

IFLA Publications 161

# THE GREEN LIBRARY

The challenge of environmental sustainability

# DIE GRÜNE BIBLIOTHEK

Ökologische Nachhaltigkeit in der Praxis

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Edited on behalf of IFLA by  
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Peter Genovese and Patricia Albanese

**“Sustainability can serve as a tool to build  
community ...”**

Sustainable libraries, sustainable services – A global view

**DE GRUYTER**  
SAUR

Peter Genovese and Patricia Albanese

## “Sustainability can serve as a tool to build community ...”

### Sustainable libraries, sustainable services – A global view<sup>1</sup>

**Abstract:** Developing buildings that are sustainable and walk softly on the landscape is an area where libraries have shown considerable accomplishment, and in so doing, have served as examples of both ingenuity and ethical leadership. This paper presents direct experiences and research on sustainable library buildings that are inspiring, functional, and successful. The paper consists of two sections. The first section answers the questions: what does sustainable mean? what are examples of library building projects across the world that have developed sustainable, green buildings? what are the characteristics of those buildings that define sustainability, effectiveness, and cost efficiency? The focus is on well-developed, full-size library facilities and includes two case studies of award-winning green libraries and interviews with the architects who designed them. The second section suggests that developing a green building is only the first step to assuring integrated sustainability. Other necessary, long-term components are required, such as understanding the needs of the community being served, developing strategies to deliver services, building organizations, and providing leadership relevant to the community. Two examples of creative and innovative responses to challenging situations are offered in this section. The first shows solutions that have been critical to the survival of a number of communities in East Africa, and the second example from Greece illustrates how leadership strategies, unique services, and the use of technology to build community, promote collaboration and market their successes has brought significant benefit to their community, assuring the long term continuation of library services even in tough economic times.

**Zusammenfassung:** In der Entwicklung nachhaltiger Gebäude, die sich zudem gut in die Landschaft einfügen, liefern Bibliotheken als Vorreiter Beispiele einer einfallsreichen und ethischen Führungsrolle. Dieser Beitrag verweist auf Erfahrungen aus und Untersuchungen zu nachhaltigen Bibliotheksgebäuden, die zu-

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<sup>1</sup> This paper is an updated version of the authors' presentation at the 77th IFLA Conference in San Juan, Puerto Rico, 13–18 Aug 2011. [www.academia.edu/1108048/Sustainable\\_Libraries\\_Sustainable\\_Services\\_A\\_Global\\_View](http://www.academia.edu/1108048/Sustainable_Libraries_Sustainable_Services_A_Global_View). Accessed on 6 January 2013.

gleich funktional, erfolgreich und inspirierend sind. Der erste Teil beantwortet Fragen wie: Was bedeutet Nachhaltigkeit? Welche Beispiele von Bibliotheksbauprojekten gibt es weltweit, die nachhaltige, grüne Gebäude hervorbrachten? Welche Eigenschaften dieser Gebäude definieren Nachhaltigkeit, Effektivität und Kosteneffizienz? Dabei liegt der Fokus auf großen Bibliotheken mit umfassendem Serviceangebot. Es werden zwei Fallstudien preisgekrönter, grüner Bibliotheken mit Kommentaren der verantwortlichen Architekten vorgestellt. Im zweiten Teil wird dargelegt, warum die Entwicklung grüner Gebäude nur der erste Schritt zur Sicherung von Nachhaltigkeit ist. Zusätzlich sind andere Komponenten erforderlich, z.B. das Verstehen und Befriedigen der Bedürfnisse der Gesellschaft, für die man arbeitet, die Gründung von Organisationen und das Entwickeln von Strategien zum Anbieten von Dienstleistungen. Zwei Beispiele für kreative und innovative Lösungen angesichts dieser Herausforderungen werden angeführt. Das erste Beispiel beschreibt Lösungen, die entscheidend für das Überleben einiger Kommunen in Ostafrika waren. Das zweite Beispiel aus Griechenland verdeutlicht, wie Führungsstrategien, einzigartige Services und der Einsatz von Technologien, um die Gemeinschaft zu festigen, Zusammenarbeit und Marketing zu fördern, erfolgreich signifikanten Gewinn für die Kommunen brachten, wenn das Angebot von Bibliotheksdienstleistungen auch nachhaltig gesichert ist – auch in wirtschaftlich schwierigen Zeiten.

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## 1 What is a green/sustainable library building project?

In beginning a discussion of green or sustainable building, it is important to establish a shared definition. While there are many possible interpretations, this paper addresses a set of common design elements and considerations such as sustainable site selection and development, water conservation, energy efficiency, local resources, material conservation and waste reduction, indoor environmental quality, and innovation in design.<sup>2</sup> For the purposes of this discussion, we shall use the broad definition that developing a green building is the practice of

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2 [www.greenbuildings.com](http://www.greenbuildings.com). Accessed on 28 December 2012.

creating structures and using processes that are environmentally responsible and resource-efficient throughout a building’s life-cycle, from site selection to design, through construction, operation, maintenance, renovation and deconstruction.<sup>3</sup> It is important to recognize that the context for sustainability in this discussion extends beyond just developing green or sustainable library buildings, and also includes developing sustainable services as part of the ongoing life-cycle of library services.

## 1.1 Key goals of green/sustainable library buildings

It is widely acknowledged that we have reached a tipping point in global awareness – our current rate of consumption and use of unhealthy products, processes, and systems are producing a serious impact on the economy, on communities, and on individuals. Evidence is growing daily that the very ecosystems necessary to support and sustain healthy life on the planet are in jeopardy. Unless we consciously make choices and decisions that reflect a more sustainable approach to our buildings and way of life, the fate of the planet and its populations are in danger of irreversible ecological shifts.

The central goals of green buildings are to produce physical structures that from their initial conception and design recognize and demonstrate that with some thoughtful early planning the project or system can minimize the consumption of resources and negative environmental impact throughout the full life-cycle of the structure. This approach extends to include efficient use of energy, water, and other resources, as well as the reduction of waste, pollution and environmental degradation. Along with the physical characteristics and systems of the building, a green/sustainable approach to library buildings recognizes the critical importance of protecting a building occupant’s health and comfort by addressing factors such as air and lighting quality.

