OPEN SPACE AND SUSTAINABLE DEVELOPMENT IN JAKARTA

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Abstract
Development of open space and green areas in Jakarta is essential to ensure the development of the city is sustainable. Current development trends in Jakarta are extremely market oriented and have resulted in many environments and socio-economic problems that are unsustainable and dangerous to the continued existence of the city itself. One of the important factors in this regard is the lack of sufficient open spaces in the city.

This paper proposes that the open spaces within private lots be eliminated and replaced by large open spaces or green areas located within the district where such private lots are located, and that the amount of open space provided within planned settlement development be increased. By doing so, environmentally sensitive areas of the city that have already become settlements can be recovered and the need for open space fulfilled, so that the development of the city can be sustained.

The paper begins with an introduction of Jakarta’s present conditions and physical development trends related to the city’s open and green spaces. Currently, open spaces are provided in three forms: those which are municipally owned; those which are mandated to be provided by property developers and those that exist as yards in private lots.

This is followed by a discussion and investigation regarding the development and provision of open and green space from the three aforementioned forms, how open and green spaces can be qualitatively and quantitatively increased, and the resultant benefits to the city.

Keywords
Urban, open and green space

1. Current conditions and development trends of Jakarta’s open spaces and green areas
Jakarta is the capital of Indonesia and the country’s largest city. The city, with a population of about 9 million, is situated to the south of Jakarta Bay and lies on a plain with a very low
A significant portion of the ground today lies below sea level as a result of subsidence due to over-exploitation of ground water. There are about 13 rivers running through the city that make Jakarta vulnerable to serious flooding that occurs almost annually during heavy seasonal rains. The current development trends in this mega city are environmentally unsustainable, as shown by the small percentage of municipal area dedicated to open and green spaces. Today, only 6,331 hectares, or 9.64 percent, of the city’s total area of 65,680 hectares, is allocated for parks, median strips, cemeteries, city forests and riverbanks (Harsanto, 2004).

As more and more land is developed for settlements, the flooding that used to occur only in the northern low lying areas now also affects the city’s south. A decade ago such flooding never occurred. Apparently, open spaces that consist of undeveloped or non-urban use private properties are being developed into urban settlements, leaving no open space for ‘water parking’, during the rainy season. This has led to frequent flooding in many areas. In addition to flooding, the lack of open space in the city, as seen in figure 1, also contributes to an unhealthy urban environment, resulting in poor air quality and a lack of open space for leisure activities. Market driven development is to blame for the current state of affairs, while the social, cultural, and economic conditions of the city allow the situation to continue.

![Figure 1: Urban form of Jakarta illustrating a lack of open space. Source Google Earth](image)

To make conditions worse, private lots, the other source of open and green spaces, are also diminishing in quality and quantity. For example, land use regulations, including floor area
and building coverage ratios, are often allowed to be increased, with no provision for open space in return. Zoning ordinances, especially those regarding lot size and building coverage are also difficult to implement and enforce. Therefore, to be environmentally sustainable, the city is unable to bank on the provision of open and green space according to today’s trend. To make future development sustainable the city needs to change its approach towards physical development. Drastic measures and changes are needed. One suggestion is to maximize the open and green space within private lots, and combine such development with the development of public property.

2. Open and green spaces in the city

Urban open space can be defined as urban land and water surfaces which are not covered by buildings and structure. This includes yards in individual lots. These open spaces can be man-made or natural. Open spaces are one of the most important elements of physical urban form. They are a vital architectural and environmental component that can create an urban esthetic, affect the urban ecological environment, and promote social interaction. Open spaces offer support for economic activities and provide places for leisure and recreation for urban dwellers (Wolley, 2003).

According to Chapin and Kaiser (1979), there are five functional areas within the city: working areas, living areas, shopping and leisure-time areas, community facility system, and the environmentally critical areas of land and water. These areas are configured into three spaces that include: residential areas, open space for environmental requirements and space for urban related facilities and activities. In addition to open space for environmental requirements, there is also open space, in the form of parks and places for leisure, within urban related facilities. Trancik (1986) refers to open and green spaces as hard spaces and soft spaces. The hard spaces consist of spaces for gathering and social activity, while the soft spaces are dominated by a more natural environment of trees and plants, used for recreation and environmental protection.

