Online Permaculture Resources: An Evaluation of a Selected Sample

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Online Permaculture Resources: An Evaluation of a Selected Sample

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Abstract

As a newly-emerging, sustainable approach to landscape management, permaculture seeks to integrate knowledge from several disciplines into a holistic system with emphasis on ecological and social responsibility. Online resources on permaculture appear to represent a promising direction in the movement by supplementing existing printed sources, serving to update and diversify existing content, and increasing access to permaculture information and praxis among the general public. This study evaluated a sample of online resources on permaculture using a framework of parameters reflecting website usability and content quality. Best practice for website usability, as well as diversity of information and applicability, was addressed. The evaluation revealed, overall, good quality and usability in the majority of cases, and suggests a strong online presence among the existing permaculture community, and accessible support for those with an interest in joining the movement.

Keywords: Online permaculture resources, evaluation framework

Research Background

Permaculture: Definitions and Origins

Permaculture is a system of guiding principles and ethics for sustainable food production and land management, developed by Bill Mollison and David Holmgren in the 1970s; the term permaculture was derived from “permanent” and “agriculture,” as well as “permanent culture” (Mollison, 1994, p. 1). The concept of permanence refers to the sustainability aspect of the approach, in contrast with conventional agriculture (Bane, 2012, pp. 8-9). The goal is to create beneficial, symbiotic relationships among system components such as energy, animals, buildings and plants. Leading permaculture experts tend to emphasize different principles and applications, yet there are connecting threads, primarily in the following ethics of the system: “care of the earth,” “care of people,” and re-investment of surplus resources to those ends (Mollison, 1994, p. 3).

Permaculture does not fit into any single academic field and is not generally taught at universities. Therefore, exchange of knowledge and methods has primarily been carried out through trained instructors and, more recently, the web and social media. Such interaction is essential, because permaculture is often unintuitive to beginners and is not easily replicated from one site or context to another. There are a number of guiding principles embedded within permaculture ethics, and these vary in emphasis from practitioner to practitioner. However, for the sake of simplicity, Mollison (1994) posits that there are nine basic principles: Table 1 highlights these principles.

The overall focus of principles across all versions and practitioners is to rely on observation and natural pattern recognition, resource cycling, multi-function inputs, planting perennials, and accelerating succession. The applications and methods in permaculture are not new in themselves; in some places, permaculture is just as likely about preserving or restoring indigenous practices.

Permaculture: Implementation of the Idea

Permaculture is capable of addressing key sustainability issues in the world by allowing communities and individuals to take ownership of enormously complex issues such as food security, climate change, soil erosion, and desertification, and by addressing them at a local scale. Because community members take part instead of relying on external aid and planning, they develop ownership in the project and are often highly motivated, leading to successful...
outcomes. Successful practices are then transferable to nearby villages and neighborhoods, often through demonstration and education sites.

Although mainstream media has largely discounted the permaculture movement, some journalists have begun to take notice. For example, a recent story highlighting its application for Malawian flood control and food security appeared in the United Kingdom’s The Guardian newspaper in April 2015 (Moorsom, 2015). Below are just three international examples of implemented permaculture projects that highlight the global reach and diversity of this emerging movement.

**Suuraga Aguyt Cooperative, Mongolia.** Suuraga Aguyt is a small cooperative with modest aims to attain food security and to adapt to climate change. At the heart of this project is creative design. An experienced design team working along with the cooperative leaders had a variety of specific issues to tackle, such as a short growing season, preparing for (climate-change driven) deep-freeze scenarios in the future, identifying low-cost inputs, and planning for the collection and storage of resources (e.g., sunlight and water). The design team received feedback from the cooperative’s leaders about existing practices and challenges on-site. Along with the local trainees, participants in a Permaculture Design Course (PDC) were then able to implement effective solutions. In his explanation that follow-up can be conducted by means of email communications, Rick Coleman, the lead PDC instructor states: “We leave behind an empowered group to design their own solutions. Permaculture is information and imagination-intensive, lending itself to be followed up even from a distance, by email or internet” (Lynch, 2014, p. 119).

There is nothing traditional about Mongolians growing lettuce or potatoes, but with the wide variations in temperature, alternative solutions are required. Between 1999 and 2002, local herds suffered losses of over eleven million cattle due to extreme, unusually cold winters (Lynch, 2014). Subsequently, many people have left the countryside for the capital, leaving food production to a small percentage of remaining farmers. Exported vegetables from China and Russia are available for sale, but those often arrive with varying degrees of spoil (Lynch, 2014). Subsequently, working with succession Accommodation of plant succession to create healthy soil and vegetative communities.

### Table 1. The nine principles of permaculture (Mollison, 1994, pp. 6-26).

<table>
<thead>
<tr>
<th>Principles of permaculture</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relative location</td>
<td>The pattern of spatial relationships that dictate the best relative location for all inorganic (such as buildings and structures) and organic (such as shade trees and crops).</td>
</tr>
<tr>
<td>Multiple purpose</td>
<td>Each element should provide multiple benefits for the site — for example, trees should be selected and located to provide shade, fruit, erosion control and mulch.</td>
</tr>
<tr>
<td>Complementary solutions</td>
<td>Essential needs (food, water, energy) are served by the design in multiple ways.</td>
</tr>
<tr>
<td>Zone planning</td>
<td>Elements are laid out in an efficient manner, following patterns of most-frequent use.</td>
</tr>
<tr>
<td>Biological resources are preferred</td>
<td>Fossil fuels and derived products are minimized to unavoidable essentials.</td>
</tr>
<tr>
<td>Re-use</td>
<td>Energy and resources should be re-used wherever possible.</td>
</tr>
<tr>
<td>Efficiency of cultivation</td>
<td>Intensive cultivation of the smallest possible area, very efficient and controlled implementation.</td>
</tr>
<tr>
<td>Working with succession</td>
<td>Accommodation of plant succession to create healthy soil and vegetative communities.</td>
</tr>
<tr>
<td>Edge effects</td>
<td>Use natural or built boundaries to maximize bio-diversity and productivity.</td>
</tr>
</tbody>
</table>
Challenging cultural norms is sometimes part of the creative design process, and here in Mongolia one of the tasks is finding acceptable ways to integrate sewage while utilizing it as a renewable resource. In another cultural setting, a system of humanure (a more direct way to compost) would cycle these resources.