When these factors are considered with the long view in mind, design and construction can produce cost-effective buildings and operations for the entire life-cycle of the structure. Creating buildings that value and support environments and operations that are healthy, flexible, and that fit naturally in their local conditions, are the goals of green/sustainable libraries. Central to this approach are the creation and promotion of the library that enriches the community and ecology with both the physical building and an information-rich environment, thus adding vitality and continuity to the quality of life of the area.

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<sup>3</sup> Basic Information, U.S. Environmental Protection Agency. [www.epa.gov/greenbuilding/pubs/about.htm](http://www.epa.gov/greenbuilding/pubs/about.htm). Accessed on 28 December 2012.

## 1.2 International green/sustainable standards

As the interest in green building has grown, so have the methods used to evaluate buildings' adherence to green principles. There are several country-specific evaluation standards in place.<sup>4</sup> Among the most widely recognized is Leadership in Energy and Environmental Design (LEED),<sup>5</sup> an internationally recognized, points based, green building certification system, which includes projects in over 30 countries. With accommodation for regional specific issues through country based building councils and the LEED International Program,<sup>6</sup> LEED provides third-party verification of building design and construction using green/sustainable strategies. LEED offers four levels of certification: Certified, Silver, Gold, and Platinum, which measure a building's performance in several key areas addressing aspects of building performance, from site selection to awareness and education of the building systems.<sup>7</sup>

Building Research Establishment Environmental Assessment Method (BREEAM)<sup>8</sup> based in the UK, is another widely acknowledged green building assessment system, in use for over 20 years. BREEAM has five levels ranging from Pass to Outstanding. While LEED and BREEAM differ in approach and emphasise different aspects of green building, both are widely recognized in assessment and verification of green buildings.<sup>9</sup>

## 1.3 The big picture

A green/sustainable perspective and approach to library buildings and services considers all aspects of the library ecosystem – the building, the services, the finishes, the systems that support the physical building and operations, as well as the supplies and services offered or used by the library. Green approaches are based on a broad awareness of the short and long term impact on the local com-

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4 "Green building." en.wikipedia.org/wiki/Green\_building. Accessed on 28 December 2012.

5 <http://new.usgbc.org/leed/rating-systems>; [www.usgbc.org/ShowFile.aspx?DocumentID=3330](http://www.usgbc.org/ShowFile.aspx?DocumentID=3330). Accessed on 6 January 2013.

6 TSAC: HCFC Task Group, U.S. Green Building Council. [www.usgbc.org/DisplayPage.aspx](http://www.usgbc.org/DisplayPage.aspx). Accessed on 28 December 2012.

7 USGBC, U.S. Green Building Council. [www.usgbc.org/Default.aspx](http://www.usgbc.org/Default.aspx). Accessed on 28 December 2012.

8 [www.breeam.org/](http://www.breeam.org/). Accessed on 6 January 2013.

9 BREEAM versus LEED, Inbuilt Ltd. [www.inbuilt.co.uk/media/406565/breeamvsleed.pdf](http://www.inbuilt.co.uk/media/406565/breeamvsleed.pdf). Accessed on 28 December 2012.

munity and demonstrate a sustainable mindset in approaching the physical and informational resources and services of the community they serve.

## 2 Case studies and a global tour

### 2.1 Case study one: Ramsey County Roseville Public Library, Minnesota (USA)<sup>10</sup>

#### 2.1.1 Why did a library in Roseville, Minnesota (USA) decide to build Green?

When the architects Jack Poling and Sean Wagner were asked if it was the community or the library leadership that pushed for the development of a green building, they indicated that the commitment to build a green building was established at the very onset of the project:

“Actually it was the county administration that mandated this path. The County Board was committed to a high standard in the use of public funds, and to present a model programme, a ‘lead by example’ project for the community. There are seven libraries in Ramsey County. When Roseville was funded for renovation, the goal was to create a building designed to save taxpayers money over the life of the building, and in addition represent the potential to educate the community about a better way to do things. For instance water is an issue in this region, due to the population density. The county now uses the Roseville Library as a better approach for the sustainable use of rainwater/storm water for other county buildings. It is now a showcase for other projects.”<sup>11</sup>

Since the County Board was ultimately interested in cost-effective use of funds we asked a question of Jack and Sean that sometimes arises in the discussion of whether to build green or not. Is it more expensive to build a sustainable building than a traditional building?

“8–10 years ago building green would have been more expensive, but not today. The industry has progressed to the point that it is really just a better choice as a decision. Perhaps this is particularly true for the cost to build a Silver LEED rather than a standard building. For a building committed to a Gold LEED certification, it may carry a small premium of costs.” (Sean Wagner)

“The fact is that the discussion on sustainable buildings has matured to where it’s the normal standard for many, but not all areas of the world. Context is an important factor; what

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<sup>10</sup> [www.rclreads.org](http://www.rclreads.org). Accessed on 6 January 2013.

<sup>11</sup> Direct quote from an interview between the author and the architects involved.

is sustainable in the US may not be in other countries. Our acceptable energy consumption may be much higher than in a developing country. The measure of ROI (return on investment) also presents contextual differences, e.g. in many places in Europe, they accept a 30–40 year ROI, whereas in the US, a three-year ROI is considered desirable or expected.” (Jack Poling)



**Fig. 2.1:** Jack Poling and Sean Wagner, Architects, Meyer Scherer & Rockcastle, Ltd. © J. Poling.<sup>12</sup>

Sean Wagner further explained:

“The end user will determine the ROI. It is essential to understand that managing the facility, taking a lot of care with maintenance schedules will be a significant factor. This includes everything from upkeeping of energy systems, purchasing decisions, cleaning etc. Facility crews, for instance, tend to have routines of maintenance that must be adapted to serve a sustainable building. This takes some reprogramming on their part. This is why using an integrated design process also known as a community input process, that engages the facility people, the staff, the community, and all stakeholders in design development often generates many benefits. It becomes both an educational as well as a consensus-building

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**12** M S & R architectural firm have designed or renovated over 100 libraries, and Mr Jack Poling AIA has personally worked on 50 libraries; he was a lead architect on the renovation of the Roseville Public Library, expanding it from 44,900 NSF (Net Square Feet) to 70,000 NSF. Sean Wagner AIA has worked on many libraries, including the Fayetteville Public Library, which won the *Thomson Gale/Library Journal Library of the Year Award*. Sean has also presented at many seminars and conferences nationwide discussing sustainability. He was a contributor to the *IFLA Library Building Guidelines* (Latimer & Niegaard 2007). See also Jeffrey Scherer’s contribution in this publication.

experience. In the end the hope is that during the process, supporters and champions are created for a new approach, one where value is understood, procedures are followed and thereby the greatest benefit of a sustainable building is achieved.”

