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# Social Impacts for Residential Neighbourhood Development Case Study: LEED, USA

المؤثرات الإجتماعية على تطوير المجاورات السكنية  
حالة دراسية: LEED ، الولايات المتحدة الأمريكية

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## المخلص

ترتكز عملية تطوير مجاورة سكنية على تطوير عاملين أساسيين، هما الفراغ المبني والمجموعة الاجتماعية التي ستقطن المجاورة، وبالتالي فإن تقييم جودة تطوير المجاورات السكنية يجب ان يكون قادرا على تحديد جودة البناء الاجتماعي للمجتمع. إن نظام الريادة في تصميمات الطاقة والبيئة- تطوير المجاورات (LEED-ND) هو نظام تصنيف يقوم بدمج مبادئ النمو الذكي والتصميم الحضري والمباني الخضراء في أول نظام لتقييم تصميم المجاورات بالولايات المتحدة الأمريكية. ولذلك فإن LEED-ND ، كاداة لتقييم الاستدامة والتي تستخدم لتحديد مقدار النجاح في تحقيق أهداف التطوير الأخضر، يجب أن تكون قادرة على تحديد مقدار النجاح في الاستدامة الاجتماعية كاحد العناصر الأساسية للاستدامة.

يفترض البحث بأنه، في حين أن تقييم الأثر الاجتماعي (SIA) يعني بشدة بتقديم بيانات أكثر استدامة وإنصافاً مادياً وإجتماعياً، فإن المؤثرات الاجتماعية يجب أخذها في الاعتبار في الإطار العام لل LEED-ND والذي يجب ان يشمل على الإعتبارات الاجتماعية والإقتصادية والبيئية. تلك الاعتبارات التي هي ذات علاقة وثيقة بتقييم الآثار لمشروع التطوير، والتي بجانب أشياء أخرى تهدف الى ايجاد "مجتمعات مستدامة" بصورة أكبر.

يقصد البحث الى وصف الخصائص الاجتماعية ب LEED-ND والتي يسعى بها الى تطوير مجاورات خضراء لتحقيق تطوير حضري مستدام، كما يبحث الابعاد والعناصر الاجتماعية والتي تم أخذها في الإعتبار في LEED-ND عن طريق تحليل ال LEED-ND بناء على أنواع تلك الابعاد والعناصر الاجتماعية المختلفة والآثار المحتملة الناجمة عن مشاريع تطوير المجاورات، يهدف بذلك الى تقييم نظام التصنيف LEED-ND من حيث أخذه تلك العناصر الاجتماعية في الإعتبار وتوضيح نقاط القوة والضعف مع عمل توصيات للتحسينات المستقبلية.

## Abstract:

The process of developing a residential neighbourhood should focus on two major factors; the build-up space and the social group which will resident the neighbourhood, hence the rating of the Neighbourhood development should be able to identify the quality of the community social construction.

Leadership in Energy and Environmental Design - Neighbourhood Development (LEED-ND) is a rating system that integrates the principles of smart growth, urbanism and green building into the first USA system for neighbourhood design rating.

LEED-ND, as a sustainability assessment tool which is used to rate the level of success in achieving the green development goals, it should be able to rate the success level in achieving social sustainability as a major component of sustainability. The paper argues that, While Social Impact Assessment (SIA) is vitally concerned with bring about a more sustainable and equitable physical and social environment, Social Impacts should be conducted within LEED-ND framework, which should encompasses social, economic and environmental considerations. These considerations are highly relevant to assessing the impacts of the development project scheme, which among other things, seeks to develop a more "sustainable community".

The paper intends to describe social features in the LEED-ND striving for Green neighbourhood developments toward sustainable urban development and investigates the social dimensions and issues considered into the LEED-ND through the analysis of the LEED-ND based on the types of social issues and possible impacts associated with a project. This analysis aims to providing evaluation of the current LEED-ND rating system for its consideration of

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these social issues and highlighting the strengths, weaknesses, successes, and failures; and making recommendations for future improvements.