But here, to strike a compromise, a system of temporary pits achieves waste disposal, and fruit trees are planted once each pit reaches capacity. Some aspects remain a challenge. Retrofitting abandoned buildings into greenhouse space takes time and finances, and building a seed bank of best fruit varieties also takes time. As the community becomes more successful, earning an income from the sale of produce surplus will help fund additional phases of the project, however, engaging and educating the community has been a gradual process (Lynch, 2014).

**Maya Mountain Research Farm, Belize.** A more established site of applied permaculture is located in the Maya Mountain Research Farm (MMRF) in Belize, which serves as a valuable example of successful land restoration in the tropics. MMRF is located at the site of an ancient Mayan city, near the Columbia Forest Reserve; it borders a well-known archaeological site. The farm is a popular training destination for a Permaculture Design Course, and features prominent experts in permaculture (Bates, 2014; Moore, 2013). At the time of its purchase by the current owner in 1988, the land was a conventional-style citrus and cattle farm; it now functions as a non-profit enterprise and a research center. The site has a number of species that is nearly overwhelming, not only in terms of various trees and plant types such as vanilla, cacao, coconut, guava, and avocado, but also in the number of varieties of each. After years of work in reforestation and achieving biodiversity, the system has reached maturity and its upkeep is largely low-maintenance, while providing most of the resources needed at the farm.

The abundance of trees on site not only provides edible crops and timber, but also captures carbon dioxide, a benefit extending beyond the farm site to the larger, global community. The farm also engages in giving back to the community by donating its food surplus to a local nutritional program for the elderly (Moore, 2013, pp. 28-30).

MMRF serves as an education and demonstration center that trains “locals, Peace Corps volunteers, government agriculture researchers, and international students” (Bates, 2014, p. 51). The farm is very active in seed exchange programs with local farmers, and considers this essential to its function in local food security and biodiversity awareness. Both cacao and vanilla are important crops at MMRF; the farm boasts “a gene bank of 250 indigenous vanilla vines” (Bates, 2014, p. 51). As in any permaculture site, most resources on site find multiple uses; for instance, cacao pods are recycled as biochar once seeds are separated from the pod.

While teaching permaculture methods, education efforts at MMRF also aim to help reverse loss of indigenous knowledge of agroforestry, a legacy of the ancient Mayan civilization. These almost-forgotten methods are endangered because they have largely been replaced with conventional crop farming. Many neighboring farms practice conventional agriculture; as part of the annual field-burn practices, an uncontrolled nearby fire in 2008 destroyed a large part of the managed forest system at MMRF. The sections still recovering are considered ‘works in progress’, now densely planted with many various plants including timber, nitrogen-fixing plants, biomass accumulators and pioneer species to address erosion and to help speed the recovery of land to health (Bates, 2014).

**Krameterhof, Austria.** One of the most well-known and recognized projects in permaculture began in the 1960s in Austria, and has grown to a size of 45 hectares (Holzer, 2011). At 1,000-1,500 m (~3200 - 4900 ft.) above sea level, several challenges such as controlling erosion, a short growing season, and temperature fluctuations need consideration. In order to control temperature, windbreaks, raised beds, stones to retain heat, and terracing techniques have all been effective in this regard. Besides helping control erosion, terracing, ponds, and other earthworks also help retain water on site to percolate down rather than create runoff (Holzer, 2011).

Trees and plants thrive in every corner of the farm. With experimentation, Holzer has been able to grow unlikely varieties, especially given the challenging site (2011). He is also fond of heirloom varieties, as these tolerate difficult and variable site conditions. In addition, heirloom edibles are often better in flavor. There are multiple cereal crops grown at Krameterhof, including ancient wheat and spelt. Tree orchards and even forest areas contain a few thousand fruit tree varieties including pears, apples, cherries, and also...
wild varieties, which helps maintain a healthy system. Natural materials are recycled on site, for example trees damaged in a storm are converted into shelter material for the animals, terracing structures for the garden or for raised beds (Holzer, 2011).

A large variety of animals are also part of the farm homestead. Holzer considers his farm animals to be workers who are largely free to roam the site (2011). While the animals are provided with shelters on site, they are not confined. Given some proper encouragement through feed placement, pigs turn the soil over for management and new planting; this is especially useful with stony soils. The farm holds heirloom pig varieties, has experimented successfully with wild cattle (yaks, bison), cows, and poultry (ducks, geese, and at times even pheasants and quail; Holzer, 2011). These kinds of successes have been the result of trial and error, and observation over time. Every aspect, from soil quality and plant pollination to managing inputs sustainably requires attention to learn what works and what does not.

While holding an on-site workshop in 1995, the owner learned that the methods utilized at his farm were very similar to permaculture (Holzer, 2011). Holzer is now teaching within the framework of permaculture as no other system matches this style of farming closely, apart from agroforestry applications with the related sections at the site. At the urging of others, Holzer decided to open up the farm to visitors and to hold public tours and training events in order to share success stories. Since then, information about the farm and its methods have also become available in several DVDs, books, and online. Krameterhof is an illustration of permaculture methods straddling new and old practices in land management and farming. It is where traditional knowledge systems - rejected or lost - become useful once again, regardless of whether the term “permaculture” is specifically applied.

