of it in Section 12.

The information community has traditionally regarded *the full text download* as the 'usage gold standard' user satisfaction indicator and a proxy for 'reading', thus providing the much sought after evidence that 'use' had occurred: the evidence the vast number of viewers are 'bouncers' makes the act of downloading a proxy for a judgement of quality on their behalf (Nicholas, et al., 2008). While simple downloading is indeed an important metric, there are significant measurement and interpretation challenges with it (see below). However, if it can be assumed that the same level of reporting error applies to all sites equally they can be used for simple comparative purposes.

More importantly, other than the R4D repository, the DFID online portals intend to offer a range services and content which are not required to be downloaded to be of value. Rather, the theory of change for the portals – stressing as it does the supplementary services offered to improve accessibility and promote demand - implies that more *extended viewership*, repeated use, and engagement are equally valid measures of use. This then implies a range of metrics, beyond simple downloading, to be utilised in monitoring and evaluating impact. Again however, they are subject to important measurement errors, the main ones of which are listed below:

Use Measurement errors

Viewing: It is difficult (but not impossible) to distinguish an actual site visitor from spiders, robots and other non-human traffic, scouring the web for information for both helpful (search engine crawlers) and hurtful reasons (address collectors for junk email), so true, specific numbers are challenging to derive without some level of inaccuracy. If the site utilises programming to serve images or other files, the numbers can be further distorted. New visitors' data may also be misleading if the "new visitors" are mobile or tablet users accessing from a constantly changing IP address location or who do not store cookies on their device. This would prevent Google from recognising them as a "returning visitor" and class them as "new visitor". While many software packages are on offer to do some of the heavy lifting, there is still usually some amount of manual filtering and analysis needed to get useful information (Thelwall, 2014). Many users, particularly in developing countries, may have IPs which show up as other countries from the ones in which they are resident. Others may have shared IP addresses, with e.g. many corporate or academic users coming from a single institutional address.

Sharing: There is an 'echo chamber' effect of social media with an overlap between followers, friends or fans of organisations and individual working in allied or similar fields, e.g. @DFID_Research's 50 biggest followers have a combined reach of 2.4 million;. @IDS_UK's 50 biggest followers have a combined reach of 3.6 million; @odi_development's 50 biggest followers have a combined reach of 4.3 million (Euforic Services, n.d.). However, it is difficult to get accurate information on retweets and tweets to identify what specifically is being shared, because of use of link shorteners to make a web address smaller. Academics seem to use Twitter to cite articles, but sometimes indirectly (i.e. not the full citation), which can cause problems for automatically harvesting these citations. There are also disciplinary differences in the extent to which Twitter is used and what it is used for (Nicholas et al, 2008). To get complete Facebook 'share' or 'like' stats is also impossible due to the privacy settings of those who share information. Altmetrics can, moreover, be also be easily manipulated. In particular, since social websites tend to have no quality control and no formal process to link users to offline identities it would be easy to systematically generate high altmetric scores for any given researcher or set of articles.

Downloading: Calculating full text views can be considerably inflated by the fact that a user may come to an article via an HTML link before downloading the PDF, thus leading to double counting. Rules for dealing with possible double counting need to be explicit. On the other hand, the 'long tail' in which the vast majority of documents receive relatively few downloads individually makes counting them a short task: McKenzie & Özler found that the typical (economics) working paper gets very few readers, especially after its first couple of months even when released through 'prestigious' channels (McKenzie & Ozler, 2014)[22]. A random sample of papers released in the NBER working paper series in January 2010 shows that the median paper in this prestigious series received 21 abstract views and 12 downloads through Repec services in the first two months, and then an average of 6-7 abstract views and 2-3 downloads per month through Repec over the next year.

Use Interpretation Challenges

There is a wide variety of viewing habits. A large number of viewings are very cursory. However, there is survey evidence to suggest that reading occurs offline (Nicholas et al, 2008). Users in the South face narrow bandwidths and other IT availability constraints which users in the North typically don't. This may affect their viewing habits (viewing time, downloading practices) and therefore how their webstats should be interpreted (i.e. differently from the average Northern user). While the full download has traditionally been the gold standard for academics, there is evidence that '*navigation towards* content is the main activity online, not downloading; navigating is a fundamental activity, not a secondary one'(Nicholas et al., 2008). Navigating quickly around the web generally and a portal in particular, can be a key part of information seeking, called 'power browsing'. Conversely it may be a symptom of the lack of digital literacy and/or unfamiliarity with the subject (Nicholas et al, 2008). This may particularly be the case in the South, as indicated earlier by the (Hepworth & Duvignea, 2010) study which found low levels of information literacy amongst students.

Nicholas et al. also found that the educational status of the user influenced whether a full text article was viewed in abstract or full text form: students were markedly more likely to opt only to view a full text article in a session than faculty staff: 64% of students saw a full text version compared to 50% of faculty staff (Nicholas et al, 2008), suggesting the latter were more able to quickly assess the value of a piece of research. It is not known to what extent these findings can be transferred to development actors: there is a strong consensus in the development research literature that policy makers (and possibly other policy actors) are a very different target group to academia: 'researchers and policy-makers operate with different values, languages, time-frames, reward systems and professional ties to such an extent that they live in separate worlds.' (Harris, 2013)

[22] A random sample of papers released in the NBER working paper series in January 2010 shows that the median paper in this prestigious series received 21 abstract views and 12 downloads through Repec services in the first two months, and then an average of 6-7 abstract views and 2-3 downloads per month through Repec over the next year

2. Uptake

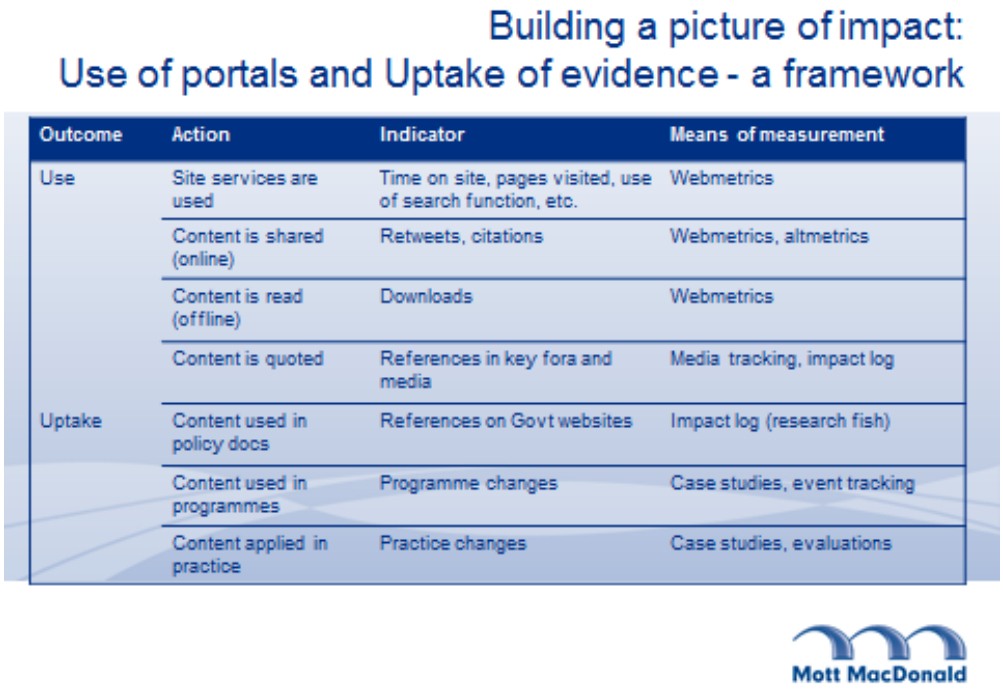
Uptake, which we will define here in line with DFID's more stringent approach as 'the *application of evidence in the policy making chain'* - as we have argued above - can never be completely identified or exclusively attributed. There are multiple reasons for this: changes in policy are usually based on an accumulating body of work, not single pieces; influences come from many sources over many years; good research can lead to 'bad' policies ideas being abandoned, yet there would be no way to demonstrate this; and with so many other conditions required to be in place before changes in practice emerge, references to influential research in policy documents does not mean they are ever implemented.

DFID's own recent literature review of the evidence of the impact of research (DFID, 2014) concluded that although various useful frameworks to categorise different types of impacts have been developed and that 'there is a large body of case study evidence describing how research findings have led to changes in policy and practice impacts... they need to be used with caution.' It quotes a systematic review of methodologies for assessing the impact of research on policy (CGIAR) which cautions that such evaluations 'stray dangerously close to the line between evaluation and promotion.'

The DFID-funded portals have all at some stage used case study approaches of different types to explore or demonstrate uptake of evidence they have made available or accessible on their sites. Indeed, GDNet and SciDev.Net logframes require these to be reported as an outcome indicator. The portal managers agree with DFID that these case studies 'can provide useful insights into the pathways by which research can lead to impact' but they are not a record of the complete impact of the portal.

The solution, albeit a partial one, lies in more systematic logging of uptake through the stages of policy process, wherever these can be found, and exploring selected examples in more detail when these are expected to be instructive. Simple software packages (e.g. Researchfish) already exist for compiling records of episodes or instances where research evidence is quoted or simply name-checked, in the press, in speeches or conferences. Again, developments in webmetrics methods can be useful here. The web impact report (WIR) (Wilkinson, et al., n.d.) is a simple record of a range of web-derived statistics about the frequency and geographic location of online mentions of an organisation's reports. Typically derived from commercial search engines, the WiR helps identify examples of uptake beyond formal citation. In addition, a host of qualitative case study methods exist, such as process tracing and most significant change methods to explore individual cases of research uptake in more detail (CDS, 2010). Taken together, with informed interpretation of selected webmetrics, and employing use and uptake definitions more systematically, a suite of indicators can be pulled together to give a more informed and systematic picture of impact.

Figure 6: Use of portals and uptake of evidence- a framework



Building a picture of impact:
Use of portals and Uptake of evidence - a framework

Outcome	Action	Indicator	Means of measurement
Use	Site services are used	Time on site, pages visited, use of search function, etc.	Webmetrics
	Content is shared (online)	Retweets, citations	Webmetrics, altmetrics
	Content is read (offline)	Downloads	Webmetrics
	Content is quoted	References in key fora and media	Media tracking, impact log
Uptake	Content used in policy docs	References on Govt websites	Impact log (research fish)
	Content used in programmes	Programme changes	Case studies, event tracking
	Content applied in practice	Practice changes	Case studies, evaluations

Mott MacDonald

9 DFID-funded portals/repositories: a preliminary analysis of their webmetrics

9.1 Background: A brief history and critique of the rise of web and altmetrics

Webmetrics: Measuring Website Visitors and Use

Webmetrics began life as simple hit counters on websites allowing webmasters to view the number of times a web page was visited or refreshed (Dems, 2010). These were typically displayed as odometer-style counters. As web robots (automated search functions) became more evident so too did the need to make a distinction between an actual visitor and a 'bot'. Web server logs developed as a tool to help differentiate between the two. They have since evolved to offer a wider range of data on user behaviour such as session times and page views. Since then their potential as a tool for web performance management has been realised and commercial companies are now offering packages and services to analysis web statistics in more depth.

Webmetrics were originally used primarily by "web masters" to manage and monitor their website: to find broken links or identify pages which weren't getting a response from visitors, for example. As more detail has become available, other parties have taken an interest in them: content editors and authors can now explore visitor engagement with the most popular page views and "hot topics"; marketing teams are able to build "user journey" and understand browsing patterns to develop strategies and campaigns to capture the attention of current and potential visitors; managers are able to align business objectives with their website performance, enabling benchmarking and target setting.

More recently, the emergence of social networks and altmetrics coupled with the increased use of mobile devices and mobile connectivity are providing more challenges, but also more scope, for ever more comprehensive offerings from web analytics. In the future it is anticipated that an inclusive package of web analytics, alt metrics, reach and syndication will become available with the ability to interrogate popular devices (i.e. mobile, tablet, watch) and software (browsers) to offer a comprehensive package of data with the ability to drill down and analyse the data at a granular level.

How useful and accurate is the data?

Every website has a raw log file that records each request to the server, such as a page or image. This log file will record this information whether it be an actual site visitor collecting this data or bots, scouring the web for information for both helpful (search engine crawlers) and hurtful reasons (address collectors for junk email). Sifting through this data to separate the real traffic from the automated makes the data useful for trends and patterns, though true specific numbers are challenging to derive without some level of inaccuracy. If the site utilises programming to serve images or other files, the numbers can be further distorted. While many software packages have been offered to do some of the heavy lifting, there is still usually some amount of manual filtering and analysis needed to get useful information.

Google Analytics, for example, is a JavaScript based tracking system. JavaScript is a common programming language used to accomplish various add-on features for many websites, from animating

buttons to making real time calculators, and it works by running within a visitor's browser. This means that when used as a statistical collection system data from only actual real site visitors, not bots, is obtained with a high level of assurance. Since the JavaScript is placed only on pages you want to track, you can avoid issues of site programming distorting the data (Terry, 2007).

One major issue with JavaScript code on pages is that if information on files or images being downloaded is required, Google Analytics will not apply the JavaScript code to them. There are some work arounds to be able to track specific file downloads as pages, but to use these methods to keep track of every image or large amounts of downloads would be impractical. Not every site visitor will have JavaScript tracking allowed in their browser, either because they are using antiquated software or they specifically have it disabled. There are also technological challenges such as tracking code syndication (sharing of content between sites) and tracking actual download figures. Coupled with this is the emergence of mobile technology and the masking of IP addresses and cookies which can often mask or share IP addresses and cookie blocking.

Altmetrics: Measuring Social Media

Altmetrics is the creation and study of new metrics based on the Social Web. They are of value to commercial businesses but they have also become of great interest to researchers and scholars. As the volume of academic literature online grew, users of research began to rely on filters to select the most relevant and significant sources. The traditional filters for importance are, however, becoming less useful: peer-review has served scholarship well, but is beginning to show its age. It is slow, encourages conventionality, and is not a failsafe indicator of quality (Priem, et al., 2010). Citation counting measures are useful, but not sufficient. Metrics like the h-index are even slower than peer-review: a work's first citation can take years and influential work may remain uncited. Furthermore, the journal impact factor, the most common measure of a journal's average citations per article, is often incorrectly used to assess the impact of individual articles and gaming is relatively easy.

Audience growth and how data is used

In growing numbers, scholars are moving their everyday work to the web. Online reference managers Zotero and Mendeley each claim to store over 40 million articles as many as a third of scholars are on Twitter, and a growing number tend scholarly blogs. Expressions of scholarship are becoming more diverse: articles are increasingly joined by the sharing of "raw science" like datasets, code, and experimental designs; "nanopublication", is emerging, where the citeable unit is an argument or passage rather than entire article and there is widespread self-publishing via blogging, microblogging, and comments or annotations on existing work. Altmetrics attempt to measure this diverse 'scholarly ecosystem' by looking beyond counting to emphasize semantic content like usernames, timestamps, and tags.

9.2 Overview of common metrics for the DFID-funded portals/repositories

Each of the portals employs webmetrics to gauge visitor traffic and engagement. Whilst having similarities, they are also quite different in the ways in which they interact with their users and share content. As we have argued in the previous section, selected common metrics can be used for limited comparisons, though this must be done with caution and with a deep understanding of the portals' *modus operandum.* Table 9.1 below summarises the most common metrics.

Table 9.1: High-level Common Webmetrics for SciDev.Net, R4D, Eldis and GDNet 2014[23]

Metric	SciDev.Net	R4D	ELDIS	GDNET
Page Views (Annual)	2,528,282	480,032	1,753,806	644,898
Number of sessions	1,954,614	255,310	759,072	272,209
Average session duration (Annual)	00:03:07	00:01:34	00:02:09	00:02:15
Facebook likes (current total)	35,037	4,434	2,411	N/A
Date of last Facebook post	21/03/15	24/10/13	21/03/15	N/A
Twitter followers (current total)	16,623	29,488*	2,664	2,163
Number of Tweets (current total)	11,866[24]	11,866*	2,608	5,917
Date of last Tweet	21/03/15	20/03/15	20/03/15	19/03/15
LinkedIn followers	1,759	N/A	N/A	39
Date of last post on LinkedIn	06/03/15	N/A	N/A	N/A
Unique Visitors	1,585,362	1,043,929 (R4D site) / 209,331 (GA)	618,746	221,026
Bounce rate[25] (average)	33%	68%	29%	63%
Downloads	N/A	1,675,961	N/A	237,919
Searches	18,361	6,253	27,976	N/A

Source: Google Analytics, Twitter, Facebook and LinkedIn - data accurate as of 21/03/15[26]

[23] Apart from GDNet which closed in July 2014. Their data is therefore for 2013

24 This is not an error. Coincidentally, these two numbers were exactly the same at the time of viewing.

25 Bounce rate is the percentage of visitors to the site who leave it from the first page, without staying on the site to look at other pages. It is generally assumed that a low bounce is good. See glossary.

[26] Twitter data for R4D is taken from the @DFID_Research account. This account has been used as a marker since R4D content and links are referenced and used by this account however not all data and tweets are associated with R4D.

Below, we summarise our review of each portals particular schedule of webmetrics in more detail. The full analysis is at Appendix E.

9.2.1 SciDev.Net

Table 9.2: DFID logframe for SciDev.Net

Outcome	Indicator 1: SciDev.Net readers use science-based information to inform decision-making and development projects. Indicator 2: Senior level policy makers and scientists as opinion authors report that there has been an improvement in research networks as well as increased engagement on policy and development as a result of publishing an opinion piece.
Output 1	Indicator 1: Production of news and features that focus on the role of science in development. Indicator 2: Content is well read by global audience. Indicator 3: High level of trustworthiness/ authoritativeness of SciDev.Net as perceived by its readers. Indicator 4: Increase global syndication of SciDev.Net content. Indicator 5: Annually introduce an innovation to digital infrastructure to improve reach of content. Indicator 6: Increase proportion and numbers of female registrants accessing our content.
Output 2	Indicator 1: Mainstream gender awareness & wellbeing approach in production and delivery. Indicator 2: Thematic columns on 5 key topics (gender, private sector, marginalised, disabled and migration) providing news analysis whose readership increases year on year. Indicator 3: Number of opinion articles by external contributors - mainly from the developing world.

Webmetrics monitoring approach

SciDev.Net monitors trends and shifts in patterns and acts on this to constantly evolve their content to be responsive to user behaviour and is engineered around user focus. The team use a mixture of tools to measure their web metrics using Google Analytics to measure page and site content in tandem with Melt Water to measure syndication and then social media for reach. This allows the team to bring a holistic picture of performance for analysis. The data suggest that the efforts made to increase exposure are working, and as a direct consequence, user engagement is increasing. The gaps show that whilst SciDev.Net are using Google Analytics for measuring webmetrics and Meltwater and Alexa.com for Syndication, there is no tool or monitoring in place for measuring and analysing reach apart from the default statistics from social media. SciDev.Net do not monitor downloads or gain any metrics regarding this on their portal.

Analysis

Currently SciDev.Net uses a “Dashboard” to report and build datasets. These are prepared using a combination of monitoring tools. Data in the Dashboard is updated regularly every three hours. The timing on “time modified” for the dashboard files changes frequently, however the data cannot be considered accurate to the minute and therefore a daily reading is taken to gauge more qualitative data. It is clear that the team made great efforts in promoting content via social media along with syndication of their content. The data shows that this effort is being rewarded with the increase in, and retention, of users. Analytics are a prominent feature used by the team to measure content and this is regularly reviewed by digital,

business development and M&E departments with all three departments working closely together. Judging from the increase in reporting and effort to monitor and more importantly "act" on data the SciDev.Net team not only see growth but retention of existing visitors.

Data gaps and issues

It is important to note that some of the data is a proxy calculation due to the challenges (which all portals share) in monitoring syndication and reach of content. It is therefore understandable, in these instances, that some form of proxy must be used. However, to form a fair comparison, one must ensure that the proxy calculations are equal and follow the same pattern / methodology between portals. To form this proxy the SciDev.Net team use Meltwater and Alexa.com. There are gaps around consistency of this data; this is due to the use of Alexa data and also how Meltwater functions. Alexa tracks statistics for everyone who has the Alexa toolbar installed on their browser, which accounts for less than 1% of internet users. A consistent challenge for all portals is to truly and accurately measure the amount of downloads which have taken place from a portal. As Google Analytics cannot measure this, Meltwater combined with Alexa.com is used for syndication and reach purposes. This, potentially, could mean that more users may be engaging with their content than is being reported.

9.2.2 R4D

Table 9.3: DFID logframe for R4D

Outcome	Indicator 1: Access to DFID funded research information by target audiences Indicator 2: Increase in size of R4D database and contains up to date records and information Indicator 3: Website, Database and Platforms (e.g. Linked Development) are maintained and accessible
Output 1	Indicator 1: Content is accessed and used (webstats) Indicator 2: Content is accessed and used by users in the North and South Indicator 3: Content is accessible via key search engines/ reference services and through feeds
Output 2	Indicator 1: Content updated and added to the R4D database Indicator 2: Content maintained, up to date and accurate Indicator 3: Metatags/metadata cleaned, updated and maintained to improve accuracy of content
Output 3	Indicator 1: Website, database and search maintained and accessible Indicator 2: Open data and applications (API) maintained and available through R4D

Webmetrics monitoring approach

As a repository, R4D is primarily a download portal with very little page-driven content. R4D does not therefore make prominent use of tools such as "Google Analytics" because this is more content / page driven analysis. Instead it uses a tool called "Smarter Stats" to record and monitor its site analytics. "Smarter stats" uses server-side logging which enables downloads to be tracked more efficiently than Google Analytics. R4D also uses HootSuite Analytics for Altmetrics (predominately focused on Twitter) and Feedburner for their newsletter subscriptions. Twitter was previously the primary altmetric used by R4D but this has since been passed back to DFID to control and R4D content is now published from the main DFID research twitter account (@DFID_Research). R4D did use Facebook but they haven't posted on this

platform since 24th October 2013. There is no LinkedIn account. R4D uses Feed Burner to generate automated emails to subscribers. The indexing drives the content into a feed such as health so they can be categorised into areas of interest which then ensures subscribers are information of content relevant to their individual interests.

All the data is sent to DFID once a month. R4D also publish it on their usage dashboard. Tableau software is used to surface data from each component and is uploaded via Microsoft Office Excel. At present CABI use the data internally, they don't act on the data other than to ensure the portal is operational within the limits and definitions of the agreed SLA.

Analysis

R4D uses Smarter Stats analytics to provide real time reporting on modules on their portal. This software analyses log files from two different web servers, the main driver behind the use of this software is primarily because it is able to analyse downloads which are PDF driven. The software looks at country data from IP addresses etc. along with page views and other basic analytics. The software also comes with other built in tools to ensure they rule out bots. Whilst Smarter Stats allows for direct metrics to be obtained in real time from the primary content source (PDF downloads) there are gaps in comparison to the data available from Google Analytics.

Data Gaps and Issues

The obvious gap is around R4D not making better use of Social Media i.e. Facebook and LinkedIn to increase reach. They are potentially missing out on another form of audience and exposure to content. Although the @DFID_Research Twitter account promotes R4D content, such messaging is not obviously linked to the information gleaned from the dashboard.

9.2.3 Eldis

Table 9.4: DFID logframe for Eldis

Outcome	Indicator 2: Number of visits to Eldis Indicator 4: Eldis valued by users.
Output 2	Indicator 2: Number of resources made available on Eldis

Webmetrics Monitoring Approach

Eldis's simple logframe reporting requirements, which monitor only the number of products placed on the site and visitors to it, do not demand sophisticated altmetrics and webmetrics monitoring. They therefore rely primarily on Google Analytics to track their portal's traffic and use. While Eldis has social media accounts, posting to both Facebook and Twitter, they have not reported on this in the last year. Eldis has begun to focus on syndication and ensuring their content is available via the Global Open Knowledge Hub

(GOKH). They have put effort into developing an API (Application Program Interface) which allows them to republish content to other sources. This is used to support the GOKH and their publication on this platform; however their content is available to other sources under their open license.

Analysis

Eldis use web analytics for managing the site and tracking broken links in the very traditional web master method of portal / website management, using trends in browsing activity to check on pages with very low usage and where time of page is very short etc. Eldis publish content to social media but they have said that they cannot justify the deep investment of time from the result of social media. As a consequence Eldis are less active today regarding Social Network usage. They have the least amount of Facebook "likes" and Twitter "followers" however they publish content on both platforms quite regularly. The number and average time of sessions along with the low bounce rate suggests that users who do visit value the website and engage with its content.

Eldis have experimented with other forms of social networking such as "Storify" but these haven't proven successful. The team have tried using Ad-words to try and reach audiences in developing countries where they couldn't ordinarily reach. They were able to expand their exposure to these sources as a result. However the Ad-words weren't successful when Eldis tried to increase subscriptions. Eldis use event tracking in Analytics to obtain a proxy to the full text documents to track the level of documents via exit. Similar to R4D, tracking document downloads is incredibly difficult and Eldis have chosen a proxy method to monitor and analyse download metrics.

Data Gaps and Issues

The clear gap is analysing and reporting. Similar to R4D, reporting on document downloads is challenging, this combined with a proxy estimation may leave gaps how accurate the data actually is. There are obvious benefits to sharing content and it is unquestionable that sharing content on multiple platforms can only increase exposure to content and surely this is a positive point. However, tracking the republication and reporting on this is a challenge.

9.2.4 GDNet

Table 9.5: DFID logframe for GDNet

Outcome	Indicator 1: Southern users make use of southern research in their own research Indicator 2: Cases of knowledge–into-use in policy processes in Southern countries
Output 1	Indicator 1: Level of use of, and satisfaction with GDNet research-oriented on-line services Indicator 2: Level of use of, and satisfaction with, themed services
Output 3	Indicator 1: GDNet user base interaction Indicator 2: Researchers' interactions with the policy domain

Webmetrics monitoring approach

GDNet closed its portal in July 2014. The evaluation team conducted Skype interviews with the GDN Director, the ex GDNet manager and the M&E consultant. However, in-depth discussions with the now disbanded GDNet web team members were not possible. We have therefore done what we can to glean information from the project documentation alone.

Analysis

GDNet tracked their portal use via Google Analytics. GDN are operating on Twitter and had a presence on LinkedIn, though these were monitored only in the latter years. As required by the DFID logframe, GDNet monitoring focussed on qualitative methods – user surveys and narrative episodes – to assess satisfaction with GDNet services and collect examples of 'cases of knowledge into use'. This was summarised into an annual M&E report which combined webmetric reporting of growth in visitors, abstract views and downloads with a detailed analysis of results from the annual web questionnaire and other information. Additional monitoring of social media use was introduced in the latter years along with plans for learning retreats to develop the team's capacity to use the information in web performance management.

Data Gaps and Issues

Monitoring focussed on uptake rather than use. Use of webmetrics to gain insight into viewing and engagement with the portal services tended to be secondary to user survey methods. Given the wider purpose of GDN, the parent organisation, to serve and develop the profile of Southern-based researchers, this is understandable.

10 A preliminary assessment of value for money of the DFID portals

Assessing Value for Money: The Challenge

The four portals/repositories covered by this evaluation represent four very different models of online research dissemination. They range from a relatively simple searchable repository of DFID funded research in its original form (R4D); through portals with links to a wider set of non-DFID (free) sources of research, supplemented by specially authored policy guides, curated links and discussion groups to promote understanding and uptake (Eldis and GDNet); through to the specialist website (SciDev.Net) which uses global science research sources to author summaries for the express purpose of being picked up and used (free of charge) in newspapers, magazines and other media sources. All of them have a worldwide target audience, except for GDNet which was specifically aimed at researchers in the South. See the summary of main descriptors of each portal in more detail in Section 4 of the report.

The DFID logframes for each of the portals reflect this variety of dissemination model, setting out different targets and means of measurement. Furthermore, the portals have widely varying annual costs.

So, the challenge to assessing the value for money of each of the portals is substantial. Assessing VFM requires comparisons and benchmarks. The ultimate 'gold standard' VFM test is a full cost-benefit analysis, comparing all costs with all potential financial and all social benefits, over the full lifetime of the portal. This requires complete information about the type and scale of the costs and the benefits which can be attributed to the portal[27]. It also requires assuming a monetary value to each of these so that the comparison can be completed.

- Since such complete information is rarely available, alternative benchmarking approaches are used. These can be internal or external:
  Internal benchmarks include comparing the current year's outputs and other key performance indicators with previous years; and comparing start of year targets with end of year results.

- ***External benchmarks*** include comparing outputs with common 'industry' performance indicators.

The DFID logframe targets for the portals generally take the **internal benchmarking** approach, looking for positive growth year on year in the various quantitative output indicators, such as unique content produced, annual visits to the site (Eldis[28]) 'access', 'use' (R4D) and 'reach'(SciDev.Net). Except for R4D, each of the portals/repositories' logframes requires it also to internally benchmark perceptions of the value of the portal, with the view of at least maintaining existing levels of user satisfaction. There are problems with both of these internal benchmark approaches however:

27 The costs on the other hand are usually, though not always, relatively easy to identify.

28 Because it is in the process of being folded into IDS's wider Global Open Knowledge Hub .Eldis's target for annual visits to the site is held to a minimum of not falling below 500,000.

- The targets set for the growth in access/reach/use in each case do not take into account the growth in use of the internet more generally, globally and in the South, generally or specifically for research dissemination purposes. It is therefore not clear whether the growth targets are sufficiently stretching.

- The portals' annual perceptions surveys are generally conducted amongst the most engaged users (usually those signed up to receive email newsletters and feeds) and receive responses from the most active of those users. Users rather than the *target audience* are therefore consulted (Romo, 2013)[29]. Information on what deters the non-users is therefore not reliably collected. Response rates to the surveys are low and reported to be falling.

External benchmarking requires commonly agreed 'industry' indicators. We have discussed the challenges to this in more detail in the section on estimating impact and set out the most common 'web traffic' and 'web behaviour' metrics in the section on webmetrics. They include indicators generally considered to represent a user's positive interaction with a site: bounce rate, page views, average session duration, searches and downloads. The portals' performance against other common metrics listed are given in Table 9.1.

Unique visits as logged by the website (usually via Google Analytics free software) is the most common external benchmark, quoted by most websites. All the portals include it in the suite of metrics they report. Again, performance varies widely: GDNet had just over 220,000 unique visits in 2013 while SciDev.Net had almost 1.6 million unique visits (2014). Subject to the measurement challenges acknowledged earlier, the unique visitor metric can contribute to a basic starting comparison between sites. It does not tell us anything, however, about the 'quality' of the visit, how the visitor used the site, what they took away from it, or how likely it is to have resulted in the further uptake of evidence.

Other common 'behaviour' metrics do begin to build a picture of how the site is used. Again, subject to measurement error correction, they show how long an average session is (the longer is assumed to be better); how often the search function is used (the more is assumed the better); what percentage of visitors left from the first page (the lower, the better).