### **2.1.2 Building design**

Roseville has many features that are green, including the water conservation and re-use of storm water (see the breakdown that follows). Building material selection included use of local materials, thus reducing transportation costs and supporting the local economy and labour. Key to the design was the extensive use of natural light and providing great views.

Jack Poling felt that this was a key feature in the design that allowed for significant natural light to fill the building:

“There is a psychological factor both for the patrons and staff. Working in a building with natural light creates a better and more comfortable work and learning environment.”

Another factor that Jack Poling emphasised was designing space for efficient use of staff:

“At Roseville from the central desk sight lines provide views into several departments, for efficient staff use and management. Although the building nearly doubled in size, it was still covered by four desks where staff managed the various services points. Efficient use of staffing is integral to planning service-area layouts successfully.”

### **2.1.3 Final advice on building green**

Sean Wagner’s final advice on building green:

“A building is not a static entity; it is active and growing. A critical factor for an efficient and successful design process is a clear understanding of not only the operational concerns, but also to develop a long term strategic plan for the building, one that considers the organization and services that it houses, and how they evolve over time.”



2.1.4 Facts: Ramsey County Roseville Library, Roseville, Minnesota (USA)

Table 2.1: Building details and description.

Square Footage	70,000 total (44,900 remodel and 25,100 addition)
Total Cost	\$9,200,000
Completed	June 2010

Ramsey County Roseville Public Library attained Gold LEED certification by achieving 40 points from the certification process. The newly remodelled building will reduce energy consumption by 15% and reduce water consumption by 30%.

Indoor Environmental quality

- Indoor air: low Volatile Organic Compound (VOC) emitting adhesives, paints, carpets and wood were selected to improve indoor air quality.
- Daylight: the large windows throughout the building allow natural light to penetrate into the building, resulting in less electrical use.
- Cleaning: library cleaning products are *Green Seal*<sup>13</sup> certified, which means they are better for health and the environment.
- Water efficiency: low-flow fixtures. Library fixtures, including toilets, sinks and urinals, are low-flow. These low-flow plumbing fixtures reduce water consumption inside the building by 30%.
- Landscaping: there are more than 30 native plants, trees, shrubs and perennials planted on the site that are well adapted to the climate and soils of the region, and require less irrigation. Rain gardens: the rain gardens provide onsite storm-water filtration and reduce surface runoff from paved areas, allowing us to collect, filter and protect our water.

Materials and resources

- Re-use: More than 75% of the original building was re-used: when you walk around on the second floor of the library, you are walking on the original roof. The fireplace in the children’s area is original and has been resurfaced.
- Recycle: More than 97% of construction waste was recycled or re-used, meaning it was kept out of our landfills. Many of the materials were made from recycled materials: each bench in the Children’s Reading Garden is made

13 [www.greenseal.org/](http://www.greenseal.org/). Accessed on 19 February 2013.

from 704 recycled milk jugs. The chairs in the children’s room are made out of recycled yogurt containers.

- Local and sustainable: in an effort to keep things close to home, many of the materials used in the building came from within a 500-mile radius. More than 95% of the wood in the library is sustainably harvested and *Forest Stewardship Council (FSC)*<sup>14</sup> certified.
- Storm water: through the use of rain gardens, a large rain-barrel and underground filtration systems, the library is collecting and filtering storm water onsite, protecting the watershed.
- Parking: there is preferred parking for carpools and fuel-efficient vehicles. Bicycles: there is a total of 27 bike parking places in the bike racks.
- Energy and atmosphere: the newly remodelled building was designed to be highly efficient. Improved mechanical systems, roofing materials and windows means the state-of-the-art HVAC systems will consume 15% less energy than a similar building.
- Lighting: sophisticated lighting controls and reduced-wattage fixtures result in substantial maintenance and energy savings.

## 2.2 Case study two: Daniel Ruiz Public Library, Austin, Texas (USA)<sup>15</sup>

On most comprehensive sustainable-city lists, you will find Austin, Texas included, as one of the greenest towns in the United States. Eco-oriented building codes allow for unconventional but proven earth-friendly buildings inside city limits. Austin even treats and re-uses its sewer sludge, selling it back to the public in the form of Dillo Dirt, approved for use in gardens. It also boasts the world’s first

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<sup>14</sup> [www.fsc.org/](http://www.fsc.org/); [www.fsc-deutschland.de/](http://www.fsc-deutschland.de/). Accessed on 19 February 2013.

<sup>15</sup> [library.austintexas.gov/locations/Ruiz%20Branch](http://library.austintexas.gov/locations/Ruiz%20Branch). Accessed on 6 January 2013. The architect L. Stanley has won numerous awards and competitive commissions for his work, which focus on integrating craft, the touch of the hand into architecture. In the January 2011 issue of *Architect* magazine he was praised as an example of an architect who has excelled by extending his practice beyond the domain of delivering buildings. His diverse portfolio reflects his interest in understanding how human energy is embodied through the process of making, and how materials and elements of the built environment are sometimes able to reflect the essence of being human. He is also a celebrated artisan of metallurgy and has built the Lars Stanley Metalworks into a successful venture, turning out award-winning gates, sculpture, furniture, architectural details and lighting fixtures. Some of his clients include the City of Austin, the National Wildflower Research Center, actor Richard Gere, and director Steven Spielberg. Lars Stanley Metalworks, Lars Stanley. [www.larsstanley.com/](http://www.larsstanley.com/). Accessed on 28 December 2012.