**Accessing Permaculture Resources: Internet & Social Media**

The three case-studies presented above demonstrate not just the international dimension of permaculture, but also highlight that the implementation is challenging and deals with fundamental survival and quality of life issues. This suggests the permaculture community can greatly benefit from inter-community advice, guidance and discussion. Permaculture projects are highly “information-intensive” (Mollison, 1994, p. 31) and so access to information, advice and case studies is very important, especially in the design and early management stages until a healthy and well-functioning ecosystem is established. Increasingly, in general readers seek information and solutions in an online environment (Waller, 2011) and permaculture projects like those presented above are more extensively documented in blogs, social media, and online video updates, than in print.

A study by Ferguson and Lovell (2014) identified just 230 traditional, academic-type publications on permaculture, including books, periodicals, conference proceedings, and graduate theses. While scientific literature on permaculture has recently increased, and numerous opportunities for academic investigation remain (Ferguson & Lovell, 2014), the Internet is often a more immediate resource of information about permaculture for the layman and, unlike printed sources, provides opportunities for interaction. For example a recent article reports on an established project in the Outer Hebrides, off the coast of Scotland, and recounts early frustrations felt by the land-owners as they attempted to kick-start their project in the 1970s, “a time before the Internet,” with little opportunity to learn from others’ experiences in a similar, challenging climate zone (Lauruol, 2014, p. 42).

Given the complexities, challenges, community focus, and global dimension of permaculture, there seems to be a good fit with online resource provision, especially case-studies and guidance. Several efforts have already been made to document global case studies in hard-copy format (Bane, 2012; Birnbaum, 2014; Holmgren, 2005). However, informal, web-based resources are also worth examining for the following reasons: their potential convenience and ease of access to the layman community; fast cross-referencing of information and sources (comparison “shopping”); and the opportunity for interactive learning (forums and social media). At first glance, the online permaculture community appears quite diverse; some webpages and videos are devoted to telling the story of an individual project (such as a blog), while others combine background information and principles overview with practical advice and techniques. Podcasts and online forums are also available, and projects with a Facebook page generally feature photos and progress updates. These resources are generated by a great variety of groups and individuals worldwide, including NGOs,
Research Objectives and Limitations

The potential for online permaculture resources is not limited to urban and developed world communities. One notable blog post from the Permaculture Research Institute (PRI) Kenya website lists a request from a local permaculture farm to donate a laptop and camera for documenting their on-site progress with project implementation (Brush, 2010). However, the dissemination of appropriate technology and information platforms in less developed or urbanized locations may be more limited; this is partly addressed in this article. More broadly, there appears to have been little attention given to the quality and accessibility of online permaculture advice and information, as a complement to the aforementioned work available in print form. Beginning to close this gap in knowledge is the overall aim of this work.

For the purposes of this study, specific research objectives are to (a) create evaluative criteria for online permaculture resources and (b) apply these criteria to a non-representative sample of case-study web-sites and online resources to tentatively identify trends in quality. It should be noted that this study was subject to narrow time-limits and, as such, cannot claim to be an exhaustive survey. The case sites of online permaculture resources presented here are not representative and therefore research findings can only be tentative. In addition, web-based resources are dynamic and the study was limited to a brief timespan. It should also be noted that the Internet is not accessible to all, and the knowledge and methods shared online are often communicated ‘second-hand’ to “Internet-free” or low-availability zones through aid organizations (i.e. NGOs, non-profits) and practitioners who travel to teach or volunteer. Therefore, assessing the quality of this information transfer is beyond the scope of this paper.

According to Barton and Kleiner (2000), evaluation of sustainable case studies must be treated with caution, since it involves a level of simplification and subjectivity; however it can be sharpened and objectified through reference to best practice. In this paper, best practice has been described in the Methods section, while the literature review provides the background for those metrics dealing with qualitative evaluations.

Online Case-Site Selection Criteria

The sample of online resources includes a diverse mix of projects in different climates and world regions. High-income countries (i.e. developed nations) are represented along with lower-income countries (i.e., lesser-developed nations). The sample includes different types of organizations by structure and funding sources, such as community, NGO (Non-Governmental Organization), private, and BOT (Build Operate Transfer). A BOT is initially a privately owned project that is transferred to the government after an agreed-upon period of time (Huijbregts, 1996). Websites operated by experts and leading figures in permaculture and prominent periodicals on permaculture are included in this study, as well as small, lesser-known individual farm and community projects. In some instances, two websites with the same owner but two separate web addresses were evaluated as a single case study due to large sections of indivisibly-shared content and their complementary function. Diverse geographic regions and climates are also represented. A more complete representation is limited by the scope of this study and the case sites presented here are, of course, not exhaustive. However, the intention here was to present a diverse range of web-based resources within the limited time of the study. The following sub-sections outline the evaluative criteria compiled to assess the case-sites of online permaculture resources, largely drawn from reported best-practice. Tables 2A and 2B below summarize the evaluative criteria for quick reference.