However, again, on their own, these behaviour metrics are difficult to interpret without understanding (i) the nature of the content that is being viewed and (ii) the information seeking habits of, and barriers facing, the viewer. For this reason, as has been set out in section 9, each of the portals – other than Eldis, which has very limited reporting requirements - has devised its own suite of extended metrics (R4D and SciDev.Net call these a 'dashboard' while GDNet produced an extensive annual M&E report) for continuously tracking activity and for use in routine performance management.

In Stage 2, our evaluation will seek to deepen our understanding of how to interpret the webmetrics. For this preliminary assessment, however, we take an intermediate approach and combine two common behaviour metrics to get a slightly more complex but, at this stage still superficial, picture of the level of 'positive interaction' with the site. The combined metrics we have selected are determined primarily by

29 SciDev.Net conducted a survey of their target audience in 2013

availability of comparable data across the four portals as well as by their assumed value in revealing engagement with the website and rational information seeking behaviour. They are:

1. Annual number of sessions x annual number of searches

2. Average session duration x total annual page views

3. Twitter followers[30] x Annual unique visitors

4. Total annual page views x (1 -) the bounce rate.[31]

[30] As we acknowledge elsewhere, Twitter following can be manipulated and may not be a particularly relevant indicator for users in the South where Twitter is less popular generally. Identification of more relevant indicators is one of the aims of the research in Stage 2

[31] The bounce rate is the percentage of visitors to a website who leave again from the first page. *1- bounce rate* is therefore the percentage who view and move onto other pages.

11 Summary of key findings and conclusions

Following our review of the general literature and DFID-funded portal project documentation as well as the preliminary assessments of the portals' accessibility, their webmetrics and their financial information, we have identified gaps in the literature and important areas of particular relevance to understanding how to reach DFID's target audience for the online research portals. This has informed our planning for Stage 2 as follows:

Information Behaviour

We have concluded that there are useful established approaches to analysing information behaviours on the web and we have adapted some of these to form the analytical framework for the original research in Stage 2.

The literature indicates that good user experience online can be demonstrated to promote use of a portal and its content. Researchers and development actors are embracing new technologies to share and access online research. This may indicate that they no longer need, to the extent they once did, the assistance provided by the DFID-funded portals in finding and assessing the value of development-relevant research. Internet users often prefer to search directly for material using general search engines (rather than site searches) using very simple search terms; on the other hand, there is also evidence of the increasing popularity of 'influencers' and 'elite bloggers' to sign-post new high quality research. The research around these trends comes largely from the North and from academic communities. It is therefore not obvious that these trends are repeated in the South amongst the DFID target group. Our Stage 2 online market research and the country case studies will investigate the extent to which these and other new online information behaviours exist.

There is strong evidence that availability of the internet is growing strongly throughout the South, particularly via mobile phone technology. However, this is effectively reduced by high costs of access and frequent drops in service, thus affecting not only the extent to which the internet is effectively available but potentially also how they use it to search, identify and verify research evidence. These differences may be identifiable through the webmetrics that are now regularly collected by the portals. This is a key new evaluation question which we will be investigating through the country case studies and the webmetrics analysis in Stage 2. Answering it will give DFID greater insight into how well the portals they fund are reaching their target population in the South and provide information to lead to improving content and use.

Accessibility and Use

Our review of the web usability literature confirms that user satisfaction with portals in general is determined by quality of service, quality of system and quality of information as well as usability of the interface. Better user experiences (and online products) are generated from a good understanding of the user, including their cultural background, information and digital literacy, how the user works and what their goals are. Local culture affects the design and the use of interactive and online products. In addition, design by locals appears to be more successful. Existing heuristics (for evaluation and/or design) have not been tailored for portals specifically, and so an evaluation using 'standard' guidelines was used to conduct a preliminary assessment of the portals. We found that the DFID-funded portals do not currently meet some heuristics for good design. Previous evaluations of the DFID-funded portals have also identified

issues with bandwidth and connectivity for users in the South. Combined with a lack of evidence that a structured approach to user-based evaluation and portal improvement has been implemented to date, this suggests there is scope for improvements as a result of this evaluation.

Measurement thresholds used to determine website quality in countries where the infrastructure quality is good cannot be used reliably for users in the South because of different contexts. Specific thresholds need to be developed. Most studies of research use in policymaking rely on self-reports through surveys and interviews, with very few observational studies that investigate policymakers in situ. Therefore, in order to adequately evaluate user interaction, specific techniques that engage Southern users in evaluation and design activities will be used in the in-country case study work, such as basing the evaluation on real tasks and taking account of contextual matters throughout. We will use the simple framework of service quality, system quality and information quality set out earlier as the basis for assessing quality and ease of use. We will also use the sensemaking models as a framework for investigating the 'use' element of research evidence processing.

Existing heuristics (for evaluation and/or design) have not been tailored for portals specifically, and so an evaluation using 'standard' guidelines might be appropriate to assess quality and ease of use. The portals do not currently meet some heuristics for good portal design, and so the evaluation of system quality could usefully focus on this aspect as well as others.

As a result, we will be able to generate original insights into users' online information behaviours, thus informing the improved design and access of the portals, raising value for money and increasing their likely impacts on decision-making in policy and practice.

Estimating the Impact of Online Research Dissemination and Webmetrics analysis

The literature on estimating impacts to date suffers from a lack of fixed terminology. This has led in turn to a lack of agreement of what constitutes real and measurable impacts of research. There is recognition that sharing, citing, reading, re-purposing research evidence (i.e. 'use') is a valued intermediate outcome. However the uptake of this research to change policies and practices which impinge on the lives of the poor as a result of these processes is the ultimate outcome. Demonstrating the latter ('uptake') remains as elusive as ever. However, the advent of webmetric software, combined with a greater understanding of how these webmetrics may be used to infer the behaviours of key target groups with online portals, provides an exciting new opportunity to monitor and evaluate more consistently the use of DFID-funded online research portals. In Stage 2, therefore, we will conduct a detailed, geographical analysis of the portals' webmetric data to explore the hypothesis that users in the South do indeed behave differently on portals .We will triangulate this with findings from the online market research and the country case studies to identify behaviour patterns on the web to be used as the improved monitoring metrics as part of a suitable suite of monitoring statistics.

Assessing Value for Money

The review of the DFID-funded portals' financial information conducted during the inception phase as part of the preliminary VFM assessment confirmed that the different portals do indeed operate quite different

models: SciDev.Net focussing on creating original editorial content, Eldis repackaging existing content (to promote accessibility) and R4D focussing on digital availability. GDNet was a more complex model which aimed at combining capacity building and support of its more specialist audience of Southern researchers with its portal services.

12 The revised theory of change

As requested in the terms of reference, we have revisited the DFID theory of change for online portals and repositories in the light of our findings from the literature and documentation review. We propose substantial revisions to the original. See the revised theory of change diagram in Figure 7, accompanied by a summary table which maps the evidence from the literature onto the new ToC. The aim is to make more explicit what we understand to be the common basic purposes of all DFID-funded online research portals and repositories. We have therefore re-organised the ToC to follow broadly the framework of the current Research and Evaluation Department research uptake theory of change, which uses a primary split of portal's functions into:

(i) **improving the supply of evidence** – by making the research content of the portals more easily ***available*** in a technical or financial sense by directing users only to free and easily downloaded resources; and by making content more ***accessible*** **-** understandable, useable, relevant - to the user through a range of portal services and technical design features; and

(ii) **improving the demand for evidence** – by facilitating the users' capacity to ***find and assess*** the research that is available with supporting uniquely authored content (policy briefs, précised abstracts, hosting online communities) and curated links and by strengthening the users' ***motivation and drivers to seek evidence***. This last element of improving the demand for evidence is more tenuous, since motivation lies primarily in the wider policy-making context. However, it can be argued that by making content more accessible, alerting registered users to new material and generally making the site attractive and user-friendly, the portal aims to improve the probability (of regular users) of finding relevant content, and thus encourage them to initiate enquiries on the site more often.

Each of the DFID-funded portals we are evaluating emphasises some functions more than others; for example, R4D focuses primarily on making content more available, with only a few additional functions to make it more accessible; SciDev.Net, with its authoring of articles to be used wholesale in news media, emphasises accessibility, while Eldis's services and supplementary pieces stress the building of users' capacity to find and assess the research content.

By adopting this structure for the theory of change and articulating the purpose of the different services that portals/repositories commonly provide, it focuses us on testing each of them separately in Stage 2: (a) how important they are for the target audience and (b) whether the DFID portals actually demonstrate them to the extent which they believe they do.

In addition to these functions (summarised in the main blue boxes) which we believe capture the *current broad consensus* of what the DFID-funded portals aim to provide, our literature and project documentation review has suggested additional portal characteristics (in the yellow call out boxes of the ToC diagram) which are necessary to reflect new evidence and emerging trends in how target groups use the internet, their information behaviour and their preferences for portal design. We will be testing these both in the country case study evaluations and the market research in Stage 2.

The theory of change also organises the intermediate outcomes into two distinct levels: 'use' and 'uptake':

- **Use** - refers to the next step by the user after accessing the research evidence via the portal/ repository. It may involve simply sharing or saving. It is therefore not an ultimate measure of impact on policy, programmes or practice but it is the proximal link in the 'results chain' and set of activities that demonstrate the portal has had the desired effect of driving content to the user. It is the primary purpose of the portals/repositories and can be monitored with new webmetrics methods. It can also be clearly attributed to the portal in question.

- **Uptake** – refers to the application of the research evidence further along decision-making process. This level of intermediate impact is differentiated from use because it is much more dependent on external factors determining the adoption of evidence. It is therefore less easily identified and attributed.

This theory of change is still a work in progress. Its revision has assisted the planning, articulation and summary of some key areas of research to be pursued in Stage 2. It is not yet complete however. We expect there to be more functions and characteristics which will identified through our evaluation. We also expect more feedback loops to be identified, thus rendering the current linear ToC a more realistic picture of the research dissemination process. We will finalise the ToC by including our findings at the end of Stage 2.

Figure 7 : Revised Theory of Change for Online Research Portals and Repositories

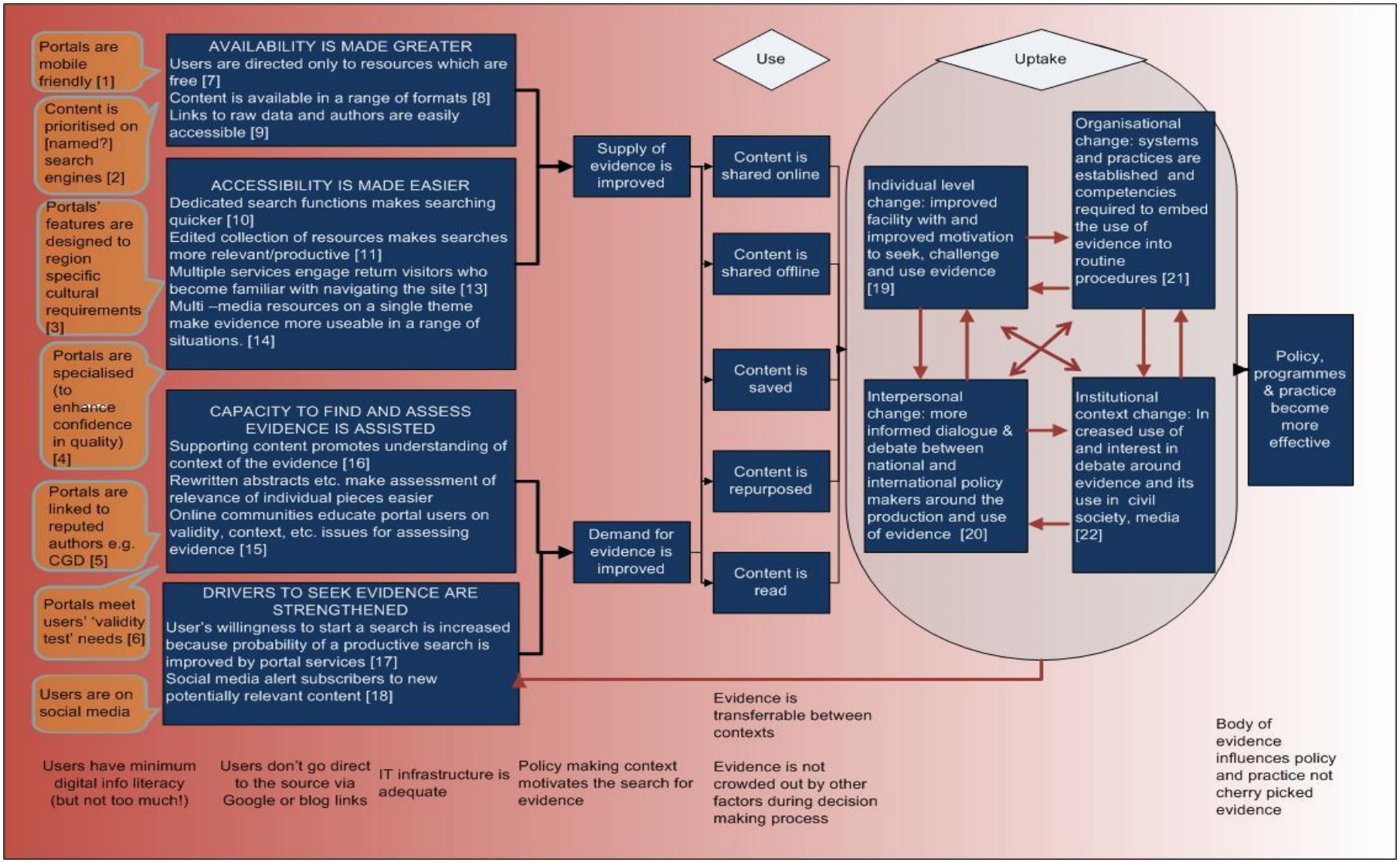


Table 12.1 Mapping Evidence from the Literature Reviews onto the Theory of Change32

	Theory of Change hypothesis	Source	Summary of conclusions from the literature
1	*Portals should be mobile friendly*	Sylla et al. (2012) Starkey (2013) Global Internet Report (2014) Debeljak, K. (2010) Euforic Services (undated) J.Adams & T. Loach (2015) Batchelor (2013) Intermedia (2010a)	Rapidly increasing use of smart phones to access internet services and social media; rapid increase in sharing citations and alerts about research via mobiles in Europe and USA; rapid catching up in mobile use in lower income countries, though little evidence of this yet extending to social media use by them to access or promote research. *Strength of evidence: Medium*
2	*Content should be prioritised on search engines*	Pew Research (2014) Bayliss, et al. (2012) De Satge (2011) Intermedia (2010a) Prakash (2013).	Users of online research, particularly non-academics, often prefer to search portals using general search engines (eg Google, Yahoo) rather than dedicated site search functions. *Strength of evidence: Strong*
3	*Portals should meet region specific cultural requirements*	Chavan et al (2009) Chavan, (2004) Bidwell and Winschiers-Theophilus (2010) Moalosi et al (2007) Faiola and Matei (2005)	Perceptions of a system's usefulness are culture-based; websites that are tailored for local audiences are demonstrably more effective in reaching that audience. *Strength of evidence: Strong*
4	*Portals should be specialised*	Intermedia (2010b) Bayliss et al. (2012)	Development policy makers often start a web search with a known 'expert' website (eg World Bank, the Lancet). *Strength of evidence: Weak*
5	*Portals should be linked to reputed authors*	McKenzie & Özler (2014) AidDATA (2015)	References, mentions, citations by known sources, 'influentials' and 'elite bloggers' have demonstrable impact on attention given to the referenced item. These results are from Northern users only. *Strength of evidence: Medium*
6	*Portal users validity tests must be met*	Masrek et al (2010) Debeljak, K. (2010) Wang (1998)	The decision whether to use research evidence, once found, follows a process of 'validation' – checking, confirming, etc. *Strength of evidence: Medium*

[32] Numbers in the left hand column refer to the hypotheses in the theory of change diagram

7	*Users prefer open access (free) resources*	Starkey (2013) Bayliss et al. (2012)	The fee required to download many academic research articles, and uncertainty as to its value up to that point, is a deterrent to its use. Being free and therefore accessible is more important to policy makers than academic rigour. *Strength of evidence: Strong*
8	*Users want content in a range of formats*	Starkey (2013) Uneke et al. (2011)	Policy makers have varying levels of time, skills or ICT for accessing and repurposing information. *Strength of evidence: Medium*
9	*Users want links to raw data & authors*	Uneke et al. (2011) Bayliss et al. (2012)	Links to authors and raw data promote interaction between researchers and allows validation. Many policy makers do not have time or skills to interrogate or repurpose raw data. *Strength of evidence: Weak*
10	*Dedicated search functions make searching quicker and easier*	Pew Research (2014) Bayliss et al. (2012) De Satge (2011) Starkey (2013)	A substantial minority of users report using site-based search functions. These may be more expert/academic users. More evidence of use of general search engines. *Strength of evidence: Weak*
11	*Edited collections make searching more relevant/productive*		No robust evidence found for academic research; analogies drawn from publishing and retailing sectors. *Strength of evidence: Weak*
12	*Rewritten abstracts and summaries make assessment easier*	Kapadia-Kundu et al (2012) Folorunso (2014) Nicholas et al (2008)	Abstracts are important for deciding when to download a full article. Faculty staff are better at selecting via an abstract than students. Simplicity of language important for access. Strength of evidence: Weak
13	*Multiple services on one portal encourage use and return visitors*	Portals user surveys	Some liking for multiple services expressed by existing portal users. *Strength of evidence: Weak*
14	*Multi-media make evidence more useable*		No robust evidence found for academic research; analogies drawn from marketing and social media. *Strength of evidence: Weak*
15	*Online communities help users assess evidence*	Portals user surveys	Some liking for online communities and discussion groups expressed by existing portal users. *Strength of evidence: Weak*
16	*Supporting content promotes understanding*	Kapadia-Kundu et al (2012) Intermedia (2010a)	Policy makers' access to research evidence is facilitated by contextualisation and editing of long articles.

			Strength of evidence: Weak
17	*Willingness to start a search is improved by portal services*		No robust evidence; analogies drawn from marketing and social media. *Strength of evidence: Weak*
18	*Social media are effective alerts to new research*	J.Adams & T. Loach (2015) Euforic Services (n.d.)	References, mentions, citations by known sources or 'elite bloggers' have demonstrable impact on attention given to the referenced item. But results are from Northern users only. *Strength of evidence: Medium*
19	*Content is used: shared online and offline, saved, repurposed and read*	Wilson (1997) Choo et al. (2000) Ellis (1989) Pujar and Fisher (2011)	Information-seeking behaviour amongst social scientists can be categorised into 6 common practices which all information retrieval systems, including web browsers, should support to maximise their usefulness. *Strength of evidence: Strong*
20	*Portal use can contribute to individual level behaviour change (around research uptake)*	Knowles et al. (2005) Knowles (1975) Tough 1967 (1971) Bandura (1988) Eden & Avirma (1993) Dunn (2002) Fishbein M. & Yzer M. (2003)	Theories of adult learning, self-learning and self-efficacy point to the potential of daily internet use and access to research evidence there to promote change in personal practices and personal behaviours in the (policy) workplace, independently of organisational procedures. *Strength of evidence: Medium*
21	*Portal use can contribute to Interpersonal behaviour change (in relation to research uptake)*	Smith (1999) Murphy (1999) Fishbein M. & Yzer M. (2003)	Individual behaviour changes can prompt change in others through 'social learning': people learn from observing other people' or through a change of 'understanding' which goes beyond individuals, resulting in collective change at a network or societal level. *Strength of evidence: Medium*
22	*Portal use can contribute to organisational behaviour change (in relation to research uptake)*		No evidence.
23	*Portal use can contribute to institutional context change (in relation to research uptake)*		No evidence.

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Appendix A. Glossary & definitions

Table A.1: Glossary & Definitions

TERM	DEFINITION	SOURCE
Access	The opportunity to use the resources that are available. It depends on personal search and discovery skills, presence of alternative research sources, e.g. research assistants and librarians, as well as the design of the interface with the online resources.	K. Wella & J Harle, ARCADIA Availability, access and use: re-understanding the e-journal problem?
Availability	The existence of the technology, connectivity and online resources. This depends on bandwidth, the quality of the IT, financial resources for online subscriptions, etc.	"K. Wella & J Harle, ARCADIA Availability, access and use: re-understanding the e-journal problem?
Awareness	The knowledge of the resources that are available.	"K. Wella & J Harle, ARCADIA Availability, access and use: re-understanding the e-journal problem?
Information behaviour	A range of activities or processes that include accidentally encountering, needing, finding, foraging, choosing, organising, sharing, using and avoiding information. Information behaviour encompasses purposive behaviours such as information seeking and passive or unintentional behaviours (including passive searching and passive listening).	Looking for Information: A Survey of Research on Information Seeking, Needs and Behaviour, Donald O. Case, 2012. New Directions in Information Behaviour, ed. Amanda Spink and J Heinstrom, 2011
Information literacy	Knowing when you need information, and are then able to identify, locate, evaluate, organise and effectively use the information to address and help resolve personal, job related, or broader social issues and problems.	UNESCO, US National Commission on Libraries and Information Science et al Goals, objectives and participant responsibilities. Meeting of experts on information literacy 2002.
Information need	A recognition that your knowledge is inadequate to satisfy a goal that you have. Information needs can include: the need for new information to form an opinion, to discover what is happening, or to build knowledge of a subject; or the need for information to confirm information or beliefs already held.	Looking for Information: A Survey of Research on Information Seeking, Needs and Behaviour, Donald O. Case, 2012. Wilson T, Walsh C. Information behaviour: an inter-disciplinary perspective. British Library Research and Innovation Report 10. London: British Library Research and Innovation Centre, 1996;
Information seeking	The conscious effort to acquire information in response to having identified a need or gap in one's knowledge e.g. through active searching or ongoing searching.	Looking for Information: A Survey of Research on Information Seeking, Needs and Behaviour, Donald O. Case, 2012.
Online research portals and repositories	Websites that make international development research findings available either as a searchable archive ('repository') or as a combination of links, services and original articles ('portal').	DFID ToRs for Evaluation of online research portals and repositories (Final version 5.1.15)
Policy actors	The people who influence the shaping and implementing of policy. They are not responsible for taking substantive decisions, but contribute indirectly by generating and promulgating research and evidence.	L. Shaxson: Developing a strategy for knowledge translation and brokering in public policymaking, 2010
Policy makers	The people who take substantive decisions about how a policy is shaped and implemented. Depending on the type	L. Shaxson: Developing a strategy for knowledge translation and

TERM	DEFINITION	SOURCE
	of policy being developed, policy makers are not only senior officials in central line Ministries; they include the network of people and organizations involved in crafting and delivering the policy throughout its lifetime. Policy makers are thus a sub-set of policy actors.	brokering in public policymaking, 2010
(Web) Portal	"an all-in-one Web site used to find and to gain access to other sites, but also one that provides the services of a guide that can help protect the user from the chaos of the Internet and direct them towards an eventual goal"	Web Portals: The New Gateways to Internet Information and Services, ed. Arthur Tatnall,
Research	Research, evaluation and data	DFID ToRs for Evaluation of online research portals and repositories (Final version 5.1.15)
South (and Southern)	Referring to the set of countries categorised as low and middle income by the World Bank.	GDNet Year 3 M&E Report, Gregorowski et al, 2014
Target Population	The intended/potential users. DFID's target population in this instance is all policy actors, especially in the South.	
Uptake	Findings being applied in international development decision-making, such as by policy-makers or practitioners.	DFID ToRs for Evaluation of online research portals and repositories (Final version 5.1.15)
Use	Reading, downloading, sharing of portal services or material found on the web.	DFID ToRs for Evaluation of online research portals and repositories (Final version 5.1.15)
User Population	Actual/current users of online research resources and evidence.	

Appendix B. Rapid literature review – how DFID target populations interact with research online

Reference & Date	Description of Study (or Abstract)	Findings	Lessons/Implications
Batchelor (2012 and 2013)	This is a draft report (2012) to share some interim findings from the study: Information Ecosystems of Policy Actors – reviewing the landscape. The draft was updated in 2013 (unpublished) to include additional data from India and Kenya. Face-to-face structured interviews with 647 policy actors in 6 countries – Bangladesh, Ethiopia, Ghana, Kenya, Nepal and India.	Although many countries have challenges over their use of modern ICT, policy actors as a part of the elite of the country have an equivalent access to the average American or UK household. About 50 per cent of policy actors are already using smartphones Over 82 per cent of respondents undertook all three conventional internet-related activities; engage with emails (97%), obtain official information (82%) and read online news (88%). International research is still trusted more highly than local research. But in India and Ethiopia local research is thought to be as relevant as international research. Interviewees in some of the lower ranking IDI countries complained about connectivity (power cuts and poor quality lines) Informal networks and personal contacts are valued and considered effective. Some policy actors report taking responsibility for their own searches for information online.	Could be some variations between countries in terms of content preference, device preferences, etc. Smart phones will be important to investigate further – are policy actors using them to access the internet (for research evidence)? Some of the conventional wisdom is challenged about policymakers being briefed rather than looking for information online themselves.
Bayliss, et al. (2012)	This study explored factors affecting information selection by international stakeholders working with invasive species.	International online questionnaire received 137 individual responses – exact response rate unknown due to how the survey was communicated to potential respondents. 72.5% of all respondents often use Internet searches to find information. This is greater than the percentage of those who often use specific websites, databases, journals, etc. However nobody said they Never use specific websites, whereas several respondents said they Never use general internet searches. For practitioners and policymakers, it is more important for information to be free, easy to access and available online than being peer reviewed (this is not true for researchers). Different groups prefer different types of information e.g. practitioners value field observations more than policymakers do, while policymakers tend to prefer systematic reviews and reports. The authors cite research about evidence use by policy analysts varying by policy sector. Ouimet et al, 2010 (this looks at Canada) but also state that the study's results are comparable to those found in the field of conservation and environmental management, and life sciences.	This study may be of particular relevance to examining SciDev.Net To what extent have the portals/repositories under investigation based their portal design and processes on primary or secondary research among target audiences (rather than users)? When surveying target audiences, should we ask what information they are seeking to inform their work and then where they go to obtain it? Or focus only on research information – we will need to be clear what we mean by research information (what is excluded from that definition?).

Debeljak, K. (2010)	InterMedia conducted in-depth interviews with 17 senior policy actors and policy implementers in Zambia to better understand how they gather, assess, share and disseminate policy-relevant information. In particular, this study focused on how the global development community can best support the policy process from an informational point of view. The interviewees, referred to in this report as 'policy actors,' came from a wide variety of practice areas.	Although traditional media is the key information source for Zambian policy actors, the internet has become an essential source for collecting background data for policy work. Ho wever, the study found that policy actors have reservations about how trustworthy and accurate information found online is, and often check it with sources they consider more reliable (colleagues, official government sources, etc.). Mobile is used more as a tool for collaboration than for collecting information. Many do not have internet-enabled mobile phones, and the same concerns about trust and reliability of information obtained through the internet apply to that collected via mobile.	Should portals be targeting those organisations and people considered to be trusted sources (i.e. those who Zambian policy actors would go to, to cross-check). What is the role of opinion-formers and opinion-leaders in evidence-informed policy-making in different countries? What makes a website perceived to be trustworthy and reliable? How well do the portals measure up? The Appendix has a very useful in-depth interview guide in terms of questions we might ask. E.g. how you are able to determine which sources are credible and provide Important information? Do you hav e certain criteria or "tests " to verify that informatio n you get is valid?
DFID (2013)	Reports on findings from a survey of DFID staff (based in the UK and overseas) issued in July 2013 that was designed to explore the attitudes to, and use of evidence, in DFID.	The biggest reported barriers to using evidence are being able to find it easily and having enough time to consider it (44 % disagreed or strongly disagreed with the statement that "evidence is easy to find". 43 % disagreed or strongly disagreed with the statement that "they have enough time to consider evidence".) The survey finds strong demand among DFID staff to increase accessibility of evidence. Overall two thirds of staff have confidence in their skills to find and use evidence, but confidence varies significantly between grades and cadres with generalists and Senior Civil Servants having significantly less confidence. About 87% of respondents had heard of R4D but less than half of these people, found it useful or very useful (figures obtained from Graph 4). Multiple choice questions designed to test knowledge of research terms and statistics showed that there are some significant gaps (percentage of respondents who answered correctly ranged from 15% to 93% for each question).	We might assume that DFID staff would be in a more favourable position than local policy actors in the South in terms of information literacy, awareness of DFID-funded portals and repositories and enabling environment to make use of them. However even among this group there are barriers to use of evidence – time, finding information easily, and awareness of R4D. The (sometimes) low scores for research and statistics knowledge questions suggests that research portals need to guard against assuming donor audiences understand research language.