## Key words

Social Impacts, Development, Residential Neighbourhood, green development, Sustainability, Urban Design, Urban Planning, Architecture, LEED, LEED-ND

## 1. Introduction

Green neighborhood developments are beneficial to the community and the individual as well as the environment. The character of a neighborhood, including its streets, homes, workplaces, shops, and public spaces, significantly affects the quality of life. While, for a community to function and be sustainable, the basic needs of its residents must be achieved. A socially sustainable community must have the ability to maintain and build on its own resources and have the resiliency to prevent and/or address problems in the future.

LEED-ND, as stated by U.S. Green Building Council, emphasizes the creation of compact, walkable, vibrant, mixed-use neighborhoods with good connections to nearby communities. In addition to neighborhood morphology, pedestrian scale, and mix of uses, the rating system also emphasizes the location of the neighborhood and the performance of the infrastructure and buildings within it. The sustainable benefits of a neighborhood increase when it offers proximity to transit and when residents and workers can safely travel by foot or bicycle to jobs, amenities, and services. This can create a neighborhood with a high quality of life and healthy inhabitants. Likewise, green buildings can reduce energy and water use, and green infrastructure.

## 2. Aims and method

This paper aims to analyze the LEED-ND based on the types of social issues and possible impacts associated with a project as presented by Environment and Social Development Department, International Finance Corporation, World Bank Group (2003). This analysis aims to providing

evaluation of the current LEED-ND rating system for its consideration of these social issues and highlighting the strengths, weaknesses, successes, and failures; and making recommendations for future improvements; focusing on the Finnish experience which is representing pioneering work in this field in USA and worldwide.

## 3. What are social impacts

The SIA community of practitioners considers that all issues that affect people, directly or indirectly, are pertinent to SIA.

It is almost impossible to catalogue all dimensions of social impacts because change has a way of creating other changes.

A convenient way of conceptualising social impacts is as changes to one or more of the following.

- **People's way of life** – that is, how they live, work, play and interact with one another on a day-to-day basis;
- **Their culture** – that is, their shared beliefs, customs, values and language or dialect;
- **Their community** – its cohesion, stability, character, services and facilities;
- **Their political systems** – the extent to which people are able to participate in decisions that affect their lives;
- **Their environment** – quality of the air, water, etc..., People's physical safety;
- **Their health and wellbeing** – health is a state of complete physical, mental, social and spiritual wellbeing;
- **Their personal and property rights** – particularly whether people are economically affected, or experience personal disadvantage;
- **Their fears and aspirations** – their perceptions about their safety, their fears about the future of their community.

#### **4. Identifying social impact assessment issues and variables**

Social analysis tells us whether a proposed project contributes to equitable and sustainable development. Equitable and sustainable development is a long-term goal.

A single project, or several, cannot achieve it. Nonetheless, as a goal it illuminates the pathways to social development. Equitable development involves leveling the playing field so that intended beneficiaries and other key stakeholders can express their opinions and participate in the development opportunities created by a project. Sustainable development is compatible with its socio cultural context—the institutions that are expected to implement the project have the capacity to do so and have some sense of ownership of the project's objectives.

The types of social issues and possible impacts associated with a project can vary considerably depending on the nature of the project, its size, location and stage in the project cycle. Table 1 shows the social issues, as presented by Environment and Social Development Department, International Finance Corporation, World Bank Group (2003), the mentioned social issues provides an overview of the types of issues that may be considered during the impact analysis process. Not all issues may apply to a given project, particularly in the case of small projects or those with limited impacts. For example, a mining investment in a remote rural area may have a very different and much broader set of social impacts than the upgrading of a manufacturing plant in an urban area.

#### **5. Case study: leed neighbourhood development (leed-nd), usa**

LEED-ND places emphasis on the site selection, design, and construction elements that bring buildings and infrastructure

together into a neighbourhood and relate the neighbourhood to its landscape as well as its local and regional context. LEED-ND creates a label, as well as guidelines for both decision making and development, to provide an incentive for better location, design, and construction of new residential, commercial, and mixed-use developments.