Usability: Layout and Style

Even with high quality content, visitors will find a website to be less than helpful if it provides poor usability experience. Usability experts Jakob Nielsen and Kara Pernice (2010) share results of their research on how visual elements in layout can strongly affect a web user’s experience, including alienating frustrated users. Generally with regard to layout, web design experts advise to keep things simple: uncluttered with sufficient white space, also known as “breathing space” (Lopuck, 2012, p. 123), along with distinct page sections to group content - this helps create a visual hierarchy and prioritize content for the reader (Krug, 2014; Lopuck,
## Table 2A. Numeric Evaluation Criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Rationale for evaluation</th>
<th>Rubric of numeric evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Usability: layout and style</strong></td>
<td>Affects ease of use. Includes: page organization; spacing, use of headings and subheadings; selection of color and style in background and fonts all to be unified through design to present content effectively.</td>
<td>1 – Very Poor: Scattered design, no evidence of strategy in visual presentation.</td>
</tr>
<tr>
<td><strong>Usability: navigation</strong></td>
<td>Affects efficiency of communication and access to content. Includes: placement of navigational elements and their persistence throughout website; section labeling and organization.</td>
<td>2 – Poor: Unclear section labeling, very poorly organized placement.</td>
</tr>
<tr>
<td><strong>Usability: search feature</strong></td>
<td>Affects ease of access to information. Includes: placement and function of the search feature throughout the website.</td>
<td>3 – Fair: Inconsistent placement, or poor function.</td>
</tr>
<tr>
<td><strong>Content updates</strong></td>
<td>Affects relevance of information. Includes: time elapsed since the last content update.</td>
<td>1 – Very Poor: No apparent updates in over 2 years.</td>
</tr>
<tr>
<td><strong>Resources and links</strong></td>
<td>Affects ease of access to additional information. Includes: presence of materials, drawings, documents, podcasts, videos, and linked resources.</td>
<td>2 – Poor: Very few or poor in quality materials, bad links.</td>
</tr>
<tr>
<td><strong>Problem-solving</strong></td>
<td>Affects implementation and dissemination of best practice. Includes: problem-solving content for do-it-yourself projects; offering PDC or referrals.</td>
<td>3 – Fair: Almost no content related to problem-solving.</td>
</tr>
<tr>
<td><strong>Financial discussion</strong></td>
<td>Affects feasibility of implementation. Includes: articles or forum posts on topics related to financing a project,</td>
<td>1 – Very Poor: Very little content, or only marginally.</td>
</tr>
</tbody>
</table>

## Table 2B. Non-Numeric Evaluation Criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Rationale for evaluation</th>
<th>Descriptive evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Interactive features</strong></td>
<td>Affects dissemination of knowledge. Includes: Presence of forums, social media links, and ability to view and post comments on website.</td>
<td>Forums included (F)</td>
</tr>
<tr>
<td><strong>Inclusion of case-studies</strong></td>
<td>Affects understanding of implementation and context of projects. Includes: Description of physical site projects, including photos, progress updates, videos, and how-to content.</td>
<td>Global scope in case-studies (G)</td>
</tr>
<tr>
<td><strong>Funding source</strong></td>
<td>Affects feasibility of implementation. Includes: source(s) of funding for the project.</td>
<td>Non-Governmental Org. (NGO)</td>
</tr>
</tbody>
</table>
Achieving organization and user-friendly design includes legible fonts, clear headings and subheadings, and page background color. According to Lopuck (2012), even seemingly minor elements, like widening letter spacing (leading) in introductory paragraphs, help enhance web users’ experience.

Graphics are also helpful for supporting content, as long as they are well-placed, relevant, and not overly large. According to Lopuck, “in web design, large photographs or complex graphics that take up the whole page can be like lumbering elephants” (2012, p. 120). In this category, evaluation ratings were based on the overall design strategy and use of the above elements to showcase content by websites in the sample. Those with a clear visual hierarchy and good organization received the highest rating (5), while those with the least user-friendly, scattered design and no visually-prioritized sections received the lowest rating (1).

**Usability: Navigation**

User-friendly navigation is an essential component for successful web experience. There are different ways to place navigation - top, left, or right - with top and left being the preferred methods. Consistency is important, as with persistent, global navigation, where the menu remains in place on all pages throughout the website (Krug, 2014). Primary navigation is the minimum and generally appears at the top or left of the page. Secondary navigation, also known as “subnavigation” (Nielsen & Pernice, 2010) may appear below the primary bar, or can be displayed when either pointing or clicking on a section in primary navigation. There can also be tertiary (sub-subnavigation) levels, and so on. Additionally, breadcrumb-style navigation is “most useful in a large site with a deep hierarchy” (Krug, 2014, p. 80). Keeping all levels of navigation consistent and organized is essential to user-friendly design. In addition, section names should organize “similar items and features” and be based on a good sitemap with prioritized levels of content (Lopuck, 2012).

Case sites in this study were evaluated based on their overall effort in utilizing the above elements to streamline user experience in navigation, rather than the presence of all features. Those with a well-organized system and good section labeling received the highest rating (5), while those with a confusing and least user-friendly system received the lowest rating (1).

**Usability: Search Feature**

The search feature on the Internet is sometimes considered a sub-utility of web navigation (Krug, 2014). Nielsen and Pernice (2010) discuss the search feature in a chapter on navigation, though it is also mentioned in page layout discussion as part of overall selection and placement of features in creating page design. By contrast, Web Design for Dummies covers the search function as part of the “Interaction Design” discussion (Lopuck, 2012, pp. 78-80). This study treats the search feature separately from navigation. When searching for very specific solutions, especially within a larger website, users expect to find a search box to help along in their quest. Preferably, the search feature should be located where users expect it, namely in the top right corner of each page (Lopuck, 2012). For this category, websites in the study sample were evaluated based on the following elements: whether a search feature was present, the relative ease in finding it on the website, and the overall functionality of the search feature. In those cases where no search feature was located, the “N/A” rating was assigned.