		26% of survey respondents reported that they didn't know what impact using more evidence had had on development results and a further 23% thought it had no impact at all.	
De Satge (2011)	Pre-feasibility study for a poverty information service, commissioned by The Programme for Support to Pro-Poor Policy Development (PSPPD) - a partnership between the Presidency, Republic of South Africa, and the European Union that aims to improve evidence-based policy making in South Africa. Primary source of data is a short survey of government and non government actors working in the poverty arena in South Africa – 31 respondents.	The majority of respondents reported finding poverty research by general internet searches, but 10 respondents (36%) also reported searching online repositories and portals. Eldis and R4D (with urls) were listed among the 20+ options in response to the question: *Which of the following portals, websites or repositories do you visit?* 10 (36%) selected Eldis and 5 (18%) selected R4D. The study included consideration of "supporting an existing international service as ELDIS to expand its offering on South Africa" as a solution to delivering a portal.	The sample is too small and not disaggregated enough to allow for us to draw strong conclusions but indicates recognition of R4D and especially Eldis as relevant portals for South African development actors. Evidence supports the assumption that people tend to use search engines as their primary search tool (and expect content from portals to appear here).
Folorunso, 2014	A study conducted at the Nigerian Institute of Social and Economic Research (NISER). Fifty eight active social sciences scholars were interviewed via a questionnaire about their information sources for research and consultancy purposes, their preference for electronic or printed formats, their use of electronic or Internet resources, and how they meet or satisfy their information needs, among others. The author uses categories of information seeking behaviour to analyse results.	The research institute provides consultancy services on social and economic development to the Federal and State Governments. The large majority (91.4%) use electronic information sources regularly for their research and consultancy work with more than 90 percent visiting the web for information-gathering either daily or several times times a day, compared to just over half who use e-journals with the same regularity. Initial information searches tend to start with the internet, and the majority always use the internet to keep informed. There's evidence that the researchers often decide if a document is relevant and then store it for later reference rather than reading it at that point.	Worth considering which research institutes and think tanks in different countries are trusted sources for policymakers? Portals should be targeting them. Abstracts are very important for researchers to filter out which documents to download and keep for reading later.
Globescan (2014, 2013a, 2013b)	Surveys of policy stakeholders conducted through online, telephone, and some face-to-face interviews in 10 African countries, 7 Latin American	Information that respondents felt was important to have but difficult to obtain was: **South Asia**: the environment (and natural resources for media, multilaterals and academic audiences). **Latin America**: Poverty alleviation and education considered very important but not	Useful for understanding the context of focus countries as all have been included. Across all three regions, information on the environment is needed

	countries; and in 5 South Asian countries. The survey explored the perceptions of individuals in senior positions who often are very difficult to reach."	easy to find; the environment and natural resources also difficult to find but of less importance. **Africa**: The environment is the one area where respondents report information is important to have but not easy to access. When asked what format they find most useful for receiving information for national policy development, in **South Asia**, three-quarters of respondents point to websites, well ahead of any other channel suggested with blogs considered the least useful. In **Latin America** it is similar although email is at least as useful as websites (79%). In **Africa**, print is valued; although websites are seen as most useful across all countries, print is a close second and in Tanzania and Ethiopia is considered more useful than websites.	but hard to find. To what extent are the portals doing annual literature reviews to see what they can learn from other studies? These reports should be of great value to them in terms of content decisions. The survey is very specific about the different groups within policy stakeholders e.g. "Media: Editors or journalists who report on public policy, finance, economics, international affairs, and/or development, who are knowledgeable about national policy issue" Trade Unions included in the Latin America study as a key group.
Intermedia (2010a)	Report presents findings from qualitative analysis of interviews in 2009 with policy actors in Ghana on how they gather, assess, share and disseminate critical policy information.	All interviewees have access to the internet and all but one believe it to be "an efficient means of tracking down specific information and cross-checking sources, mainly through Google or Yahoo!." "Policy actors overwhelmingly visit GhanaWeb, a private website developed by an expatriate Ghanaian as a central portal for information on Ghana". http://www.ghanaweb.com/GhanaHomePage/aboutus.php Policy actors in Ghana do not restrict their internet searches to information from Ghana looking for "examples of policies and best practices from other governments as well as for resources on the websites of major international organizations, such as the World Bank, the World Trade Organization and the World Health Organization." P.19 Some fears expressed about the danger of using the internet (fraud, unreliability) and that this might deter use. "Six of the 15 interviewees reported having internet-capable phones, but none claimed to use the mobile web regularly or for much more than quickly scanning email messages." Policymakers express preference for summaries or distilled analyses of research reports and are frustrated at the lack of concrete recommendations or practical solutions. The study also recommended that those trying to reach policymakers should	Given the popularity of GhanaWeb, should we try to understand why? What it is about the design and content that makes it appealing, and ask users to compare it to the DFID portals? (user-based comparisons). Ghanaian policy actors appear to be happy to seek out research and information from other countries and regions. This contradicts research in other countries e.g. India. Is this a factor to consider when sampling for the primary research? This data is over 5 years old now, but raises question over whether access to internet enabled phones leads to use of portals via mobiles. What are the cost implications? Are DFID-portals useful at a mobile phone level? Evidence supports the approach that (some) portals take of

		present information from more than one source. Study found that personal networks are very important for policy actors who rely heavily on them to circumvent the slower formal channels of communication.	summarizing, synthesizing, pulling out recommendations, and making practical material available (manuals, guidelines, etc.). The authors say "it is therefore vital for development groups to expand their definition of 'influentials' to include these broader personal networks, and to tap into them whenever possible" – how do we capture these views in our primary research?
Intermedia (2010b)	As above, but based on interviews with 15 policy actors in Kenya.	The study found that the majority of policy actors make use of ICTs to gather information: they and their staff use the internet daily to conduct research on specific topics or to visit particular websites (especially those of popular newspapers); policy actors often sign up for SMS or email alert services that notify them of the latest news. As with Ghana, there is interest in case studies or comparative analyses about other countries if applicable to the Kenyan context and Kenyan policy actors tend to seek this online. In this case, a very strong demand: "The chief concern among interviewees was a perceived lack of information about practical policies that had been tried in other African countries. "p.36 The authors recommend development organisations fill the gaps in Kenyan media coverage by producing email updates or print bulletins summarizing the latest news on key development topics e.g. sanitation. Study describes policy actors in Kenya as part of the "internet elite" as they enjoy far better access to the internet at work and home, and make more frequent use of it, than many others in Kenya. Their starting points online tend to be search engines (e.g. Google or Yahoo!), websites of Kenyan newspapers, and some key development organisations such as World Bank or IMF. "The internet has become a crucial means of conducting policy-related research. Notably, policymakers use the internet to find examples of policies and best practices from other governments as well as for resources on the websites of major international organizations such as the World Bank, United Nations Development Programme, and the	It would be safe to assume that portals that had relevant information for Kenyan policymakers – and were well-optimised for search engines – would be relevant and used on a regular basis. Although mobile is used, it is likely that for this group, they would be able to access the internet through computers. How much effort is put into presenting the context of the research items in portals e.g. political, geographical, climatic, etc. IDS research from 2004/5 also found interest among Kenyan development actors for research about the UK given the influence it had on the education and health systems in Kenya (probably true of other former British colonies?).

		African Development Bank."	
Kapadia-Kundu et al (2012)	To better understand health information needs and barriers across all of levels of the health care system, the authors conducted a needs assessment in Lucknow, Uttar Pradesh, India. Data collection consisted of 46 key informant interviews and 9 focus group discussions.	No strong clear findings about information-seeking behaviour, however all levels of the health system reported problems with accessing information online as the internet is often down (and from State level downwards, the power is often cut off). At the national level, information from other countries is not seen as relevant to India. The importance of usability or "actionable information" was a core theme across all levels. The authors identified five parameters of usability from the interviews (what makes information actionable for the interviewees) and associated barriers: Language – complexity, not in native language. Time and timeliness – websites not updated, lack of time to search. Simplification – either key issues not highlighted in long reports or practical/how-to instructions are not available. Amount of information – too lengthy,	Is the value of a portal that it makes information more actionable? Whereas with a repository, there is little control over whether the content uploaded is actionable information? Are the actionable information parameters useful here? The lead author has presented them elsewhere as the "Actionability Framework" which can be used to assess the utility of information products.
Meagher and Lyall, (2013)	A summary of evaluations of publicly funded research to capture insights into the processes and good practice.	The authors present some ways of categorizing non-academic research impacts citing Nutley's Instrumental use, Conceptual use and Capacity-building and suggest there are shorter-term process-oriented impacts that could be measured e.g. attitudinal change: positive changes in institutional cultures and individual attitudes toward knowledge exchange enduring connectivity: when researchers and prospective users stay in contact even after a funded project ends. To investigate these two impacts, the Authors recommend searching for indicators of demand "evidence that prospective users know about the research and may be approaching the knowledge producers for further advice and information." In impact evaluations, the authors use impact pathways to identify likely steps towards impact, and from this identify shorter-term proxy indicators that would indicate the likelihood of higher level impacts happening later e.g. "1 Dialogue/networking between academics/non-academics. 2 Joint knowledge exchange activities, for example workshops, training, reciprocal visits between academics/non-academics. 3 Active ongoing collaboration, for example follow-on research, new pilot projects. 4 Utilisation of research ideas, for example	Knowledge brokers in this paper are commonly individuals. It would be helpful to see a copy of the review undertaken by one of the authors of ESRC's research brokerage (which is a source for this publication). The "'ideal' steps towards impact development, as used in the PACCIT evaluation example, may be a useful model for assessing impact of portals/repositories.

		informing new policies or company research strategies. 5 Utilisation of research findings, for example impact on policy/practice, use in development of new products"	
Oliver et al. (2014)	A Systematic review of online databases including Medline, Embase, SocSci Abstracts, CDS, DARE, Psychlit, Cochrane Library, NHSEED, HTA, PAIS, IBSS (Search dates: July 2000 - September 2012). Studies were included if they were primary research or systematic reviews about factors affecting the use of evidence in policy. Studies were coded to extract data on methods, topic, focus, results and population.	145 new studies were identified, of which over half were published after 2010, including 13 systematic reviews. Compared with the original review, the studies covered a much wider range of policy topics and included a larger proportion about low and middle income countries. The theme of knowledge brokering emerged in the updated systematic review. The most frequently reported barriers to evidence uptake were poor access to good quality relevant research, and lack of timely research output. The most frequently reported facilitators of evidence uptake were collaboration between researchers and policymakers, and improved relationships and skills. There is an increasing amount of research into new models of knowledge transfer, and evaluations of interventions such as knowledge brokerage.	Most of the studies looked at perceptions only and most studies had researchers as participants. The authors comment on the need for other forms of research than surveys and interviews, and for policymakers to be consulted in the design of these studies. The barriers and facilitators identified in the review are important to consider in the revised Theory of Change and/or the review helps us to assess the strength of evidence to support assumptions made in the Theory of Change.
Prakash (2013)	Survey of researchers of Indian Veterinary Research Institute about their use of internet services during the academic year 2008-09.	Although all respondents said that they used Google, 60% also use the search engine, Rediff.	Rediff is an Indian news portal and search engine similar in style to Yahoo! Do portals need to consider SEO for other search engines than Google? What is known about search engine preference in the South and would it affect the portals' visibility?
Starkey (2013)	Study produced for AFCAP to review the storing, sharing and disseminating of rural transport knowledge. Research methods include needs assessment survey of transport professionals (online survey, 74 opt-in responses from 29 countries) and key informant interviews. Some reviewing of transport knowledge portals and websites.	From the survey: Respondents gained most information from th e internet and mobile phones are also used to gain information, but respondents warned about connectivity problems especially for rural colleagues (websites need to be easy-to-search). Respondents wanted documents on open-access websites with alerts and newsletters. Eldis presented as a case study of good practice to emulate – editorial approach, use of partners to source grey literature and make it accessible online (harvesting and scanning), email alerts – but Eldis's practice of linking rather than hosting full text docs warned against. R4D also mentioned and both websites recommended as part of any solution.	Survey sample too small and results not disaggregated so not possible to report findings by individual target audience groups. Some hypotheses to pursue include: people are increasingly using a search engine to find research information online rather than visit specific portals/repositories and rather than locate a specific publication they have a copy of somewhere in print.

		Reasons why grey literature on transport is not (easily) available online include consultant/client contract conditions, poor website design (publications on a website can be found using Google but not through the website's own search engine) Study concludes there are five major requirements to improving knowledge management and sharing in transport sector. 1) Make relevant literature available on the web. 2) Put details of literature into user friendly, accessible databases. 3) Inform and alert people to available resources. 4) Use key knowledge for derivative publications to influence policy and practice. 5) Encourage and facilitate discussions and personnel contacts."	Portals/repositories need to have sustainability and legacy built into their design (single-donor portals are risky). Coalition approaches are better than single institution hosts for portals. DFID could play an important advocacy role to encourage other donors and organisations to support open access and enable grey literature to be made available.
Sylla, A. H. et al. (2012)	This study collected qualitative data from 75 key informants and members of two focus groups in Senegal on various aspects of health information needs, particularly in family planning and reproductive health, including information sources, strategies, and systems to transfer and share information; and barriers to accessing, sharing, and using health information. Study respondents the full range of development actors	Information needs and preferred sources varied between groups however: Internet was cited as a key source of health information and widely available but at community level access to internet is virtually nonexistent and printing equipment is not widely available. Print documents also stated as essential especially resource centers offering Senegal-specific materials. Many respondents at the district and health post level reported that their Internet access was limited, and web searches rarely yielded information specific to Senegal. Although mobile phones are possibly the most ubiquitous communication tool across all levels of the health system, many preferred not to use phones because of the expense. Evidence of a well-functioning system of information exchange using email to share information quickly and meetings to discuss how to apply knowledge. Reaching the District and Regional level health teams seems to be key in Senegal.	Print, or print-friendly materials seem to be relevant in this context to reach all groups and for circulation by those who have better internet access. Is portal content curation influenced by DFID (or other donor) funding priorities? Does it matter if Senegal-specific materials are not made available, if it's not a priority country for DFID? How global in geography and theme should portals be? Are they donor-driven, user-driven, target-audience driven, or supply-driven?

Appendix C. Rapid literature review: assessing portal quality and accessibility

Reference & Date	Description of Study (or Abstract)	Reported findings	Lessons/Implications for portals evaluation
O'Malley et al (1985) Clemmensen et al (2008)	Constructive interaction is an alternative to verbal protocols	Constructive interaction avoids the possible cultural influences on concurrent protocol verbalisation	Paired working for user-based task evaluation may be needed
Pew Research (2014)	Pew Research of three months of comScore data	Users who come directly to news sites through a desktop or laptop computer, spend three times as long as those who arrive through a search engine or from Facebook. Direct visitors also view roughly five times as many pages per month as those coming via Facebook referrals or through search engines	Direct users of the portals are more likely to use the portals in a meaningful way (?). Searching by google or Facebook may not increase the number of meaningful users, i.e. those who use the results in a policy-setting
NNgroup (2015)	This is a set of linked reports on portal design, evaluating portals – intranet and internet-based	45 best practices in the first report but none are being used in the follow-up three years later. This focuses on enterprise portals	I suspect they use a different meaning to 'portal' than DFID use. They refer particularly to intranet portals
Global Internet Report (2014)		It is striking that the majority of Africa has less than 20% internet penetration. For Ghana are 145th at 12.3%, Tanzania is 168th at 4.4%, Bangladesh is 157th at 6.5%	Data about internet access in the South
Chavan et al. (2009) Chavan, (2004)	Recounting lessons learned in cross-cultural design for interactive products	How easy it is for corporations moving their products to a different country to make mistakes, e.g. corn flakes in India	Local knowledge is crucial for successful products
Bidwell, and Winschiers-Theophilus, (2010)	Localizing interaction design in Africa is critical for improving usability and user experience for African populations. Genuine localization, as Lucy Suchman and others argue, requires locating accountability in the production of technologies; for Africa, this means design by Africans in Africa for African situations	IT systems first introduced to Africa by American and European multinational companies, or by white Africans during the Apartheid era, are embedded with values and practices that differ from those of African people. While systems might be customized for African contexts, they are founded on non-African values and practices	Quality of portals is country and context-dependent
Moalosi et al. (2007)	Cultural factors were extracted from traditional stories and designers were asked to design products based on these factors. All conducted in Botswana	They found that the designs were original and innovative within the local socio-cultural context and that including these factors added value in a way that made the products more acceptable to local people. Cultural factors influence the design of the product	Quality of portals is country and context-dependent
Smith (2007)	Based upon a review of two European Union funded projects that aimed to support usability in India and China this paper discusses the	Definition of usability varies across cultures. For localisation to be achieved three non-sequential (indeed iterative) elements are required: firstly a redefinition of HCI and usability	Quality of portals is country and context-dependent

Reference & Date	Description of Study (or Abstract)	Reported findings	Lessons/Implications for portals evaluation
	localisation of effective usability practice in these countries	practice, secondly the formation of a national organization around the redefined discipline that can actively promote HCI and usability, and thirdly the roll-out of effective practice in industry	
Faiola and Matei (2005)	This study explores issues related to Web designers' cultural cognitive styles and their impact on user responses. The results of an online experiment that exposed American and Chinese users to sites created by both Chinese and American designers indicate that users perform information-seeking tasks faster when using Web content created by designers from their own cultures	Website users performed better on tasks when the website was designed by people from the same culture. Numerous studies have identified links among culture, user preferences, and website usability. Most of these studies were reports of findings from a behavioural perspective in explaining how cultural factors affect processes of Web-related content design and use. Based on the research of Vygotsky and Nisbett, the authors propose a broader model, referred to as "cultural cognition theory," by which Web design, like other types of information production, is seen as being shaped by cultural cognitive processes that impact the designers' cognitive style	Indicating that the culture impacts upon the design product
Aptivate (2015)	Company website describing a range of products and projects they have undertaken for the South	See the 'process' under aptivate's example projects – many (all?) product developments include a period of user research: looking at what users do, interviewing them, studying context	Detailed user research leads to better online products
Hariri Nourazi 2011	Review of papers to find criteria for the evaluation of digital library user interface	22 criteria identified, which are largely based on good practice for interaction design (such as the heuristics above, and well-known design principles such as user control, consistency etc.)	Criteria to evaluate/judge portals follows 'standard' web-based criteria
Lwoga (2013)	The study examined the role of quality (service quality, information quality and system quality) in influencing user perceived net benefits, satisfaction and intention to reuse library 2.0 application. A case study research design was used in this study. Self-administered questionnaires were distributed to all first year undergraduate students (n ¼ 408) at MUHAS, with a rate of return of 71.8%	The study findings confirm the validity of using the proposed IS model for library 2.0 adoption assessment. The users' intention to reuse is quite important, and accurately predicts the usage behaviour of library 2.0 services. The perceived net benefits had the strongest effect on users' intention to reuse library 2.0 systems than any other determinants within the model. Among the three quality-related constructs, service quality had the strongest total effect on perceived net benefits and intention to reuse. Compared to system quality, information quality had the largest effect on user satisfaction. It is thus important for librarians to consider all	Emphasis on effect of service quality, information quality and system quality on user satisfaction, not just usability

Reference & Date	Description of Study (or Abstract)	Reported findings	Lessons/Implications for portals evaluation
		these factors for effective adoption of library 2.0 projects in research and academic institutions	
Masrek et al 2010	The paper is survey based; 400 self-administered questionnaires were sent out to students of Faculty of Information Management, University of Technology MAR, Malaysia	In terms of information quality assessment, respondents indicated that the library portal met their expectations. All the information quality attributes, namely completeness, comprehensiveness, accuracy, timeliness, reliability and appropriateness of format were rated highly by users. Equally important to information quality is systems quality and service quality. When asked to evaluate the systems quality aspect of the library portal, respondents have also rated highly	Information quality dimensions: completeness, comprehensiveness, accuracy, timeliness, reliability and appropriateness
Shaltoni et al (2015)	The purpose of this paper is to investigate the factors affecting students' satisfaction with university portals in developing countries. The factors examined are educational services, availability, user ability, system quality and information quality. A self-completion questionnaire was developed and distributed to a sample of 550 students in several universities. Correlation and regression analysis were used to identify relationships and explore which of the factors had the strongest explanatory power	The results showed that educational services availability, system quality and information quality influence students' satisfaction, with service availability being the major determinant. The cultural perspective was employed to explain these results. Five Jordanian universities took part	Service availability is the major determinant of portal user satisfaction
Granić et al (2013)	Web portals are a special breed of website, providing a large and diverse user population with a blend of information, services and facilities. Whether they reach their aim of facilitating users' access to diverse resources and to which extent, remains an open question. In the paper this issue is addressed with usability inspection of horizontal information (news) portals. The reported experiment was targeted to establish whether expert reviews can be performed with a reasonable level of performance by non-usability	Expert reviews can be performed with a reasonable level of performance by non-usability experts with some training. Although the findings from a single experience cannot be generalised, we believe that the results of this study could contribute to improve the general understanding of the field. However, in order to draw general sound conclusions and to examine the robustness and validity of the findings, more studies should be conducted	Expert usability reviews can be conducted by non-usability experts

Reference & Date	Description of Study (or Abstract)	Reported findings	Lessons/Implications for portals evaluation
	experts with some training		
Jiang 2014	The paper reports results of a study that examines user's adoption and continuance intention (CI) of e-government web portal from the perspective of service level and service quality. A research model uses data based on a sample of 630 individual e-government web portal users in China	E-government web portal service level and service quality are critical factors that determine user's adoption and continuance use. Three types of user groups are identified based on the purposes of use and the primary activities: information acquisition, information exchange, and transaction processing. Service quality is measured by web portal's information quality, design/function, reliability, security and privacy, and system responsiveness. Results show that the web portal's service quality affects user's adoption and continuance intention and the effect differs among different types of user groups. Implications based on the findings of the study are discussed in term of e-government web portal implementation	Service level and service quality are measures of overall portal quality
Komba 2015	This study tests the model of information system success proposed by DeLone and McLean using data that was collected in three selected districts of Tanzania. A survey was administered to elicit factors for e-government adoption in Tanzania using the DeLone and McLean model of information system success	Quality systems including easy to use and easy to learn are key for e-government adoption. Policy makers and e-government project teams should consider system quality as a barrier to e-government adoption and hence find ways of ensuring easy-to-use and easy-to-learn systems in order to facilitate e-government adoption within the country	E-government is a form of web portal. These tend to be for the general public though, so the question arises of the type of user. This is a study of Tanzania
Preece et al. (2015)	Interaction Design: beyond human-computer interaction	Textbook on interaction design and evaluation, specifically explaining usability and user experience goals and their impact and how to achieve a good design, and how to evaluate good design	Lessons in here go beyond user interface design. Interaction design in this context is “designing interactive products to support the way people communicate and interact in their everyday and working lives”
Abdelnour-Nocera, J., Dunckley, L. and Sharp, H. (2007)	An investigation of the way usefulness of an information system is shaped by sociocultural factors in a work context	Technological frames are proposed as an analysis framework for assessing how context and local culture shape the utility and usability of systems in situ, that is, once they are deployed to their actual contexts of use	Usefulness of a system depends on the perspectives being taken by the different stakeholders
Paul C. Avey and Michael C. Desch (2014)	A survey to current and former policymakers to gauge when and how they use academic social science to inform	Policymakers do regularly follow academic social science research and scholarship on national security affairs hoping to draw upon its substantive	Policymakers use research evidence in different ways than the originators may expect. It

Reference & Date	Description of Study (or Abstract)	Reported findings	Lessons/Implications for portals evaluation
	national security decision-making	expertise. But results call into question the direct relevance to policymakers of the most scientific approaches to international relations. And they at best seriously qualify the "trickle down" theory that basic social science research eventually influences policymakers. Policymakers often find contemporary scholarship less-than-helpful without a clear sense of how such scholarship will contribute to policymaking	may take a long time before research evidence influences policymaking. We need to be open-minded in our evaluations to identify the influence of the portals
Bowen (2010)	InterMedia conducted in-depth interviews with 15 senior Ghanaian policy actors, comprising mostly senior politicians and bureaucrats, as well as a few influential figures outside government. The interviews focused on how the policy actors gather, assess, share and disseminate information critical to development policy work	The policy actors showed substantial overlap in information source preferences and media use habits, as well as in the ways they share information with fellow policy actors. They highlighted several actions that development organisations could take to improve the policy information environment. They also described many challenges in communicating with the public about development issues, as well as offering some creative solutions. The policy actors rely heavily on Ghanaian radio "news headline" programs, newspapers and radio call-in shows to inform policy priorities and set agendas, even though they are frustrated with a perceived lack of accuracy and objectivity of local media. Policy actors have, on the whole, adopted new technologies to meet specific information needs.	We need to be open-minded about the sources of influence for policymakers and take into account that focusing just on the portals may not help us to understand better how they can be used to influence policy
Oliver et al. (2014)	A systematic review of barriers to evidence uptake	Timely access to good quality and relevant research evidence, collaborations with policymakers and relationship- and skills-building with policymakers are reported to be the most important factors in influencing the use of evidence. Although investigations into the use of evidence have spread beyond the health field and into more countries, the main barriers and facilitators remained the same as in earlier reviews. Few studies provide clear definitions of policy, evidence or policymaker. Nor are empirical data about policy processes or implementation of policy widely available. It is therefore difficult to describe the role of evidence and other factors influencing policy	Conducting studies of policymaking in situ is rare

Reference & Date	Description of Study (or Abstract)	Reported findings	Lessons/Implications for portals evaluation
Crow et al. (2012)	A survey of health care professionals and a research synthesis focusing on Sub-Saharan Africa (SSA), an area with low levels of ICT infrastructure. It presents a synthesis of statistical analyses and a review across disciplines of information published on the state of ICT and health information access in SSA.	Health care practitioners rely on access to relevant and up-to-date medical information in order to effectively treat their patients. One efficient, low-cost avenue for such information is online collections, but certain regions lack the information and communication technologies (ICT) necessary for widespread and reliable access to online resources. The synthesis and preliminary results from our survey suggest that Internet connectivity remains highly unreliable in Sub-Saharan Africa and that mobile devices provide the most reliable technology for health care providers to carry out their work	Informs the internet situation in our target countries
Smith (2011)	This chapter focuses on the localisation of usability testing methods and specifically on the extent to which cultural differences between users and developers impinge on the effectiveness of such methods. It presents a review of different methods for user based testing/evaluation	It provides a summary of key aspects within relevant literature on the ways in which cultural issues may influence evaluation effectiveness. It also reports on studies to date that document the effects of culture and usability evaluation. The chapter concludes by presenting potential guidance on the selection and implementation of usability evaluation methods within local and global contexts	Techniques should be chosen for our target countries
Veselinovic 2015	An overview of internet use in Africa	Most people in Africa access the web through a mobile phone The continent's broadband growth is increasing at twice the global average rate A host of mobile-based start-ups have exploited this by offering services from banking to farming	Use of mobile in the stage two studies

Appendix D. Rapid literature review: webmetrics Literature Review

Reference & Date	Description of Study (or Abstract)	Reported findings	Lessons/Implications for portals evaluation
Roemer R.C & Borchardt R (Nov 2012)	List of current online resources for analysing webmetrics.	Brief critique of pros and cons with weblinks for further info.	A source for free online tools. Some ideas for comparator portals e.g. PLoS as comparator for R4D.
Bernstein, Michael S. et al (2013)	Survey and large-scale log data are combined to examine how well users' perceptions of their audience match their actual audience on Facebook. Audience logs for 222,000 Facebook users' posts over the course of one month were analysed to explore the 'invisible undercurrents' of audience attention and behaviour in online social networks.	Social media users consistently underestimate the audience size for their posts, guessing that their audience is just 27% of its true size. Publicly visible signals — friend count, likes, and comments — vary widely and do not strongly indicate the audience of a single post. Despite the variation, users typically reach 61% of their friends each month.	Users often consume content and make judgments without taking any publicly visible action In addition, there are consistent patterns in online communities that might bias estimates. However, this study surveys *individual* Facebook users rather than organisations tasked with research dissemination so transferability of the conclusions to the latter may be limited.
Doemeland,D. & Trevino, J. *(May 2014)*	This study measures the demand for and use of reports through downloads and citation counts for all policy reports which are part of the World Bank's Documents and Records (D&R) database. Download counts were gathered using Omniture web analytics software.	13% of policy reports were downloaded at least 250 times; but more than 31% of policy reports are never downloaded. 87% of policy reports were never cited. More complex, multi-sector, core diagnostics reports on middle-income countries with larger populations tend to be downloaded more frequently. Internal knowledge sharing matters: support provided by the WB's Research Department consistently increases downloads and citations. A large portion of policy reports were downloaded relatively few times: almost 40% of policy reports were downloaded between 1-100 times. The "knee of the curve" of the dataset occurs around 250 downloads. Downloads of reports decline over time: Policy reports have an average of 1.6 daily downloads during their first year of release, which decreases to 0.6 downloads during their second year and approximately 0.4 downloads during the third year. While only 17 policy reports in the dataset were supported with press releases, the average downloads per document for these reports was much higher than for those without PR. On average a policy report launched with PR had 208 downloads, while a policy report without had 109.	The possibility that some policy reports could additionally be hosted on databases other than D&R and would therefore not be captured in the data, was considered unlikely to significantly affect the results. Citation and download activity vary substantially, possibly due to the different way in which the audiences (policy makers v researchers) use the reports. Measuring internal knowledge transfers is difficult because it is almost impossible to assess the costs and benefits of knowledge sharing among staff because the inputs and outputs are not systematically monitored and because of the heterogeneity of the methods of disseminating knowledge – also relevant for assessing an element of R4D's purpose. Useful and relevant benchmarks and

			comparators for DFID portals, esp. R4D.
Carl Bergstrom May 2007	Short definition and pros/cons of an early bibliometric – the EigenFactor.	'The scientific literature forms a network of scholarly articles, connected by citations. Each connection in this network—that is, each citation—reflects the assessment of an individual scholar regarding which papers are interesting and relevant to his or her work. Thus contained within the vast network of scholarly citations is the collective wisdom of hundreds of thousands of authors.'	A neat quote for the rationale of using citations as a measure of quality and therefore (by implication) impact.
D. McKenzie & B, Özler 2014	Event study analysis, regression analysis, original survey evidence, and a randomized experiment to measure whether blogging about a research paper leads to more people looking at that research (in the field of economics).	The typical economics working paper gets very few readers, especially after its first couple of months: a random sample of papers released in the NBER working paper series in January 2010 shows that the median paper in this prestigious series received 21 abstract views and 12 downloads through Repec services in the first two months, and then an average of 6-7 abstract views and 2-3 downloads per month through Repec over the next year. Given these low readership levels, blog posts which draw attention to such research can potentially have large relative impacts on readership. The data which are available suggest that the most-read blogs have significantly lower click-through rates than the more research-focused niche blogs.	Strong results found for blog postings causing a large increase in the number of abstract views and downloads of linked papers. The research relates to '(super) elite bloggers' so transferability to a typical blogger may be limited. A good source of benchmarks for some click through rates.
J.Adams & T. Loach 2015	An analysis of 4 million mentions to research documents collected and indexed by Altmetric.com Aug 2013-2014 to explore the relevance of altmetric indicators in analysing 'impact through sharing' via blogging, micro-blogging and comments	Altmetric.com is a key commercial source of systematically indexed and collated research mentions. The share of papers that are mentioned rose from fewer than 1 in 20 in 2009 to almost 1 in 4 of output in 2013. Media mentions are a new tool for professional and interest groups to draw rapid and informal attention to research. The UK and US are major tweeters about research. Outside of Egypt, there is a low level of mentions of research in Africa. The distribution of mentions across research papers is highly skewed: 80% of research papers get less than 5 mentions. Mentions point more towards biomedics and clinical sciences than to other sciences. Mentions are not 'controlled' by journals so they may point to new communities of knowledge dissemination, especially beyond those who do not normally scan research journals. There are multiple motives for mentions, including 'communities of practice' i.e. sharing amongst practitioners and 'communities of interest' e.g. patients, carers and charities.	Social media mentions offer a non-academic parallel to citations – so important for us to analyse. Citations and mentions are skewed towards health research – implying different sectors share information differently - so need to take this into account in stage 2 evaluations and cover multiple sectors. 'Not all stakeholders in research have a [policy] influence but they have an acute interest. Social media enables them to signal that interest where they see research publications of significance' – so in the online survey we need to include 'interest' as well as 'influence'.