The Law on Land Use, UU RI No. 26, 2007, states that open and green spaces comprise those owned and controlled by the municipality and those owned privately, including yards within individual lots. The law mandates that open spaces owned and controlled by the city should comprise a minimum of 20 percent of the total city area. Additionally, open space in private lots is intended to be a minimum of 10 percent of the city area (Dadang, 2007). Those spaces controlled and owned by the city are in the form of urban forests, parks, green belts associated with infrastructure lines, and cemeteries. The other major forms of open space are large sport fields and golf courses. These can belong to either the municipality or private entities.

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The portion of open space owned and controlled by the city, as compared to that owned by private entities is always changing. Privately owned open spaces are being constantly reduced as they are converted into building sites. The city is losing many of its open and green spaces, which are mostly located on private properties in the form of open and agriculture lands. Privately owned open and green spaces, which include environmentally sensitive lands that are not owned by the city, are rapidly converted into building sites and settlements, by way of spontaneous development; this creates urban kampung and planned developments that create new subdivisions, leading to shrinking of open space availability. At the same time, the size of the yards within individual lots is on the decline, because of overbuilding.

This situation is reflected in the city master plans: In the 1965 - 1985 Jakarta Master Plan, the open space or green area is set at 37.20 percent (24,180Ha) of the city land. In the 1985 - 2000 Jakarta Master Plan this figure decreases to 26.10 percent (16,965Ha) and in 2000 - 2010 Jakarta Master Plan it set at a mere 13.94 percent (9.140Ha). However, today the open space actually owned by the city is only 6,331 hectares or 9.64 percent of the city’s total area of 65,680 hectares. This is far from the ideal of around 30 percent of the total area, or 19,704 hectares.

Therefore, in general, the decline of open and green space in Jakarta is caused by the very slow increase in the area of publicly owned spaces and the very rapid decrease in the open spaces within private lots. Since, at present almost all of the city area is fully developed, the only solution to increasing the amount of open and green space is through a program of reclaiming the built out areas and maintaining the spaces within private lots. These two strategies can be incorporated into one solution. Compactness in developing urban area can increase sustainable effectiveness (Farr, 2008).

2.1 Public owned open and green space
The city has difficulties in meeting its planned goals for the provision of publicly owned open and green space. To increase the amount of publicly owned open and green space is made difficult by a number of reasons. Foremost among these are a lack of funds and availability of land and a lack of political will. Therefore, the provision and development of new open and green spaces by the public sector is dependent on the city budget. To implement the Jakarta Master Plan, two city agencies are directly charged with the responsibility for provision and development of open and green spaces, the City Parks Agency and the Agriculture and Forestry Agency. The former has been establishing new community parks, mostly in urban kampung and slum areas, since 2001 in a bid to increase the number of green spaces in densely populated areas. The latter is responsible for the existing 18 urban forests that cover
a total of 195.8 hectares in the city (City News, 2004). Unfortunately, the Jakarta Master Plan is only a guideline, lacking any real plan for action and implementation. As the city is predominantly in the form of urban kampung and planned subdivisions, the quality and the quantity of the open space in the city is severely affected. Urban kampung mainly consist of private properties and contain almost no open space. Most of the land is occupied by private lots and only a small portion is used for roads, public facilities such as mosques and schools, which often lack yards, and have very limited open space. Land that was originally predominantly agricultural has been spontaneously subdivided into settlements. Public facilities within these settlements are built only if the inhabitants need and can afford them, mostly in the form of roads or paths that connect the private lots to the main road. Lands that are used for open space such as football fields and other open spaces are gradually being subdivided by the owners. Environmentally sensitive areas are often included in these kinds of settlement. In older, planned subdivisions, private lots comprise about 60 percent of the area and public facilities, including open space, makes up the remaining 40 percent. However, in newer subdivisions, only 35 percent of land area is used for public facilities and most of this is used for roads, leaving virtually nothing to be used for parks or recreation. The developers that create these newer planned subdivisions are required by law to provide public facilities that, when the construction is finished, are to be handed over to the city (Hanousek, 1989). In Jakarta, to be granted permission to develop a property larger than 5,000 square meters in area, developers are required to hand over about 35 percent of the development’s land for public infrastructure, part of which is intended to be used for open and green spaces. The public facilities provided within the subdivision depend on the size of the developed area and must be in accordance with the city guidelines for the provision of such facilities. The bigger the area, the more facilities provided, including open spaces in various forms such as parks, green areas and cemeteries. However, most developers provide only roads, since the small size of many developments limits the kinds of facilities that can be provided. Due to a scarcity of land, often environmentally sensitive lands are reclaimed and incorporated into planned subdivisions. Since there are many new developments responding to the market and rebuilding previously built up areas of the city that were often lacking in open space, these development projects should be encouraged, because they have a new window of opportunity to increase the city’s open space. Today’s property development trends, which embrace the concept of a greener environment, can be the trigger for this kind of development. The city needs to encourage, or possibly
even require, these developments to use a larger portion of the 35 percent of the land for open space instead of just for roads, as is currently the norm. The developer has the option to choose to provide some of these obligations off site. Indeed, this may be the most beneficial solution for both parties, the developer and the city, since this may involve reclamation of previously built up environmentally sensitive areas.

