LEED GAP ANALYSIS RESPECTING DIVERSITY THROUGH THE LOCALIZATION OF THE LEED RATING SYSTEM IN THE REGION — JORDAN AS A CASE STUDY

Adnan M. Al-Ma'ali

Architectural Engineering Section Council, Jordan

Information in this document was obtained from the document "LEED gap analysis Respecting diversity through the localization of the LEED rating system in the Region — Jordan as a case study" by the Jordan green building council, any information provided is a reference to the document. There are no guarantees to the accuracy or the reliably of this information.

Acknowledgement

We would like to thank the works the Jordan Green Building Council (JordanGBC) including all the voluntary work by the Architects, Engineers, Contractors, Consultants and all other participant's amazing efforts to make available this document.

Preface

The LEED rating system was used as the primary reference analysis in order to adapt a credit by credit rating system according to Jordan's own sustainable requirements. Using the LEED's 5 primary credit subjects (Sustainable sites, Water efficiency, Energy & atmosphere, Materials & Resources, and Indoor Environmental Quality.)

Abstract

Gap Analysis Methodology

1. Gap analysis: Code versus Credits

The Jordan GBC's technical committee analyzed the LEED's Rating system in accordance to the local market, building codes and technical expertise of the construction field of the key stakeholders and credits were organized as

- (A) Applicable — Meets requirements of LEED with little effort
- (AWD) Applicable with difficulty — Require extra effort
- (NA) Not applicable — Due to difficulty the current local situation

2. Credit Prioritization

The technical Committee set a local scale of 1—5 to prioritize the LEED credits based on local needs with the following criteria in mind.

- Current Practice: 1 = not in practice 5 = common practice
- Ease of Implementation: 1 = Hard 5 = Easy
- Additional initial cost: 1 = High additional Cost 5 = Low Additional Costs
- Feasibility: 1 = not feasible 5 = feasible

average score of 2 = Low Priority 2.1—3.9 = medium Priority 4—5 = High Priority

3. International Consultant Review

Experts in the Green Building and LEED were invited to review the analysis, and provided their expert recommendations, which lead to modifications in the Rating system. Such as the use of a survey to broaden the information base.

4. Survey Design, Dissemination & analysis

An online technical survey intended to find information regarding the importance of the local rating system, Identifying the most important Sustainable design Component (Water, Energy etc), Types of building to include in rating system and any additions to the rating system.

Out of 100 professionals & practitioners statistics show 49.3% think a ratings system is important, 72.1% think water is the most important component. Educational buildings were thought to be the most important typology in the rating system.

5. Credit weighting

The integrity of the ratings were maintained so did the total number of points, changes were made to give more credits to water and energy.

Proposed Credit weighting per category:

Category	Points	Percentage
Sustainable Sites (SS)	20	18%
Water efficiency (WE)	26	24%
Energy & Atmosphere (EA)	30	27%
Materials & Resources (MR)	13	12%
Indoor Environment Quality (IEQ)	15	14%
Innovation in Design (ID)	6	5%
total	**110**	**100%**

Sustainable Sites

This section assesses the applicability of the Sustainable Sites (SS) prerequisite and credits for Jordan. Challenges to meet the criteria are the following:

♦ Dust reduction from construction site is a prerequisite and an important aspect for air quality, even in a desert environment.

♦ Currently, sustainability is not an integrated part in urban planning for major urban areas in Jordan. There are certain exceptions, namely components of the Master Plan for Amman, and certain parts of development in Aqaba. In rural areas urban planning is not much more than a parcellation plan with functional zoning.

♦ Concepts like urban density which contribute to the economic feasibility of mass transportation must become integral in future urban master plans.

♦ Currently, land preservation of specific areas only occurs through the creation of Nature Reserves (National Parks), under the auspices of the Royal Society of the Conservation of Nature and the Ministry of Environment.

♦ At present public transportation is underutilized, due to the lack of information on public transportation systems and the negative image associated with public transit. In part this is the result of public transportation being viewed as unappealing and low quality and the fact that Jordanians generally have a strong preference to drive their own car.

♦ Some regulations and baseline references that are referred to in LEED credits originate from the United States of America and are not relevant to Jordan. Additionally, in some cases equivalent local regulations or guidelines do not exist (e.g. dust prevention in construction or flood plans). In these cases, recommendations are given for each credit, based on regional experience and best practices.