Nicholas et al., 2008	Reviews the weblogs of a number of electronic journal libraries using Deep Log Analysis to examine frequency, characteristics and diversity of full text viewing	The information community has tended to regard the full text download as the 'usage gold standard' user satisfaction indicator and a proxy for 'reading', thus providing the much sought after evidence that a positive academic outcome has taken place. The evidence from other indicators that the vast number of viewers are 'bouncers' makes the act of downloading a proxy for a judgement of quality on their behalf. There is a wide variety of full-text viewing habits. A large number of viewings are very cursory but there is survey evidence to suggest that reading occurs offline. Calculating full text views can be considerably inflated by the fact that a user may come to an article via an HTML link before downloading the PDF, thus leading to double counting. Rules for dealing with possible double counting need to be explicit. Whether a full text article was viewed depended on the status of the user: when given the choice of viewing an article in abstract or full text form, students were markedly more likely to opt only to view a full text article in a session than faculty staff: 64% of students saw a full text version compared to 50% of faculty staff. Whether or not a full text article was viewed depended to a certain extent on the navigational route or mode of access the user took to finding content. Weblog usage data records *access* rather than use. Such data requires also the understanding of the context of use and a more definitive statement of value from the user. 2/3 of the last reading was of an article identified online. Shorter articles receive relatively more time spent on them. Estimates of the reading time of an article has increased from 45 mins to 52 mins, probably due to the increase in the average lengths of articles from 7.4 pages to 11.7 pages - but may vary from field to field (Tenopir & King 2000).	*Navigation towards content* is the main activity online, not downloading; navigating is a fundamental activity, not a secondary one. Navigating around can be a key part of information seeking (power browsing), unless it is a symptom of the lack of digital literacy and/or unfamiliarity with the subject - so assessing this should be a key part of the evaluation. GS users face narrow bandwidths and other IT availability constraints which GN users don't. This may affect their viewing habits (viewing time, downloading practices) and therefore how their webstats should be interpreted (i.e. differently from GN users) – i.e. we need a GN control group in the evaluation. Online behaviour varies *by level of qualification* (i.e. familiarity with how to interpret academic literature) *and by sector* – so need to cover this in the evaluation too
Harle, J. ACU 2010	A survey of four national research universities in east and southern Africa – the universities of Nairobi, Dar es Salaam, Rwanda (NUR) and Malawi (Chancellor College).	Researchers' awareness of the resources available to them is often low, and many are unfamiliar with the key publications in their field.79% of the top-ranked international journals were available online, free at the point of use, at the four case study universities. But researchers reported that they struggled to get hold of the journals they needed. Access	To find the portal, the user needs to have a sufficiently high level of information literacy – be aware of their own additional evidence checking/validating needs, etc. For portals still to be relevant

		schemes have helped to dramatically increase the availability of academic journals across the region. Technology constraints pose significant problems, but access to computers and broadband connectivity is steadily improving. The challenge is to ensure that staff and students can make effective use of this technology. Search and discovery skills are often under-developed. Many researchers are unable to find and download what they need, with the result that new research does not take into account the latest work in the field. Librarians and information specialists can make important contributions to research training, but links between libraries and academics are often weak.	assumptions are required to hold (users don't just go to Google, don't go direct to the researchers' home page). Researchers can be supported by being guided to advanced searches, specialised databases, and librarians etc.; policy makers in LDCs don't have those needs or resources. Portals serve the mid-range of info literacy skills – which is disappearing (hypothesis); Repositories on the other hand belong to the low and advanced info literacy skills range.
Hepworth, M. & Duvigneau, S. (2012)	A study with three African institutions (University of Botswana, University of Zambia and Mzuzu University in Malawi) of 3 areas fundamental to research capability: information literacy, critical thinking and independent learning. Also investigated were factors that have an impact on these capabilities: institutional norms, staff capabilities and ICT infrastructure.	Many graduates currently lack information literacy, critical thinking and independent learning capabilities. The students were often described as passive and embracing a 'least effort' culture. On the other hand, students involved in innovative training such as problem- or inquiry-based research with a 'real world' setting, or encompassing a competitive element, demonstrate the motivation, enthusiasm and capacity for developing their information capabilities. Inadequate and inappropriate resources present real challenges to building information capabilities. Specific challenges include high student and low staff numbers, funding issues, limited ICT and out-of-date and Northern-biased information resources.	Policy makers are likely to suffer from the same low info literacy skills, although this could be counteracted by a work-place culture that motivates evidence seeking. Portals will be effective if they tap into policy makers' *specific information literacy skills* which are likely to be a combination of poor info literacy enhanced by mobile/Google technology.
Hovland, I (2007)	A review of approaches to M&E of the non-academic impact of research based on the current experience of a range of research institutes, think tanks and funding bodies.	Conventional academic research is usually evaluated using two approaches: academic peer review, and number of citations in peer-reviewed publications. For policy research programmes, these evaluation tools have proven too limited. They are not well suited to capture some of the broader aims of policy research, such as policy impact, changes in behaviour, or building of relationships. Methods to assess uptake in non-academic contexts include: impact logs, new citation analysis, outcome mapping (of changes in the behaviours, relationships, actions or activities of people, groups, and organisations), most significant change (MSC) stories, innovation histories and episode studies. A mixture of self-assessment and external evaluation is recommended.	M&E of the DFID portals have focused on (i) self-assessment and (ii) qualitative methods to demonstrate impact through use. Increased use of technology, especially social media for sharing. has increased the scope for more quantitative methods to demonstrate impact through uptake/sharing.
Carden, F.	Discusses a range of	Developing countries often lack the	Questions for the evaluation:

2009	issues that determine how much effect research studies have on the bureaus, legislatures, and administration of governments in developing countries.	intermediary institutions that carry research to policy; Policymakers lack confidence in their own researchers; Researchers in development often lack hard data. Southern countries too seldom share research among themselves. Demand for research can be missing. The revolutions in information and communication technologies—from mobile phones to web-based commerce and education—have caused policymakers to search out knowledgeable advice. There are three overall categories that describe how research can affect policy: expand policy capacities; broaden policy horizons; and affect decision regimes. The most meaningful and lasting influence is less about specific policy change than about building capacity—among researchers and policy people—to produce and apply knowledge for better development results.	Are portals and repositories responding to the changing IT capabilities of Southern policy actors? Are they making the most of emerging technologies to promote capacity building and interaction of researchers and policy actors?
Shaxon, L (2010)	Report of a DFID-funded two day workshop	The field of research communication is moving away from a reliance on the linear model to one which appreciates the contribution made by a wide variety of actors. We know more about how to improve supply than we do about how to improve demand for evidence. Increasing pressure to demonstrate that research is having an impact; creating value, affecting decision-making, and having a positive effect on people's livelihoods. Measures of impact shifting from content analysis and Google Analytics-type information on hit rates, downloads and citations to measures of inclusivity and stakeholder involvement in project and programme plans and institutional strategies.	Need to develop an impact assessment framework that includes not just research use (an intermediate impact) but also uptake (an impact the next stage along the results chain).
Heeks,R. (2010)	Editorial discussion	Infrastructure and access are only the starting point in understanding ICT's contribution to development; they are inputs whereas our real attention should be focused on outputs. ICT4D impact assessment often lacks rigour: being descriptive rather than analytical; and often lacking clarity around the nature of research. The absence of ICT4D research impact on practice and policy-making is due to substandard research in the ICT4D field. Poor quality of ICT impact assessment to date derives from its lack of conceptual foundations.	There are no ready-made conceptual frameworks out there!
Euforic Services	A study exploring the value of social media and other web 2.0 tools in encouraging uptake of DFID funded research, material. Methods	Policy actors ('people whose work is wholly or partially involved in developing or seeking to influence national and regional development policies') do have an appetite for research, although they rate international research higher than local research.	Engagement in this context is generally taken to mean individuals moving from simply accessing or consuming the content and services offered by an online

	involved desk research, prototyping and experimenting with a range of online tools and consulting with experienced practitioners in three Peer Exchange meetings (at DFID).	Policy actors are finding their own information and using the emerging technologies: so make it easy for them to locate research findings in easy to read forms, e.g. local research needs to be found on international sites or creating smartphone 'apps' which push research onto their phones. They are using a range of ICT to get information, and the media plays an important role in their lives, which implies researchers should actively try to get their research findings into the mainstream 'news'. Currently they see an absence of reporting on development which they would like to see filled. Relatively new function of 'social search' takes this one step further. This enables users to include direct searches of networks on Facebook and Twitter as part of a standard Google search, e.g. the Wajam platform incorporates search results from Twitter followers. An important consequence of this trend is the growth in importance of influencers, people who are active in social media and whose recommendations are followed by their many followers or friends. There is evidence that using social media increases the number of people who know about specific research projects and development research generally, and that people who are connecting with development research are likely to share that research.	platform to becoming more involved in the platform, recommending or promoting it and actively co-creating the content. Online media accessed through digital devices – PCs, pads and mobile phones – play a central role in all areas of knowledge and research. It is therefore important to understand the online behaviour of the target audiences for development research as well as the wide range of available platforms and tools.
Brown, C (2012)	A study of secondary sources to establish current levels of adoption of web 2.0 tools for research collaboration and knowledge sharing by development researchers in the South.	Although evidence was only available on adoption of web 2.0 tools among academics *in Europe,* rather than in the South, levels of take-up among academics are relatively low. The Research Information Network 2010 study found that for UK researchers, the policy of international peer reviewed journal citations being those that count towards academic promotion, rather than online citations, discourages informal publishing online.	Confirms the need to repeat this in the South and amongst policy actors (and academics?).
Assessing the Strength of Evidence. DFID Practice Paper DFID, 2013	Guidance to DFID and other practitioners.	Rankings and rating systems applying to both journals and individual academics can provide a useful proxy guide to the quality of a research study although the validity of such rankings for such purposes is subject to considerable debate. Journal rankings provide an indication of the standard of peer review to which a publication has been subjected, or information on the frequency with which a study or academic has been cited. DFID staff should treat academic peer-review as an important mechanism. However, not all well-designed and robustly applied research is to be found in peer reviewed journals and not	Don't rely soley on citation data.

		all studies in peer-reviewed journals are of high quality. Journal rankings do not always include publications from southern academic organisations or those in online journals, so a broad and inclusive approach is required to capture all relevant studies.	
Scott, N. (2012)	A blog post on creating a set of benchmarks for ODI, to be able to assess success in reaching and influencing audiences online.	Digital tools do not offer a panacea for the measurement of policy influence: it is unlikely that tools will ever be available that can report on exactly who is reading or engaging with particular pieces of content. Even if you stick to assessing and taking action on only those things that are measurable, it is important to avoid over complication by being quite picky in what you do and don't include in any dashboard. Select indicators to provide insights into trends for the **viewership, usage and engagement with communications products.** It is also important to know whether you're getting the full picture for a set of statistics or not, to avoid skewing your tools. To get complete Facebook 'share' or 'like' statistics is also impossible due to the privacy settings of those who share information. Other platforms don't offer statistics as a matter of principle due to their ownership – for example, it isn't easy to get information on visits to a blog placed on a top media site because this information isn't generally shared (being commercially sensitive). Finally, even the platforms that do offer statistics easily and openly do so in various different formats, making it hard to tie them together.	Don't be too dependent on webmetrics, they are changing. Two recommended GA metrics: Unique page views – number of times a page has been visited by a unique person and details on the country that person was in. Entrances – number of arrivals at the site, which page they arrived on and how they came to the site. Combine web and altmetrics with an impact log (e.g. research fish) to capture dissemination activities which are not covered by the former. Assessing uptake and impact must make greater use of qualitative data.
Thelwall, M (2014)	Quarterly magazine article providing objective, up-to-the-minute insights into scientific trends based on bibliometric analysis.	For a vast majority of time the traffic analytics were derived from log analysis. Every website has a raw log file that records each request to the server, such as a page or image. This log file will record this information whether it be an actual site visitor collecting this data or bots, scouring the web for information for both helpful (search engine crawlers) and hurtful reasons (address collectors for junk email). Sifting through this data to separate the real traffic from the automated makes the data useful for trends and patterns, though true specific numbers are challenging to derive without some level of inaccuracy. If the site utilises programming to serve images or other files, the numbers can be further distorted. Another disadvantage is that sometimes the data provided is too detailed and complicated to interrogate and analyse. High level data and figures often requires configuration or "someone of knowledge" to setup these	Lists some important pitfalls in analysing web logs.

		reports.	
Kristina Dems ed. Rebecca Scudder (2010)	Online article summarising altmetric studies of research dissemination.	Altmetrics grew from the recognition that the social web provided opportunities to create new metrics for the impact or use of scholarly publications. A wide range of social web services can be harnessed, from Twitter to Mendeley, and large scale data can be harnessed automatically from the social web through Applications Programming Interfaces (APIs). There is good evidence that some altmetrics could have value as impact indicators. A large-scale study investigated 11 different altmetrics and up to 208,739 PubMed articles for evidence of a relationship between citations and altmetric scores gathered for 18 months from July 2011. The study found most altmetrics to have a statistically significant positive (Spearman) correlation with citations but one that was too small to be of practical significance (below 0.1). The exceptions were blogs (0.201), research highlights (0.373) and Twitter (-0.190). The reason for the negative correlation for Twitter, and perhaps also for the low correlations in many other cases, could be the rapid increase in citing academic articles in social media, leading to more recent articles being more mentioned even though they were less cited. This suggests that, in most cases, altmetrics have little value for comparing articles published at different points in time, even within the same year. In summary, it seems that although many altmetrics may have value as indicators of impact, differences over time are critical and so altmetrics need to be normalised in some way in order to allow valid comparisons over time.	A useful indication of some pitfalls in using altmetric analysis. Altmetrics should not be used to help evaluate academics for anything important, unless perhaps as complementary measures, because of the ease with which they can be manipulated. In particular, since social websites tend to have no quality control and no formal process to link users to offline identities it would be easy to systematically generate high altmetric scores for any given researcher or set of articles.
Zins, C.(2007)	Summary of a Critical Delphi study conducted in 2003–2005 exploring the foundations of information science. The international panel was composed of 57 leading scholars from 16 countries.	This article documents 130 definitions of data, information, and knowledge and maps the major conceptual approaches for defining these three key concepts.	
McGowan J, et al. (2009)	A systematic review of evidence for the effectiveness of interventions intended to provide electronic retrieval (access to information) to health information by healthcare providers to improve practice and patient care.	Two studies were found. Neither study found any changes in professional behaviour following an intervention that facilitated electronic retrieval of health information. There was some evidence of improvements in knowledge about the electronic sources of information reported in one study. Neither study assessed changes in patient outcomes or the costs of provision of the electronic resource and the implementation of the recommended evidence-based practices.	The review concluded that access to electronic information may be beneficial to the practice of evidence-based health care, but appears to be insufficient in itself to influence behaviour change in healthcare professionals – so unlikely that we would find any impacts on change in

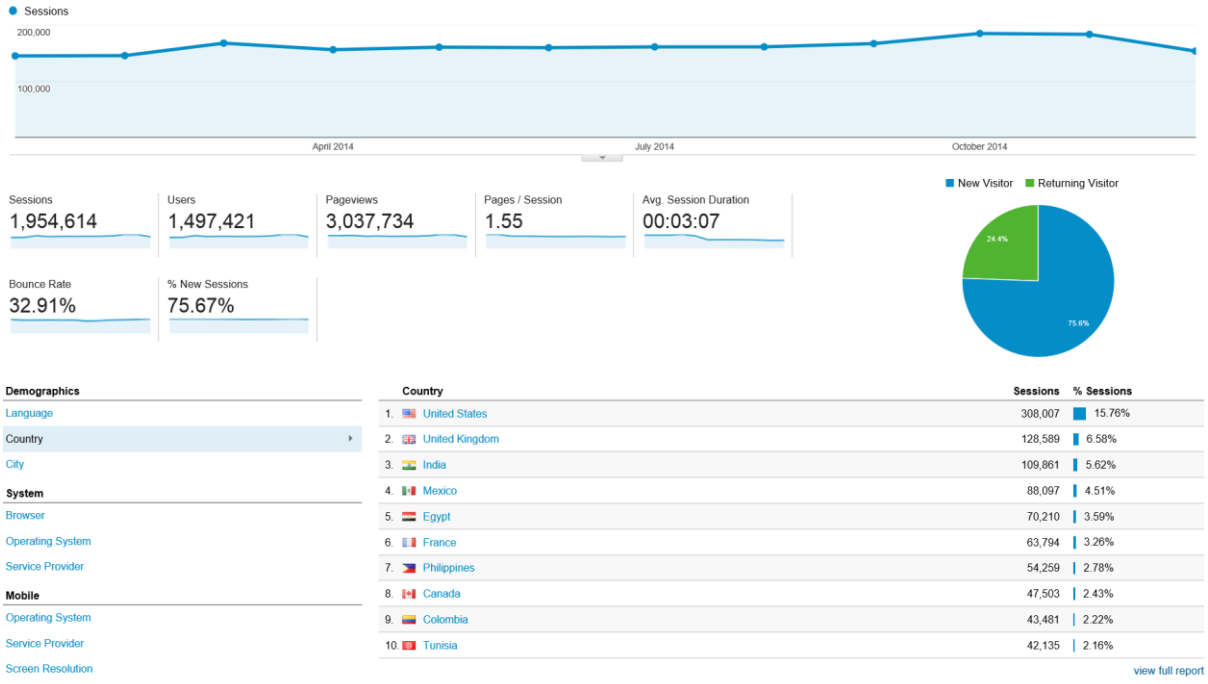
			behaviours in our study.
J. Jansen,et al. (2010)	Investigates opinion sharing attitudes and behaviours of 13 - 24 year olds on social media platforms. This research utilises data from 34,514 survey respondents from users of the social media site, myYearbook.	Results show that those more engaged with multiple social media platforms are more willing to share opinions, seek opinions, and act on these opinions. However, there were statistically significant differences among users of myYearbook, MySpace, Facebook, and Twitter.	There are demographic differences in use of social media. Not a surprise, but we need to remember this in our analysis of results of the online survey and any further webmetrics analysis we do.

Appendix E. Preliminary webmetrics analysis for the DFID-funded portals/ repositories

E.1 SciDev.Net

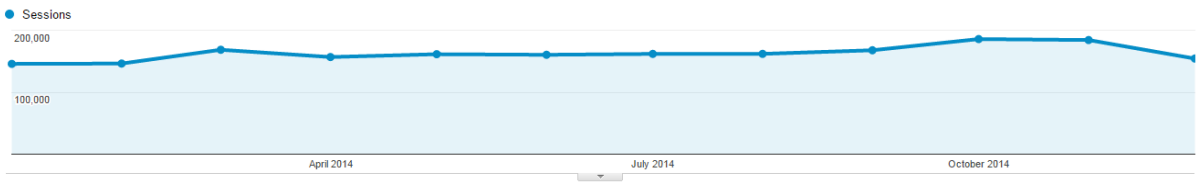
E.1.1.1 Overview Dashboard

Figure 8: SciDev.Net Web metric Overview 2014 – Source = Google Analytics



E.1.1.2 Session data

Figure 9: SciDev.Net Session data 2014 – Source = Google Analytics



User Type	Acquisition			Behavior		
	Sessions ↓	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration
	1,954,614 % of Total: 100.00% (1,954,614)	75.77% Avg for View: 75.67% (0.12%)	1,480,940 % of Total: 100.12% (1,479,142)	32.91% Avg for View: 32.91% (0.00%)	1.55 Avg for View: 1.55 (0.00%)	00:03:07 Avg for View: 00:03:07 (0.00%)
1. New Visitor	**1,476,946** (75.56%)	100.27%	1,480,940 (100.00%)	34.95%	1.41	00:02:06
2. Returning Visitor	**477,668** (24.44%)	0.00%	0 (0.00%)	26.60%	1.99	00:06:14

- Looking at the session data, one can see that a majority of users of SciDev.Net were “new visitors”.
- However the data may be misleading for the following reasons:
  - if the “new visitors” were mobile or tablet with / or the user accessing from a constantly changing IP address location;
  - the user is unable to store cookies on their device;
  - javascript is disabled on the device (although it is appreciated if this was the case most websites wouldn’t function correctly);
  - the user is visiting on a device using a proxy server or browsing privately;
  - This would prevent Google from recognising them as a “returning visitor” and class them as “new visitor”.
- Another point to raise is that returning visitors do tend to stay on the site three times longer than that of new visitors, with their session duration lasting (on average) **6 minutes 14 seconds** (**00:06:14**), whereas new visitors tend to stay on the site for **2 minutes, 6 seconds** (**00:02:06**).

E.1.1.3 Location

Figure 10: SciDev.Net Location data 2014 – Source = Google Analytics

Country	Acquisition			Behavior		
	Sessions ↓	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration
	1,954,614 % of Total: 100.00% (1,954,614)	75.77% Avg for View: 75.67% (0.12%)	1,480,940 % of Total: 100.12% (1,479,142)	32.91% Avg for View: 32.91% (0.00%)	1.55 Avg for View: 1.55 (0.00%)	00:03:07 Avg for View: 00:03:07 (0.00%)
1. United States	308,007 (15.76%)	76.74%	236,372 (15.96%)	32.80%	1.47	00:02:59
2. United Kingdom	128,589 (6.58%)	59.61%	76,654 (5.18%)	30.61%	2.20	00:04:12
3. India	109,861 (5.62%)	82.24%	90,345 (6.10%)	35.39%	1.61	00:02:53
4. Mexico	88,097 (4.51%)	84.76%	74,672 (5.04%)	33.32%	1.36	00:02:35
5. Egypt	70,210 (3.59%)	73.46%	51,575 (3.48%)	30.14%	1.56	00:03:29
6. France	63,794 (3.26%)	79.52%	50,728 (3.43%)	29.40%	1.49	00:02:42
7. Philippines	54,259 (2.78%)	73.95%	40,122 (2.71%)	39.19%	1.87	00:04:09
8. Canada	47,503 (2.43%)	72.75%	34,559 (2.33%)	30.39%	1.63	00:02:58
9. Colombia	43,481 (2.22%)	80.00%	34,786 (2.35%)	31.05%	1.50	00:03:17
10. Tunisia	42,135 (2.16%)	77.28%	32,564 (2.20%)	27.60%	1.16	00:02:28

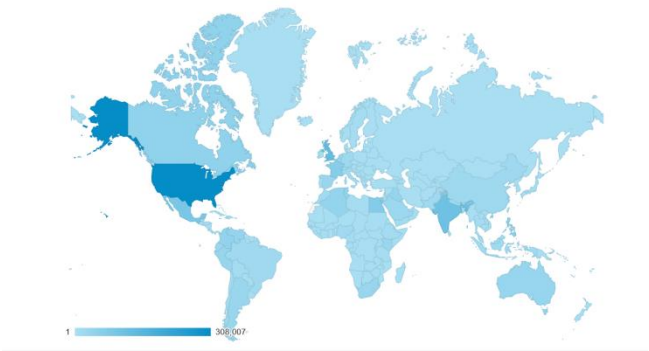


Figure 11: map showing SciDev.Net usage by country

The data from Google suggests there were a total of **1,954,614** sessions during 2014 to the SciDev.Net portal based upon the code available.

The top 10 countries' data is listed above with the **United States (308,007)** being the most active with just over double the number of visitors to its closest competitor, the **United Kingdom (128,589)**.

Figure 12 : SciDev.Net Southern usage data 2014

Country	Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration
India	109861	82.24%	90345	35.39%	1.61	173.35
Egypt	70210	73.46%	51575	30.14%	1.56	209.29
Philippines	54259	73.95%	40122	39.19%	1.87	248.61

Country	Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration
Kenya	29425	57.03%	16780	29.05%	2.10	304.12
Pakistan	17756	78.08%	13864	38.96%	1.50	169.02
Indonesia	16485	79.18%	13052	48.52%	1.48	154.29
Morocco	15330	82.93%	12713	26.13%	1.31	171.38
Palestine	15267	79.43%	12127	29.19%	1.28	148.11
Nigeria	14311	68.54%	9809	29.52%	1.62	252.58
Yemen	12845	76.57%	9836	29.01%	1.40	188.93
Nepal	12385	69.21%	8572	41.38%	1.57	203.64
Bolivia	11370	80.77%	9184	32.15%	1.35	194.99
Ethiopia	9871	76.30%	7532	32.42%	1.58	203.36
Bangladesh	8848	70.25%	6216	35.90%	1.58	180.80
Uganda	7652	65.13%	4984	22.94%	1.73	301.05
Senegal	7398	68.34%	5056	23.21%	2.30	310.14
Guatemala	7078	83.82%	5933	36.38%	1.34	149.57
Sri Lanka	6900	64.20%	4430	33.04%	1.81	208.83
Tanzania	6403	64.58%	4135	28.19%	1.87	266.69
Cameroon	6038	68.98%	4165	21.43%	1.74	273.77
Ghana	5596	64.72%	3622	25.30%	1.89	254.90
Côte d'Ivoire	5242	76.86%	4029	19.94%	1.79	227.03
Vietnam	5014	77.54%	3888	38.97%	1.39	165.61
Somalia	4721	80.98%	3823	32.05%	1.43	160.07
El Salvador	4618	86.05%	3974	28.87%	1.35	157.88
Nicaragua	4500	80.87%	3639	23.47%	1.42	174.30
Paraguay	4428	77.21%	3419	30.33%	1.28	183.28
Benin	3649	58.13%	2121	23.68%	1.97	347.83
Zimbabwe	3620	64.53%	2336	30.99%	1.70	259.18
Madagascar	3405	76.83%	2616	17.94%	1.78	292.45
Sudan	3389	76.10%	2579	21.69%	1.85	244.59
Honduras	3353	85.24%	2858	29.05%	1.31	154.87
Rwanda	2783	69.60%	1937	23.32%	1.64	280.28
Gambia	2349	76.29%	1792	33.55%	1.38	185.65
Zambia	2295	75.29%	1728	29.67%	1.86	206.50
Burkina Faso	2198	69.93%	1537	20.56%	1.64	345.26
Malawi	2115	68.84%	1456	25.72%	1.65	237.34
Cambodia	2105	66.08%	1391	26.98%	1.92	279.67
Afghanistan	2038	71.88%	1465	66.09%	1.29	113.51
Bhutan	1947	79.66%	1551	64.97%	1.39	99.14
Congo (DRC)	1943	78.90%	1533	20.79%	1.84	277.44

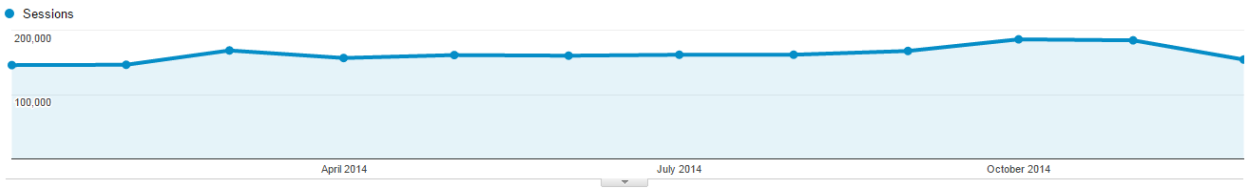
Country	Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration
Liberia	1908	83.28%	1589	35.69%	1.38	131.12
Ukraine	1650	73.70%	1216	39.76%	1.41	173.05
Syria	1569	85.91%	1348	21.22%	1.56	172.65
Mali	1486	66.69%	991	26.92%	1.69	282.38
Mauritania	1459	75.19%	1097	18.37%	1.40	275.42
Togo	1441	61.35%	884	34.00%	1.57	247.51
Niger	1154	68.11%	786	20.62%	1.86	382.23
Mozambique	1151	68.55%	789	22.07%	1.38	239.53
Haiti	1066	78.24%	834	22.05%	1.50	184.97
Myanmar (Burma)	1024	77.64%	795	29.59%	1.63	206.11
Guinea	985	80.30%	791	20.61%	1.65	231.24
Burundi	974	79.57%	775	22.79%	1.60	226.82
Djibouti	767	81.62%	626	24.38%	1.38	184.73
Lesotho	765	75.56%	578	26.14%	1.38	159.03
Papua New Guinea	730	74.11%	541	27.67%	1.60	231.06
South Sudan	720	70.00%	504	26.94%	1.42	242.33
Laos	610	59.18%	361	19.34%	1.58	269.54
Congo (Republic)	487	75.56%	368	18.89%	1.65	280.43
Guyana	403	70.97%	286	25.56%	1.37	287.47
Georgia	379	86.81%	329	40.37%	1.41	115.69
Sierra Leone	364	70.60%	257	28.30%	1.73	329.39
Kosovo	334	87.43%	292	39.22%	1.43	164.74
Swaziland	331	78.85%	261	29.91%	1.90	207.30
Mongolia	301	85.05%	256	40.53%	1.36	260.06
Samoa	291	65.64%	191	17.87%	1.73	298.71
Timor-Leste	286	47.90%	137	23.43%	1.77	270.14
Comoros	271	83.76%	227	21.03%	1.52	211.19
Chad	246	76.42%	188	23.17%	1.66	271.85
Vanuatu	209	67.46%	141	24.40%	1.67	352.65
Uzbekistan	188	76.60%	144	32.45%	1.85	214.78
Cape Verde	184	56.52%	104	30.98%	1.87	213.81
Kyrgyzstan	171	73.68%	126	31.58%	1.46	151.34
Moldova	153	88.24%	135	35.95%	1.64	119.49
Armenia	146	81.51%	119	28.77%	1.58	216.21
Solomon Islands	140	76.43%	107	24.29%	1.30	174.27
Kiribati	109	25.69%	28	19.27%	1.54	437.73
Central African Republic	86	80.23%	69	24.42%	1.95	339.02
Tajikistan	81	69.14%	56	27.16%	1.30	147.21

Country	Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration
American Samoa	63	73.02%	46	26.98%	1.22	188.49
Micronesia	63	66.67%	42	17.46%	1.48	164.48
Guinea-Bissau	46	58.70%	27	26.09%	3.87	545.43
Eritrea	32	96.88%	31	53.13%	1.59	141.44
São Tomé & Príncipe	20	75.00%	15	15.00%	1.40	188.95
Total / Average	535,843	**73.55%**	**402,211**	**29.05%**	**1.62**	**227.28**

From the **1,954,614** sessions **535,843** were from the South which constitutes just over a quarter of visitors to the portal. From the total **1,480,940** users **402,211** were from the South. On average users from the South visited **2** pages per visit, with a bounce rate of **29%** (both figures are consistent with all users of the site).

