

# A Human-Oriented Study of the Assessment Method for Sustainable Urban District in China - Comparison of LEED Neighbourhood Development, BREEAM Community, CASBEE-Cities and DGNB Urban Districts

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## ABSTRACT

The development of “Green and Eco-Urban District” is one of the major tasks in the “national promotion of the construction of ecological civilization (生态文明建设)”, which has also significant impact on the implementation of new urbanization (新型城镇化) in China. Consideration for humanities and humanism, which reflects the qualitative factors besides quantitative ones, is one of the assessment aspects in the Chinese national standard “Evaluation Standard for Green and Eco-Urban District”. This research will first compare the definition of humanities and humanism between China and western countries. Secondly, it will compare the human oriented issues of the four world leading green assessment standards – the US LEED Neighborhood Development, UK BREEAM Community, Japan CASBEE-Cities and German DGNB Urban Districts. Through the above comparisons, this research attempts to establish the assessment method and framework for the humanism aspect (人文章节) of the Evaluation Standard for Green and Eco-Urban District in China.

**Keywords:** *sustainable neighbourhood, humanism, China GBL*

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## 1. BACKGROUND

### 1.2 Definition of humanities and humanism

The character 「人文」 which means humanity in China first came up in the Book of Changes (中文名称：《易经》) (Xu, 1992), whose core spirit is the unity of man and nature in Confucian philosophy. While, in the West, humanism means a doctrine, attitude, or way of life centered on human interests or values, in particular it is a philosophy that usually rejects supernaturalism and stresses an individual's dignity and worth and capacity for self-realization through reason (University, 2014). Therefore, it could be found that there are certain differences in meanings of humanity between China and the West.

### 1.3 Human-oriented content in green and eco-urban district

In 1975, the United Nations set up the United Nations Habitat and Human Settlements Foundation (UNHHSF) and committed itself to the Habitat Agenda with issues as adequate shelter for all, sustainable human settlements, enablement and participation, gender equality, financing shelter and human settlements, and international cooperation and assessing progress (UNHHSF, 1996). We summarized the four principles of the above commitment as sustainability, openness, engagement and equality.

In China, the national urbanization plan for the 2014-2020 period, issued in 2014 (MOHURD, 2014), put forward the human-oriented city construction topic in part three, which contained chapter eighteen including history & culture conservation, cultural and sports facilities and free of charge public facilities.

Through comparative analysis between the United Nations' Habitat Agenda and National Urbanization Plan (2014~2020), we found out their common principles and different points of focus, shown as Table 1.

Principles	UN Habitat Agenda	Chinese Urbanization Plan (2014~2020)
Public Open Spaces/ Facilities	✓	✓
Public Engagement	✓	×
Equality	✓	×
Sustainability	✓	✓
Green Education	×	✓
History & Culture Conservation	×	✓

Table 1: Comparison of the principles of human-oriented city between China and the United Nations

From Table 1 above, it could be found that the UN Habitat Agenda focuses on the human-oriented urban planning issues and environmental sustainability issues, but lacks due consideration for green education, promotion of green lifestyle and cultural sustainability. In contrast, China pays less attention on human-oriented issues, especially on public engagement and equality. Thus, some form of integration of global and local principles is necessary and may point to a more comprehensive framework on the aspect of humanism. Hence, the integrated framework of the humanism aspect in the Evaluation Standard for Green and Eco-Urban District should include four sub-categories – human-oriented design, green lifestyle, green education, and history and culture conservation.

## 1.4 Methodology

To establish the detail requirements of the four sub-categories in the aspect of humanism, this research used a comparative study method to compare the human-oriented and social related credits in LEED, BREEAM, CASBEE and DGNB with the aim to extract common and particular requirements in the four standards.

Since presently there are very few standards for defining green and ecological urban districts and the scale for an urban district is different in different countries, the scope for comparison covered three different urban scales, neighbourhood, urban district and city scale. It aimed to identify the human-oriented social issues that are of urban district scale and suitable for adoption in China.