Credits that are Not Achievable or can be achieved with difficulty are:

♦ Prerequisite 1: Controlling erosion and dust is difficult to achieve, since it is based on foreign regulations and equivalent local regulations are not in place. Furthermore there is a lack of knowledge/ skills with contractors and related workers.

♦ Credit 1: Avoiding development of inappropriate sites is difficult to achieve due to lack of local regulations.

♦ Credit 3: In terms of Brownfield redevelopment, lack of local regulation is an issue.

For these credits it is recommended that similar regulations be developed by the government or that credits are checked against local planning regulations.

Credits that do not meet the credit intent or are less relevant for Jordan are the following:

♦ Credit 4: Alternative transport:

♦ Credit 4.2: Bicycle Storage and Changing Rooms is difficult to achieve due to absence of bike-lane infrastructure and natural typography.

♦ Credit 4.3: Low Emitting and Fuel Efficient Vehicles are uncommon and natural typography makes electrical cars less efficient that in a flat topography.

SS Prerequisite 1: Construction Activity Pollution Prevention

♦ To prevent loss of soil during construction by storm water runoff and/or wind erosion, including protecting topsoil by stockpiling for reuse.

♦ To prevent sedimentation of storm sewers or receiving streams.

♦ To prevent pollution of the air with dust and particulate matter.

Current Practices			Ease of Implementation			Cost			Feasibility		
Already done	Partially Done	Not Done	Easy	Med	Hard	Low	Medium	High	Feasible	Med	Not Feasible
		X			**X**		**X**			**X**	

Although not in practice present, it is important that this prerequisite is maintained in order improve current construction practices. This is particularly true for large scale projects with higher impact due to various construction activities and excavation practices. In addition, maintaining the prerequisite would allow for better maintenance of construction sites where sites and materials are covered and properly stored to minimize the impact of construction activity, not only on the site itself but also into neighboring sites.

SS Credit 1: Site Selection

Do not develop buildings, hard cape, roads or parking areas on portions of sites that meet any of the following criteria:

♦ Prime farmland as defined by the U.S. Department of Agriculture in the United States Code of Federal

♦ Previously undeveloped land whose elevation is lower than 5 feet above the elevation of the 100-year flood as defined by the Federal Emergency Management Agency (FEMA).

♦ Land specifically identified as habitat for any species on federal or state threatened or endangered lists.

♦ Land within 100 feet of any wetlands

♦ Previously undeveloped land that is within 50 feet (15.25 meters) of a water body, defined as seas, lakes, rivers, streams and tributaries that support or could support fish, recreation or industrial use, consistent with the terminology of the Clean Water Act.

♦ Land that prior to acquisition for the project was public parkland, unless land of equal or greater value as parkland is accepted in trade by the public landowner (park authority projects are exempt).

Current Practices			Ease of Implementation			Cost			Feasibility		
Already done	Partially Done	Not Done	Easy	Med	Hard	Low	Medium	High	Feasible	Med	Not Feasible
	x		x			x			x		

SS Credit 2 — Development Density and Community Connectivity

Option 1: Development Density

Construct or renovate a building on a previously developed site AND in a community with a minimum density of 60,000 square feet per acre net (1,486.5 square meters per 4.05 Dunams). The density calculation is based on a typical two-story downtown development and must include the area of the project being built.

Option 2: Community Connectivity

Construct or renovate a building on a site that meets the following criteria:

♦ Is located on a previously developed site.

♦ Is within 1/2 mile (0.80 km) of a residential area or neighborhood with an average density of 10 units per acre (4.05 Dunams) net.

♦ Is within 1/2 mile (0.80 km) of at least 10 basic services.

♦ Has pedestrian access between the building and the services.

Current Practices			Ease of Implementation			Cost			Feasibility		
Already done	Partially Done	Not Done	Easy	Med	Hard	Low	Medium	High	Feasible	Med	Not Feasible
	x		x			x			x		

SS Credit 3: Brownfield Redevelopment

Option 1

Develop on a site documented as contaminated (by means of an ASTM E1903-97 Phase II Environmental Site

Assessment or a local voluntary cleanup program).

OR

Option 2

Develop on a site defined as a Brownfield by a local, state, or federal government agency.