E.1.1.4 Device usage

Figure 13: SciDev.Net device usage data 2014 – Source = Google Analytics



	Device Category	Acquisition			Behavior		
		Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration
		1,954,614 % of Total: 100.00% (1,954,614)	75.77% Avg for View: 75.67% (0.12%)	1,480,940 % of Total: 100.12% (1,479,142)	32.91% Avg for View: 32.91% (0.00%)	1.55 Avg for View: 1.55 (0.00%)	00:03:07 Avg for View: 00:03:07 (0.00%)
	1. desktop	**1,498,449** (76.66%)	75.33%	1,128,752 (76.22%)	30.14%	1.62	00:03:23
	2. mobile	**353,973** (18.11%)	79.24%	280,477 (18.94%)	43.72%	1.31	00:02:06
	3. tablet	**102,192** (5.23%)	70.17%	71,711 (4.84%)	36.06%	1.38	00:02:41

From the data above a large majority of users are accessing the portal via **desktop devices**. Two conclusions can be drawn from this:

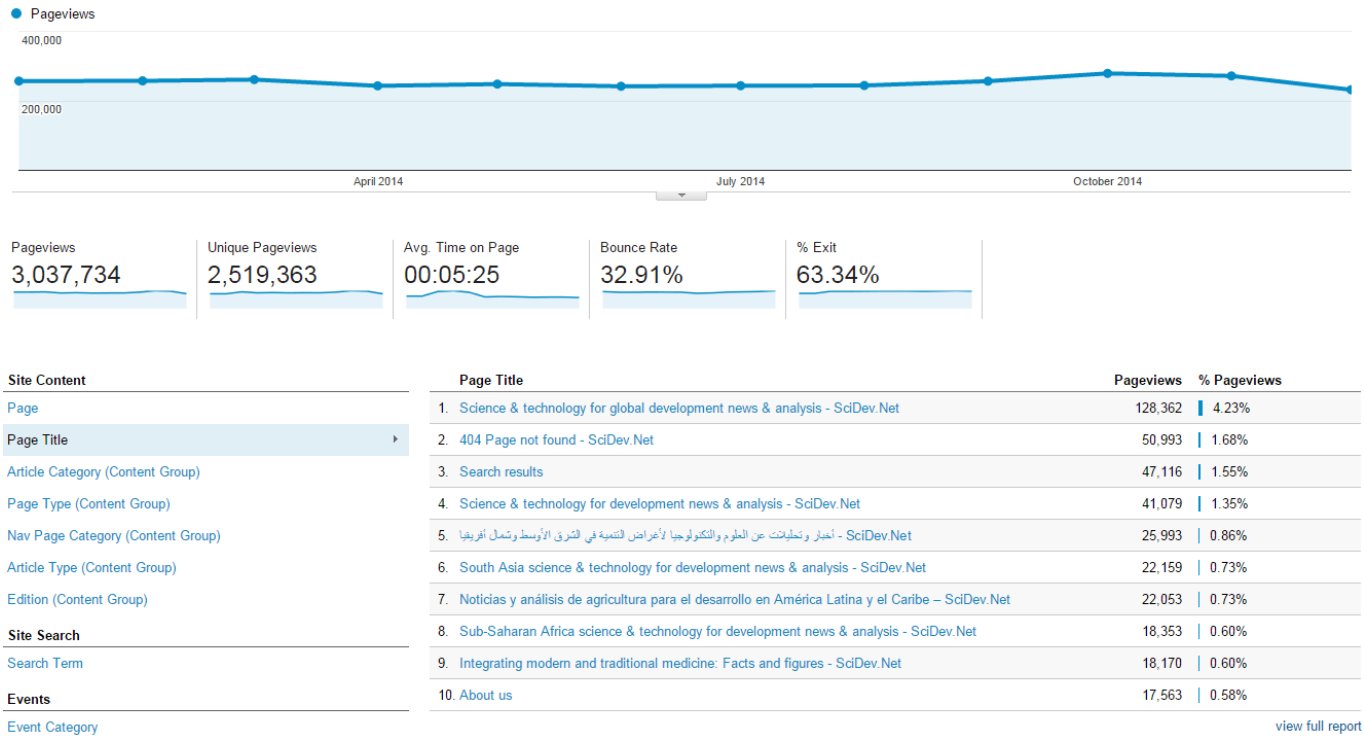
- Either the site isn't very mobile friendly and isn't conducive to mobile and tablet devices
- Or users who are interacting with the content tend to use / prefer desktop devices for searching and viewing content from the portal

It will be interesting to see if this changes in 2015 with the ever increasing use of mobile and tablet devices. However, interesting there are mobile users visiting the site via mobile devices than tablet. This could be due to the emergence and quality of connectivity with mobile devices and prominence of 4G / WiFi hotspots.

One would expect Mobile (**00:02:06**) users to have the lowest average session time then Tablet (**00:02:41**) and Desktop (**00:03:23**) users spending most time on the portal.

E.1.1.5 Page Views

Figure 14: SciDev.Net Page view data 2014 – Source = Google Analytics



According to Google Analytics over the course of 2014 there were a total of **3,037,734** page views, **2,519,363** of these were unique. The average time on a page was five minutes, twenty five seconds (**00:05:25**) with a bounce rate of **33%** and an exit rate of **63%**.

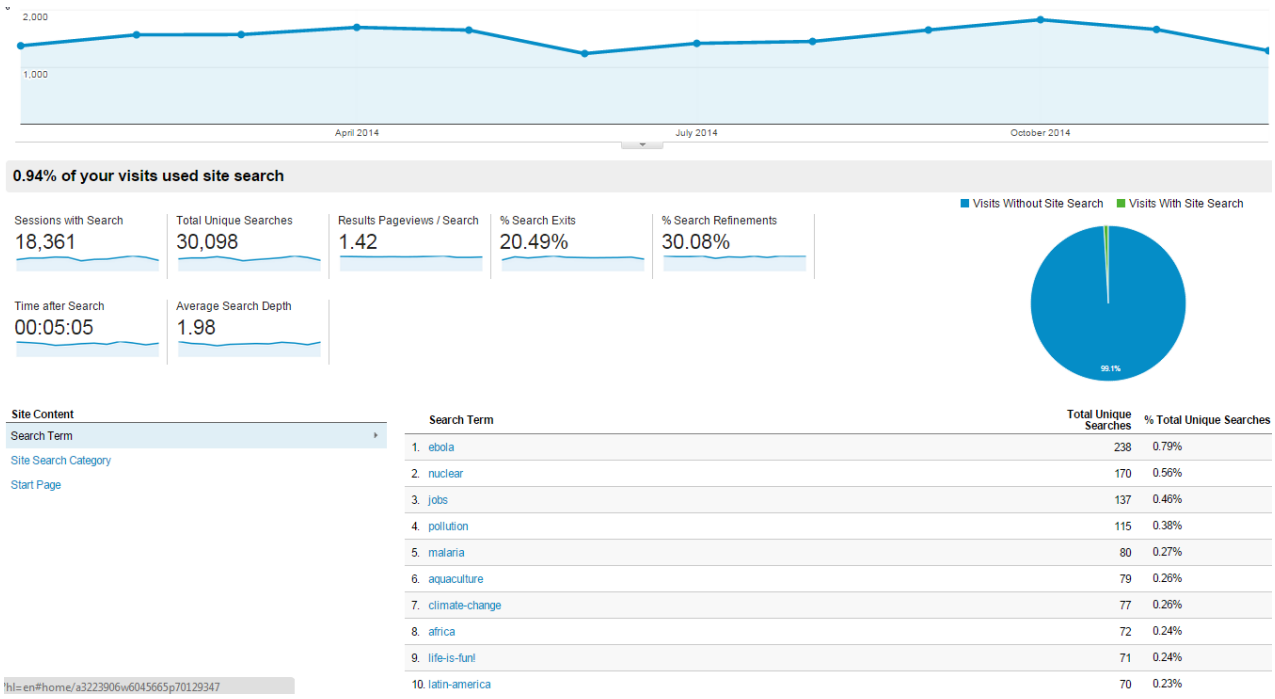
The data would suggest that users are only viewing a page once (and not returning to it) and they are engaging with the content and then leaving the site and a smaller proportion moving to another page.

The data also suggests that the “Global home” page is the most commonly viewed page by a large proportion which indicates that users are directly browsing to the home page of the Global version of the site. Looking at the next two most commonly viewed pages i.e. a “404 error” and then “search-results”

would suggest an issue with error related pages. Potentially this could result from search issues or pages returned from the search which are broken or no longer exist. Another explanation is that users are bookmarking pages which no longer exist or their URL (Uniform Resource Locator) change.

E.1.1.6 Search

Figure 15: SciDev.Net Search data 2014 – Source = Google Analytics



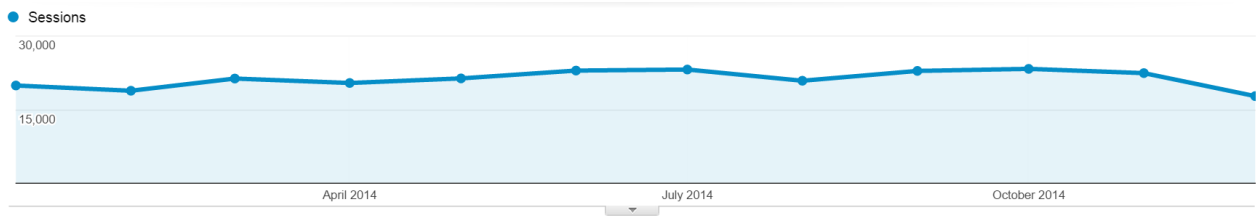
According to the data **0.94%** of users used the site search. There were **18,361** searches within sessions. This would suggest that users are directly browsing to content (either directly or via the menu) or that users are having difficulty with using the search.

It seems that users most commonly searched for the term "**ebola**" which, considering the current climate is to be expected.

E.2 R4D

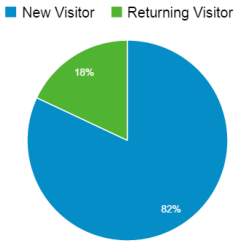
E.2.1.1 Overview Dashboard

Figure 16: R4D Web metric Overview 2014 – Source, Google Analytics



Sessions	Users	Pageviews	Pages / Session
255,310	212,526	480,032	1.88

Avg. Session Duration	Bounce Rate	% New Sessions
00:01:34	67.94%	81.96%

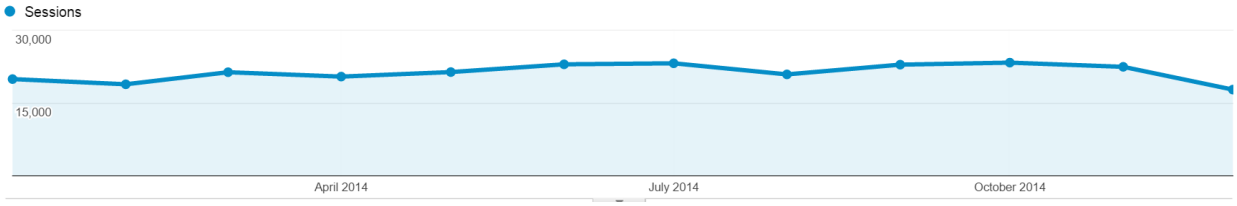


Demographics
Language
Country
City
System
Browser
Operating System
Service Provider
Mobile
Operating System
Service Provider

	Country	Sessions	% Sessions
1.	United Kingdom	50,477	19.77%
2.	India	28,866	11.31%
3.	United States	26,702	10.46%
4.	Kenya	9,533	3.73%
5.	Philippines	6,985	2.74%
6.	Netherlands	6,796	2.66%
7.	South Africa	6,012	2.35%
8.	Nigeria	5,887	2.31%
9.	Australia	5,629	2.20%
10.	Canada	5,204	2.04%

E.2.1.2 Session data

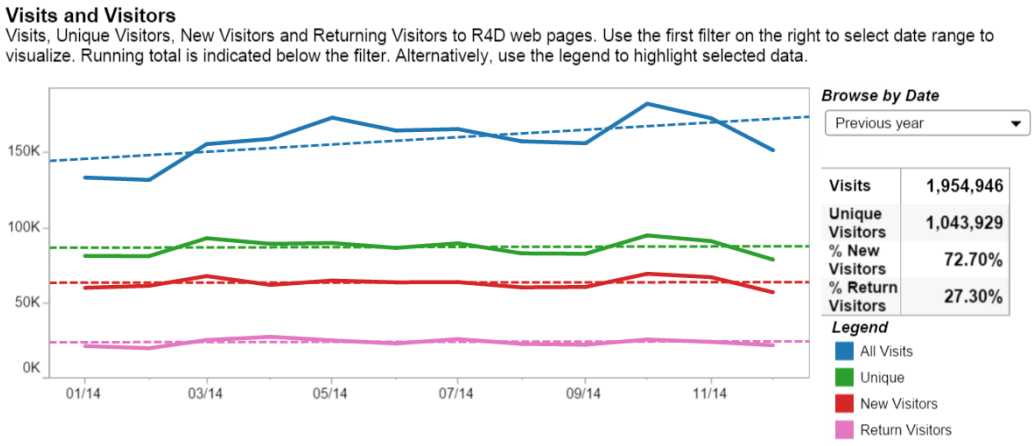
Figure 17: R4D Session data 2014 – Source = Google Analytics



User Type	Acquisition			Behavior		
	Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration
	255,310 % of Total: 100.00% (255,310)	81.99% Avg for View: 81.96% (0.04%)	209,331 % of Total: 100.04% (209,243)	67.94% Avg for View: 67.94% (0.00%)	1.88 Avg for View: 1.88 (0.00%)	00:01:34 Avg for View: 00:01:34 (0.00%)
1. New Visitor	**209,331** (81.99%)	100.00%	209,331 (100.00%)	70.37%	1.67	00:01:15
2. Returning Visitor	**45,979** (18.01%)	0.00%	0 (0.00%)	56.89%	2.83	00:03:02

- Looking at the session data, one can see that a majority of users of R4D were “new visitors”. However the data may be misleading if the “new visitors” were mobile, or tablet, or users accessing from a constantly changing IP address location, or those who do not store cookies on their device. This would prevent Google from recognising them as a “returning visitor” and class them as “new visitor”.

Figure 18: R4D Visit data 2014 – Source = SmarterStats Analytics



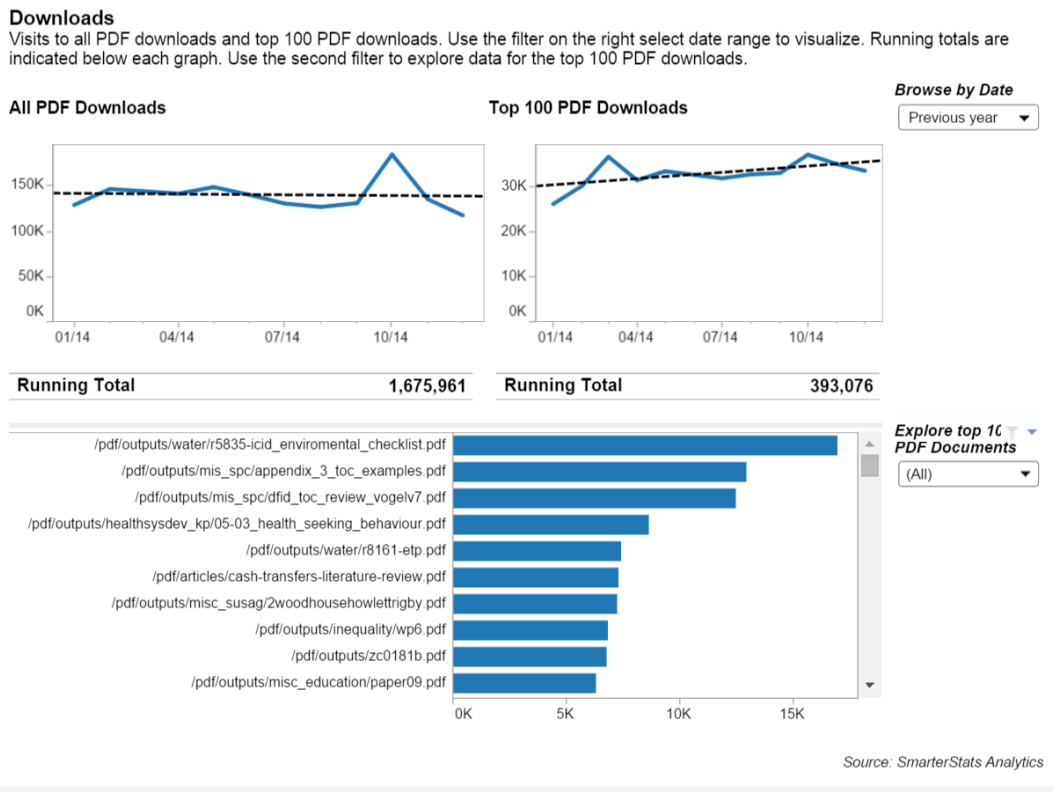
The data above suggests that a majority of visitors to the portal are new visitors, however this data is typically based on IP address. The discrepancy for number of unique visitors between Google Analytics and SmarterStats could potentially be linked back to downloads but also three potential technical problems, or finally it may well be that SmarterStats isn’t counting unique users correctly.

- If users browse directly to the download from another location SmarterStats will count this but Google won’t (as you can’t embed Google tracking code in a PDF), but SmarterStats would obtain the data from the logs.
- IP address. If users are sharing an IP address they won’t be counted as unique in Google Analytics, however SmarterStats may not use the same methodology of classing unique visitors.
- Cookies. Some users don’t save cookies or privately browse which means they don’t send data back or store data for Google to retrieve data on users. However SmarterStats data is based on server logging so cookies would not be required to obtain a count.
- Web proxy. Some users are behind a web proxy server which MAY prevent data being sent to Google.

- SmarterStats isn't calculating the unique visitor data correctly.

Unique visitors are determined by the number of unique IP addresses on incoming requests that a site receives, but this can never be 100% accurate. Depending on configuration issues and type of ISP service, in some cases, one IP address can represent many users; in other cases, several IP addresses can be from the same user. Another important fact to consider is the count of how many different people access a website. For example, if a user leaves and comes back to the site five times during the measurement period, that person is counted as one unique visitor, but would count as five "user sessions". It may simply be there is a difference between the measurement period to class a user as "unique" between SmarterStats and Google Analytics. One, some, or all of these factors may represent a data mismatch between SmarterStats and Google Analytics.

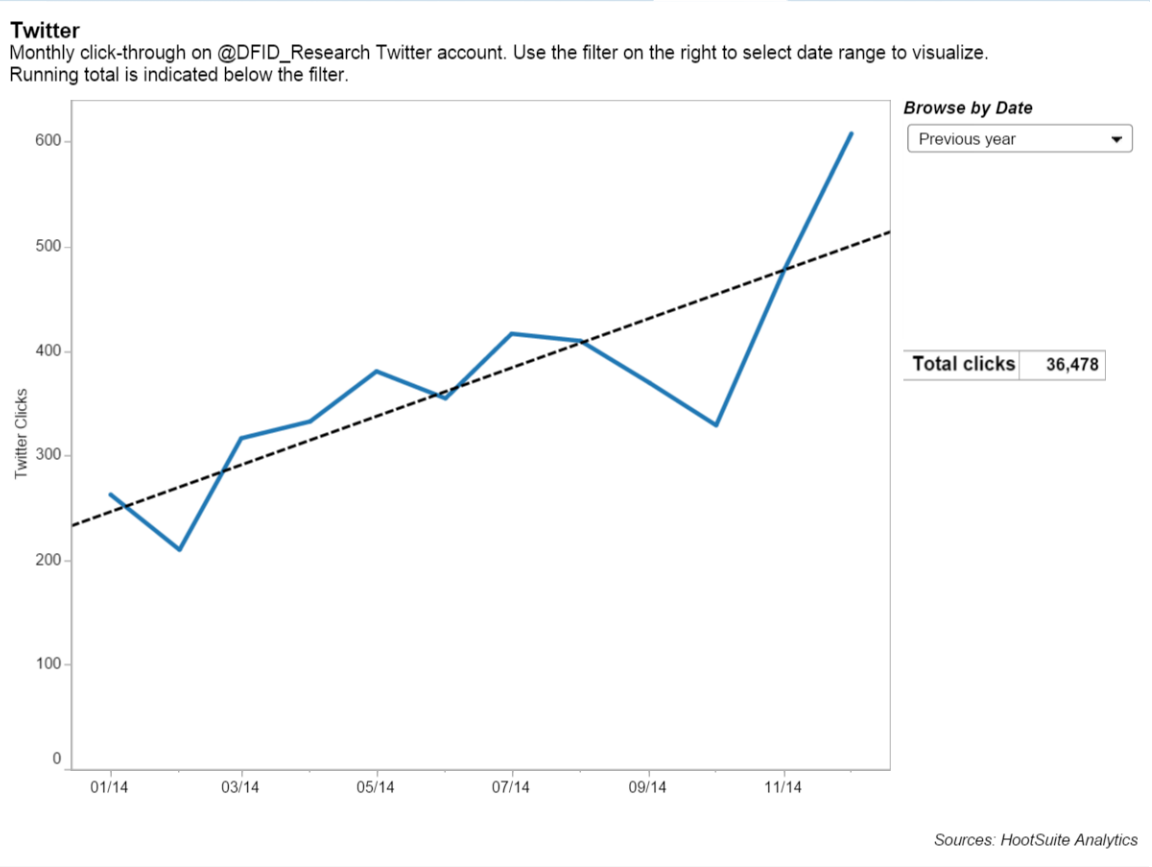
Figure 19: R4D Download data 2014 – Source = SmarterStats Analytics



Note that the graph above suggests that the data is based upon visits to the PDF download. It is unclear whether this constitutes a download, view or even if the visitor has read the PDF.

The total visits for 2014 were **1,675,961**.

Figure 20: R4D Twitter click-through data 2014 – Source - HootSuit Analytics

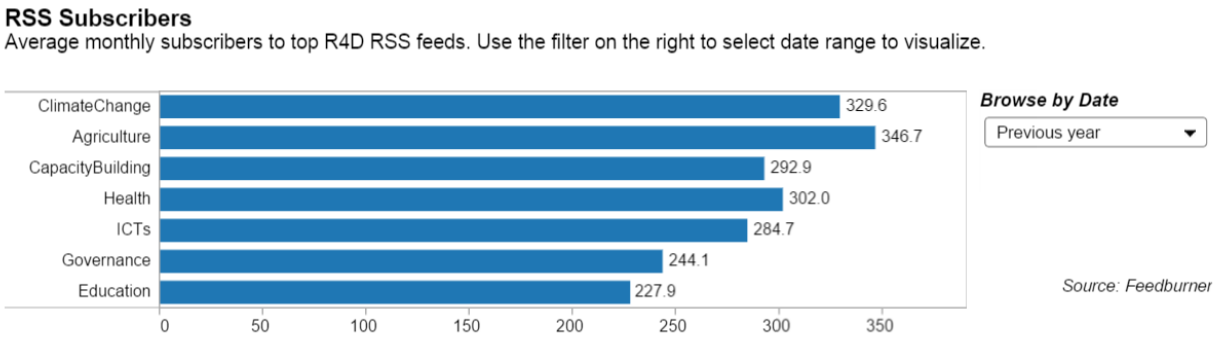


As figure 20 depicts above, R4D have suffered a slight loss of click-through in October 2014 but this took a steep rise in November and December to reach nearly 600 click-throughs.

According to the data, 2014 totalled **36,478** click-throughs from R4D's twitter account to their portal.

- R4D has a strong Twitter following. They frequently publish using this medium and it's the most prominent use of all metrics.
- As a result of the lack of interaction on Facebook the number of Facebook "likes" for R4D is far smaller than it should be, for a portal of this size, quality and nature.
- There are tools available which allow posting to both Social Media platforms from one console and therefore it is recommended that this be considered to, without any extra effort, increase exposure to a wider audience which may potentially be missed by not publishing content onto Facebook.

Figure 21: R4D RSS Subscriptions 2014 – Source =- Feedburner

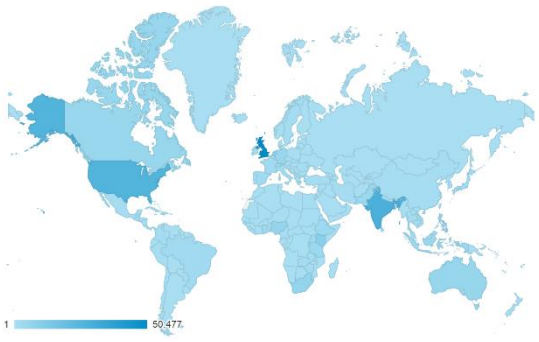


- R4D's subscription service shows the number of topics visitors to the site have subscribed to and received targeted RSS feeds based on the topic(s) of choice. Note: the figures above are a monthly average for the year 2014.
- R4D could make more use of Social Media platforms in line with the other portals offered by DFID and as a result the quality of reach measurement will not be as high as it could potentially be.
- Potentially the use of Smarter Stats may allow the team to report accurately on downloads however there are gaps in useful data due to limitations with available data. R4D may benefit from using a hybrid of Google Analytics and smarter stats to offer a more comprehensive set of metrics and stats.

E.2.1.3 Location

Figure 22: R4D Location data 2014 – Source = Google Analytics

Country	Acquisition			Behavior		
	Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration
	255,310 % of Total: 100.00% (255,310)	81.99% Avg for View: 81.96% (0.04%)	209,331 % of Total: 100.04% (209,243)	67.94% Avg for View: 67.94% (0.00%)	1.88 Avg for View: 1.88 (0.00%)	00:01:34 Avg for View: 00:01:34 (0.00%)
1. United Kingdom	**50,477** (19.77%)	70.63%	35,654 (17.03%)	57.31%	2.57	00:02:08
2. India	**28,866** (11.31%)	87.08%	25,136 (12.01%)	76.53%	1.56	00:01:14
3. United States	**26,702** (10.46%)	85.58%	22,851 (10.92%)	68.13%	1.86	00:01:16
4. Kenya	**9,533** (3.73%)	81.87%	7,805 (3.73%)	72.89%	1.65	00:01:31
5. Philippines	**6,985** (2.74%)	91.14%	6,366 (3.04%)	81.69%	1.29	00:00:59
6. Netherlands	**6,796** (2.66%)	84.56%	5,747 (2.75%)	70.73%	1.62	00:01:11
7. South Africa	**6,012** (2.35%)	84.88%	5,103 (2.44%)	69.59%	1.78	00:01:31
8. Nigeria	**5,887** (2.31%)	82.69%	4,868 (2.33%)	74.93%	1.67	00:01:45
9. Australia	**5,629** (2.20%)	82.59%	4,649 (2.22%)	66.05%	1.80	00:01:20
10. Canada	**5,204** (2.04%)	83.44%	4,342 (2.07%)	64.58%	1.93	00:01:28

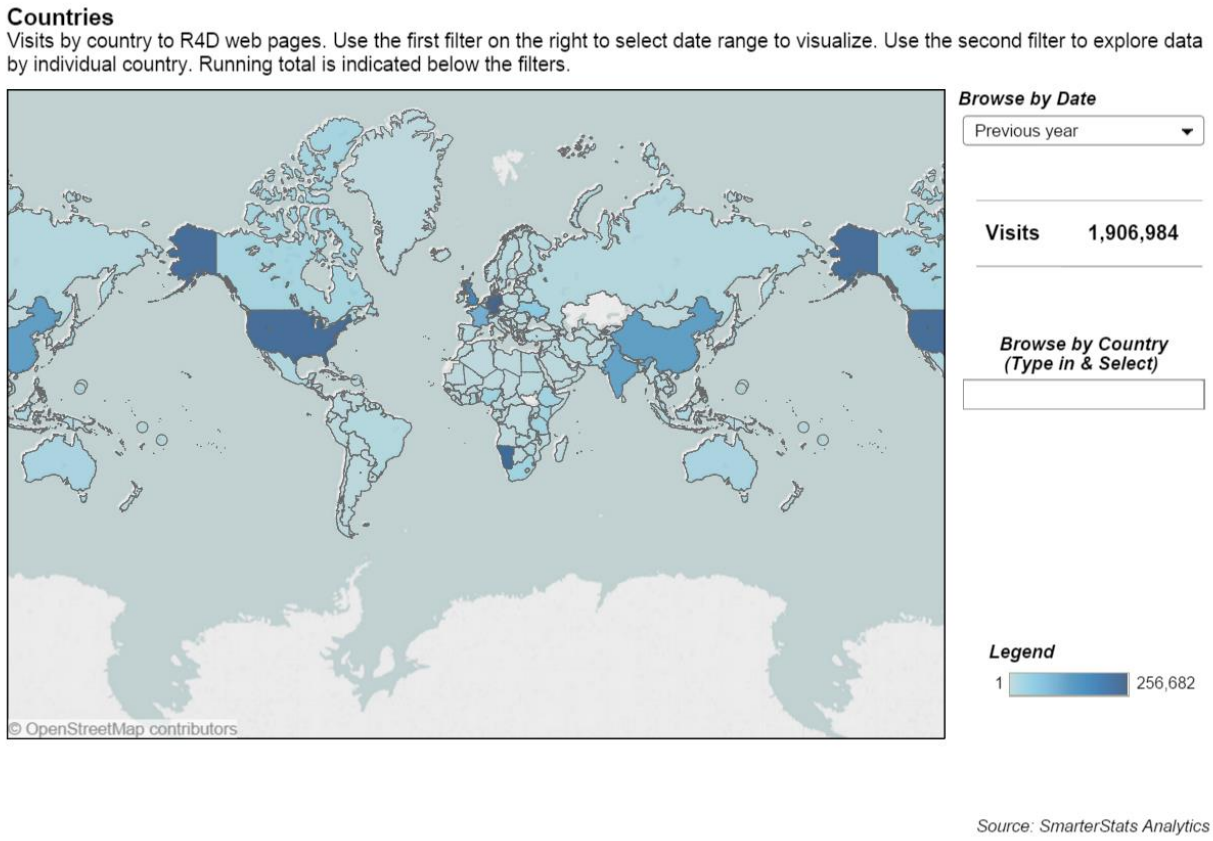


The data from Google suggests there were a total of **255,310** sessions during 2014 to the R4D site based upon the code available on the R4D portal.

The top 10 countries' data is listed above with the **United Kingdom (50,477)** being the most active with just under double the number of visitors to its closest competitor, **India (28,866)**.

Figure 23: Map showing R4D usage by country

Figure 24: R4D Location data 2014 – Source = SmarterStats Analytics



From the Smarter Stats we are only able to view the heat map; there are correlations with Google so it would suggest the data is accurate. The only available information is that there were a total of **1,906,984** visits, which is different to that displayed by Google; however Google's data is based upon sessions rather than visits. Unfortunately we cannot determine whether these are unique visitors.

One would expect differences in data as Google only tracks page views on the R4D site whereas SmarterStats Analytics will also take into account download / PDF views, which would account for the difference and significantly higher stats from SmarterStats Analytics.