2.2 Open and green space in private lots
The other source of open and green space in the city is contained within the private lots in the form of their yards. Not all land within private lots is being built-up, and the size of these open spaces depends, for the most part, on the zoning ordinances and building regulations applicable to these lots.

Today, most of the private lots in the city are utilized for urban activity. Urban land utilized for agricultural purposes is almost nonexistent. The lands within these private lots that are not built upon are diminishing fast. The chief reasons for this are the pressures from market oriented development and the fact that urban design guidelines and building regulations that limit building coverage to a certain percentage of private lot area are often undermined. Frequently, illegal construction takes place and designated building coverage guidelines are exceeded, sometimes by as much as 100 percent. Any remaining open spaces are, all too often, also paved.

Today, property owners can ask for exemptions to building coverage limits for their property, and choose instead to simply pay a fine. Illegal construction, exceeding building coverage limitations, is taking place on many individual lots, especially in areas that are not easily visible from the street. These situations are reducing the open and green spaces within private lots significantly. If this trend continues, the remaining open and green space in the city will only be in the form of publicly owned space.

The city is also having difficulty in implementing its zoning ordinances. Many small lots with large building coverage are located within areas zoned for larger lots with smaller building coverage. According to the ordinance, building coverage in southern Jakarta, which is designated as a water catchment area, is set at 20 percent. As a result of this ordinance there is almost no large planned subdivision taking place in this area, because it is not financially feasible. What are being developed are mini gated community less than 5,000 square meters in size, and many urban kampungs. Many of these urban kampungs have very dense settlements with small lots having no yard. Only large properties belonging to the wealthier people, including expatriates who seem to love the area, comply with the ordinance and building regulations. As in many other urban kampungs, public facilities in these areas are usually minimal.
Qualitatively, these open spaces within private lots are not effective, either environmentally or socially. Because these small open spaces are separated from each other a natural environment that fosters local flora and fauna is difficult to find. If these spaces were put together and integrated to form a larger contiguous area, a natural environment could be created in the middle of the city, or in the environmentally sensitive areas that are already being developed as settlements.

2.3 The ongoing physical development of the city and the open space

The city area is almost completely built up. Only a few areas in the eastern part remain undeveloped. But, these too are becoming new targets for development because now there is better access to these lands.

Additionally, new physical development is taking place in the form of redevelopment of the built up areas of the city. Older subdivisions are being redeveloped into more dense settlements with capital intensive. These kinds of development are controlled by the city and the developers are required to follow all applicable regulations, including their obligation to provide public facilities to the city.

With this trend, gradually the whole city will be redeveloped. Older planned subdivisions and urban kampungs will be redeveloped into new planned subdivisions, denser than what they are today. These new developments will create open spaces for the city in the form of private yards and public facilities. Because these developments are profit motivated, they tend to maximize the use of the land. Thus the developers are willing to pay more to get more density, which includes bigger building coverage that will compromise the existence of the yards within their developments.

For new developments including redevelopments of existing settlements, there will be open spaces created in the form of public facilities and in the form of yards within private lots located within the development. Mathematically, if the combined total of all private lots is equal to 65 percent of the total area of the city, and the average building coverage within these lots is 70 percent, then the open space within these lots is equal to 19.5 percent of the total area of the city, or 15,785 hectares. This is more than double the amount of open and green space controlled by the city today. If this open space within the private lots is added to the open space owned by the public, then the total open space in the city would be 19,116.5 hectares, or 29.14 percent of the city area, a figure very close to the 30 percent required by law.