## 2. LITERATURE REVIEW

### 2.1 LEED ND, BREEAM communities, CASBEE for cities, DGNB UD

In the 1990s, Americans put forward the concept of smart growth after realizing development problems resulting from loose expansion from urban to suburban. Green districts under the frame work of smart growth becomes the development mode based on a human-oriented concept (Huang, 2008). A community's smart growth means the communities provided well open space, farmland, and expanded the range of transportation, employment, and housing choices. As a guideline for sustainable neighbourhood development, initiated in 2004 (Xin, 2014), LEED ND encompasses not only transportation, ecological environment and economy aspects (Xiaoqian Teng, 2014), but also human-oriented aspects that integrates humanity into the rating system. LEED ND is primarily concerned with site location and land use to the neighbourhood scale, and explores integrated strategies from three parts including smart location and linkage, neighbourhood pattern and design, and green infrastructure and buildings and the human-oriented issues are mainly elaborated in the last two parts. LEED ND-certified developments improve building performance, energy conservation, greenhouse gas emissions reduction, and provide healthier and more productive environment for the occupants.

First launched in 1990, the UK BREEAM was the world's first environmental assessment method for new buildings design (BRE, 2012). The BREEAM Communities that came out in 2009 is an independent, third party assessment and certification standard based on the established BREEAM methodology (Ziping Xu, 2002). The assessment criteria in BREEAM Communities consider human-oriented issues in two aspects, namely governance and social and economic wellbeing. On governance aspect, public consultation and engagement are considered a necessary process in sustainable social development and addresses numbers of related credits that require local community and stakeholders involvement in each development stages in various forms. While economic wellbeing aspect addresses demographic needs and priorities issues to ensure that the development makes provision for housing, services, facilities and amenities on the basis of local demographic trends and priorities and public realm issues to encourage social interaction by creating comfortable and vibrant spaces, by analysis and regulating the multiple uses for different development users, barrier free design and community identity.

Comprehensive Assessment System for Built Environment Efficiency (CASBEE) in Japan, also known as “CASBEE for Cities” (hereinafter referred to as CASBEE-City) was a tool designed specifically for city assessment and was developed in close cooperation with the central government and local governments in Japan to support local governments and other stakeholders to identify environmental, social, and economic characteristics of their cities and in quantifying the effectiveness of city policies (S. Kawakubo, 2014, IKAGA Toshiharu, 2010). Development of the initial version of the tool began in 2008 and it was released in 2011 after extensive discussion among experts in the field (JSBC, 2011, Murakami, 2011). We studied the second, revised version that was released in 2012 for this paper. In CASBEE-City assessment tool, the categories in social aspect included living environment, social services and social vitality, which the assessment is based on quantitative indicators. In living environment category, crime prevention was put forward under the topic of district security and crime prevention was included as a factor to assess of sustainable social development. With the population-aging reality, CASBEE-City conducts quantitative analysis of the population in social services and social vitality aspects. Under social services aspect, it analyses the adequacy of childcare services and adequacy of services for the elderly by indication of the number of childcare and senior care facilities respectively. Besides, evaluate the education and culture quantitatively to show its emphasis on compulsory education as well as the culture communication richness. In social vitality aspect, it addresses regional living population according to the rate of population change due to both births & deaths and migration as people is the basis of a city’s development and the key factor of regional sustainability.

The DGNB System was developed in close collaboration with the German Federal Ministry of Transport, Building, and Urban Affairs (BMVBS) and began a pilot phase in 2011 then released in 2012 (Zhu, 2010). In DGNB UD, the credits related on the humanity could be found mainly in two aspects, both sociocultural and functional quality including diversity of social functions, subjective and objective safety and security, comprehensive accessibility and public art setting and process quality (Lu, 2010). Overall, the evaluation is primarily based on qualitative indexes, which the assessment requires corporation approach in certain case that promoting communities’ sustainability while in turn increasing the difficulties of communities’ development.