Figure 25: R4D Southen usage data 2014 - Source = Google Analytics

Country	Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration
India	28866	87.08%	25136	76.53%	1.56	73.70

Country	Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration
Kenya	9533	81.87%	7805	72.89%	1.65	91.36
Philippines	6985	91.14%	6366	81.69%	1.29	59.11
Nigeria	5887	82.69%	4868	74.93%	1.67	104.51
Bangladesh	4578	84.93%	3888	70.23%	1.76	99.03
Pakistan	4383	87.25%	3824	68.99%	1.82	97.80
Indonesia	4094	87.47%	3581	76.38%	1.48	74.17
Ethiopia	3960	83.51%	3307	69.97%	1.76	111.37
Tanzania	3897	82.70%	3223	72.90%	1.60	100.96
Uganda	3646	82.67%	3014	70.76%	1.67	110.38
Ghana	3332	79.02%	2633	70.80%	1.64	108.34
Zimbabwe	2293	83.04%	1904	75.10%	1.45	95.88
Nepal	1744	80.33%	1401	63.99%	1.94	113.75
Sri Lanka	1552	87.24%	1354	76.03%	1.43	60.11
Vietnam	1535	84.56%	1298	67.88%	1.64	83.34
Egypt	1192	79.36%	946	70.47%	1.76	95.49
Zambia	1174	85.60%	1005	68.99%	1.71	100.38
Malawi	883	82.67%	730	66.82%	1.66	97.00
Rwanda	762	85.96%	655	74.28%	1.64	118.25
Cambodia	521	83.30%	434	68.91%	1.84	92.16
Cameroon	493	87.02%	429	67.75%	1.91	181.79
Sudan	474	79.54%	377	68.99%	2.24	170.77
Myanmar (Burma)	464	82.33%	382	68.10%	1.72	126.62
Afghanistan	442	76.92%	340	56.56%	2.34	170.29
Bolivia	425	86.59%	368	75.53%	1.46	91.54
Mozambique	329	78.12%	257	59.27%	2.13	115.50
Somalia	312	79.81%	249	67.31%	2.04	140.37
Congo (DRC)	265	63.40%	168	55.09%	2.23	154.01
Senegal	255	81.96%	209	61.18%	2.03	131.94
Sierra Leone	241	79.67%	192	62.66%	2.14	165.97
South Sudan	190	74.21%	141	59.47%	4.03	299.73
Laos	165	80.00%	132	64.24%	1.87	99.72
Papua New Guinea	159	86.79%	138	74.21%	1.80	103.26
Côte d'Ivoire	153	86.27%	132	70.59%	1.83	109.05
Guyana	149	86.58%	129	69.80%	1.54	125.61
Bhutan	140	74.29%	104	70.00%	1.61	88.59
Yemen	138	84.78%	117	62.32%	2.12	163.07
Swaziland	127	85.04%	108	69.29%	2.20	143.86
Liberia	124	87.10%	108	66.13%	1.98	113.93

Country	Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration
Gambia	123	60.16%	74	78.86%	1.86	70.94
Burkina Faso	119	82.35%	98	60.50%	2.40	185.68
Benin	112	78.57%	88	75.00%	1.90	119.88
Guatemala	107	85.98%	92	69.16%	1.53	63.93
Madagascar	98	78.57%	77	61.22%	1.96	254.55
Mali	91	84.62%	77	57.14%	1.97	154.49
Lesotho	88	89.77%	79	70.45%	1.43	87.09
Timor-Leste	76	80.26%	61	59.21%	2.17	213.58
Honduras	75	90.67%	68	65.33%	1.51	114.27
Burundi	73	76.71%	56	60.27%	1.75	105.82
Nicaragua	73	91.78%	67	61.64%	1.48	95.63
Mongolia	62	96.77%	60	67.74%	1.34	53.10
Haiti	57	77.19%	44	66.67%	1.75	135.74
Niger	56	78.57%	44	58.93%	1.71	141.09
Kosovo	50	88.00%	44	66.00%	1.66	42.40
Libya	47	89.36%	42	65.96%	1.72	46.77
Paraguay	32	68.75%	22	71.88%	1.34	23.31
Solomon Islands	32	87.50%	28	71.88%	1.47	64.94
Togo	32	87.50%	28	65.63%	1.75	108.03
Djibouti	28	82.14%	23	67.86%	1.46	134.39
Congo (Republic)	21	71.43%	15	47.62%	1.86	175.33
Cape Verde	18	83.33%	15	72.22%	1.56	95.56
Chad	18	77.78%	14	55.56%	1.50	150.94
Eritrea	13	76.92%	10	76.92%	1.54	153.46
Samoa	13	100.00%	13	76.92%	1.15	63.54
Mauritania	12	100.00%	12	66.67%	1.58	189.67
New Caledonia	11	100.00%	11	63.64%	1.45	34.18
Central African Republic	10	90.00%	9	70.00%	1.30	116.50
Guinea	10	100.00%	10	80.00%	1.10	17.10
Micronesia	8	62.50%	5	25.00%	2.88	466.50
Kiribati	3	100.00%	3	100.00%	1.00	0.00
Guinea-Bissau	2	100.00%	2	0.00%	10.00	285.00
Comoros	2	100.00%	2	100.00%	1.00	0.00
Total / Average	**97,434**	**83.89%**	**82,745**	**67.26%**	**1.87**	**118.70**

From the **255,312** sessions **97,424** were from the South which constitutes a large proportion of visitors to the portal. From the total **212,526** users **82,745** were from the South. On average users from the South

visited **2** pages per visit, although they had a high bounce rate of 67% (both figures are consistent with all users of the site).

E.2.1.4 Device usage

Figure 26: R4D device usage data 2014 – Source = Google Analytics

Device Category	Acquisition			Behavior		
	Sessions ↓	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration
	255,310 % of Total: 100.00% (255,310)	81.99% Avg for View: 81.96% (0.04%)	209,331 % of Total: 100.04% (209,243)	67.94% Avg for View: 67.94% (0.00%)	1.88 Avg for View: 1.88 (0.00%)	00:01:34 Avg for View: 00:01:34 (0.00%)
1. desktop	**215,898** (84.56%)	81.27%	175,454 (83.82%)	65.61%	1.97	00:01:41
2. mobile	**31,723** (12.43%)	87.45%	27,742 (13.25%)	82.67%	1.30	00:00:50
3. tablet	**7,689** (3.01%)	79.79%	6,135 (2.93%)	72.71%	1.75	00:01:22

From the data above a large majority of users are accessing the portal via desktop devices. Two conclusions can be drawn from this:

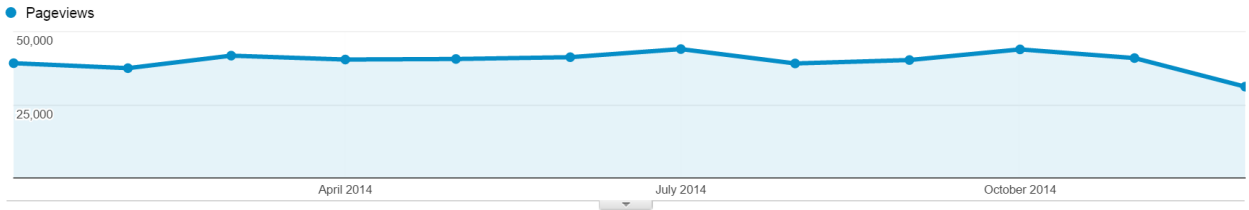
- Either the site isn't very mobile friendly and isn't conducive to mobile and tablet devices
- Or users who are downloading tend to use / prefer desktop devices for searching and downloading from the portal

It will be interesting to see if this changes in 2015 with the ever increasing use of mobile and tablet devices. However, it is interesting there are more mobile users visiting the site via mobile devices than tablet. This could be due to the emergence and quality of connectivity with mobile devices and prominence of 4G / WiFi hotspots.

One would expect Mobile (**00:00:50**) users to have the lowest average session time then Tablet (**00:01:22**) and Desktop (**00:01:41**) users spending most time on the portal.

E.2.1.5 Page Views

Figure 27: R4D Page view data 2014 – Source = Google Analytics



Pageviews	Unique Pageviews	Avg. Time on Page	Bounce Rate	% Exit
480,032	404,410	00:01:46	67.94%	53.00%

Site Content
- Page
- Page Title

Site Search
- Search Term

Events
- Event Category

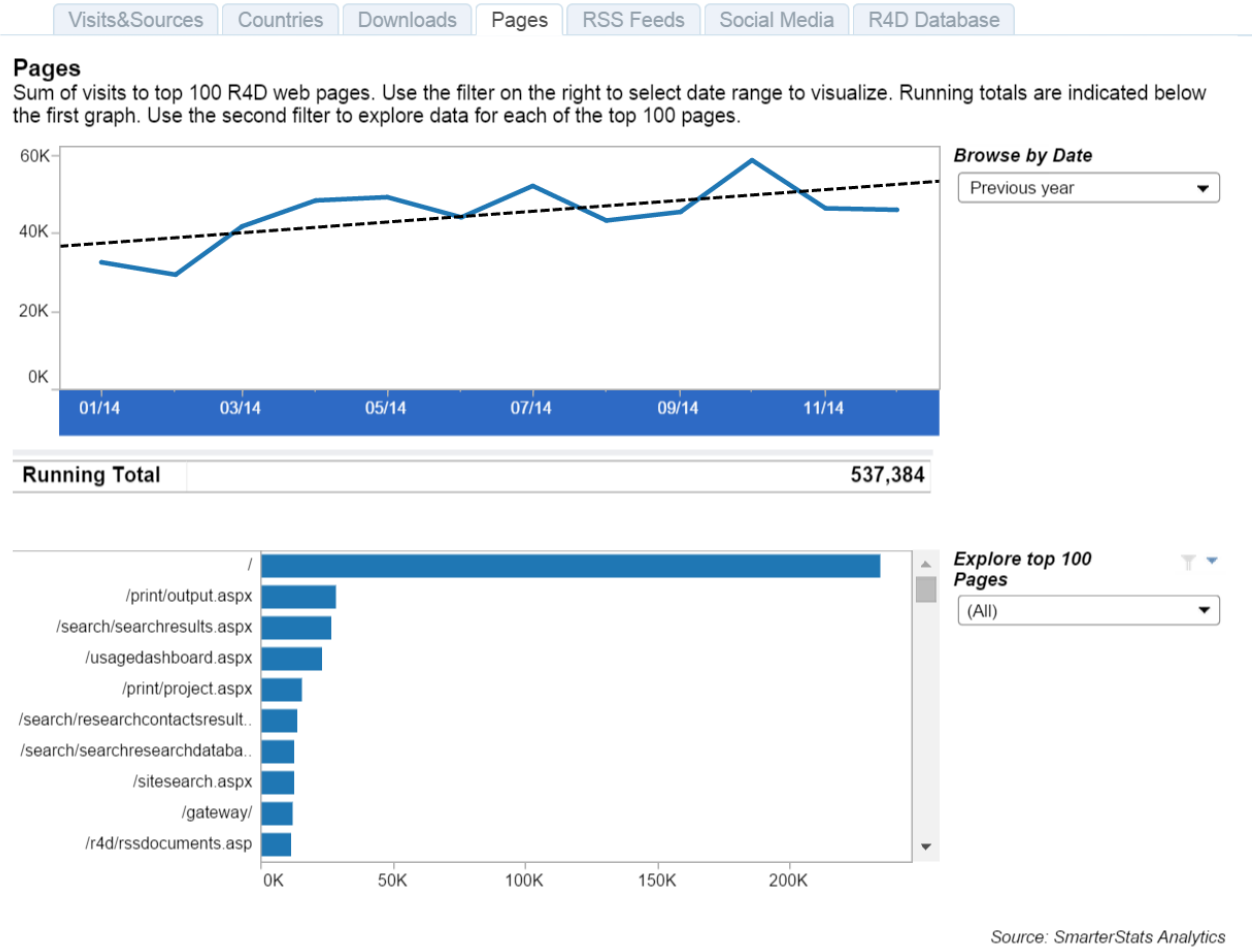
	Page Title	Pageviews	% Pageviews
1.	DFID - Research for Development - Advanced Search Results	76,782	16.00%
2.	DFID - Research for Development - Home	28,799	6.00%
3.	DFID - Research for Development - Site search	17,464	3.64%
4.	(not set)	12,225	2.55%
5.	DFID - Research for Development - Research Contact Results	11,139	2.32%
6.	DFID - Research for Development - Search Research Database	8,748	1.82%
7.	DFID - Research for Development - Research by Country	8,559	1.78%
8.	DFID - Research for Development - Research by Themes	7,696	1.60%
9.	DFID - Research for Development - Links to Documents	5,255	1.09%
10.	DFID - Research for Development - Systematic Reviews	3,583	0.75%

According to Google Analytics over the course of 2014 there were a total of **480,032** page views, **404, 410** of these were unique. The average time on a page was one minute, forty six seconds (**00:01:46**) with a bounce rate of **68%**.

The data would suggest that over half of the users of the portal are not even viewing the page. However as this may relate to downloads or PDF links that would correlate to a high bounce rate. On the other hand if you consider the average time on a page of 01:46 this would suggest users are staying on the page far longer than expected if viewing a download. This could either be because of a long waiting time for downloads due to size or connectivity.

The data also suggests that the “Advanced Search Results” page is the most commonly viewed page by a large proportion which again indicates that users are using the search but the data would suggest with the high bounce rate that the results and pages returned do not correspond to search results, or that the user isn’t clear on how to use the search facility to reach their destination of choice.

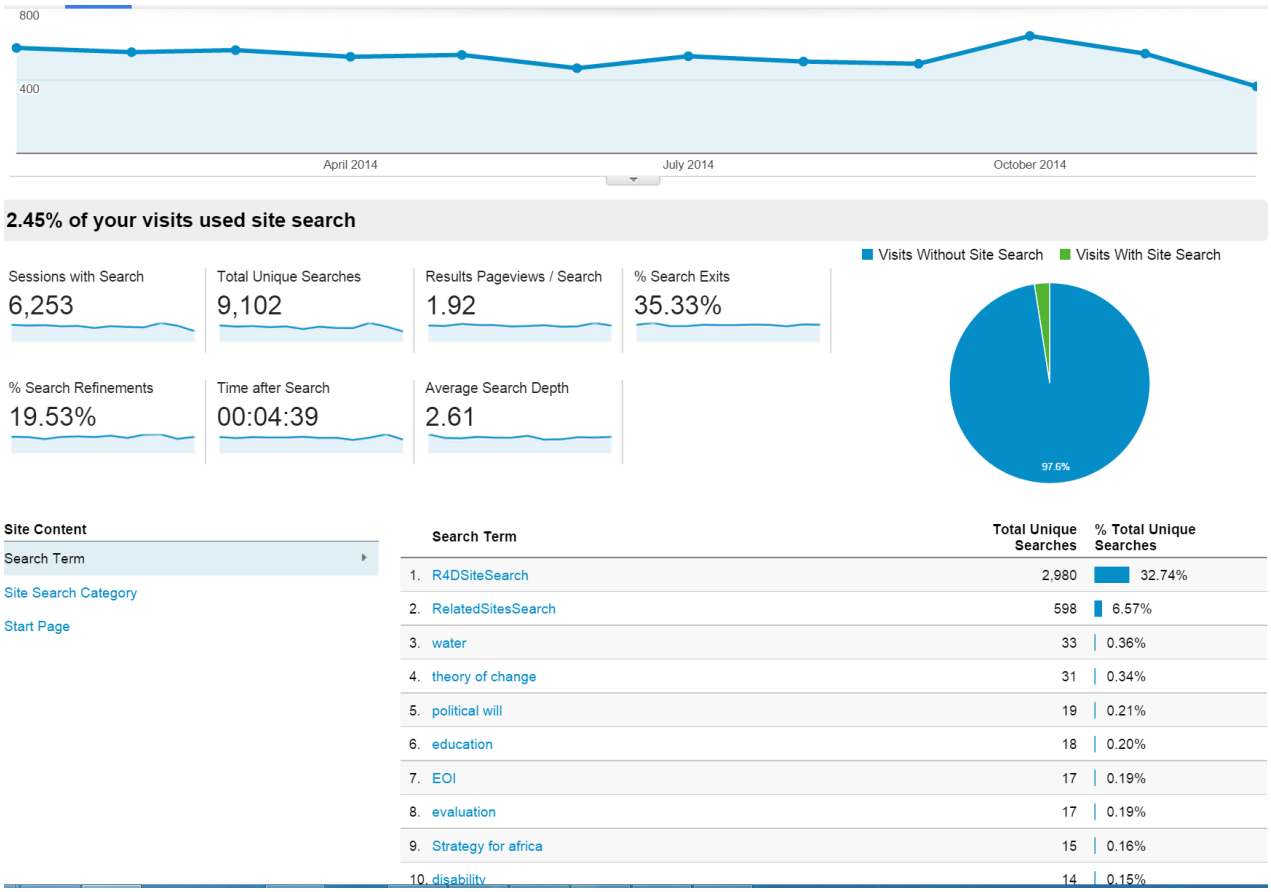
Figure 28: R4D Pages data 2014 – Source = SmarterStats Analytics



There is a mismatch between the data from Google Analytics to SmarterStats by nearly fifty thousand. SmarterStats suggest the running total for 2014 was **537,834** page views, whereas Google Analytics suggests **480,032**. It is understood that this may relate to PDFs but it would be anticipated, if this was the case, that the difference would have been far higher due to Google inability to track downloads. The only factor which could explain the data difference would be some downloads are triggered via page load and others via direct download.

E.2.1.6 Search

Figure 29: R4D Search data 2014 – Source = Google Analytics



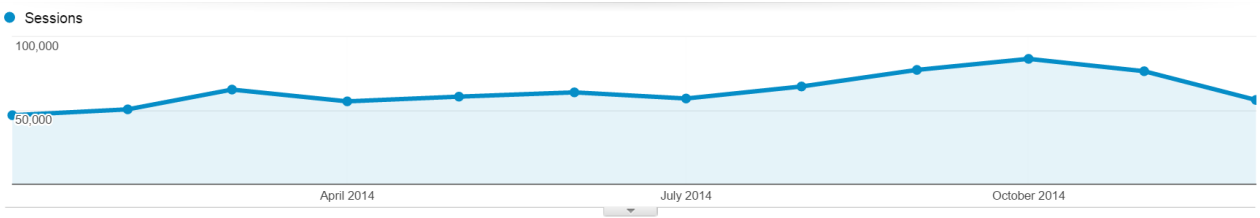
According to the data **2.45%** of users used the site search, which for a portal of this focus and type, one would expect this figure to be higher. There were **6,253** searches within sessions.

It seems that users most commonly searched for the term “R4DSiteSearch” which would suggest that users are having difficulty locating the search or a suitable search which was also reiterated as part of the R4D Sprint 1 Report 2014-10-22.pdf, in which users’ difficulty with the search was also suggested.

E.3 Eldis

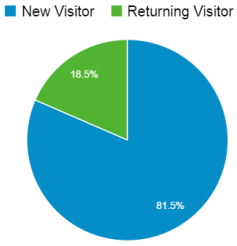
E.3.1.1 Overview Dashboard

Figure 30: Eldis Web metric overview 2014 – Source = Google Analytics



Sessions	Users	Pageviews	Pages / Session
759,072	626,073	1,753,806	2.31

Avg. Session Duration	Bounce Rate	% New Sessions
00:02:09	28.98%	81.46%

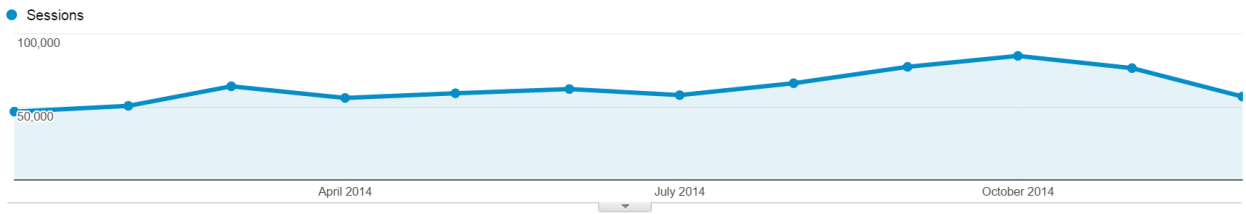


Demographics
Language
Country
City
System
Browser
Operating System
Service Provider
Mobile
Operating System
Service Provider

	Country	Sessions	% Sessions
1.	United States	148,679	19.59%
2.	United Kingdom	90,338	11.90%
3.	India	63,407	8.35%
4.	Kenya	23,212	3.06%
5.	Canada	20,562	2.71%
6.	Australia	19,804	2.61%
7.	Netherlands	19,765	2.60%
8.	Philippines	18,921	2.49%
9.	South Africa	18,018	2.37%
10.	Germany	17,811	2.35%

E.3.1.2 Session data

Figure 31: Eldis Session data 2014 – Source = Google Analytics



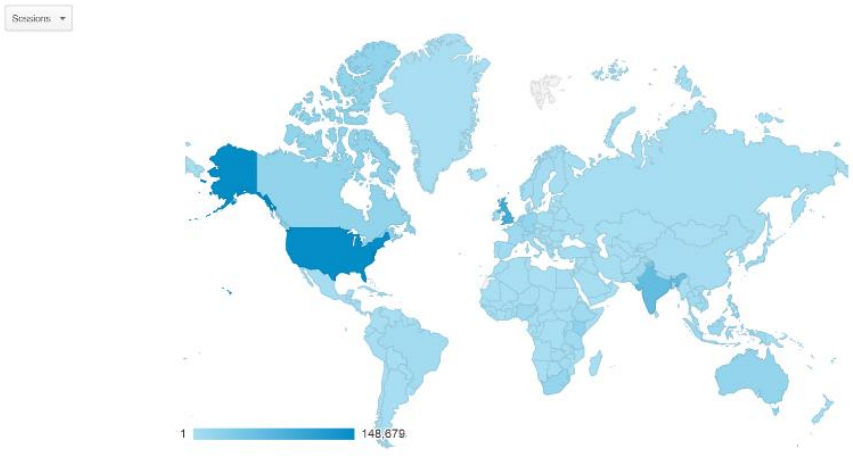
User Type	Acquisition			Behavior		
	Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration
	759,072 % of Total: 100.00% (759,072)	81.51% Avg for View: 81.46% (0.06%)	618,746 % of Total: 100.06% (618,355)	28.98% Avg for View: 28.98% (0.00%)	2.31 Avg for View: 2.31 (0.00%)	00:02:09 Avg for View: 00:02:09 (0.00%)
1. New Visitor	**618,746** (81.51%)	100.00%	618,746(100.00%)	28.81%	2.00	00:01:39
2. Returning Visitor	**140,326** (18.49%)	0.00%	0 (0.00%)	29.73%	3.69	00:04:22

- Looking at the session data, one can see that a majority of users of Eldis were “new visitors”.
- However the data may be misleading for the following reasons:
  - if the “new visitors” were mobile or tablet with / or the user accessing from a constantly changing IP address location
  - the user is unable to store cookies on their device
  - javascript is disabled on the device (although it is appreciated if this was the case most website wouldn’t function correctly)
  - the user is visiting on a device using a proxy server or browsing privately
  - This would prevent Google from recognising them as a “returning visitor” and class them as “new visitor”.
- Another point to raise is that returning visitors do tend to stay on the site three times longer than that of new visitors, with their session duration lasting (on average) **4 minutes 22 seconds** (**00:04:22**) whereas new visitors tend to stay on the site for **1 minutes, 39 seconds** (**00:01:39**).

E.3.1.3 Location

Figure 32: Eldis Location data 2014 – Source = Google Analytics

Country	Acquisition			Behavior		
	Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration
	759,072 % of Total: 100.00% (759,072)	81.51% Avg for View: 81.46% (0.06%)	618,746 % of Total: 100.06% (618,355)	28.98% Avg for View: 28.98% (0.00%)	2.31 Avg for View: 2.31 (0.00%)	00:02:09 Avg for View: 00:02:09 (0.00%)
1. United States	148,679 (19.59%)	88.87%	132,137 (21.36%)	33.72%	1.91	00:01:09
2. United Kingdom	90,338 (11.90%)	72.62%	65,604 (10.60%)	29.26%	2.76	00:02:44
3. India	63,407 (8.35%)	85.83%	54,422 (8.80%)	21.27%	1.97	00:01:53
4. Kenya	23,212 (3.06%)	76.97%	17,866 (2.89%)	25.97%	2.49	00:02:54
5. Canada	20,562 (2.71%)	78.84%	16,212 (2.62%)	24.40%	2.59	00:02:20
6. Australia	19,804 (2.61%)	81.79%	16,197 (2.62%)	22.83%	2.20	00:01:53
7. Netherlands	19,765 (2.60%)	80.72%	15,954 (2.58%)	24.50%	2.20	00:01:51
8. Philippines	18,921 (2.49%)	87.41%	16,538 (2.67%)	27.36%	1.87	00:02:04
9. South Africa	18,018 (2.37%)	82.06%	14,786 (2.39%)	22.38%	2.38	00:02:31
10. Germany	17,811 (2.35%)	74.29%	13,231 (2.14%)	34.19%	3.66	00:03:53



The data from Google suggests there were a total of **759,072** sessions during 2014 to the Eldis portal.

The top 10 countries' data is listed above. Similar to SciDev.Net, the **United States (148,679)** being the most active with slightly under double the number of visitors to its closest competitor, the **United Kingdom (90,338)**.

Figure 33: Map showing Eldis usage by country

Figure 34: Eldis Southern usage data 2014 - Source = Google Analytics

Country	Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration
India	63407	85.83%	54422	21.27%	1.97	113.33
Kenya	23212	76.97%	17866	25.97%	2.49	174.33
Philippines	18921	87.41%	16538	27.36%	1.87	123.60
Nigeria	10950	77.93%	8533	25.37%	2.46	183.64
Pakistan	10176	83.25%	8472	29.48%	2.20	139.70
Indonesia	10101	85.09%	8595	25.21%	1.88	105.05
Ethiopia	9848	76.16%	7500	28.04%	2.68	217.76
Bangladesh	9369	79.39%	7438	24.03%	2.35	159.26
Uganda	8302	74.15%	6156	27.04%	3.24	241.56
Tanzania	8119	74.34%	6036	22.13%	3.12	262.68
Zimbabwe	5374	75.25%	4044	27.74%	2.79	227.72
Ghana	5258	74.50%	3917	28.43%	2.57	204.23
Vietnam	5101	85.02%	4337	25.45%	1.90	107.77
Nepal	4439	76.82%	3410	28.45%	2.73	203.64
Sri Lanka	3411	75.81%	2586	30.81%	1.96	102.35
Egypt	3347	82.13%	2749	36.24%	2.14	116.46
Malawi	3260	68.59%	2236	22.48%	3.59	266.51
Zambia	2825	78.27%	2211	22.23%	2.76	203.30
Cambodia	2800	79.93%	2238	23.18%	2.26	128.82
Rwanda	1708	78.40%	1339	24.53%	2.75	209.21
Cameroon	1657	68.14%	1129	28.49%	4.20	364.68
Morocco	1623	88.66%	1439	43.31%	1.88	79.18
Sudan	1179	68.79%	811	27.91%	3.16	261.54
Senegal	1131	64.72%	732	36.96%	3.63	276.74
Honduras	1060	83.68%	887	68.21%	2.07	88.70
Somalia	1001	77.82%	779	35.06%	2.85	244.55
Afghanistan	994	73.14%	727	32.39%	2.96	184.69
Myanmar (Burma)	992	80.44%	798	32.26%	2.36	186.56
Sierra Leone	930	55.05%	512	31.29%	5.16	515.38
Bolivia	785	88.28%	693	32.48%	2.20	132.90
Mozambique	781	73.62%	575	26.25%	3.64	253.56
Côte d'Ivoire	678	57.37%	389	30.68%	6.35	477.43
South Sudan	654	66.06%	432	39.14%	3.22	298.55
Congo (DRC)	640	57.50%	368	36.41%	4.44	381.36
Guatemala	623	69.82%	435	54.57%	2.08	102.36
Papua New Guinea	540	84.07%	454	29.07%	2.44	169.36
Laos	521	66.03%	344	32.44%	2.98	220.80

Country	Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration
Liberia	520	76.15%	396	37.12%	3.21	269.61
Yemen	513	77.19%	396	41.91%	2.37	164.73
Burkina Faso	500	54.00%	270	32.80%	4.87	421.36
Lesotho	498	79.12%	394	20.28%	2.77	198.46
Benin	488	55.74%	272	32.38%	2.81	218.47
Georgia	479	85.80%	411	34.24%	2.57	110.63
Guyana	456	85.09%	388	21.05%	1.69	127.46
Bhutan	454	87.67%	398	22.25%	1.89	144.95
Haiti	391	76.47%	299	46.80%	2.74	172.97
Mali	358	54.75%	196	47.21%	3.09	245.66
Nicaragua	357	70.03%	250	36.41%	3.59	205.85
Armenia	355	86.48%	307	38.03%	1.70	67.39
Madagascar	348	60.06%	209	27.30%	6.10	356.10
Mongolia	323	83.90%	271	23.53%	2.74	155.90
Swaziland	313	83.39%	261	22.68%	2.25	132.88
Moldova	280	81.07%	227	37.14%	1.78	72.62
Gambia	268	72.76%	195	29.10%	3.53	289.15
Burundi	265	76.60%	203	29.81%	3.57	256.86
Togo	250	64.00%	160	41.20%	2.52	229.02
Kosovo	249	83.13%	207	32.93%	2.05	73.19
Timor-Leste	225	68.00%	153	38.67%	4.72	278.56
Niger	213	68.54%	146	53.99%	2.25	186.01
Kyrgyzstan	194	80.41%	156	39.18%	2.07	128.66
Guinea	193	43.01%	83	58.03%	2.47	146.85
Tajikistan	181	71.82%	130	26.52%	2.90	211.67
Belize	172	82.56%	142	17.44%	2.09	138.41
Vanuatu	121	63.64%	77	10.74%	8.13	450.31
Djibouti	108	74.07%	80	44.44%	3.73	311.25
Chad	108	66.67%	72	38.89%	5.36	571.83
Congo (Republic)	96	66.67%	64	35.42%	2.56	248.04
Paraguay	90	96.67%	87	50.00%	1.79	102.02
Mauritania	78	75.64%	59	41.03%	3.09	149.94
Samoa	66	65.15%	43	27.27%	2.71	216.26
Central African Republic	61	70.49%	43	59.02%	3.07	302.02
Cape Verde	61	68.85%	42	31.15%	2.61	153.23
Guinea-Bissau	57	24.56%	14	50.88%	2.35	248.98
Eritrea	33	84.85%	28	30.30%	2.94	389.70

Country	Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration
Comoros	21	71.43%	15	33.33%	1.90	106.00
Micronesia	16	68.75%	11	18.75%	1.56	85.25
Kiribati	10	90.00%	9	30.00%	1.60	96.40
Equatorial Guinea	9	77.78%	7	33.33%	1.00	2.78
Total / Average	**235,495**	**73.99%**	**189,298**	**32.88%**	**2.87**	**207.26**

From the **759,072** sessions **235,495** were from the South – i.e. 30%. On average users from the South visited **3** pages per visit, although they had a moderate bounce rate of 33% (both figures are relatively consistent with all users of the site).