LEED-ND three Major categories: Smart Location and Linkage, Neighborhood Pattern and Design, and Green Infrastructure and Buildings. An additional category, Innovation and Design Process, addresses sustainable design and construction issues and measures not covered under the three categories. Regional bonus credits are another feature of LEED-ND. These credits acknowledge the importance of local conditions in determining best environmental design and construction practices as well as social and health practices.

In LEED 2009, the allocation of points among credits is based on the potential environmental impacts and human benefits of each credit with respect to a set of impact categories. The resulting allocation of points among credits is called credit weighting.

The LEED-ND Rating System is a set of performance standards for certifying the planning and development of neighborhoods. Prerequisites and credits in the rating system address five topics:

- Smart Location and Linkage (SLL)
- Neighborhood Pattern and Design (NPD)
- Green Infrastructure and Buildings (GIB)
- Innovation and Design Process (IDP)
- Regional Priority Credit (RPC)

There is no minimum or maximum size for a LEED-ND project

Based on the social issues as mentioned under Social Impact Assessment Issues and Variables in this paper, the paper, in the next part, will review the LEED-ND for the consideration of these social issues.

**a) Population and demographic movement:**

Concerning **Population and demographic Movement** the LEED-ND under the category of **Neighborhood Pattern and Design; Compact Development** credit requires to design and build the project such that residential and nonresidential components achieve specific densities per acre of buildable land and **Mixed-Use Neighborhood Centers** credit requires to Locate and/or design the project such that 50% of its dwelling units are within a 1/4-mile walk distance of the number of diverse uses.

**b) Economic Environment:**

Under the **Smart Location and Linkage** category; Part of the **Preferred Locations** credit intent is to conserve natural and financial resources required for construction and maintenance of infrastructure.

**Mixed-Income Diverse Communities** credit, under **Neighborhood Pattern and Design** category, promotes socially equitable and engaging communities by enabling residents from a wide range of economic levels, household sizes, and age groups to live in a community while **Local Food Production** credit intends to support local development that increases the economic value and production of farmlands and community gardens by promoting community-based food production.

**Existing Building Reuse** credit, under the **Green Infrastructure and Buildings** category, aims to extend the life cycle of existing building stock to conserve resources, reduce waste, and reduce adverse environmental effects of new buildings related to materials manufacturing and transport and **On-Site Renewable Energy Sources** credit encourages on-site renewable energy production to reduce the adverse economic effects associated with fossil fuel energy production and use.

**c) Natural Resource Management and Land Use:**

The **Natural Resource Management and Land Use** was given the highest attention in LEED-ND Rating System. **Natural Resource Management and Land Use** issue was considered in most of the credits mentioned under the LEED-ND three major categories: **Smart Location and Linkage, Neighbourhood Pattern and Design, and Green Infrastructure and Buildings** and one another bonus credit under **Regional Priority** category.

The main intention of **Smart Location and Linkage** category is to:

- Encourage development within and near *existing* communities and public transit infrastructure and encourage the reuse of land.
- Floodplain Avoidance and minimize erosion to protect habitat and reduce stress on natural water systems by preserving steep slopes
- Conservation of wetlands, wildlife habitat, water bodies and native plants conservation and restoration.

On the other hand, the **Neighbourhood Pattern and Design** category is found to be more concerned with the land uses and improving the public health by encouraging daily physical activity

While the **Green Infrastructure and Buildings** category focus more on the nature resources management to reduce energy use, pollution, adverse energy related environmental effects, effects on natural water resources, burdens on community water supply and wastewater systems, and economic effects.

The **Regional Priority** category aims to encourage strategies that address geographically specific environmental, social equity, and public health priorities.

**d) Community Organization and Local Institutions**

The credit which is found to address the **Community Organization and Local Institutions** is the **Community Outreach**

**and Involvement credit under Neighborhood Pattern and Design category.** The credit intends to encourage responsiveness to community needs by involving the people who live or work in the community in project design and planning and in decisions about how it should be improved or how it should change over time.