LEED Platinum hospital, the Mueller Children's Hospital, incorporating 47,000 tons of the old airport runways into its design. The hospital generates all of its own energy on site, harvests rainwater, and is fitted out with solar interior lighting.

For many in this southwestern city, sustainability is not an option but a lifestyle. This is true of Lars Stanley, a man of Austin, and a believer in the importance of sustainability; he is both an architect and artisan of metals. He and his wife, Lauren, live in a growing urban homestead on two acres, with a food-garden courtyard at its heart. Their super-insulated home is built out of wheat-straw structural insulated panels and powered by a photovoltaic array. It stays cool thanks to the local prairie grasses that grow on the roof and age-old Texas cooling techniques such as paddle fans, salvaged operable windows, and a thermal chimney. The Stanleys capture rainwater, re-use grey water in the landscape, and irrigate the living roof with air-conditioner condensate. Lars Stanley's envision becoming "a link in a chain of productive urban green spaces that demonstrate new paradigms for survival" (Lars Stanley).

In 2004 the "Best Building in Austin", as voted by the *Austin Chronicle*, was the Daniel E. Ruiz Public Branch Library, which was designed by Mr Stanley. Sitting in Iron Works, a local landmark and former historic blacksmith's shop, Lars Stanley explained some of the features of the Ruiz library and its important sustainability aspects:

"First, the key to any structure is the building envelope, which partly controls energy consumption and air quality; the balance, keeping the heat out or in depending on the time of the year, and, in the southwest of the United States where we are, also keeping coolness in. It is an airtight system, but with the proper air flow to keep the building fresh and healthy."

"Ruiz Library has an efficient water system, with on-site runoff control and retention. The building includes many re-use features, such as: 100% recycled carpet, recycled steel joists and beams, 75% recycled acoustic ceiling tiles, native stone, water efficient plumbing fixtures, recycled moulded hardwood tiling, small point-of-use hot water heaters, etc. The landscape preserves existing trees and vegetation buffers, and used native plants to further landscape. The outside space is enhanced by integrating public art into it, thus extending the reach of the building. At Daniel Ruiz Library the design strived for the integration of elements both inside and outside of the building."

"Another key feature is the orientation of the building, which recognizes solar control and southern exposure, with window shades on south and west exposures. It was a goal of the library to use the bountiful sun that shines in Austin."

Lars Stanley created clearstory space in the central part of the building that provided illumination over the main stacks and patron work areas. He pointed out:

“If no lights are on in the building during the day because of this design of natural lighting, not only is electricity saved, but the city youth and the other patrons clearly get the concept and its usefulness. The library wanted us to let sunlight in so people would be aware of it, to show that there is something going on outside to the benefit of inside. It was a clear example to the community, consciously applied by the library in the design.”

One question was, now that the building had functioned for seven years, has it shown savings? Lars Stanley answered:

“Yes it has, but savings in green buildings are contingent on an important aspect that sometimes is neglected, the strict adherence to the maintenance schedule. [The point that Jack Poling and Sean Wagner made earlier.] You can have all the fancy systems in line in a building but if they are not running successfully and following proper schedules you will not accrue the energy benefits and ROI. In the case of Ruiz Library the ROI was slowed somewhat.”

Lars Stanley estimated that it took about four till five years to achieve their ROI, as there was staff turnover, which meant staff had to be trained and then retrained to manage the schedules. It is running smoothly now, and Mr. Stanley estimated that Ruiz enjoys about 10–20% of energy savings due to the design and systems.

### **2.2.1 What is the great advantage of designing a green or sustainable library?**

“It is less obvious initially, but evident later”, offered Lars Stanley. He said:

“We saw it clearly only after it was built, that the library, by creating a sustainable, transparent approach was serving the function of a true learning institution, modelling for the community the value and benefit of sustainable components. It translated into people pointing it out to their friends and to their families; getting an idea of what this sustainability issue is really all about. Illustrating how the library supported the values that Austin and its municipal government projected.”

“The notion of what Austin tried to put in their library is the sense of community; the Ruiz Library has community spaces; it is a gathering place. This is also a key feature of sustainability. Libraries must serve their community. There are so few truly public spaces. The Ruiz Library is a model for community values, a centre to gather at, a learning space for all.”

Since the Ruiz Library was built, energy costs have gone up significantly in the USA as well as around the world, and the need for communities to work together has become even more apparent. Like in Japan during the tsunami, when suddenly crisis hits and supplies are low, the community had to pull together. Many in the world marvelled at the discipline and patience that the Japanese people showed following the tsunami. If the habit and example of working together is

already in practice, the process of sustaining through difficult emergencies by community effort is an added benefit. A community can be better prepared by having done it before and accepting common values. Learning how to be a community, through one of its components, the library, is very important. The library can become one of the liveliest places in the community, a key part of it; a neighbourhood town hall, a learning commons in its most generic form, and a model for appropriate actions. As Lars Stanley suggests, "Sustainability can become a tool to build community."

### 2.2.2 Sustainability features

- HVAC commissioning – programmable to occupancy;
- Pre-design coordination among consultants;
- Basic building orientation recognizes solar control, southern exposure;
- Advanced building control system;
- Zoned low-maintenance HVAC systems;
- 100% recycled carpets;
- Porous paving for Fire Lane to reduce impervious cover;
- Extensive natural day-lighting to reduce lighting loads;
- 20% post-consumer / 40% post-industrial recycled re-engineered steel joists and steel beams;
- 75% recycled acoustic ceiling tiles;
- Low/no VOC finishes;
- Low-E insulated glazing;
- Window shades on south and west exposures;
- Native stone;
- Water-efficient plumbing fixtures;
- Rock-wool building insulation;
- Locally produced steel/concrete;
- High efficiency HVAC, lighting, plumbing fixtures – meeting or exceeding City of Austin Sustainability Guidelines and specifications;
- Use of small point-of-use water heaters;
- Recycled moulded hardwood tiling;
- Recycled areas incorporated throughout building;
- Building fenestration oriented primarily to the south for control;
- On-site runoff control and retention on-site;
- Preservation of existing trees and vegetation buffers;
- Creation of extensive outdoor spaces, integrated with public art;
- Airtight building envelope to reduce infiltration and maximize efficiency.