**Interactive Content and Features**

Interaction is key for many users at all levels of familiarity with permaculture. Learning, browsing for general solutions, searching for a specific answer, or just being a part of the larger community are all good reasons to communicate in an interactive environment. In addition, some visitors are looking for local resources or other nearby practitioners to exchange ideas. Websites with blog comment options enabled, forums, and websites with a prominently displayed link to their Facebook page received a rating in this category, whereas those without either of these features were marked “N/A” for “not available.” Among those with interactive features, forums with recent user activity received a rating of “F” (for forums), and those with a link to their active Facebook page or a YouTube channel received a rating of “S” (for social media); forums with open blog comments received a rating of “Cm” (for comments). A combination of letters in ratings indicates a presence of multiple features in this metric.
Inclusion of Case-Studies

Case studies of implemented permaculture projects can supplement and enhance problem-solving content found on a given website, and readers may find stories inspiring. They can be similar to those covered in the literature review section of this study, or can be more or less descriptive. Project case studies in this evaluation constitute project descriptions in articles, blogs, forum threads, or in the “resources” section of the website, or the sum total of content found in these sections. Therefore, in this context a case study is a loose term encompassing all information (description, explanations, photos, videos, progress updates) across a website regarding one or more physical site(s). This evaluative category of ratings examined websites based on the amount of content describing the projects (case studies). Those with in-depth descriptions received the highest rating (5), while those with few, poor, or vague descriptions were rated lower. In cases where projects were not covered at any length, the “N/A” rating was assigned.

While permaculture methodology and application is highly transferable due to its basic principles, building on local or regional experience helps eliminate guesswork and create better and more efficient designs. For easy reference of the project scope in table format, resources evaluated in this study were also categorized in terms of geographic focus, regardless of the level of supporting detail. For the purposes of this evaluation, this category was classified as follows: “G” – global scope; “R” – regional (multiple projects in one country or geographic region); “L(s)” – local, single project; and “L(v)” – local, various projects (when located across different parts of the world).

Content Updates

Frequent updates to websites are key; this is especially true for websites with interactive focus and blogs. In terms of blog-type websites and those with project updates, consistency in documenting progress and showcasing recent developments look more appealing to the reader. With forums, a lack of recent activity and updated information may create a perception that the online community is not active or has moved on to another website. Other sections in need of regular updates are those that pertain to upcoming events (if any). This study evaluated websites based on timely updates. Those with updates within the last month received the highest rating (5), while those with less-frequently updated content were rated lower.

Resources and Links

If a website has proven to be easy to navigate and has good content, visitors may also hope to find links to other useful resources and websites. Some resources can be made available through a link, while others blend in with website content through embedded placement on-page. Visual and audio media, links to forums or other blogs on permaculture, PDF files, and book excerpts are examples of typical resource variety users might expect to find. The study evaluated the sample by considering the number, quality, and relevant nature of the resources offered by each website. Due to the limitation in the scope of this study, resources and links were randomly selected for testing as opposed to performing a complete, all-inclusive test. In addition, it should be noted that a broken link may be updated or restored at any time (though not likely), and a functioning link may likewise become broken or lead to a no-longer working site. A low quantity and/or poor quality of links and resources resulted in lower scores, while websites with many resources and links received the higher ratings. In cases where no resources or links were located, the “N/A” rating was assigned.

Problem-Solving

No matter how pleasant the browsing experience or how frequent the blog updates, some users are just looking for substance; in other words, readers want to know if there are specific answers, tips, and real-world solutions available on the website. Evaluation ratings in this category were assigned based on the amount of content that could be used in problem-solving, or troubleshooting problems likely to arise in a do-it-yourself permaculture design project. A low amount of problem-solving content resulted in lower scores, while websites with many versatile solutions (whether in forum threads or article format) received the higher ratings. Consideration was also given to the possibility that some hopeless cases may need more emergency-type intervention and users may be willing to attend a Permaculture Design Course or even hire an expert. Therefore, websites making such offerings were considered as providing a certain level of problem-
Financial Discussion or Tips

While not as essential for small-scale backyard projects, financial matters are likely to be at the foundation of design for many users, both at the outset and at every new stage in permaculture design. Financial topics may include discussion about loans for permaculture projects, creating means of income while homesteading on a permaculture farm, or making the best use of existing resources and means according to the permaculture principles and philosophy. For this category, a low quantity and/or poor quality of discussion about finances or related tips resulted in lower scores, while websites with multiple articles addressing the subject, or those with opportunities to follow, continue, or open, such a discussion (as with forums) received the higher ratings. In cases where no related discussion or tips were located, the “N/A” rating was assigned.

Funding Source

The funding source identifies each project by type (organization or individual) and can serve to inform the reader about the aims of the project, its limitations, and its stakeholders. It may be useful to connect the metrics discussed above in the context of each website’s ownership, and to identify trends (if any) based on the type of project. The types of projects and abbreviations used are as follows: NGO – Non-Governmental Organization; P – Private; PA - Private with additional funds (donations, grants); NP – Non-Profit Organization; BOT – Build-Operate-Transfer; and C – Community.

Results

A summative table of the evaluation is presented at the end of this section (see Table 3). The following sub-sections describe observed trends against each evaluation criteria in more detail.

Usability: Layout and Style

Although very different in their layout and style selections, the majority of websites displayed good organization and simplicity in style, with elements that do not impede the browsing experience or obscure content. Pages at Reinventing Roots are grouped by related content that is also supported with relevant graphics; there is good use of headings, a simple and legible font style, and the elements are consistent throughout the site (n.d.). A two-layer background adds interest and a photo image is overlaid with a semi-opaque page to frame content. The Permaculture Magazine website also achieves a good impression, featuring clearly organized sections (“Readers’ Solutions”, “Reviews”) with good fonts, however the background here is simple—a basic white (2015). In the somewhat less effective category of websites, Pattern Literacy uses few images with a dominance of text content—which, despite good use of headings, could use grouping and added visual organization. On the other hand, Permaculture for Peace displays a persistent (all-pages) large photo with an overlaid banner, stretching from the top down to the “page fold”, which means scrolling down to view content (n.d.). The least effective design in terms of layout and style choices is at Permaculture Activist, where line borders attempt but fail to achieve intended content organization, along with low white space ratio. In addition, text line spacing is too close on most pages, and bold fonts in every shape, color, and style appear haphazard. Some pages feature block sections of bright yellow or light green background alternate in multiple shades, which makes for unpleasant reading (n.d.). As an aside, the magazine has recently completed a successful Kickstarter campaign to raise funds for a new website.