## **2.2 Summary**

Although the assessment scale of LEED ND, BREEAM Communities, CASBEE-City and DGNB UD are different, they all address human-oriented and social sustainability issues in different considerations. LEED ND seems more concerned about human’s green behaviour. And BREEAM Communities make effort to provide adequate facilities for different needs. While CASBEE-City assessment tool expands the assessment concept of urban development’s sustainability and positively responds to social problems and development trends by emphasizing regional security, cultural education and service facilities as well as the relationship between growth trends, childcare and senior care service facilities under Japan’s unique aging social structure. DGNB UD in the other hand place emphasis on community accessibility and connectivity.

## **3. COMPARATIVE STUDY**

Latest version of BREEAM-Communities, CASBEE-Cities and DGNB UB were all released in 2012 while LEED ND were updated in 2014. In these 4 rating systems, BREEAM-Communities and LEED ND launched and developed earlier than CASBEE-Cities and DGNB UB. We shall conduct a comparative analysis between the four different rating systems from three aspects, including human- oriented design, green education, and history and culture conservation. The comparative analysis result can be found below in Table 2.

Key Indicators of Humanity Aspect		Credit Requirements				
		LEED-NB	BREEM-Communities	CASBEE-Cities	DGNB-Urban Districts	
Human-oriented Design	Engagement	Community Outreach and Involvement	Consultation plan	—	Participation level	
			Consultation and engagement			
			Design review			
			Community management of facilities			
	Public Open Spaces/ Facilities	Access to Civic and Public Spaces	To encourage social interaction by creating comfortable and vibrant spaces in the public realm	Adequate provision of parks and open spaces	Adequacy of cultural services	Society and economy infrastructure
				Access to Recreation Facilities		Adequacy of cultural services
	Equality	Mixed-Income Diverse Communities	Affordable rented, social rented and intermediate affordable housing		Crime prevention	
				Demographic needs and priorities		Adequacy of education services
		Visitability and Universal Design	Enhancing, diversifying or adding employment opportunities and/ or skills training		Adequacy of services for the elderly	
				Adequacy of services for the disabled		Social vitality
Adequacy of child care services		Adequacy of services for the elderly	Social and functional diversity			
			Adequacy of services for the disabled	Social vitality	Subjective/ objective security	
Adequacy of services for the elderly	Social vitality	Society and economy infrastructure				
		Green Lifestyle	—	—	—	—
Green Education	—	—	—	—		
History & Culture Conservation	Historical resources conservation and adaptive reuse	—	—	—		

Table 2: Comparison results of the four world-leading standards

### 3.1. Human - oriented design

#### 3.1.1 Engagement

Except CASBEE Cities, LEED-ND, BREEAM-Communities and DGNB-UD have requirements on public engagement from planning stage to construction stage, especially in BREEAM-Communities. BREEAM has detailed procedures and guidelines for the implementation of public engagement form both top-down and bottom-up approaches. It is suggested that public engagement should be regulated into sustainable and green community development to enhance the awareness of public participation during community's planning and development process.

### 3.1.2 Public open spaces/ facilities

All the four rating systems place emphasis on provision of the public open spaces and facilities but from different point of view. LEED ND requires the provision of sufficient public open spaces within community, initiating the integration of infrastructure and public spaces as there is great potential for green infrastructure to be made available as neighbourhood facilities like roof garden, children garden, orchard, vegetable garden, street greenery and backyard garden. While BREEAM-Communities emphasizes the multi-functional open spaces from user-demand-side, aiming to create more communication spaces for residents. DGNB UB, on the other hand, focuses on the connectivity and walkability of the open spaces design. Both BREEAM-Communities and DGNB UB regulate for public spaces/ facilities and provide guidance on the accessibility between community and city by enhancing connecting residents to more transportation selections. CASBEE-Cities evaluate quality by the adequacy of cultural services, calculated as number of community centres, together with the number of libraries/ land area of municipality, so as to guide and encourage the provision of public spaces and facilities.