E.3.1.4 Device usage

Figure 35: Eldis device usage data 2014 – Source = Google Analytics

Device Category	Acquisition			Behavior		
	Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration
	759,072 % of Total: 100.00% (759,072)	81.51% Avg for View: 81.46% (0.06%)	618,746 % of Total: 100.06% (618,355)	28.98% Avg for View: 28.98% (0.00%)	2.31 Avg for View: 2.31 (0.00%)	00:02:09 Avg for View: 00:02:09 (0.00%)
1. desktop	**639,221** (84.21%)	81.31%	519,754 (84.00%)	29.37%	2.40	00:02:16
2. mobile	**94,014** (12.39%)	84.42%	79,366 (12.83%)	25.83%	1.68	00:01:27
3. tablet	**25,837** (3.40%)	75.96%	19,626 (3.17%)	30.73%	2.43	00:02:09

From the data above a large majority of users are accessing the portal via desktop devices. Two conclusions can be drawn from this:

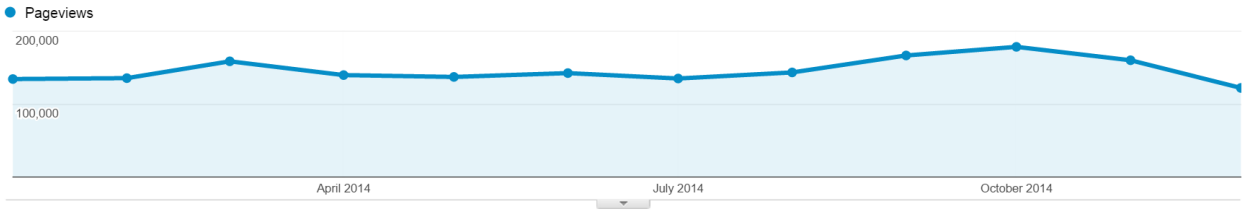
- Either the site isn't very mobile friendly and isn't conducive to mobile and tablet devices
- Or users who are interacting with the portal tend to use / prefer desktop devices

It will be interesting to see if this changes in 2015 with the ever increasing use of mobile and tablet devices. However, it is interesting that there are more mobile users visiting the site via mobile devices than tablet. This could be due to the emergence and quality of connectivity with mobile devices and prominence of 4G / WiFi hotspots.

One would expect Mobile (**00:01:27**) users to have the lowest average session time then Tablet (**00:02:09**) and Desktop (**00:02:16**) users spending most time on the portal.

E.3.1.5 Page Views

Figure 36: Eldis Page view data 2014 – Source = Google Analytics



Pageviews	Unique Pageviews	Avg. Time on Page	Bounce Rate	% Exit
1,753,806	1,363,991	00:01:38	28.98%	42.93%

Site Content
Page
Page Title

Site Search
Search Term

Events
Event Category

	Page Title	Pageviews	% Pageviews
1.	Jobs - Eldis	280,653	16.00%
2.	Welcome to Eldis - Eldis	126,119	7.19%
3.	Canadian Center of Science and Education - Eldis	124,756	7.11%
4.	Country and Region Profiles - Eldis	20,870	1.19%
5.	Topics - Eldis	15,785	0.90%
6.	Livelihoods - Eldis	15,122	0.86%
7.	Eldis - Page Not Found	12,706	0.72%
8.	How can developing countries benefit from globalization: the case of China - Eldis	10,615	0.61%
9.	Not found - Eldis	10,273	0.59%
10.	Searching Eldis - Eldis	10,264	0.59%

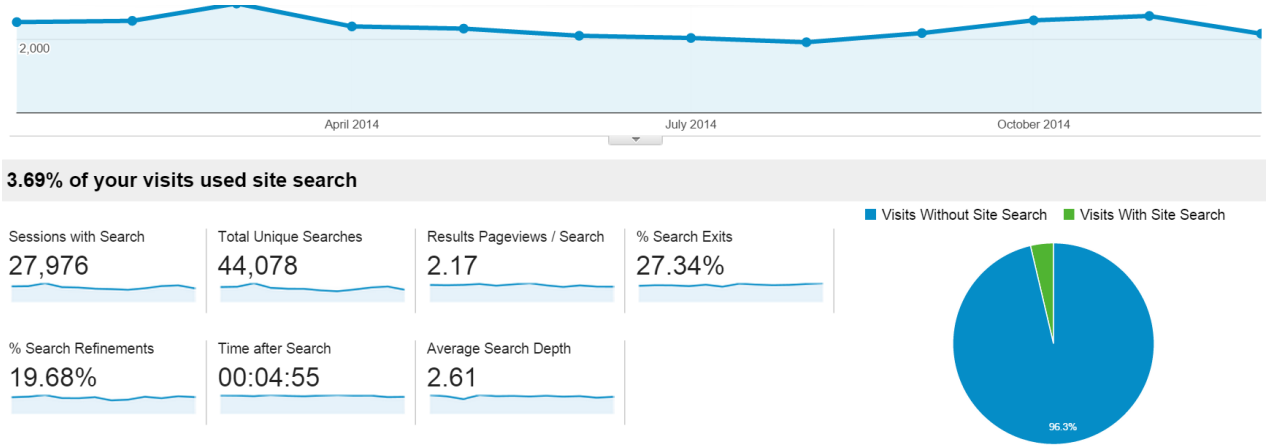
According to Google Analytics over the course of 2014 there were a total of **1,753,806** page views, **1,363,991** of these were unique. The average time on a page was one minute, thirty eight seconds (**00:01:38**) with a bounce rate of **29%**.

The data would suggest that just under a third of the users of the portal are not even viewing the page. However as this may relate to downloads or PDF links that would correlate to a high bounce rate. On the other hand if you consider the average time on a page is 00:01:38, this would suggest users are staying on the page far longer than expected if viewing a download. This could either be because of long waiting time for downloads due to size or connectivity.

The most commonly viewed page is the "**Jobs**" page, which has nearly twice as many views as the next closest page on the site.

E.3.1.6 Search

Figure 37: Eldis Search data 2014 – Source = Google Analytics



Search Term	Total Unique Searches	% Total Unique Searches
1. Search...	748	1.70%
2. internship	271	0.61%
3. education	136	0.31%
4. india	135	0.31%
5. kenya	134	0.30%
6. intern	132	0.30%
7. gender	126	0.29%
8. london	125	0.28%
9. water	116	0.26%
10. SADC	97	0.22%

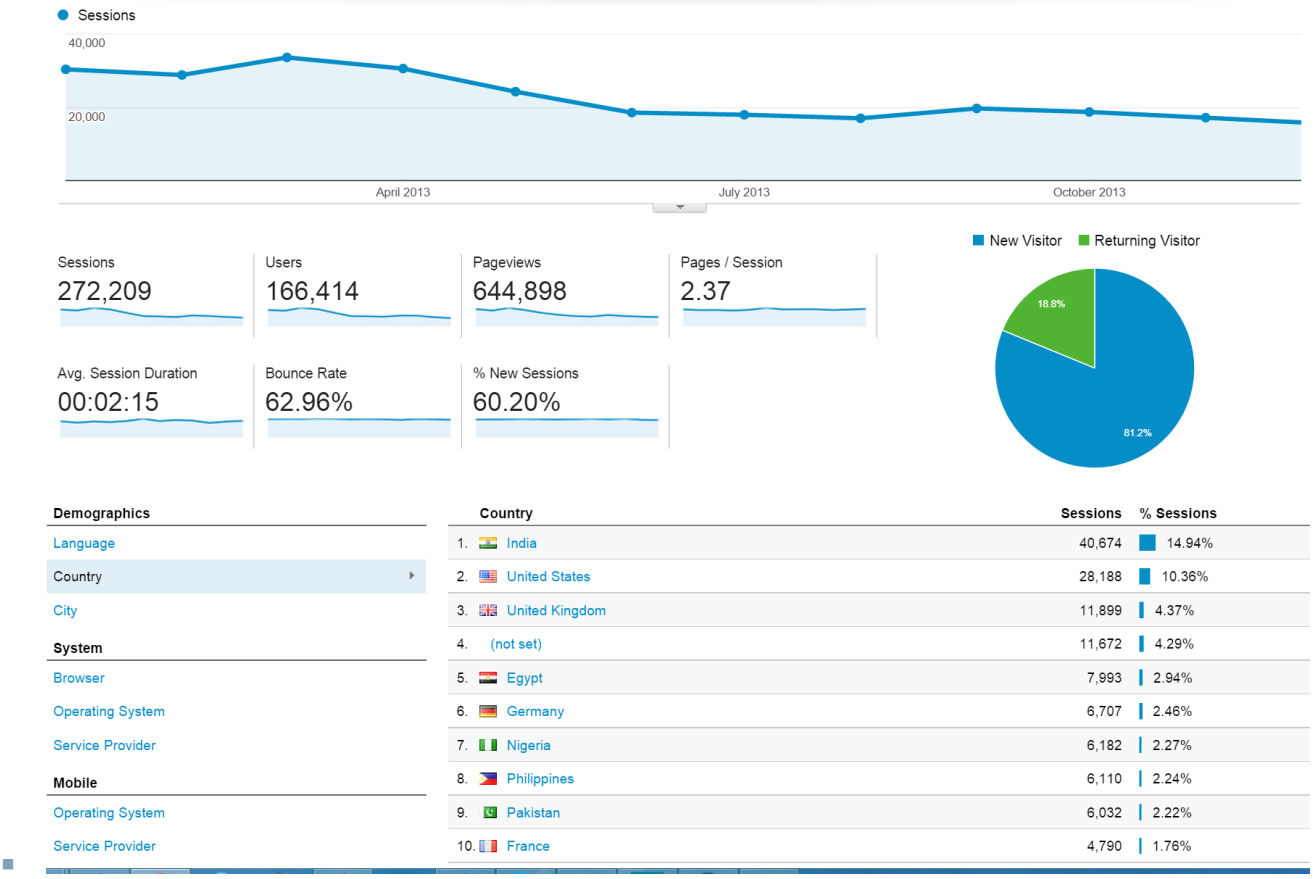
According to the data **3.69%** of users used the site search, which for a portal of this focus and type, one would expect this figure to be higher. There were **27,976** searches within sessions; however there were **44,078** unique searches, which would equate that for every session there were around two searches performed, on average, per session.

It seems that users most commonly searched for the term “Search…” which would suggest that users are having difficulty locating the search or a suitable search and if they are searching twice would also indicate the search isn’t providing users with the correct results.

E.4 GDNet

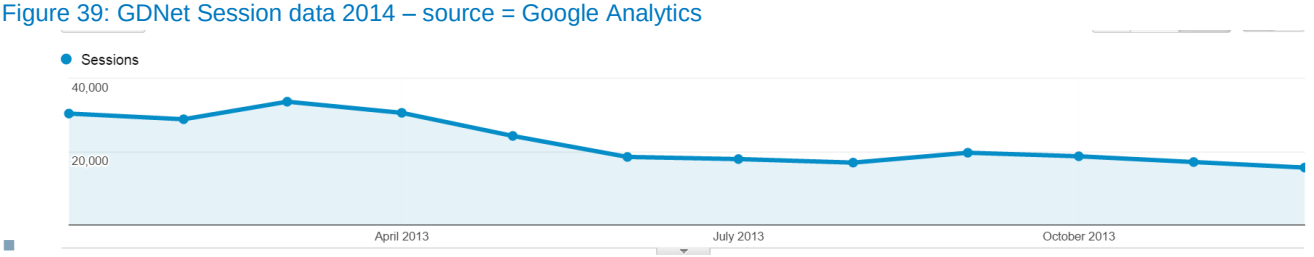
E.4.1.1 Dashboard overview

Figure 38: GDNet Web metric overview 2014



E.4.1.2 Session data

Figure 39: GDNet Session data 2014 – source = Google Analytics



User Type	Acquisition			Behavior		
	Sessions ↓	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration
	272,209 % of Total: 100.00% (272,209)	81.20% Avg for View: 60.20% (34.88%)	221,026 % of Total: 134.88% (163,867)	62.96% Avg for View: 62.96% (0.00%)	2.37 Avg for View: 2.37 (0.00%)	00:02:15 Avg for View: 00:02:15 (0.00%)
1. New Visitor	**221,026** (81.20%)	100.00%	221,026 (100.00%)	65.64%	2.09	00:01:39
2. Returning Visitor	**51,183** (18.80%)	0.00%	0 (0.00%)	51.41%	3.59	00:04:51

Looking at the session data, one can see that a majority of users of GDNet were “new visitors”. However the data may be misleading if the “new visitors” were mobile or tablet, or users accessing from a constantly changing IP address location, or who do not store cookies on their device. This would prevent Google from recognising them as a “returning visitor” and class them as “new visitor”.

E.4.1.3 Location

Figure 40: GDNet Location data 2014 – Source = Google Analytics

Country	Acquisition			Behavior		
	Sessions ↓	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration
	272,209 % of Total: 100.00% (272,209)	81.20% Avg for View: 60.20% (34.88%)	221,026 % of Total: 134.88% (163,867)	62.96% Avg for View: 62.96% (0.00%)	2.37 Avg for View: 2.37 (0.00%)	00:02:15 Avg for View: 00:02:15 (0.00%)
1. India	**40,674** (14.94%)	80.44%	32,718 (14.80%)	58.99%	2.67	00:02:36
2. United States	**28,188** (10.36%)	88.41%	24,921 (11.28%)	68.58%	1.97	00:01:12
3. United Kingdom	**11,899** (4.37%)	83.12%	9,890 (4.47%)	63.56%	2.34	00:01:36
4. (not set)	**11,672** (4.29%)	85.65%	9,997 (4.52%)	71.60%	1.69	00:01:42
5. Egypt	**7,993** (2.94%)	39.17%	3,131 (1.42%)	39.75%	4.91	00:09:43
6. Germany	**6,707** (2.46%)	88.13%	5,911 (2.67%)	52.20%	2.07	00:01:04
7. Nigeria	**6,182** (2.27%)	74.43%	4,601 (2.08%)	60.11%	2.40	00:03:31
8. Philippines	**6,110** (2.24%)	81.67%	4,990 (2.26%)	64.84%	2.56	00:02:29
9. Pakistan	**6,032** (2.22%)	83.32%	5,026 (2.27%)	60.59%	2.55	00:02:42
10. France	**4,790** (1.76%)	83.70%	4,009 (1.81%)	63.63%	2.29	00:01:26

The data from Google suggests there were a total of **272,209** sessions during 2013 to the GDNet portal.

- Looking at the data in the table above **India (40,674)** has the most sessions and visits over the course of the year, nearly doubling that of its closest country **United States (40,674)**.
- We know that the content editors were based in **Egypt (7,993)** which would correspond with the data shown, as they don't top the list of sessions but this country has the lowest number of new sessions and bounce rate. They also more than double the pages per session and their average session duration is considerably higher.
- There is an entry "not set"; one can surmise that this is due to IP masking or cookies not being enabled / accepted from the device.
- Based on the data available for year 3 (2013), the total figure of Southern visitors was **115,380**[33].

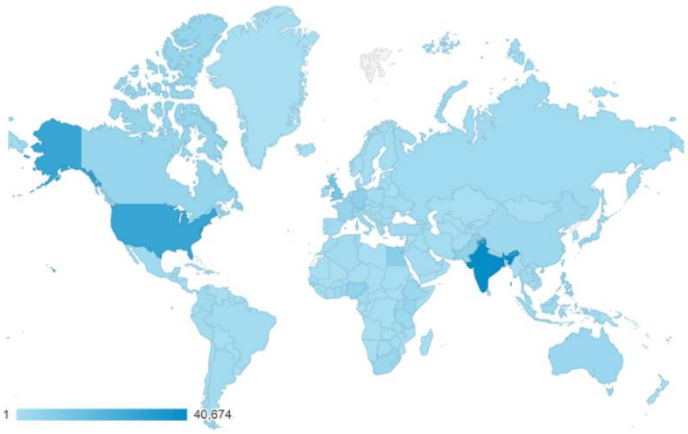


Figure 41: Map showing GDNet usage by country

E.4.1.4 Device usage

Figure 42: GDNet device usage data 2014 – Source = Google Analytics

Device Category	Acquisition			Behavior		
	Sessions	% New Sessions	New Users	Bounce Rate	Pages / Session	Avg. Session Duration
	272,209 % of Total: 100.00% (272,209)	81.33% Avg for View: 60.20% (35.10%)	221,378 % of Total: 135.10% (163,867)	63.03% Avg for View: 62.96% (0.10%)	2.34 Avg for View: 2.37 (-1.10%)	00:02:13 Avg for View: 00:02:15 (-1.89%)
1. desktop	**250,993** (92.21%)	81.06%	203,453 (91.90%)	62.22%	2.40	00:02:17
2. mobile	**15,186** (5.58%)	87.23%	13,246 (5.98%)	74.15%	1.60	00:01:15
3. tablet	**6,030** (2.22%)	77.60%	4,679 (2.11%)	68.59%	1.97	00:01:31

As the data above is taken from 2013, it can be assumed the number of mobile and tablet visitors would be slightly lower due to connectivity, and devices getting more advanced year on year.

Consistent with the other portals from the data above a large majority of users were accessing the portal via desktop devices. Two conclusions can be drawn from this:

- Either the site isn't very mobile friendly and isn't conducive to mobile and tablet devices

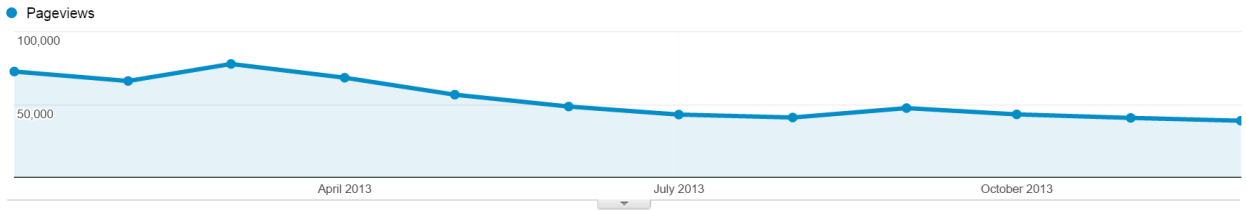
[33] GDNet. 2014. *GDNet M&E Report 2014 – Year 3.* [ONLINE] Available at: http://r4d.dfid.gov.uk/pdf/outputs/GDNet/ME_year3_2014.pdf

- Or users who are interacting with the portal tend to use / prefer desktop devices

One would expect Mobile (**00:01:15**) users to have the lowest average session time, then Tablet (**00:01:31**) and Desktop (**00:02:17**) users spending most time on the portal.

E.4.1.5 Page Views

Figure 43: GDNet Page view data 2014 – Source = Google Analytics



Pageviews	Unique Pageviews	Avg. Time on Page	Bounce Rate	% Exit
644,898	506,943	00:01:39	62.96%	42.21%

Site Content
Page
Page Title

Site Search
Search Term

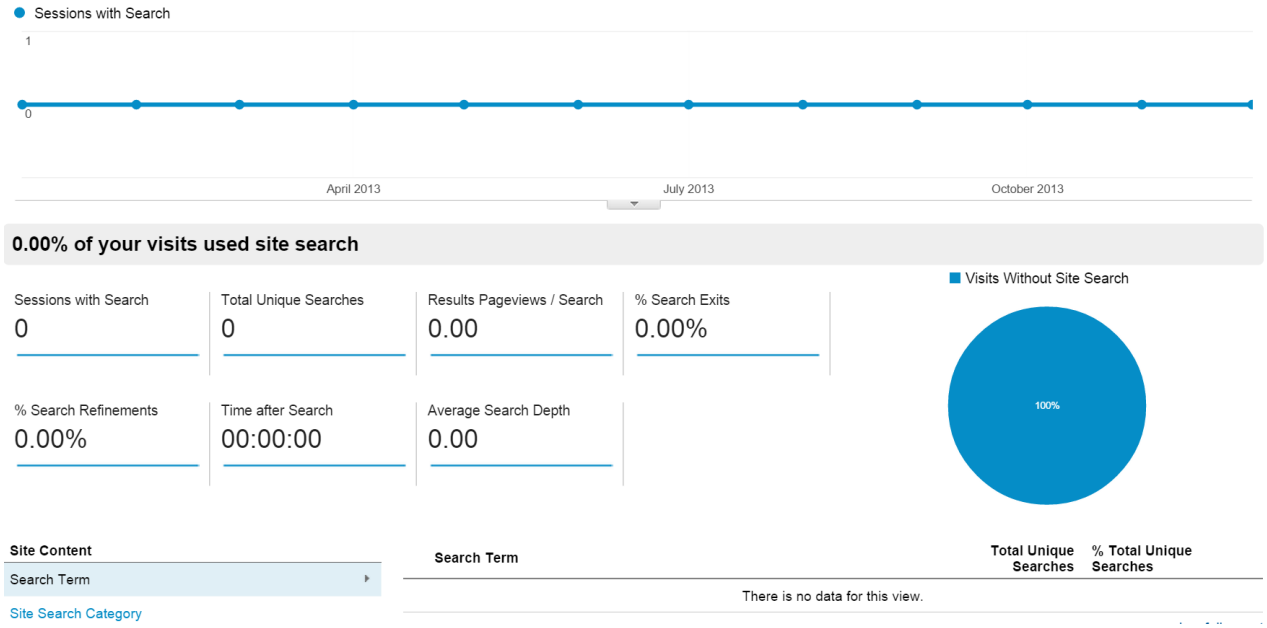
Events
Event Category

	Page Title	Pageviews	% Pageviews
1.	GDN: Promoting Development Research	141,137	21.89%
2.	Untitled Document	65,976	10.23%
3.	GDNet: Home Page: Promoting Development Research	62,339	9.67%
4.	GDNet: Funding Opportunities	9,099	1.41%
5.	GDNet Knowledgebase: Agriculture	5,158	0.80%
6.	GDNet Knowledgebase: Educaton and Training	4,672	0.72%
7.	GDNet Knowledgebase: South Asia	4,344	0.67%
8.	GDNet Knowledgebase: Africa	4,006	0.62%
9.	GDNet Knowledgebase: Environment and Climate Change	3,027	0.47%
10.	GDNet Knowledgebase: Macroeconomics and Economic Growth	2,899	0.45%

- From the data above the "**GDN Promoting Development Research**" page was the most visited and popular page on site, this is over twice as many as the next most popular page.
- "**Untitled document**" would suggest that when downloading a resource, a new tab or page was opened to enable some form of download tracking to take place. This would account for its high placing on the table.
- The average time on page is **low** in comparison to other portals with research based content.

E.4.1.6 Search

Figure 44: GDNet Search data 2014 – Source = Google Analytics



- No search data was available; there are two possible explanations for this:
- Google didn't introduce tracking at this time or the search couldn't be tracked via Google
- The search wasn't used or one wasn't available

Appendix F. Heuristic evaluation of the DFID-funded portals/repositories

F.1 Heuristic evaluation of R4D

Table F.1: Heuristic evaluation of R4D

Website: R4D **Website URL: http://r4d.dfid.gov.uk/**			
		Session date: 9th March 2015	
Relevant task or task step	Heuristic being assessed	**Usability defect description**	**Expert evaluator's comments regarding the usability defect**
Searching for relevant information.	**Visibility of system status** The system should always keep users informed about what is going on, through appropriate feedback within a reasonable time.	The simple search is quick whereas the advanced search is not. At present the only indication that the website is doing something and that it hasn't crashed is given by the web browser trying to load the results page.	Feedback on the progress of a search would be helpful. Could some form of search progress bar be given which indicates to the user that something is happening?
Is the language used on the website familiar to its intended audience?	**Match between system and the real world** The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system oriented terms. Follow real-world conventions, making information appear in a natural and logical order.	There are no real issues here although I did wonder what Theme and Research contacts were on the home page.	Perhaps expand the explanation of what the Theme and Research contacts were
Navigation and control.	**User control and freedom** Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Supports undo and redo.	There isn't an obvious 'Home' button. I kept clicking on the DFID logo and ending up in the wrong place. The breadcrumb trail is useful but having to use it all the time to get to the R4D home page is a bit fiddly. Eventually I realised that the 'Research for Development (R4D) database' was a clickable link.	Please can you provide a more obvious 'Home' button?
Navigating the website.	**Consistency and standards** Users should not have to wonder whether different words, situations, or actions mean the same thing.	The menu in the left hand panel could be more obvious and grouped more logically. The Usage pages were fascinating but to	Menus across the top of a web page feel more natural these days, with a menu bar down the left hand side of the page being

Website: R4D Website URL: http://r4d.dfid.gov.uk/			
	Follow platform conventions.	see these so prominently displayed on a website is unusual. The Contact R4D page would most usually appear in a menu at the foot of the page.	used for a secondary menu. Browse could be a separate category, as could Search. The Usage pages could be displayed less prominently, perhaps on an About page (which is also missing)?
Simple and advanced search. Can you get the same results?	**Help users recognise, diagnose, and recover from errors** Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.	Performing the same search with the Simple and Advanced search yields a different number of documents. The documentation explains that Simple search searches the full text of the documents whereas Advanced search does not.	I think it would be helpful if the Advanced search returned the same result set as the Simple search, otherwise having two searches that do different things can be confusing to users. Another reason for doing this is so that users of the Simple search can benefit from the options provided for limiting, refining and sorting the search results.
Article selection and refinement.	**Error prevention** Even better than a good error message is a careful design which prevents a problem from occurring in the first place.	In the Advanced search, the Document publication year runs from 1971 to 2025. So I had to try them. There were no documents returned for 1971, 2016 and 2025 (the latter two not surprisingly). The latest project end date is in 2019, but curiously, you can only suggest a project end date in the range 2016-2019. The beginning of the end date range can be no later than 2016.	While there are some arguments for starting the date selector at 1971 (since there are two projects that started in 1971), I don't think it should be possible to select document publication dates into the future.
Advanced search	**Recognition rather than recall** Make objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.	Rather than a Submit button in the advanced search, I would call it Search, since that is what you are doing. I recognised the open padlock symbol on the Advanced search page as being something to do with Open Access. The icon by it I did not recognise until the pop-up told me what the icon meant. Size may have been an issue here. The consistent use of pop-ups to describe links on the Advanced Search	No major issues here.
Does the website have any shortcuts for proficient users?	**Flexibility and efficiency of use** Accelerators -- unseen by the novice user – may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.	The multiplicity of options in the advanced search is of benefit here. Conversely it makes the simple search look rather weak. The output of both searches could be improved to enhance use. The simple search could give the full title of the	Much could be learnt from other websites about how to present the results of document searches in order to make them of most use to researchers.

Website: R4D Website URL: http://r4d.dfid.gov.uk/			
		document in addition to the 'Google-like' keywords in context that it gives at the moment. The advanced search could give a separate link to the abstract of the document, if available.	
General website appeal and initial impressions	**Aesthetic and minimalist design** Dialogues should not contain information, which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.	The immediate impression is that the website looks dated. There are no photographs and only a few logos to provide non-text elements of the website. Between the logos is blank space that feels as though it could be used more effectively. The website doesn't resize if the browser window is resized. I looked for a search box at the top right of the website home page which is where it is often positioned. (I am not sure I have read the three paragraphs of text below the R4D heading on the home page. I just scanned them looking for links.)	I suggest that the look of the website is refreshed with a few images to increase the attractiveness of the home page. The home page of the website could be updated by putting in a list of selected recent publications. Given the central function of the website to provide search across a document collection, the search box could be positioned nearer the top of the home page, where it is more likely to catch users' eyes.
How do I use the advanced search?	**Help and documentation** Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large.	A comprehensive document is provided which explains how to use the different browse and search facilities. It would be even more useful as a set of interlinked web pages which was accessible on the website (in addition to a PDF version that could be downloaded and printed out).	I particularly liked the table on the first page in the Overview section. An excellent summary.

F.2 Heuristic evaluation of Eldis

Table F.2: Heuristic evaluation of Eldis

Website: Eldis Website URL: http://www.eldis.org			
		Session date: 9th March 2015	
Relevant task or task step	**Heuristic being assessed**	**Usability defect description**	**Expert evaluator's comments regarding the usability defect**
Searching for relevant information.	**Visibility of system status** The system should always keep users informed about what is going on, through appropriate	In the carousel at the top (with the little orange arrows) there is no indication of how many items there are in the carousel so you	Use some form of visual indication to show your position in the carousel

Website: Eldis Website URL: http://www.eldis.org			
	feedback within a reasonable time.	have to recognise when you have seen an image and caption before. What is the website doing? When I type a term such as 'climate change' into the search box on the home page and then press the return key, the website takes some time to load the next page. Has it crashed, have I lost my network connection, or what?	Feedback on the progress of a search is helpful. Could some form of search progress bar be given which indicates to the user that something is happening?
Is the language used on the website familiar to its intended audience? Is it clear who owns and maintains the website?	**Match between system and the real world** The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system oriented terms. Follow real-world conventions, making information appear in a natural and logical order.	I couldn't work out what Eldis stands for (assuming that it is an acronym) but it is clear who owns and runs the website. Too often, click through (e.g. the ubiquitous Meet the editor link) takes you to the IDS website.	I would separate more completely Eldis from IDS, largely by rebranding some of the IDS pages as Eldis pages.
Navigation and control.	**User control and freedom** Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Supports undo and redo.	On the site map page, I tried typing 'icts' (as in ICTs) into the search box on the left hand side of the page, then pressed Go. The page refreshes but nothing else seems to happen.	If it doesn't make sense to be able to enter a search (what am I searching – the page, or across the whole website?) then perhaps the search box should be removed.
Does the website follow discipline and international conventions?	**Consistency and standards** Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.	'Fattening' is lost on me. Why, when I click on the '+' subscribe button on the home page, do I get taken to a page with the title 'Subscribe to fattening services' and a sub-title of 'Fattening reporters', which goes on to say 'Eldis reporters …' And then there's 'Fattening jobs'.	Have I ended up on a junk food website? If you are going to use jargon, please explain it. … It's a bug. If you change language to French, then back to English, 'Fattening' is substituted for 'Eldis'.
Interaction with the website	**Help users recognise, diagnose, and recover from errors** Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.	The carousel at the top scrolls far too fast. I don't have time to finish reading the text attached to the three images before it has scrolled out of view. There is a broken link. Clicking on the 'Knowledge Services from IDS' link in the bar right at the bottom of each page gives a 'Server Error: 404 – File or directory not found.'	Give users more time to read the text, or reduce the number of text and images shown, or reduce the text attached to each image. The server error page could be replaced with a more friendly error message and the broken link could be fixed.
Article selection and refinement.	**Error prevention** Even better than a good error message is a careful design which	Having searched on climate change, I then chose ICTs for development in the 'Filter by'	It should be clear how the search and refinement of documents is used. Maybe

Website: Eldis Website URL: http://www.eldis.org			
	prevents a problem from occurring in the first place.	topic menu on the search results page. I was confused when Eldis said that 'Your search for '**climate change**' within **Ethical business** found **280** documents .' I didn't ask for the search to be limited to the Ethical business document section, so why has Eldis searched within this collection?	this is a labelling error. If I select Agriculture and food instead of ICTs for development, Eldis tells me that it has searched within Agriculture and food.
Subscribe to content	Recognition **rather than recall** Make objects, actions, and options visible. The user should not have to remember information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.	The blue and grey icons towards the bottom of the page (contribute, get the data and discuss) confused me. The contribute icon (a pen or pencil?) looks more like a label that you can write on when planting seeds to me (it is that time of year). I thought the icons were clickable, but they are not.	If these icons are standard then this user needs to learn a new icon set. Arranging the icons so that they project above the bar that they on makes them look clickable. Perhaps the bar should surround the icon?
Does the website have any shortcuts for proficient users?	**Flexibility and efficiency of use** Accelerators -- unseen by the novice user – may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.	The carousel is becoming annoying. Can I freeze it or can it not be on pages that I want to spend time studying, e.g. search results? The only way I could focus on search results was to scroll down the page so that the carousel was hidden. There doesn't seem to be any way of sorting or further refining documents. With 280 documents returned for my search on Climate change then ICTs for development, I would like further ways to refine the documents that are returned.	I would like to be able to freeze the carousel or for it not to appear on pages below the home page of the website. It takes up space on the page and is distracting. Providing ways to sort (e.g. by date and/or author) or filter by the addition of extra keywords would make it easier to refine the document collection returned in searches.
General website appeal and initial impressions	**Aesthetic and minimalist design** Dialogues should not contain information, which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.	The website looks appealing. I liked the choice of pastel colours. The bottom banner is too large; could the site and engage menus be collapsed or turned in to drop-down menus? The behaviour of the website differs depending upon your route to viewing a report. If you enter a search then select a report, you have the carousel at the top of the page. If you select a country, then select a report, there is static photograph of several flags (which is quite appealing), with a distracting Reporter email bulletins flag with a photograph of Tracy Zussman. This	It would be good if the layout for the display of individual documents (the document abstract page) was consistent, no matter what route you took to get to the document abstract page. I would remove the Reporter email bulletins panel from the Regional and Country profiles page.