Usability: Navigation

For the most part, the sample included in this study showed well-designed navigation systems, with the majority earning a “Good” or “Excellent” rating. Wayne Weiseman’s Permaculture Project has a simple, consistent navigation design whereby the website features a persistent left-sidebar menu along with breadcrumb navigation at the top, and an additional menu at the bottom of the page (n.d.). Other websites had a less intuitive navigation design and earned a slightly lower rating of “Good.” Specifically, primary or secondary navigation may have suffered from poor labeling and/or organization. An illustration of this scenario may be found at Paul Wheaton’s Richsoil website. Here, labeling does not indicate that by clicking on the “Video” section in top navigation, the user will...
abandon the site and end up at Paul Wheaton’s video channel on YouTube. Also, the Blog section oddly features no blog articles, but only podcasts - which, by the way have their own section, “Podcasts” (Wheaton, 2015c).

Another commonly disorienting experience, where sections do not highlight to reflect current location, earned some websites a lower rating – as illustrated at the La’akea Community’s site (n.d.). The most confusing design is featured at Permaculture Activist. The navigation menus are located inconsistently at a different place on different pages. Clicking on the “Blog” menu option takes the user, without warning, to a series of blogs, some of which are defunct or have not been updated in years, and located on unrelated websites - with the only option: advance on to the next blog by selecting “Next” at the top of the page (n.d.).

Usability: Search Feature

Some version of the search feature was available on all except three websites in the sample. Lower scores resulted in instances where the search feature was not global; in other words, it only extended to a specific section of the website. For instance, the search feature at the Permanomades website (n.d.) is limited only to the blog section of the website. Most websites featured a simple box-style search feature, however Permaculture Research Institute’s Worldwide Permaculture Network offers an advanced version in the “Projects” section, where users may search for registered permaculture projects across the globe by keywords, climate region, or designated type (2015). One website, the Permaculture Activist, placed the search feature (powered by the DuckDuckGo search engine) at the bottom of the home page, where it may be difficult to notice, whereas other pages display it at the top center of the page (n.d.). Permies forums do not have a search box on the homepage or main forum category pages, however it appears once the user has selected a specific topic within a forum section – such as “lawn” (a topic) within the “growies” forum (Wheaton, 2015a).

Interactive Features

The majority of websites in this sample include at least some level of interactive features; however some were quite obscure in the process. For instance, Never Ending Food (2015) only links to the Facebook page following an article (at the bottom of one webpage) in the “Who We Are” section. Other websites were more successful and embedded a prominently-located preview link to Facebook, including recent posts showing in the window (as with Reinventing Roots). Half the websites allowed article and blog comments on their pages. Several websites, like the Permaculture Project, have opted to disallow comments in their blog section, possibly due to maintenance considerations such as time in managing responses and spam posts. Two large permaculture forum websites were included in this study (forums at Permaculture Research Institute and at Paul Wheaton’s site), with the latter appearing the larger of the two based on the number of visitors and total content. At Paul Wheaton’s forums website, a separate forums section called “Regional Resources” demonstrated a good level of activity with threads to connect locally in every part of the world, and may serve to further encourage international participation in permaculture (2015a).

Inclusion of Case-Studies

Informal project descriptions and updates appear in some depth or level of detail on most of the sampled websites. For most, this type of case study information is generally scattered across different sections of the website. It should be noted here, in attempting to get the “big picture” of any given project, user-friendly organization of the website (as covered in the usability metrics above) proved indispensable. At the Food Water Shelter website (2015), project details can be gathered from the yearly annual reports available in PDF format. The Panya Project community (2011) has a historic section detailing the original funding proposal and incremental progress since the beginning of the farm. Where made available, blog sections provide a well-organized venue for project updates. In the case of websites with forums, many visitors have shared details of their projects, often with added photos or other supplemental information. Never Ending Food’s “Design Ideas” section (2015) documents several local projects over the last few years, including schools, neighbors’ properties, and even a small nearby village. Depending on the needs and preferences, readers may also browse through the pages of the Permaculture Research Institute’s Worldwide Permaculture Network (listing numerous projects worldwide), or decide to...
focus on immersing in a single project to get all the details (2015). Those websites with a global focus (“G”) contain numerous articles on a variety of projects worldwide, as seen at the Permaculture Magazine (2015) and Permaculture Research Institute (2015a). Websites detailing a single farm, “L(s)”, or experiences at several small farms, “L(v)”, are mainly focused on updates about their own project, as with the La’akea Community (n.d.) and Permaculture for Peace (n.d.). A distinct small group of regional project case study websites is also represented: Never Ending Food (projects in several villages in Malawi) (2015), Itinerant Permaculture (multiple educational projects, mostly in India and Cambodia) (Zook, 2012), and at Reinventing Roots (Israel’s Negev desert region, with projects in multiple Bedouin villages) (n.d.).