## 2.3 Global tour

This section of the paper takes readers around the world to view five examples of green/sustainable libraries. This quick tour offers an overview of the characteristics, locations, systems, services, etc. of some outstanding examples. Within the tour are academic, national and public libraries, as well as a library which is also a cultural centre.

### 2.3.1 B. Thomas Golisano Library at Roberts Wesleyan College, Rochester, NY (USA)<sup>16</sup>

This is the first academic library building in the region to achieve a LEED Silver certification and uses various methods to make it 40% more energy efficient than the *New York State Energy Code*<sup>17</sup> recommendations.



Fig. 2.2: B. Thomas Golisano Library. © P. Albanese.

<sup>16</sup> [www.roberts.edu/library/](http://www.roberts.edu/library/). Accessed on 6 January 2013.

<sup>17</sup> [www.energycodes.gov/adoption/states/new-york](http://www.energycodes.gov/adoption/states/new-york). Accessed on 19 February 2013.

**Table 2.2:** B. Thomas Golisano Library.

Built	Opened 2007
Awards	The first academic facility to achieve LEED Silver certification.
Green features	<p>Temperature of the two-storey, 43,000-square-foot facility is regulated through geothermal methods. Water is either heated up or cooled off as it is pumped through varying depths of its many wells.</p> <p>The building also uses energy derived from wind or biofuels by purchasing renewable resource energy from a New York-based company.</p> <p>Library shelves limit daylight from side windows, so the design compensated by using a large atrium to provide natural daylight to both levels of the building. Use of white paint and solar shades reflect the direct rays of the sun and bounce light to specific areas. The internal lights respond to outside conditions.</p> <p>Building includes renewable materials, such as cork flooring, carpet squares made of highly recycled content, and sunflower board cabinetry; efficient T-5 fluorescent lighting, and locally harvested building materials.</p>
Service features	3,000-square-foot commons area comprised of a café, computer lab, study spaces, and meeting rooms.
Other features	This building energized the library community in its region and inspired other institutions to consider options that incorporated sustainable features. (Blumenstein 2009)

**2.3.2 Singapore National Library Building<sup>18</sup>**

This National Library combines a focus on energy efficiency and partnerships to create a building that engages the community and welcomes millions of visitors each year.



**Fig. 2.3:** Singapore National Library Building. © Sengkang.

**18** [http://virtualtour.nlb.gov.sg/static/abt\\_archi.htm](http://virtualtour.nlb.gov.sg/static/abt_archi.htm). Accessed on 6 January 2013.

**Table 2.3:** Singapore National Library Building.

Age	Built 2005
Awards	Green Mark Platinum award
Green features	<p>Building is oriented away from the east-west sun, combined with sun-shading features on the west face of the building as an additional shield against solar heat gain and glare. Sun-shading features include the low-emissive double-glazing glass panel façade and large overhangs on the external façade.</p> <p>Light shelves that extend into the library space reflect sunlight further into the building. This optimizes daylight and thus reduces the use of artificial lighting.</p> <p>Extensive landscaping, sky terraces and roof gardens are utilized to lower local ambient temperature.</p> <p>Use of rain sensors as part of the automatic irrigation system for rooftop gardens. Water-efficient taps and cisterns are also used to conserve water.</p> <p>Energy-efficient features include daylight sensors that are used together with automatic blinds at the building façades, public toilets installed with motion sensors. There is night setback for the air-conditioning system in the library spaces after library operation hours.</p> <p>Energy monitoring via BMS (Building Management System) provide additional energy management controls.</p>
Service features	<p>Visited by close to four million locals and tourists annually. Co-location of reference collection with public library makes service more accessible throughout phases of life; high tech and high touch.</p>
Other features	<p>Functions as a cultural facility as well as a civic place for Singapore; a place for other public activities, including a 615-seat theatre run by the National Arts Council; icon for people’s passion for life long learning; designed as a “Library for the Tropics” using bioclimatic design techniques; calculations show that they save an average of about 33% on the monthly energy bill compared to a similar building.</p>



2.3.3 Beitou’s Green Library: East Asia’s most eco-friendly building<sup>19</sup>



Fig. 2.4: Taipei Public Library, Beitou Branch. © K.U. Werner.

Table 2.4: Taipei Public Library, Beitou Branch.

Age	Built 2006
Green features	<p>The library’s wooden walls recall Japan’s 1895–1945 occupation of Taiwan, during which thousands of buildings were constructed of timber felled from the island’s forests. Its shape and the vast amount of window area, however, make it very different in appearance to Beitou’s Japanese-era bungalows. The library’s large windows help cut electricity use in two ways. An abundance of natural light means less interior lighting is needed. Also, the windows are often opened wide for ventilation, thus reducing the need for fans and air-conditioning.</p> <p>One part of the roof is covered by photovoltaic cells that convert sunlight into electricity. Inside the building, by the loans-and-returns desk, an electronic information board shows how much electricity is being generated and consumed. The board also records humidity and carbon dioxide levels, plus precise interior temperatures (to 1/10,000th of a degree) in different parts of the library.</p>

<sup>19</sup> [www.tpml.edu.tw/](http://www.tpml.edu.tw/) [in Chinese]. Accessed on 6 January 2013.

Another part of the roof is covered by 20 cm of soil to provide thermal insulation. During Taipei’s chilly winters, this soil layer cuts heat loss through the ceiling while in the summer, it helps shield the building from the sun’s heat. The library conserves water by capturing rainfall. The sloping roof gathers rainwater, which is then stored and used to flush the library’s toilets. (Crook 2007)

Service features    Civic pride; gives the impression of being outside while inside the building. Located within a park.

2.3.4 Brighton’s Jubilee Library (UK): winner of multiple building awards<sup>20</sup>



Fig. 2.5: Brighton’s Jubilee Library. © The Voice of Hassocks.

Table 2.5: Brighton’s Jubilee Library.