### 3.1.3 Equality

CASBEE-Cities, BREEAM-Communities and DGNB for UD have social indicators on housing and social mix, education level, and criminal rate. However, the detailed requirements on such indicators are different due to different population configuration in each country. CASBEE focuses more on facility provision for the elderly and children, which reflects the actual situation in Japan. BREEAM-Communities, on the other hand, focuses more on the provision of affordable housing and job opportunities within the communities (Gu, 2013). Whereas DGNB UD has similar requirement on the evaluation of unemployment rate. For LEED ND, it not only requires the provision of affordable housing but also stipulate the different mix of residence types, aiming to encourage better social mix within the communities.

Accessibility for disables is another important indicator for equality. LEED ND and DGNB UD both have credits for barrier-free and universal design. LEED ND gives credits for visitability and universal design to increase the proportion of areas usable by a wider spectrum of inhabitants' mobility, regardless of age or ability. DGNB UD also gives credits on visitability and universal design as being one of the unique features of the system.

### 3.2. Green lifestyle and education

All four standards have no credits on the promotion of green lifestyle and education. However, behavioural change is given same importance as the technical requirements for environmental sustainability. Thus, the humanity aspect in our country's green building label for urban district (GBL for UD) established requirements for these two indicators, to become an issue of innovation and a special characteristic of this research. It is suggested that credits should be given not ungenerously but should be based on practical results to avoid green education being reduced to just hollow pledge with no accountable achievement on outcome in practice.

### 3.3. History and culture conservation

For this indicator, only LEED sets requirements for the conservation of historical buildings. Nevertheless, cultural sustainability is a vital part of sustainable development and the humanity aspect in GBL for UD extends the requirements from buildings to the protection of intangible heritage relevant to the country's culture.

## 4. CONCLUSION AND SUGGESTION

Human-oriented design is the key principle for human-oriented city construction, and is also the core concept for Green and Eco-Urban District development, of which public engagement is an important tool to understand human-oriented planning and design, construction and operation of a Green and Eco-Urban District. It is suggested that criterion should be established to help the Evaluation Standard for Green and Eco-Urban District in China, and guide and ensure the operation of public engagement to safeguard residents' participation. Meanwhile, the standard should also require provision of accessible and inviting public open spaces to improve communities' communication and interaction. In addition, barrier-free-design and senior services facilities should also be considered in the GBL for UD, as well as the free of charge public service facilities to ensure the provision of humanistic care for all different users.

Green education is the important guarantee for Green and Eco-Urban District construction. All four standards, including LEED ND, BREEAM-Communities, CASBEE-Cities and DGNB-Urban Districts have no credits on the promotion of green lifestyle and education, while this aspect was highlighted in GBL for UD. Nevertheless, this part should be scientifically and logically based on practise experience and results covering the whole spectrum of students of different ages to avoid green education being reduced to just hollow pledge with no measurable outcome. Besides, it is suggested in the research to actively promote green life-style starting with changing people's mind-set and behaviour. Districts and communities could compile a green life-style to educate residents how to achieve energy and water saving, waste reduction and travel by public transportation.

History and culture conservation is an integral part of planning and design of Green and Eco-Urban District. For this aspect, BREEAM-Communities, CASBEE-Cities and DGNB-Urban Districts other than LEED set no requirements for the conservation of historical buildings. To revitalize and reuse old historical and cultural buildings is not only a means to save resources but also a good way to preserve our city's historical. In addition, setting urban design guidelines are recommended and helpful to integrate building form and design language, facade treatment and material expression to record the historic evolution of the city, to reflect the regional and climatic characteristics, as well as cultural heritage connotations.

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