#### e) Social Services and Infrastructure

**Social Services and Infrastructure** was considered in most of the LEED-ND credits. Most of the credits under **Smart Location and Linkage, Neighbourhood Pattern and Design and Green Infrastructure and Buildings** categories aim to improve the community social services and infrastructure.

**Smart Location and Linkage** category focused on the location of the development and its relation to existing cities, suburbs, and towns, and the public transit infrastructure and its effect on the public health and daily physical activity.

While **Neighbourhood Pattern and Design** category concentrates on transportation efficiency and transit use, Internal connectivity, cluster diverse land uses and parking design, Community interaction and engagement and providing a variety of open spaces and recreational facilities. The intention is to improve physical, mental health and public health, and social capital by encouraging daily physical activity

The credits under **Green Infrastructure and Buildings** category are mostly concerned about the sustainability of the buildings and infrastructure of community. The category is assigning credits to promote for sustainable buildings, Energy and Water Efficiency, Stormwater, Wastewater, Solid Waste Management, and Light Pollution reduction.

#### f) Vulnerable Groups

**Under Neighborhood Pattern and Design category the Visitability and Universal Design** credit was the only identified credit to be concerned about the vulnerable groups.

The **Visitability and Universal Design** credit intention is to enable the widest spectrum of people, regardless of age or ability, to more easily participate in community life by increasing the proportion of areas usable by people of diverse abilities.

#### g) Cultural Property

The community **Cultural Property** is considered in the Historic Resource Preservation and Adaptive Use credit under **Green Infrastructure and Buildings category.** The credit intends to encourage the preservation and adaptive use of historic buildings and cultural landscapes that represent significant embodied energy and cultural value, in a manner that preserves historic materials and character-defining features.

#### h) Employment and Labor

**Housing and Jobs Proximity** credit, **under Smart Location and Linkage category,** Intends to encourage balanced communities with a diversity of uses and employment opportunities.

#### i) Social Conflict

Social conflict issue was not considered in the LEED-ND rating system.

These social conflicts such as conflict between local population and newcomers; the backgrounds (e.g., urban, educated, skilled, foreign language, expatriates, different customs, etc.) can often differ greatly and provide potential for misunderstanding and conflict that needs to be addressed early in the project cycle

#### j) Lifestyle and Culture

Most of the LEED-ND credits is promoting for designing communities for a lifestyle which encourage and contributes to the sustainability of the community. The lifestyle is considered in four of The **Neighborhood Pattern and Design** category: **Compact Development, Access to Civic and Public Spaces, Access to Recreation Facilities** and

### **Local Food Production**

The overall intention of these credits is to promote livability, walkability, and transportation efficiency, including reduced vehicle miles travelled and providing a variety of open spaces and Recreation Facilities close to work and home to facilitate social networking, civic engagement, physical activity, and time spent outdoors, In addition to promoting for community-based food production.

Although the community lifestyle is not directly addressed under **Green Infrastructure and Buildings** category, the community lifestyle is affected, indirectly, by the intentions of most of the category credits which aiming to achieve energy and water efficiency; reduce pollution and adverse environmental effects; extend the life cycle of existing building and minimize effects on the microclimate and human and wildlife habitat.

### **k) Health**

Most of LEED-ND credits intents to improve the health conditions of the community, particularly by encouraging daily physical activity, Reducing pollution and adverse environmental effects, and community-based food production.

Health is addressed under the LEED-ND three major categories: **Smart Location and Linkage, Neighborhood Pattern and Design** and **Green Infrastructure and Buildings**. In addition, the **Regional Priority Credit** category encourages strategies that address geographically specific environmental, social equity, and public health priorities.

The LEED-ND aims to encourage daily physical activities by promoting walking, bicycling and transportation efficiency, including reduced vehicle miles travelled. In addition, LEED-ND aims to reduce pollution and adverse environmental effects.

Also the LEED-ND promotes community-based food production and improves nutrition through increased access to fresh produce.

### **l) Equity**

The Equity issues which were considered in the LEED-ND falls under the **Neighborhood Pattern and Design and Regional Priority Credit** categories.