Age	Built 2005
Awards	14+ awards, including a BREEAM Excellent rating
Green features	Use of setting, sunshine and wind; south facing, heat stored in walls and floors, slow release to assist in HVAC of building, wind towers draw off excess heat from building, use of concrete as thermal mass, toilets use recovered rainwater. South-facing glass for solar gain; use of louvres to deflect heat in summer; heat recovery from lights, building occupants, equipment and re-used in building systems; use of TermoDeck <sup>20</sup> and exposed concrete thermal mass reduces the HVAC systems requirements.
Service features	“A new approach to library service delivery.” The Jubilee Library aims to offer choice, comfort and accessibility. Uses self service check out; staff walk the floor to provide assistance when and where people need it. Designed to

<sup>20</sup> www.termodeck.com. Accessed on 21 March 2013.

Other features	<p>empower library users, encouraging them to browse and explore; use of open stacks wherever possible.</p> <p>Heavily used building, nearly 1 million visits every year, hosts around 500 events per year. It continues to attract new members to the Library.<sup>21</sup></p> <p>Design process engaged community early in the process with regular community public meetings. Relatively low cost; less than conventional HVAC systems. <i>“Brighton has got itself a new civic amenity that seems a hit with the public and somewhere that makes reading cool again, in more senses than one. The building sits modestly in its landscape, yet with a great impact on the eye – and a minimum impact on the environment.”</i><sup>22</sup></p>
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### 2.3.5 Openbare bibliotheek Amsterdam (oba): The most sustainable building in Amsterdam, Netherlands, 2008<sup>23</sup>



Fig. 2.6: Openbare bibliotheek Amsterdam. © Centurion.<sup>24</sup>

<sup>21</sup> Jubilee Library Award Winning, Brighton & Hove City Council. [www.brighton-hove-rpml.org.uk/Libraries/sites/Jubilee/Pages/JubileeLibraryAwardWinning.aspx](http://www.brighton-hove-rpml.org.uk/Libraries/sites/Jubilee/Pages/JubileeLibraryAwardWinning.aspx). Accessed on 28 December 2012. See also the article “Landmark with ‘green’ credentials” by G. Gabel in this publication.

<sup>22</sup> [www.brighton-hove-rpml.org.uk/libraries/sites/jubilee/pages/home.aspx](http://www.brighton-hove-rpml.org.uk/libraries/sites/jubilee/pages/home.aspx). – Jubilee Library, Brighton, The Concrete Centre. [www.concretcentre.com/online\\_services/case\\_studies/jubilee\\_library\\_brighton.aspx](http://www.concretcentre.com/online_services/case_studies/jubilee_library_brighton.aspx). – Jubilee Library, Brighton & Hove City Council. [www.brighton-hove.gov.uk/index.cfm?request=c1139701](http://www.brighton-hove.gov.uk/index.cfm?request=c1139701). Accessed on 28 December 2012.

<sup>23</sup> Source: [www.oba.nl/](http://www.oba.nl/). Accessed on 6 January 2013.

<sup>24</sup> From [http://en.wikipedia.org/wiki/File:BibliotheekOBA\\_1.jpg](http://en.wikipedia.org/wiki/File:BibliotheekOBA_1.jpg). Accessed on 8 February 2013.

**Table 2.6:** Openbare bibliotheek Amsterdam (Amsterdam Public Library).<sup>25</sup>

Age	Opened 2007
Awards	Named the most sustainable public building in Amsterdam in 2008, based on BREEAM method.
Green features	<p>The building uses a ground-source heat system together with highly efficient boilers. It also makes use of free cooling from the cold air outside whenever possible.</p> <p>The building is equipped with abundant solar panels, has double glazing, and sustainable materials have been used.</p> <p>The building is connected to the Long-Term Energy Storage System that sustainably generates heat and refrigeration (for the entire island). This sustainable energy system is a joint initiative of the development partners involved: the Municipality of Amsterdam, the Stichting Amsterdamse School voor de Hoge Kunsten, New China Town, and OOA CV (a joint venture between Bouwfonds MAB and Meyer Bergman).</p> <p>It is easily accessible by bicycle and by public transport, so that the Openbare bibliotheek Amsterdam also scored high on the element of transport.</p>
Service features	<p>There is a theatre, a readers' café and a restaurant overlooking the city.</p> <p>It is designed to connect learning with participation and experience.</p>
Other features	The building attracts 2 million visitors a year; engages partnerships with other organizations; provides 2,000 secure bicycle racks; and is seen as part of the vision for the future of the city.

### 3 Sustaining services: sustaining human potential

There are essential truths about the state of the resources of our planet. There can be great importance in utilizing these resources in ways that will prolong their availability, and key methods and approaches to best utilize resources in an efficient and appropriate manner. In developing green buildings, planners try to put these truths and methods into practice. Part of the essential purpose of libraries has to do with supporting human beings and building human potential. Most would agree that libraries should be places to nurture human possibility and aspiration. In the coming decades, libraries, hybrid services, and learning organizations will become more essential to sustaining human potential, yet they

<sup>25</sup> [www.holland.com/press/story\\_ideas/sustainableholland/sustainable.jsp](http://www.holland.com/press/story_ideas/sustainableholland/sustainable.jsp). – Arup. [www.arup.nl/](http://www.arup.nl/). – Sustainability Award 2008 for the Amsterdam Public Library, MAP Development. [www.mab.com/en/news/Pages/SustainabilityAward2008fortheAmsterdamPublicLibrary.aspx?archieef=true](http://www.mab.com/en/news/Pages/SustainabilityAward2008fortheAmsterdamPublicLibrary.aspx?archieef=true). Accessed on 28 December 2012.

will be challenged by economic, social, and political pressures. How will libraries meet these challenges? They must be innovative, creative, technological, and also partner with like-minded organizations. It is useful to see how organizations that are striving to nurture human potential and need are providing the tools and information in today's world. Perhaps their example can be both instructive and inspiring, as well as illustrating how services provided can sustain a community.

### 3.1 On the front lines of climate change

*Arid Lands Information Network (ALIN)*<sup>26</sup> is an international NGO that facilitates information and knowledge exchange to and between extension workers or “infomediaries” and the arid lands communities in Kenya, Uganda and Tanzania. These communities are experiencing threats to their way of life that can be assisted and balanced by new methods, techniques and vital information.