Content Updates

Over half the websites in the sample contain recent material updated within the last month. The updates are typically in the form of blog entries, information about a recent or future event at the project site, or an upcoming Permaculture Design Course. The Panya Project’s blog features a recent blog update about processing coffee beans by hand as part of the experiment at the farm (2011). Another example, Richsoil regularly features new podcasts about various aspects of permaculture – interviews with experts, how-to advice on popular permaculture topics, alternative energy, and more (Wheaton, 2015c). There are a few minor consistency issues associated with content updates, as with some sections of The Permaculture Magazine’s website (2015). For example, the articles here do not display dates of postings, whereas others have the dates listed, but only on the section preview page. The study also revealed similar issues with other websites. This may be confusing to readers looking for information specifically in the context of date order or new content. Itinerant Permaculture and the Permaculture Activist Magazine earned a lower rating due to a lack of recent content updates (miscellaneous postings in the schedule and events sections aside) (Zook, 2012). Similarly, at the La’akea Community website, the “Updates” section, persistent on the right side every page, has clearly not received updates in some time as it announces a tour and other events in 2013 and 2012, with no updated events added since (n.d.). Some of the websites presented embedded links to their respective Facebook or wiki pages, however, this did not help improve their respective rating in this category unless newly-updated content was embedded and visible on the website itself.

Resources and Links

There is a wide variety of permaculture resources available in this small group of websites. As might be expected, the larger websites (forums, Permaculture Magazine) offered a lot of resources. With smaller websites, even where content volume was limited, much of the information is still of good quality. For those interested in earlier, “historic” materials in permaculture, Permaculture Project shares several pamphlets in PDF format, based on a Permaculture Design Course taught by Bill Mollison in 1981. There are also images of drawings, master plans, and other resources for multiple projects in the author’s Design Portfolio section, as well as a section of design plans from student projects. Pattern Literacy offered excerpts from the author’s Gaia’s Garden book, a practical manual on permaculture, plant lists in PDF form, and articles with reflective essays grounded in the permaculture frame of reference, providing a philosophical perspective. There are also several embedded videos of Toby Hemenway’s lecture presentations. Paul Wheaton’s Richsoil website links to his YouTube channel on permaculture and also offers a large number of podcasts. Never Ending Food contains a “Research” section with links to papers and research on permaculture in Malawi (2015). Many of the websites surveyed featured embedded or linked resources, including YouTube videos and podcasts, and sometimes linked to their respective pages on Facebook. There were incidences of dead or broken links with some of the listed resources, for instance at La’akea Community website and Rico Zook’s I-Permaculture site (2012).

Problem-Solving

For the most part, the larger websites in the group offer the best option for finding solutions, and appeal to a wide, international audience. This is due to the broad global scope with coverage of diverse projects worldwide. Forums at Permaculture Research Institute and Permies websites have a wealth of content, and users have the freedom to build on prior discussions or start a new thread. Examples of current threads dealing...
with issues include “need advice on squirrel control” at Permies’ Critter Care forums (Wheaton, 2015a), and “Establishing orchard - to swale or not to swale?” at Permaculture Research Institute forums (PRI’s Permaculture Forums, 2015c.). When looking for an area-specific answer (best locally available renewable resources, water harvesting laws, etc.), the smaller, local websites such as the Panya Project (2011) and Never Ending Food (2015) also had good information and articles to offer. With both of the above projects, the websites offer visits so that local residents may arrange a site visit to get answers or suggestions in person. A half of the websites in this category received low scores. While they offered some combination of workshops, PDCs, and design or consulting services, for someone browsing for no-cost solutions (or just not willing to commit), PDCs and consulting are not much help. One exception is a low-commitment course at Permaculture for Peace, where users can “drop-in” at any course online for a small donation of ten U.S. dollars (n.d.).

Financial Discussion or Tips

The vast majority of websites in this study do not specifically address financial topics. As to those with financial topics present, The Permaculture Magazine has several interesting articles in this regard (“Learn Permaculture Design for Free” and “How to Crowdfund Your Permaculture Project”; Adams, 2012; Harland, 2014). While originally part of the paid magazine content, these were made available as blog posts for free access. At Permies forums, there is a separate forum on “financial strategy” under the “living” section (Wheaton, 2015b), with threads like “farm land financing” (Hunter, 2014) and “investing the permaculture way” (Lapointe, 2013). The Permaculture Research Institute, in its financial management section, offers articles and tips, two examples being “Crowdfunding Your Permaculture Project – Which Type is the Best Fit?” and “3 Keys to Starting A Successful Permaculture Based Business” (Permaculture Research Institute, 2015b). The complementary forums section of this site does not appear to have much easily-identifiable and current content related to financial tips, however users may post new threads with specific questions of their choice.

Funding Source

Information about the project funding sources is generally included in the “About Us” or a similar section of the website. Some projects use mixed funding sources to promote permaculture in the area, such as Never Ending Food, where in addition to private funding and grants there is a separate section for donations (2015). Another growing trend is to utilize a well-known crowdsourcing platform like Kickstarter to help with funding. A recent successful campaign by the Permaculture Activist Magazine to raise funds for updating the website and digitizing content of past magazine issues is a great example. At Paul Wheaton’s Richsoil and Permies forums websites, Kickstarter campaigns serve to create an educational permaculture deck of playing cards and a set of DVDs on rocket mass heaters (2015a; 2015c). In addition to the majority of privately-funded projects, two Non-Governmental Organizations, two community-funded projects, and one Balance Operate Transfer organization are featured in this study.