Current Practices			Ease of Implementation			Cost			Feasibility		
Already done	Partially Done	Not Done	Easy	Med	Hard	Low	Medium	High	Feasible	Med	Not Feasible
		X			X		X				X

SS Credit 4.1: Alternative Transportation—Public Transportation Access

Locate the project within 1/2-mile (0.80 km) walking distance (measured from a main building entrance) of an existing or planned and funded commuter rail, light rail or subway station.

Another option is to locate the project within 1/4-mile (0.40 km) walking distance (measured from a main building entrance) of one or more stops for two or more public, campus, or private bus lines usable by building occupants.

Current Practices			Ease of Implementation			Cost			Feasibility		
Already done	Partially Done	Not Done	Easy	Med	Hard	Low	Medium	High	Feasible	Med	Not Feasible
		X			X		X				X

Final Conclusions

Going through this publication, it cannot be stressed enough that the applicability of the analysis completed goes just as well for the region as it does when taking Jordan's codes and regulations as a case example, with little if any modification. The criteria adopted and methodology applied allowed for such flexibility, keeping in mind the added value of any modification taking regional contingencies into perspective.

It is clear that the ease of implementation and associated costs are highly correlated to the level of integration of sustainability concepts into the design right from the start of the project where user requirements are defined prior to conceptual design. A collaborative design and construction approach involving all disciplines early on is the key to a successful cost effective conclusion to the project. It is also key to have commissioning agents and contractors involved in the conceptual design review, final detailed design review, and maintaining an open channel of communication throughout the project life

cycle with a responsive design team to concerns; suggestions can only help realize the project timeline and budgets.

Integrating sustainability elements into any design should not be perceived as an aesthetic luxury to the building. There should be hard and fast rules and calculations showing the economic feasibility of each addition with a reasonable payback time. If the implementation of such projects is to have a real effect on our neighborhoods and our life, they have to become mainstream with a large stock of the built environment developed "green". Today in our region green development is an exception to the rule and the road to the mainstream is clearly a few steps ahead. Going the route of introducing non cost effective additions would lead us down a path where sustainability concepts are to be perceived as a nice to have feature and developers eventually shying away from a "foreign" approach.

Our efforts to localize the rating systems pulls us away from this path of being perceived as foreign and allows us to focus on local priorities that re-instill the developers belief in the importance of moving forward with sustainability requirements. Clarifying the payback of initially higher capital costs with significantly lower operating costs and environmental impacts, makes the life of the engineers/architects much easier to approve and finalize their designs.

When reviewing the feasibility of sustainability concepts a holistic approach should be adopted, not only by looking for potential incentives for their implementation, but also on the removal of current subsidies in our region that are a deterrent to resource consumption reduction. One good example is the subsidization of energy and water in many parts of our region. The feasibility calculations might lead to negative results at present time, yet might have quite different implications in the future. Accordingly, designers should take that into account and have some provisions for the addition of certain sustainability modules in the future. A global increase in energy prices, which occurred in the last two decades, would call for a provision of additional tubular connections on the roof as an example to provide for when the time comes to add domestic solar hot water panels.

When analyzing such systems pertaining to sustainable design, a long term perspective should always be the priority going forward. The status quo is not necessarily where we will end up and more importantly not where we need to steer the industry. A case in point being the current lack of infrastructure for the recycling industry should not shy away any prudent designer or developer from focusing on the incorporation of recycled material collection areas and other related design features that would encourage occupant behavior in that direction.

The foreseen benefits of making the green built environment mainstream are twofold; in addition to having a significant reduction on environmental degradation, economies of scale create a platform to optimize infrastructure related items such as the recycling system in the region/ local, waste diversion, landfill handling operation, and the pool of suppliers for lower environmental impact materials, fixtures and outfits. A cross sector impact can only be achieved by gathering momentum with a large building stock and not with a few scattered projects.

LEED GAP-АНАЛИЗ С УЧЕТОМ РЕГИОНАЛЬНЫХ ОСОБЕННОСТЕЙ СИСТЕМЫ РЕЙТИНГА LEED — НА ПРИМЕРЕ ИОРДАНИИ

Аднан М. Аль-Маали

Секция архитектурного проектирования
Совета по зеленому строительству Иордании

Система рейтинга LEED (Лидерство в энергетике и экологическом проектировании) была проанализирована в качестве основной с целью приведения ее в соответствие с национальными требованиями устойчивого развития Иордании. Использованы пять основных критериев LEED (устойчивость территорий, рациональное водопользование, энергосбережение и атмосфера, материалы и ресурсы, качество внутренней среды зданий и сооружений).