ALIN provides information exchange activities focused on small-scale, sustainable agriculture, climate-change adaptation, natural resources management and other livelihood issues. They have recognized the essential need for their clients in rural and remote farming areas to have access to critical information on climate change, new farming techniques, and information on possible markets, in ways that have never before been accessible. Without these services, the communities and the individuals themselves are in jeopardy. By providing these services they have developed a plan, a community-sustaining model that offers opportunities for growth and knowledge. Their vision is of a knowledge-driven society and their mission is to improve the livelihoods of arid lands communities in East Africa through delivery of practical information using modern technologies.<sup>27</sup>

ALIN has a clear model. First it establishes a *Maarifa* or *Community Knowledge Centre*, in some of the most remote areas of East Africa.<sup>28</sup> These centres start with a facility fashioned out of a recycled, fabricated shipping container. “Maarifa” is the Swahili word for knowledge. These centres are established in isolated communities, and equipped with computers and internet access.

With the support of field workers from ALIN, ICT training is provided to all community members who are interested, many of them young people, some who have graduated from secondary schools, as well as primary school pupils who later form information clubs. Over time the Maarifa Centre becomes a rich infor-

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26 [www.alin.or.ke/](http://www.alin.or.ke/). Accessed on 19 February 2013.

27 “What we do, ALIN.” [www.alin.or.ke/Who%20we%20](http://www.alin.or.ke/Who%20we%20). Accessed on 28 December 2012.

28 [www.alin.or.ke/Introduction](http://www.alin.or.ke/Introduction). Accessed on 12 February 2013.

mation hub, as the individual skills build, by providing publications, newsletters, research reports and electronically stored information, audiovisual material and compendiums supplied by ALIN or by community members. The Maarifa also serves as a gathering point for the community.

The ICT equipment that is available enhances information access via the internet, in content creation, and in skills development among these rural communities. The centres also act as information access points for community development workers who provide agricultural and related extension services in the region. In this partnership, the centres are used to acquire free (online) development information and to send weekly reports to their ministries or organizations, but these workers also benefit from basic office services such as typing, photocopying, and free internet access. Everyone’s capacities are improved; relationships are built and developed.

The typical Maarifa Centre is managed by a selected advisory committee of five to eight members, drawn from the local community stakeholders. According to ALIN, the selection process ensures that the membership is gender-balanced, represents interests of special groups, and has a diverse background. ALIN’s volunteer programme ensures that the centres are running smoothly. The volunteers work at a given centre for one year and are supervised by local host partner organizations. The volunteers manage the centre’s activities, coordinating the collection of development-oriented local knowledge and experiences, and train local communities in the use of ICT tools. These individuals become community leaders as well as trainers. The Maarifa Centres, by supporting the involvement of women, enhance the capacity of women to play an active role in development initiatives and reverse the trend of insufficient inclusion, especially in the dry land areas.<sup>29</sup>

Ten Maarifa Centres now exist, including eight in Kenya, one in Tanzania, and one in Uganda, with plans to open many more. Some of their accomplishments are detailed below.

Easy access to information and knowledge resources, the capacity to develop local knowledge databases/reservoirs, engagement of youth in productive activities, access to IT skills, the ability to develop online marketing portals enabling communities to trade globally, improved agricultural techniques, the capacity to access government forms and information saving difficult travel time, more students applying to colleges, etc. All have given a new approach and hope to these rural areas.

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<sup>29</sup> “Access to information and training – from rural to national, ITU.” [www.connectaschool.org/en/community/ict/women/enpowerment/Section4.1\\_access\\_info\\_training/](http://www.connectaschool.org/en/community/ict/women/enpowerment/Section4.1_access_info_training/). Accessed on 28 December 2012.

The community facilitators eventually become the managers of the centres and thus the centres are sustained by their own community capacity. The Nguruman Maarifa Centre located in the Magadi Division, about 160 km southwest of Kenya's capital Nairobi, was named as one of the ten most remote parts of the world (Haris 2009). Yet their community is now part of the global network. Thus by using recycled shipping containers, installed technologies, and through training and partnering with ALIN who provide critical skills and information access, Maarifas create an environment in which individuals can improve their livelihood and in the process build community leadership and possibilities for sustainability. Most importantly, Maarifa Centres support the potential for several communities to help themselves. There is much in this process that could be replicated in principle by libraries.

### **3.2 Sustainable services: Veria Public Library, Greece**

Library buildings, whether green or not, serve a region or area, and must recognize the needs of the communities that they serve. Through the facility, of and by means of, the staff, resources, leadership, and services, a strategy should be developed for providing for the needs of the service area and the enhancement of the life of their patrons. The next example of sustainable services is a library that has used innovation, creativity, staff expertise, advocacy, marketing, and wise leadership to serve its users successfully through unique programmes and collaboration. By marketing their accomplishments they have achieved significant recognition and added monetary support to the library.

Economic conditions are very difficult in many places across the globe. In Greece the economy has been particularly challenged. Veria Public Library, located in Northern Greece, sits at a confluence of numerous ethnic identities that are moving into the region. Many places, faced with the same situation, have not embraced the complex issues that this kind of influx can bring to a community. Veria Public Library reacted to the situation by reaching out to immigrants, striving to make them feel welcome, and helping them to assimilate into the community. One of its many programmes is called "Untold Stories", which offers immigrants from Albania, Russia, Ukraine, and Bulgaria access to computers to create visual narratives about their lives. These stories are then posted on YouTube and on a dedicated project website. Immigrants are given a voice and platform, and the community at large can learn from their stories, hardships, and their accomplishments. Much is learned through this process.

This type of customized, relevant programme does not require vast resources, only an idea and some energy and expertise. For a moderate-sized library faced



with a tight budget, Veria has not stopped growing or evolving, nor allowed the situation to constrain it. Rather, it has used a variety of methods to create successful, sustainable strategies. While books are still important to Veria Public Library’s service area of 50,000 residents and 130,000 additional people in the surrounding region, it has built its reputation on a commitment to innovation and experimentation. Taking this approach has made it a model for libraries in Greece and throughout the world, especially since submitting and winning the *2010 Access to Learning Award* from the Bill and Melinda Gates Foundation from amongst hundreds of other applicant organizations from around the world.<sup>30</sup>

What are the principles that have pushed this organization forward? Ioannis Trohopoulos, the library’s director, says: “We have built our name on the concept that we give services to make your life easier and more enjoyable.”