Additional Resources on Permaculture – Facebook and YouTube

Many of the websites in this survey also maintain a Facebook page. Facebook does not tally the number of pages in a keyword search, but according to Google, there are over 500 Facebook pages that include permaculture in their name. Some, of course, do not explicitly state “permaculture” in the title. In addition, many more incorporate permaculture ideas and applications alongside other sustainable methods in their work. Overall, on Facebook there appears to be a lot of activity on the topic of permaculture – with individuals, non-profits, educational and community organizations, landscaping services, and permaculture farms present, among others. A search for “permaculture” on YouTube currently yields around 189,000 results. Since individual users self-post content, video titles and tags may be riddled with spelling errors or not very descriptive titles. There is an interactive component in that users are able to discuss content, as long as comments are not disabled for the specific video. Other, mostly relevant suggestions appear on the sidebar. Advertisements hinder the interface but mostly are a minor annoyance. There are around 30,800 YouTube Channels ready to follow; some channels include just compilations, while
others offer self-recorded material. Some of the videos include recordings of the Permaculture Design Course, a great resource for those who have not received this training or would like to refresh their knowledge. YouTube also contains videos in other languages, which is an added benefit to multi-lingual users and those based in non-English speaking countries. A free account is required to subscribe to a channel, upload content, and create playlists.

**Discussion**

Whereas Scott (2010) has argued the permaculture literature is lacking updates and content can be redundant, the answer may rest in supplementing such existing information with current online resources. Updates that are even in small numbers (such as those evaluated in this study) appear to fill the gap quite well and present content that is very diverse.

This study evaluated a sample that illustrates resource diversity in terms of content and delivery (types of media), with good quality of resources overall. The larger websites cover significantly more content, and are much more diverse in scope than those devoted to

### Table 3. Evaluation table of online permaculture resource case-site

<table>
<thead>
<tr>
<th>Website (name and URL)</th>
<th>Usability: layout and style</th>
<th>Usability: navigation</th>
<th>Usability: search feature</th>
<th>Interactive features</th>
<th>Inclusion of case-studies</th>
<th>Content updates</th>
<th>Resources and links</th>
<th>Problem-solving</th>
<th>Financial discussion</th>
<th>Funding source</th>
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NGO – Non-Governmental Organization; P – Private; PA – Private w/ additional funds; NP – Non-Profit Organization; BOT – Build Operate Transfer; C – Community; Cm – Comments; F – Forums; S – Social Media; G – Global; R – Regional; L(s) – Local, single project; L(v) – Local, various projects

N/A – not available; 1 – very poor; 2 – poor; 3 – fair; 4 – good; 5 – excellent
one or two projects. The individual project sites (with single, various, or regional projects) offer content with a more narrow focus in a specific climate and cultural setting, which allows a closer look at specifics. Mostly, the content focuses on creative, practical solutions within the framework of permaculture, as opposed to discussion of permaculture in an academic context. Examples include topic-specific discussions in problem-solving, projects of various scope with supporting visual details, and even some financial guidance provided by some of the websites in the sample. Project case studies also include models for community and NGO projects; these categories in themselves warrant future research due to the potential social and economic impact.

While permaculture is experimental (if only because natural patterns have become so foreign to many in today’s world), the content in this sample of websites provides a solid frame of reference to help absorb the methods, ethics, and applications. This is important as few have the skills, time, or financial resources to manage a permaculture project without the shared pool of knowledge from the permaculture community at least part of the time.

In terms of usability, the websites in the sample are largely accessible and user-friendly, with the exception of the Permaculture Activist, where upgrades will soon be underway. Navigation and search features are generally good, though some improvements would further increase accessibility to the users. The websites make use of good fonts and many use headings, though none appear to have experimented with some of the finer stylistic techniques, such as leading (covered in the section on website usability). Detracting from the overall quality in the sample are a few cases with rarely updated content and those with poorly designed content organization. Several websites do not offer much case study material and only briefly demonstrate their projects. This may be, at times, due to the existence of a respective Facebook page with project updates; however the study does not include these as part of the evaluation. Facebook and other social media websites present a potential area for research in the permaculture movement that would augment the findings presented above.

Websites in this study also show content designed to attract interns and volunteers, potential community members, or Permaculture Design Course (PDC) participants. To this extent, a fair amount of information on evaluated websites is devoted to showcasing the physical site and its appeal. Whether such visits and on-site training are on the increase or decline is a question that may suggest further research. Regardless of the actual numbers however, the PDC remains critical to the permaculture movement as the most in-depth format with experiential and team-learning components. However, there are now online versions appearing due to lower cost and higher demand (e.g., aimed at those who cannot travel due to obligations, scheduling conflicts, or added cost). Permaculture for Peace is one of the organizations in this sample offering such a flexible learning experience. Although emphasis on knowledge and information has always been central in permaculture, the findings imply that especially with the adoption of (and increasing access to) the Internet, successful project models can continue to pave the way for the permaculture movement’s success and expansion.

As concerns further research, a physical visit to permaculture site locations would expand and enrich the findings presented in this study, as well as present a wealth of data for additional inquiry. One such area would be to examine effects on local biodiversity. Another study might focus on areas of convergence between permaculture and traditional practices as a way of indigenous cultural preservation. In more broad terms, because permaculture connects several disciplines, it offers a wide range of opportunities not simply for research within those fields, but also for collaborative, interdisciplinary type of studies.

**Conclusion**

This study has created a simple evaluative framework for online permaculture resources, based largely on best practice identified in the literature on web-design and communication. This framework was then applied to a non-representative sample of permaculture webspources. Findings from the evaluation demonstrate that the online permaculture community is capable of providing support and the necessary knowledge to help beginners move into a more sustainable direction in land use and care, and to provide continuing expertise to those with ongoing projects. Part of the process is being able to vision such systems and to be inspired by others’ results. A land use study by Boland (2014) addresses the importance of such perceptions. With large-scale applications, permaculture offers inspiring and valuable case studies that can be applied to lessen...
effects of pollution, climate change, and even normalize rainfall patterns. The inspiration and guidance needed to bring permaculture to life is available in the sum total of resources evaluated in this study.

References