- **Social equitability is addressed in Mixed-Income Diverse Communities** credit which promotes socially equitable and engaging communities by enabling residents from a wide range of economic levels, household sizes, and age groups to live in a community and designing the community to have a Diversity of Housing Types and Affordable Housing; and

Also **Social equitability** is addressed under **Regional Priority Credit** by encouraging strategies that address geographically specific environmental, social equity, and public health priorities.

- **Accessibility** is addressed in **Mixed-Use Neighborhood Centers** credit which requires to cluster diverse land uses in accessible neighborhood and regional centers;

**Street Network** credit which promotes *projects* that have high levels of internal connectivity and are well connected to the community at large;

**Access to Civic and Public Spaces** credit by providing a variety of open spaces close to work and home;

**Access to Recreation Facilities** credit by providing a variety of recreational facilities close to work and home;

**Visitability and Universal Design** by enabling the widest spectrum of people, regardless of age or ability, to more easily participate in community life by increasing the proportion of areas usable by people of diverse abilities;

**Local Food Production** credit to improve nutrition through increased access to fresh produce; and

**Neighborhood Schools** credit which promotes community interaction and engagement by integrating *schools* into the neighborhood

• **Community Participation** is addressed in **Community Outreach and Involvement** credit by involving the people who live or work in the community in *project* design and planning and in decisions about how it should be improved or how it should change over time.

#### m) **Induced Impacts and Associated Facilities**

Social impacts of all activities in the project area of influence should be considered, including associated facilities or ancillary aspects of a project such as access roads, pipelines, construction camps, etc., as well as unplanned developments induced by the project.

Under **Green Infrastructure and Buildings** category the **Existing Building Reuse** credit aims to extend the life cycle of existing building stock to conserve resources, reduce waste, and reduce adverse environmental effects of new buildings related to materials manufacturing and transport, While the **Light Pollution Reduction** credit aim is to minimize light trespass from project sites, reduce sky-glow to increase night sky access, improve night time visibility through glare reduction, and reduce adverse effects on wildlife environments.

#### n) **Cumulative Impacts**

Cumulative Impacts is the direct, indirect and secondary impacts resulting from existing projects, the proposed project and anticipated future projects.

**The Long-Term Conservation Management of Habitat or Wetlands and Water Bodies** credit under **Smart Location and Linkage category** aims to conserve native plants, wildlife habitat, wetlands, and water bodies by Creating and commitment to implementing a long-term (at least ten-year) management plan for new or existing onsite native habitats, water bodies, and/or wetlands and their buffers, and create a guaranteed funding source for management, While it is

part of **Transportation Demand Management** credit requirements, under **Neighbourhood Pattern and Design category**, is to create and implement a comprehensive transportation demand management (TDM) program for the project that reduces weekday peak-period motor vehicle trips by at least 20% compared with a baseline case, and fund the program for a minimum of three years following build-out of the project aiming to reduce energy consumption, pollution from motor vehicles, and adverse public health effects by encouraging multimodal travel.

#### o) **Bio-Physical Aspects**

The **Bio-Physical Aspects** like, the effect of the climatic conditions on the project, impacts of recurrent droughts on food security, impacts of water resources and hydrology, impacts on soil and vegetation resources or wild life...etc were considered in the three major categories of the LEED-ND.

To manage the Project's **Bio-Physical Aspects** the **Smart Location and Linkage category** assigned credits such as Wetland and Water Body Conservation; Agricultural Land Conservation; Floodplain Avoidance; Steep Slope Protection; Site Design for Habitat or Wetland and Water Body Conservation Restoration of Habitat or Wetlands and Water Bodies.

**While Neighborhood Pattern and Design category** included credits such as Compact Development and Local Food Production.

**Green Infrastructure and Buildings** category has Stormwater Management and Heat Island Reduction credits

#### p) **Alternatives Analysis**

To provide a systematic review / analysis of alternatives and options of the proposed development in terms of their potential impacts; **Innovation and Exemplary Performance** Credit under **Innovation and Design Process** category aims to develop



options to encourage exemplary performance above the requirements set by the LEED-ND Rating System and/or innovative performance in green building, smart growth, or new urbanist categories not specifically addressed by the LEED for Neighborhood Development Rating System.