If the quantity of the open space that is part of the developer’s obligations is increased by decreasing the use of land for other public facilities such as roads, and if the yards within the private lots are reduced to 0 percent and converted into public open space, then the city will
gain large tracts of open space. There is an opportunity to increase both the quantity and quality of the open space created.

2.4 Proposal for new development
To increase the quality and the quantity of open space in the city, the solution is to increase the contribution of the space from the redevelopment of existing settlements and also from the redevelopment of existing individual lots. In the redevelopment of settlements that include new subdivisions, the open space portion of the developer's obligation is increased, while the yards within the individual lots are reduced and replaced with off-site open space in the form of public green space.

When developers use existing settlements for their projects, the developer's obligations, specifically the portion of land dedicated for open space is increased to 15 percent and the maximum portion allotted for roads is limited to 20 percent. The other public facilities are provided in the form of floor space within the development buildings. If 60 percent of the city area were redeveloped, then the open space created as part of the developer's obligation would be about 9 percent of the city area or 5,904.2 hectares.

For individual spontaneously developed private lots outside planned subdivisions, such as the urban kampung, to avoid the elimination of open space within private lots and to maximize the use of these lots for building, the requirement for providing open space within these lots is shifted to an offsite location and pooled into one large contiguous open space located within the district. In return, the private lots can be developed more fully, allowing 100 percent of lot built up. These offsite open and green spaces resulting from the transfer of open space from private lots can be developed by the city in the form of land banking, to be funded by an open space transfer fee assessed on the owners of the private lots. This fee could be in the form of part of a onetime up-front development fee or, alternatively, collected over a period of time, preferably a 30 year period, and paid together with annual property taxes. The contribution from the conversion of yard space into the open space would amount to 11,808.41 hectares, or about 18 percent of the total city area.

The benefit of combining the amount of open space previously located in private lots into an integrated open green space is three fold: It maximizes social usage of the space, it ensures more environmental benefits to the city, and the space can be easily guarded and monitored. The open spaces created from these two aforementioned actions would total 27 percent of the city area. Together with the existing public owned open space, the total amount of open space in the city would then be 36.64 percent or 24,036.67 hectares (see table 1).
Table 1: Potential sources of open space for Jakarta

<table>
<thead>
<tr>
<th>Source</th>
<th>Hectares</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Developer obligation</td>
<td>5,904.20</td>
<td>9.00</td>
</tr>
<tr>
<td>From yard conversion</td>
<td>11,808.41</td>
<td>18.00</td>
</tr>
<tr>
<td>Existing open space</td>
<td>6,331.00</td>
<td>9.64</td>
</tr>
<tr>
<td>Total open space</td>
<td>24,036.67</td>
<td>36.64</td>
</tr>
</tbody>
</table>

These open spaces could be distributed all over the city and combined with the existing open spaces owned by the public. Some of them should be located within the settlements and others located in environmentally sensitive areas, such as along the riverbanks, creating green belts where a flourishing natural environment can be recreated.

There are many sensitive land areas that are unsuitable for urban development. Some of these have, unfortunately already been developed into settlements such as kampungs and planned subdivisions. Many of these lands are located on riverbanks and in low-lying areas that are vulnerable to flooding. These lands need to be recovered and transformed into open spaces and green areas. This will greatly improve the city’s environmental conditions, since many rivers flow through it.

3. Conclusion
The pressure of the current trend of market oriented development in Jakarta’s physical growth will reduce the open space in the city. However, with the same pressure, but with a different approach to physical development, new open spaces can be created. The momentum in redevelopment of the city’s settlements in response to the market’s need for more residential and commercial space can be used to create additional open space.

Additional open space can be created when the physical development of the city responds to the growth taking place. The change in the approach when redeveloping the city, which includes the reorganization of its lands by providing more open space in the new and redevelopment projects, and by putting all individual yard together into one big open space, will create new open space to the city that enabling it to be environmentally sustained.

To ensure the contribution of open space from private lots, such spaces should be located separate from the lot itself. Despite the absence of yards, open and green spaces within private lots can still be created in the form of rooftop gardens that can benefit the environment.
References


City News (March 29, 2004) City Forests in Dire Need of Donors, The Jakarta Post


Harsanto, Damar (October 28, 2004), Jakarta sluggish about park development, The Jakarta Post, Headline News