It is a fairly simple and elegant concept that they strive for. For instance, the Veria Public Library opened a new children’s area called “Magic Boxes”. The idea was to create a space for children that would encourage their curiosity and show that the library can be a place of surprise and excitement. The bold, bright colours of Magic Boxes create a joyous atmosphere for children and parents alike. An outdoor garden provides areas for climbing, playing and exploring. Also there are plenty of comfortable places for reading and listening to music and stories. There are computers with children’s software, video games, and regular activities and programmes to keep young minds active and engaged. They put the emphasis on promoting reading, creativity and especially digital literacy to children. To this end, they provide creative workshops in such subjects as robotics, 3D gaming, storytelling, painting, sculpting, theatre and music.

Another crucial aspect of the Veria Public Library’s services is its mobile library programme, which brings books and computer access to thousands of people in the surrounding villages that otherwise would not have easy access to a library. Two years ago, the library had to stop the mobile library programme because it could not get support from the state to retain their drivers. This is true of many libraries, in many places. However, Veria was determined to find a way to keep serving the people who were counting on them. The staff went directly to the mayors of the villages, advocated for the service, and asked them for help to supply the drivers, to which it turns out they gladly responded. “I’m not exaggerating when I say that when the library visits these kinds of small places, where there’s no library, or any kind of access to technology, in a way it changes their lives”, said Kostas Karelis, the mayor of the Meliki Authority. Veria advocated, promoted, and succeeded in this partnership.

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**30** [www.gatesfoundation.org/Media-Center/Press-Releases/2010/08/Veria-Central-Public-Library-Wins-Access-to-Learning-Award-2010](http://www.gatesfoundation.org/Media-Center/Press-Releases/2010/08/Veria-Central-Public-Library-Wins-Access-to-Learning-Award-2010). Accessed on 21 April 2013.



Most effective has been their approach to technology. The staff realized the power of technology early on. In 1992, the library's catalogue was already fully automated. In 1996, the library became the first in the nation of Greece to provide its users free access to computers and the internet. In 1997, it was the first to have its own website. The list of leadership steps that they have taken is extraordinary, the numerous international projects that they have collaborated in is truly impressive. The projects are listed below.

- **MOBILE (1993–1995):** This was the first European project in which the library participated. During that time the first Electronic Book Mobile was developed, and the use of electronic material in small remote areas was investigated.
- **PUBLICA (1997–1999):** The first programme which started building a consortium of public libraries across Europe, aiming to support the position of public libraries in general.
- **ISTAR – Information Society Training and Awareness Raising Networks (1997–2000):** ISTAR provided a model for promoting awareness and extending network access to businesses, especially SMEs (Small & Medium Enterprises), individual teleworkers, open and distance learners in support of each region's key economic development drivers. Veria Public Library was the key partner from the Imathia region, among others from Thüringen in Germany, Essex County from the UK, and Omagh in Northern Ireland.
- **PULMAN & PULMAN XT (2001–2003):** The PULMAN Network of Excellence was launched within the European Commission's research programme for a user-friendly Information Society. PULMAN XT was established later with the goal of extending the benefits of the PULMAN Network and initiating new activities. In both projects Veria Public Library was responsible for developing and managing the web site.
- **CALIMERA (2003–2005):** Calimera stands for Cultural Applications: Local Institutions Mediating Electronic Resource Access. Locally focused, Calimera has mobilized local cultural institutions for a new role in transforming innovating technologies into helpful services for ordinary citizens.
- **Light: Bring to Light the value of cultural heritage (2004–2006):** A 26 month project funded by INTERREG IIIC East was a partnership of five libraries which promoted cultural heritage through a network of museums, archives and cultural sites. Veria Central Public Library was the coordinator of the operation and created an educational digital map of the city's cultural monu-

ments, with multimedia links to content – some of which were created by children.<sup>31</sup>

Any one of these projects might have been enough for some institutions. Veria Public Library has worked diligently to form partnerships with other libraries, programmes, and institutions within Greece and worldwide. Because it has been innovative, embraced the old and new components of its community, because it has marketed itself and used the tools of technology, it has been able to grow and thrive, and even in tough times, sustain itself. These are important lessons.

Library director Ioannis Trohopoulos stresses that the most important thing for a library to do is listen to the needs of the people it serves. “The key is you have to be relevant. If your organization manages to be relevant throughout its life, it can survive.”

## 4 Conclusion

In this brief paper we have tried to explore what it means to develop sustainable libraries in terms of the facility, its characteristics, what constitutes important features, how architects view sustainability, and we have showcased some of the world’s green library buildings. We have also advanced the idea that while developing a green building is vital, it is only an essential first step to sustainability. To remain relevant to the community, and assure organizational sustainability, libraries must understand, listen to, and develop services that create a better life for their users and the stakeholders who support their organizations.

As in East Africa and in Veria, where climatic or economic conditions have threatened livelihood or quality of life, libraries must be conscious that business as usual may not be achievable without a sound strategic plan, a flexible building design, acceptance that change is the norm not an anomaly, and that staff and leadership must be creative, innovative and service oriented. It is also, as in the Daniel Ruiz Library model, possible to become a model to a community as part of the educational mission. In this way, as Lars Stanley suggested, “Sustainability can serve as a tool to build community”.

The next 20 years will be crucial for the planet in terms of climate change, concerns over water, the need for food production, economic stability; almost every area of planetary resources will be challenged. The cost of going green is

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<sup>31</sup> [www.light-culture.net](http://www.light-culture.net). – Veria Central Public Library; [blog.libver.gr/en/](http://blog.libver.gr/en/). Accessed on 28 December 2012.

no longer a serious issue. ROI can be accomplished fairly rapidly. Libraries have led the way as creative and ethical examples to their communities and should continue to do so; they should market and advocate the benefits of their libraries to their communities, stakeholders, and funders. It is our hope that this paper will be of assistance to libraries seeking to be positive agents of learning in the communities they serve, and in the development of sustainable/green buildings and services.

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