Website: Eldis Website URL: http://www.eldis.org			
		is confusing because I wondered what she had to do with the report that I was looking at?	
Navigation around the website – is there a consistent view?	**Help and documentation** Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large.	I didn't find any help pages. The website is mostly intuitive to use, but how to use the document search and refinement facilities to maximum effect would be helpful. The Correct a Document pop-up page doesn't re-size properly. You can get to this from the article abstract page. The text below the heading 'About this form' runs off the right hand margin so that the page has to be resized in order to read the text.	Scrolling through multiple pages of documents on a search is tedious. Explanations of how to refine searches so that a more focused set is returned would be helpful. Wrap the text so that it is all visible in the window.

F.3 Heuristic evaluation of SciDev.Net

Table F.3: Heuristic evaluation of SciDev.Net

Website: SciDev.Net Website URL: http://www.scidev.net/global/			
		Session date: 8th March 2015	
Relevant task or task step	Heuristic being assessed	**Usability defect description**	**Expert evaluator's comments regarding the usability defect**
Searching for relevant information.	**Visibility of system status** The system should always keep users informed about what is going on, through appropriate feedback within reasonable time.	When searching the articles, ranking the topics by their frequency is interesting, but makes it hard to find further topics of interest, except by scanning the whole list. I am not even sure how the search and refine topics works. For example, if I search on biofuels, I couldn't find ICTs as a refine topic, but when I searched on "biofuels and ICTs" six articles were found.	Consistent behaviour in the search and refine would be good and / or some documentation that explains how search and refine work. For example, does search work across the full text of the articles, whereas refine works just on the keywords?
Is the language used on the website familiar to its intended audience? Website trustworthiness – do I trust the information on the website?	**Match between system and the real world** The system should speak the users' language, with words, phrases and concepts familiar to the user, rather than system oriented terms. Follow real-world	I struggled to find an author for the articles. I looked at the top of the article under the heading and at the foot of the article. It was some time before I realised that they were positioned to the right of the photograph,	Maximise use of home page metadata so that the portal has an informative description in search engine output. (This is separate from ensuring that the portal appears near the top of relevant searches.)

Website: SciDev.Net Website URL: http://www.scidev.net/global/			
Is it clear who owns and maintains the website?	conventions, making information appear in a natural and logical order.	below the date. The portal doesn't recognise that it is being accessed from a mobile phone.	There was a link which said 'Mobile' so I tried accessing the website from my phone. It would be good if the website recognised that it was being accessed from a mobile phone. The mobile version looks good. I particularly liked the 'Load more' link.
Are there clear ways to navigate around the website (e.g. is there a home button?)	**User control and freedom** Users often choose system functions by mistake and will need a clearly marked "emergency exit" to leave the unwanted state without having to go through an extended dialogue. Supports undo and redo.	In the carousel at the top (with the large red arrows) there is no indication of how many items there are in the carousel so you have to recognise when you have seen an image/caption before. There are at least three menus of items, with the one at the bottom being least visible.	Use some form of visual indication to show your position in the carousel. Potentially merge the very top and bottom menus together? The fact that the main menu (the grey one) is always visible is a very powerful feature.
Does the website follow discipline and international conventions?	**Consistency and standards** Users should not have to wonder whether different words, situations, or actions mean the same thing. Follow platform conventions.	What does 'Browse type' in the grey bar towards the top of the page mean? Dates are reported as 11/02/05.	I had to look to see what Browse type meant because it wasn't intuitive. Browse by type or Browse by type of article would be better (but probably wouldn't fit into the menu bar). For an international audience, this could be ambiguous. Was the article written in 2011 or 2005?
Interaction with the website – form filling.	**Help users recognise, diagnose, and recover from errors** Error messages should be expressed in plain language (no codes), precisely indicate the problem, and constructively suggest a solution.	No problems found. When filling in the registration form, errors were reported through short error messages which were reasonably clear.	
Article selection and refinement.	**Error prevention** Even better than a good error message is a careful design which prevents a problem from occurring in the first place.	Browse type, as a way of selecting the type of articles to view is powerful but cannot be used in combination with the subject by selecting from the menu bar. So, I wanted to select the subject, e.g. climate change, then select the browse type, e.g. practical guides. You can't do this by selecting from the menu bar.	In some senses this behaviour is logical. Selecting a subject or type of article from the menu bar selects a subset of the articles. But having selected a subject, you can then refine the articles by topic and type of article. So when refining articles, article subject and type act independently, but when selecting from the menu bar, they are not.
Website search and customisation (e.g. is there word completion in search)	**Recognition rather than recall** Make objects, actions, and options visible. The user should not have to remember	I didn't know what some of the icons meant in the row of six that begins with the Twitter and Facebook icons. In particular, I don't	There is no 'hover' function that says what the icons mean. Worse, this is inconsistent. On an article page, there are four icons in

Website: SciDev.Net Website URL: http://www.scidev.net/global/			
	information from one part of the dialogue to another. Instructions for use of the system should be visible or easily retrievable whenever appropriate.	recognise the third and fifth icons. There is no automatic word completion in the search box, nor does search take account of different spellings of the same word, such as programme and program (in the sense of a programme consisting of a group of projects).	red below the author name (or at least I assume that it is the author's name). Two have labels that appear if you hover over them; two do not. The portal appears to adopt English rather than American spellings (e.g. Aluminium returns 19 hits but Aluminum returns 0). While it would be ideal to be able to search on both words where there are alternative spellings, this is probably beyond the scope of most portals.
Does the website have any shortcuts for proficient users?	**Flexibility and efficiency of use** Accelerators -- unseen by the novice user – may often speed up the interaction for the expert user such that the system can cater to both inexperienced and experienced users. Allow users to tailor frequent actions.	There is some repetition of material (links) under different headings and different positions on the page. For example, the article on drones appeared twice. I would have to click through to the articles to see if they referred to the same or different content. This is potentially confusing.	Analysis of the URL shows that the links come from different areas of the page (the carousel versus the homepage list). The use of different captions and pictures could be confusing to users while they work out whether they links on the home page refer to the same or different content.
General website appeal and initial impressions	**Aesthetic and minimalist design** Dialogues should not contain information, which is irrelevant or rarely needed. Every extra unit of information in a dialogue competes with the relevant units of information and diminishes their relative visibility.	The website looks appealing but quite busy, with a lot of photographs. The website is up to date, with the main image and caption highlighting International Women's Day (it is). Photographs can become over-used. On the About us page, I found myself wondering about the Contact us, Follow us and Donate to us links because they are all illustrated by people holding what looks like mobile phones. Are all the photographs over-printed with a title? With a third of each photograph obscured by the title it is difficult to see what is in the photograph.	If anything the home page is too busy and too long. I wonder how many people will take the time to scroll to the bottom of the page? I suggest reducing the number of photographs used and move the titles to below the photographs.
Navigation around the website – is there a consistent view?	**Help and documentation** Even though it is better if the system can be used without documentation, it may be necessary to provide help and documentation. Any such information should be easy to search, focused on the user's task, list concrete steps to be carried out, and not be too large.	In the site map (a useful feature by the way), Browse type is called Content. Notices in the site map are a sub-category of Browse type, where it is called Notices. Does the colour scheme have meaning? Some articles labelled Multimedia have white titles on a red background with a photograph. Others have no photograph	A consistent mapping between the site map, as one way of navigating the website, and various menus would be helpful. A consistent look is good. Or, if the colour scheme conveys information, then some way to find out what the colour scheme means would be good – a key, in other words.

Website: SciDev.Net Website URL: http://www.scidev.net/global/
with titles in red.

Appendix G. Bibliography

Abdelnour-Nocera, J., Dunckley, L. & Sharp, H., 2007. *An approach to the evaluation of usefulness as a social construct using technological frames International*. Journal of HCI, 22(1), p. 157–177.

Adams, J. & Loach, T., 2015. *Altmetric mentioned and the communication of medical research: disseminating research outcomes outside academia,* London, Digital Science

Adolph et al., 2010. Learning lessons on research communication and uptake. A review of DFID's Research and Evidence Division's human development (health and education) and agriculture portfolios and their contribution to the 30% policy. Triple Line Consulting Ltd. UK.

Ahmed, M., 2013. *The difference between Google and Bing.* [Online] Available at: http://pageonepower.com/2013/05/difference-google-bing/. [Accessed 2015].

Anon., n.d. [Online] Available at: http://www.drussa.net/index.php?option=com_content&view=article&id=1938%3Ablog-9&catid=203%3Adefining-the-field&Itemid=300&lang=en. [Accessed 11 March 2015].

Aptivate, 2009. *When it comes to websites, small IS beautiful* [Online] Available at: http://blog.aptivate.org/en/blog/2009/07/09/when-it-comes-to-websites-small-is-beautiful/ [Accessed August 2016]

Bachelor, S., 2012. *Information Ecosystems of Policy Actors – Reviewing the Landscape*. Institute of Development Studies. [Online] Available at: https://www.ids.ac.uk/files/dmfile/WP401.pdf. [Accessed August 2016]

Bandura, A., 1977. *Self-efficacy: Toward a unifying theory of behavioral change*. Psychological Review, 84(2), pp.191–215.

Bandura, A., 1988. *Organizational applications of social cognitive theory*. Australian Journal of Management, 13(2), pp.275–302.

Barnard, G., 2013. *FEATURE: Portal proliferation syndrome responding to treatment.* [Online] Available at: http://cdkn.org/2013/08/feature-portal-proliferation-syndrome-responding-to-treatment/ [Accessed 2015].

Batchelor, S., 2013. *Information Ecosystems of Policy Actors – Reviewing the Landscape (Updated draft October 2013),* s.l.: Unpublished and made available to the evaluators by the author, with datasets..

Bayliss et al., 2012. *Does research information meet the needs of stakeholders? Exploring evidence selection in the global management of invasive species*. Evidence & Policy, vol 8(no 1), p. 37–56.

Bergstrom, C., 2007. *Eigenfactor: Measuring the value and prestige of scholarly journals*. College & Research News, vol 68(5), pp. 314-316.

Bernstein, M. S., Bakshy, E., Burke, M. & Kramer, B., 2013. *Quantifying the Invisible Audience in Social Networks.* Paris, France, CHI.

Besemer, H. & Parr, M., 2013. *Scholarly use of R4D documents:A bibliometric exploration (draft),* [Online] Available at: http://r4d.dfid.gov.uk/pdf/outputs/communication/Scholarly_use_of_R4D_documents_a_bibliometric_exploration_final.pdf [Accessed August 2016]

Bidwell & Winschiers-Theophilus, 2010. *'Interaction design in Africa: Beyond the Benjamins: Toward an African Interaction Design' Interactions,* s.l.: s.n.

Brown, C., 2012. *Are southern academics virtually connected?.* [Online]. Available at: http://r4d.dfid.gov.uk/pdf/outputs/GDNet/GDNet_study_of_adoption_of_web_2_tools_v2.pdf. [Accessed August 2016]

Brown, C., 2013. *Implementing a gender audit of an online knowledge service: The experience of GDNet,* New Delhi, India: Global Development Network (GDNet).

Budui & Nielsen, 2010. *Usability of iPad Apps and Websites,* California. Nielsen Norman Group

Budui & Nielsen, 2011. *Usability of iPad Apps and Websites*, California. Nielsen Norman Group

Carden, F., 2009. *Knowledge To Policy: Making The Most Of Development Research,* s.l. SAGE Publications Inc/IDRC.

CDS, 2010. *UK CDS Evaluating the Impact of Research programmes – Approaches and Methods.,* [Online] Available at: http://www.ukcds.org.uk/sites/default/files/content/resources/Evaluating%20the%20Impact%20of%20Research%20Programmes%20-%20Approaches%20and%20Methods.pdf [Accessed August 2016]

Chavan, 2004. *'The Bollywood Method'. In: Schaffer, E. Institutionalization of Usability; a Step-by-Step Guide.* New York: Addison Wesley, pp. 129-130.

Choo, C. W., Deltor, B. & Turnball, D., 2000. *Information seeking on the web: An integrated model of browsing and searching.* First Monday, p. 5(2).

Clemmensen, T. et al., 2008. *Cultural Cognition in the Thinking-Aloud Method for Usability Evaluation.* Paper presented to Twenty Ninth International Conference on Information Systems, Paris, December 2008. Available at: https://www.researchgate.net/publication/221598683_Cultural_Cognition_in_the_Thinking-Aloud_Method_for_Usability_Evaluation

Crow, J. et al., 2012. *A Synthesis of Research on ICT Adoption and Use by Medical Professionals in Sub-Saharan Africa*. IHI'12, p. 28–30.

De Satge, R., 2011, *Assessing the need for a poverty information service,* s.l.: s.n.

Debeljak, K., 2010. *Communicating with Policymakers in Zambia: A Guide for the International Development Community,* s.l.: s.n.

Deloitte, 2013. The state of the global mobile consumer, 2013: Divergence deepens. [Online] Available at: http://www2.deloitte.com/content/dam/Deloitte/global/Documents/Technology-Media-Telecommunications/dttl_TMT-GMCS_January%202014.pdf [Accessed August 2016]

Dems, K., 2010. *A brief history of web analytics.* [Online] Available at: http://www.brighthub.com/internet/google/articles/76256.aspx. [Accessed 2015].

DFID Evidence into Action Team, 2013. *DFID Evidence Survey Results Report, November 2013,* London, DFID.

DFID, 2015. *DFID ToRs for Evaluation of online research portals and repositories, Final version 5.1.15.* s.l.:s.n.

DFID, n.d. *Assessing the strength of evidence.* s.l. Practice Paper Department for International Development, UK.

Doemeland, D. & Trevino, J., 2014. *Which World Bank Reports are widely read?,* s.l.: World Bank Operations & Strategy Unit.

Dunn, L., 2002. *Theories of Learning*, [Online] Available at: https://www.brookes.ac.uk/services/ocsld/resources/briefing_papers/learning_theories.pdf. [Accessed August 2016]

Eden, D. & Avirma, A., 1993. *Self-efficacy training to speed reemployment: Helping people help themselves*. Journal of Applied Psychology, 78, pp.352–360.

Ellis, D. 1989. *A behavioral approach to information retrieval system design*. Journal of Documentation, 45(2)

Euforic Services, 2013, *Social Media Engagement: A report of activities from the R4D Project,* Oxford, UK. CABI

Faiola & Matei, 2005. Cultural cognitive style and web design: Beyond a behavioral inquiry into computer-mediated communication. *Journal of Computer-Mediated Communication,* 11(1), pp. 375-394.

Fishbein M. & Yzer M., 2003 Using theory to design effective health behaviour interventions. Communication Theory, 13:164–183

Folorunso, 2014. Information-seeking behaviour of social sciences scholars: a Nigerian case study. *AFRICAN JOURNAL FOR THE PSYCHOLOGICAL STUDY OF SOCIAL ISSUES,* Vol.17(No.2).

Ghana Open Government Partnership Initiative, 2012. *The Ghana Action Plan.* [Online] Available at: http://www.ghanaopengov.org/wiki/ghana-action-plan

Gillham, 2005. *Research Interviewing: The Range Of Techniques: A Practical Guide*. Maidenhead: Open University Press

Globescan, 2013a. *Think Tank Initiative Policy Community Survey 2013, Report on South Asia,* [Online] Available at: http://www.thinktankinitiative.org/content/2010-and-2013-policy-community-surveys [Accessed August 2016]

Globescan, 2013b. *Think Tank Initiative Policy Community Survey 2013, Report on Africa,* [Online] Available at: http://www.thinktankinitiative.org/content/2010-and-2013-policy-community-surveys [Accessed August 2016]

Globescan, 2014. *Think Tank Initiative Community Survey 2013, Report on Latin America,* [Online] Available at: http://www.thinktankinitiative.org/content/2010-and-2013-policy-community-surveys [Accessed August 2016]

Govender, P., 2015. *S. African power cuts hold off doomsday as sector seeks rescue.* [Online] Available at: http://www.reuters.com/article/2015/01/29/safrica-eskom-idUSL6N0V83RR20150129

Gregorowski, R., Dubber, J. & Brown, C., 2014. *GDNet M&E Report 2014 – Year 3.,* New Delhi, India: Global Development Network (GDNet).

Hammill, A., Harvey, B. & Echeverria, D., 2013. *Understanding Needs, Meeting Demands:User-oriented analysis of online knowledge broker platforms for climate change and development,* Winnipeg, International Institute for Sustainable Development

Harle, J., 2010. *Growing knowledge: Access to research in east and southern African universities.* London. The Association of Commonwealth Universities.

Harle, J., 2011. *Access to research in east and southern African universities*. ACU Spotlight, June, Issue No. 1.

Harris, R., 2013. *Impact of research on development policy and practice: An annotated bibliography*.[Online] Available at: http://www.rogharris.org/uploads/5/0/5/4/5054025/impact_of_research_on_development_policy_and_practice_annotated_bibliography.pdf [Accessed August 2016]

Harris, R., 2013. *The impact of research on development policy and practice: An introduction to a review of the literature.* [Online] Available at: http://www.researchtoaction.org/2013/07/the-impact-of-research-on-development-policy-and-practice/ . [Accessed 2015].

Heeks, R., 2010. *Do Information And Communication Technologies (ICTs) Contribute to Development?.* Journal of International Development, Volume vol. 22.

Hepworth, M. & Duvignea, S., 2010. s.l.: s.n.

Hepworth, M. & Duvigneau, S., 2012. *Building Research Capacity: Enabling Critical Thinking Through Information Literacy in Higher Education in Africa,* s.l.: Institute of Development Studies.

Hofstede, G., 2005. *Cultures and organizations: software of the mind.* Revised and expanded 2nd ed. New York: McGraw-Hill.

Holtzblatt, K. & Jones, S, 1993. *Contextual inquiry: A participatory technique for system design.* In Schuler, D., & Namioka, A. (Eds.) *Participatory design: Principles and practices.* Hillsdale. Lawrence Erlbaum Associates

Hovland, L., 2007. *Making a difference: M&E of policy research.* [Online]
Available at: http://www.odi.org/sites/odi.org.uk/files/odi-assets/publications-opinion-files/2426.pdf

Intermedia, 2010a. *AudienceScapes Africa Policy Research Series: Ghana Communicating with Policymakers about Development Issues,* s.l.: s.n.

Intermedia, 2010b. *AudienceScapes Africa Policy Research Series: Kenya communicating with Policymakers about Development issues,* s.l. InterMedia Survey Institute

Internet.org, 2015. *Internet.org App Available in Ghana.* [Online]
Available at: http://internet.org/press/internet-dot-org-app-available-in-ghana
[Accessed 2015].

ITU, 2013. *Study on international internet connectivity in Sub-Saharan Africa,* [Online]. Available at: https://www.itu.int/en/ITU-D/Regulatory-Market/Documents/IIC_Africa_Final-en.pdf
[Accessed August 2016]

Jackson, A., 2009. *When it comes to websites small is beautiful.* [Online]
Available at: http://www.aptivate.org/en/blog/2009/07/09/when-it-comes-to-websites-small-is-beautiful/

Jansen, J., Sobel, K. & Cook, G., 2010. *Gen X and Y's Attitudes on Using Social Media Platforms for Opinion Sharing.* New York.

Kapadia-Kundu et al, 2012. Understanding Health Information needs and gaps in the Health care system in Utter Pradesh. *Journal of Health Communication,* Volume 17, p. 30–45.

Knowles, M.S., 1975. *Self-directed learning, New York*: Associated Press.

Knowles, M.S., Holton, E.F. & Swanson, R.A., 2005. *The Adult Learner: The Definitive Classic in Adult Education and Human Resource Development*, Elsevier. Available at: http://books.google.co.uk/books/about/The_Adult_Learner.html?id=J6qGsHBj7nQC&pgis=1 [Accessed December 4, 2014].

Lwoga, 2013. *Measuring the success of library 2.0 technologies in the African context,* s.l.: s.n.

Mancini et al, 2009. *From spaces to places: emerging contexts in mobile privacy.* In: Ubicomp '09: Proceedings of the 11th international conference on Ubiquitous computing, ACM, New York.

Manyika, J. et al., 2013. *Lions go digital: The Internet's transformative potential in Africa.* [Online] Available at: http://www.mckinsey.com/insights/high_tech_telecoms_internet/lions_go_digital_the_internets_transformative_potential_in_africa. [Accessed 2015].

Masrek et al, 2010. *Evaluating academic library portal effectiveness*. Library Review, 59(3), pp. 198 - 212.

McGowan, J. et al., 2009. *Electronic retrieval of health information by healthcare providers to improve practice and patient care.* Cochrane Database of Systematic Reviews, Issue 3.

McKenzie, D. & Ozler, B., 2014. *The Impact of Economics Blogs: Dissemination Effect,* s.l.: s.n.

Meagher, L. & Lyall, C., 2013. *The invisible made visible: usisng impact evaluations to illuminate and inform the role of knowledge intermediaries*. Evidence & Policy, vol 9(no 3), pp. 409-18.

Meagher, L. R., 2009. *Impact Evaluation Of People At The Centre Of Communication And Information Technologies (PACCIT) Programme,* s.l.: Technology Development Group.

Miller, J. D., 2014. *Panda 4.0: Redefining Site Authority.* [Online] Available at: http://searchengineland.com/panda-4-0-redefining-site-authority-193636?_sm_au_=iSVs0JWtHWBZqS2j. [Accessed 2015].

Moalosi et al, 2007. *'Product analysis based on Botswana's postcolonial socio- cultural perspective'. I*nternational Journal of Design, 1(2), pp. 35-43.

NetIndex, 2014. [Online] Available at: https://www.techinasia.com/hows-southeast-asia-performing-internet-speed-race-infographic/

Nicholas, D. et al., 2008. *Viewing and Reading Behaviour in a Virtual Environment: The Full Text Download and What can be Read into It*. School of Information Sciences Publications and Other Works.

Nielson, 2013. *Smartphones keep users in India Plugged in,* [Online] Available at: http://www.nielsen.com/content/dam/corporate/india/reports/2012/Featured%20Insight_%20Indian%20Smartphone%20User.pdf [Accessed August 2016]

NR International, 2010. *Final Report, Review of progress to date and effectiveness of the Eldis project,* [Online]. Available at: http://www.eldis.org/vfile/upload/1/document/1403/ELDIS%20REVIEW%202010%20FINAL%20REPORT%20AND%20ANNEXES1.pdf [Accessed August 2016]

O'Malley, C., Draper, S. & Riley, M., 1985. *Constructive Interaction: A Method for Studying Human–Computer Interaction.* London, Elsevier.

Oliver et al., 2014. *A systematic review of barriers to and facilitators of the use of evidence by policy makers*. BMC Health services Reseach, 14(2).

Payne, N., 2004. *Culture and website localisation.* [Online]. Available at: http://www.webcitation.org/5uaaxzK3s. [Accessed 2015].

Pirolli, P. & Card, S., 2005. *Sensemaking processes of intelligence analysts and possible leverage points as identified through cognitive task analysis.* Virginia, McLean.

Prakash, G., 2013. *Use of internet by the researchers of Indian veterinary research institute, Izzatnagar, Bareilly: A survey*. Library Philosophy and Practice (e-journal), p. Paper 943.

Prakesh, E., 2013. *Use of internet by the researchers of Indian veterinary research institute, Izzatnagar, Bareilly: A survey.* Library Philosophy and Practice (e-journal), p. Paper 943.

Preece et al., 2015. *Interaction Design: Beyond Human-Computer interaction.* Chichester. John Wiley & Sons Ltd.

Priem, J., Taraborelli, D., Groth, P. & Neylon, C., 2010. *Altmetrics: a manifesto.* [Online] Available at: http://altmetrics.org/manifesto/?_sm_au_=iSVs0JWtHWBZqS2j. [Accessed 2015].

Tough, A., 1967. *Learning Without a Teacher*, Toronto. The Ontario Institute for Studies in Education.

Tough, A., 1971. *The Adult's Learning Projects: A Fresh Approach to Theory and Practice in Adult Learning,* Toronto: Ontario Institute for Studies in Education.

Pujar, S. & Fisher, C., 2011. *Stimulating demand for research: Exploring cultures of information use in South Asia. A desk based study.* Brighton, Institure for Development Studies, p. 24.

Rao, S. S., 2001. *Portal proliferation: an Indian scenario*. New Library World, vol. 102(9), p. 325 – 331.

Roberts, J., 2011. *Video diaries: a tool to investigate sustainability-related learning in threshold spaces.* Environmental Education Research, 15(5), pp. 675-688.

Roemar, R. & Bornhardt, R., 2012. *Bibliometrics to altmetrics: A changing scholarly landscape,* s.l.: Association of College and Research Libraries.

Romo Ramos, Y. J., 2013. *Mapping the Impact of Science Journalism,* s.l.: SciDev.Net.

Romo, J., 2013. *Global Science Journalism Report,* SciDev.Net [Online]. Available at: http://c96268.r68.cf3.rackcdn.com/SCIDEV_-_LEARNING_SERIES_3_DIGITAL_MASTER_COMPRERSSED_130110112629778.pdf [Accessed August 2016]

Rowlands, I., Nicholas, D., Williams, P. & Huntington, P., 2008. *The Google generation: the information behaviour of the researcher of the future*. Aslib Proceedings: New Information Perspectives, April, Vol. 60(No. 4), pp. 290-310.

Russell et al., 1993. *The cost structure of sensemaking.* Paper presented at the INTERCHI '93 Conference on Human Factors in Computing Systems, Amsterdam

Russell, D. & Jeffries, R., 2008. *Sensemaking for the rest of us.* Florence, Italy, ACM.

Murphy, P., 1999. *Learners, Learning and Assessment*, London: Paul Chapman.

Satge, De, R., 2011. *Assessing the need for a poverty information service: Programme to Support Pro-Poor Policy Development,* [Online] Available at: http://www.carnegie3.org.za/papers/68_de%20Satge_Assessing%20the%20need%20for%20a%20poverty%20information%20service.pdf [Accessed August 2016]

Savage, M. & Davine, F., 2013. *How can the results from a web survey represent a whole society?.* [Online] Available at: http://www.bbc.co.uk/science/0/22006066. [Accessed 2015].

Scott, N., 2012. *A pragmatic guide to monitoring and evaluating research communications using digital tools.* [Online]
Available at: http://onthinktanks.org/2012/01/06/monitoring-evaluating-research-communications-digital-tools/. [Accessed 8 March 2015].

Shaltoni et al., 2015. *Exploring students' satisfaction with universities' portals in developing countries*. The International Journal of Information and Learning Technology, 32(2), pp. 82-93.

Shaxon, L., 2010. *Improving the impact of development research through better research communication and uptake.* [Online] Available at: http://www.ukcds.org.uk/sites/default/files/content/resources/AusAID-DFID-workshop-background-paper.pdf. [Accessed August 2016]

Singh et al, 2005. *Analyzing the cultural content of web sites.* International Marketing Review, 22(2), pp. 129 - 146.

Smith, M.K., 1999. *The social/situational orientation to learning. The encyclopedia of informal education*. [Online]. Available at: http://infed.org/mobi/the-socialsituational-orientation-to-learning/.

Song, S., 2014. *African undersea cables 2016.* [Online]. Available at: http://manypossibilities.net/african-undersea-cables. [Accessed March 2015].

Starkey, P., 2013. *Feasibility study of options for long term knowledge sharing and management: Final Report (for IFRTD),* Crown Agents. Available at: http://r4d.dfid.gov.uk/pdf/outputs/AfCap/AFCAP-GEN0-96-Knowledge-Final-Report.pdf [Accessed August 2016].

Sylla et al., 2012. Qualitative study of health information needs, flow and use in Senegal. *Journal of Health Communication,* Volume 17, p. 46–63.

Terry, 2007. *The Pros and cons of google analytics.* [Online]
Available at: http://www.smtusa.com/blog/posts/the-pros-and-cons-of-google-analytics.html

The Internet Society, 2014. *Global Internet Report,* [Online] Available at: https://www.internetsociety.org/sites/default/files/Global_Internet_Report_2014.pdf [Accessed August 2016]

Thelwall, M., 2014. *A brief history of altmetrics.* [Online]
Available at: http://www.researchtrends.com/issue-37-june-2014/a-brief-history-of-altmetrics/

Uneke et al., 2011. *Individual and organisational capacity for evidence use in policy making in Nigeria: an exploratory study of the perceptions of Nigeria health policy makers*. Evidence & Policy, vol 7(no 3), pp. 251-76.

Veselinovic, M. & Clements, B., 2015. *Reading this on a computer? Then you (probably) don't live in Africa.* [Online] Available at: http://edition.cnn.com/2015/02/19/africa/africa-mobile-internet/) [Accessed 2015].

Wang, S., 1998. *A Cognitive Model of Document Use during a Research Project. Study I. Document Selection*. Journal of The American Society for Information Science and Technology, 49(2), pp. 115-133.

Wilkinson, D., Sud, P. & Thelwall, M., n.d. *Substance without Citation: Evaluating the Online Impact of Grey Literature ,* s.l.: Statistical Cybermetrics Research Group, School of Technology, University of Wolverhampton.

Wilson , T. & Walsh, C., 1996. *Information behaviour: an inter-disciplinary perspective. British Library Research and Innovation Report 10,* London: British Library Research and Innovation Centre.

Wilson, T. D., 1997. *Information behavior: an interdisciplinary perspective. Information processing & managemen*t, 33(4), p. 551:572.

Wilson, T. D., 1999. *Models in information seeking behaviour research.* Journal of documentation, pp. 249-270.

Zins, C., 2007. *Conceptual approaches for defining data, information, and knowledge*. Journal of American Information Sciences, Volume 58.