Meanwhile the **LEED Accredited Professional** credit requires at least one principal member of the project team must be a accredited Professional to support the integrated planning and design required for a LEED for Neighborhood Development *project* and to streamline the application and certification process.

The following table summarizes the findings of the previous review and illustrates the social issues and its relevant LEED-ND categories, LEED-ND credits and points.

## 6. Conclusion

The LEED-ND rating system considered most of the SIA social issues as presented by World Bank Group, but LEED-ND gave different levels of attention to these social issues in terms of prerequisite and credit points weighting.

Social issues such as: Natural Resource Management and Land Use; Social Services and Infrastructure and Health were, obviously, addressed in the LEED-ND and they were considered in a high number of prerequisites and its related credits were given a high value of credit points.

Lifestyle and Culture was considered in prerequisite credits and related credits were given a moderate value of credit points.

Bio-Physical Aspects and Population/Demographic Movement were considered in prerequisite credits; however its related credits were given a low value of credit points.

Credits, identified to be related to Economic Environment and Equity, were given a moderate value of credit points, but Economic

Environment and Equity were not considered in prerequisite credits.

Although the remaining social issues, Except Social Conflict, were addressed in the LEED-ND, but its related credits were given a low value of credit points.

On the other hand, LEED-ND didn't show how other important social issue should be addressed and rated as part of designing toward sustainable neighbourhood, such as: social conflicts between local population and newcomers, social cohesion and distribution (separation of families and communities) or changing relationships between groups in terms of gender, age, socioeconomic status and ethnicity.

Although the LEED-ND Rating System gave attention to many of the SIA issues, but a separate SIA should be conducted at early stages of the project planning to highlight and conclude the social issues which will affect or affected by the project. The result of that SIA should be one of the planning decision making tools.

The social issues which should be considered as a part of a SIA process varies based on the locality of the project; however common factors can be identifies for the same region. These same region common factors should be investigated and agreed upon, then addressed as part of the LEED-ND rating process.

Rating scale should be developed to measure the success level in implementing the recommendation of the SIA and it should be a key Rating Credit in LEED-ND.

		LEED-ND Categories									
		Major Categories						Additional Categories		Total Number of Prerequisite credits and Points Per Issue	
		Smart Location and Linkage	Neighborhood Pattern and Design		Green Infrastructure and Buildings		Innovation and Design Process	Regional Priority Credit			
		Number of Prerequisite credits and Possible Points									
<b>Social Issues for Consideration</b>		27	5P	44	3P	29	4P	6	4	110	12P
<b>A. Population/Demographic Movement</b>				12	1P					12	1P
<b>B. Economic Environment</b>		10		8		4				22	
<b>C. Natural Resource Management and Land Use</b>		23	5P	15	2P	23	3P		1-4	62-65	10P
<b>D. Community Organization and Local</b>				2						2	
<b>E. Social Services and Infrastructure</b>		14	1P	33	3P	20	3P			67	7P
<b>F. Vulnerable Groups</b>				3						3	
<b>G. Cultural Property</b>						1				1	
<b>H. Employment and Labor</b>		3								3	
<b>I. Social Conflict</b>										0	
<b>J. Lifestyle and Culture</b>				9	1P	13	3P			22	4P
<b>K. Health</b>		8		29	3P	19	3P		1-4	57-60	6P
<b>L. Equity</b>				20					1-4	21-24	
<b>M. Induced Impacts and Associated Facilities</b>						2				2	
<b>N. Cumulative Impacts</b>		1		2						3	
<b>O. Bio-Physical Aspects</b>		3	3P	7	1P	5				15	4P
<b>P. Alternatives Analysis</b>								2-6		2-6	
<b>Number of Social issues considered under each category prerequisites and credits</b>		7		11		8		1	3		

Table1: Analysis of Social Issues in relation to the value of LEED-ND possible points  
(X)P: Number of Prerequisite credits

1 to 21	Low Value
22 to 43	Moderate Value
44 to 65	High Value

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