



Background paper prepared for the 2016 Global Education Monitoring Report

Education for people and planet: Creating sustainable futures for all

Urban Environmental Education in Latin America and the Caribbean

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Abstract

We live in an increasingly urban age; and Latin America is the most urbanized region in the world. As we grapple with the challenges of sustainable development and our planetary well-being, it is critical that we pay attention to how engagement with nature in urban settings can influence environmental behaviour, and what governments can do to ensure that we lead more environmentally sustainable urban lives.

This paper's aim is to discuss the linkages between education, green urban planning and urban spaces in the Latin American and Caribbean context. It discusses the environmental education possibilities in urban parks, the evidence linking exposure to nature and environmental behaviour, and the urban planning processes that are necessary to foster multidisciplinary, sustainability approaches.

1 Introduction

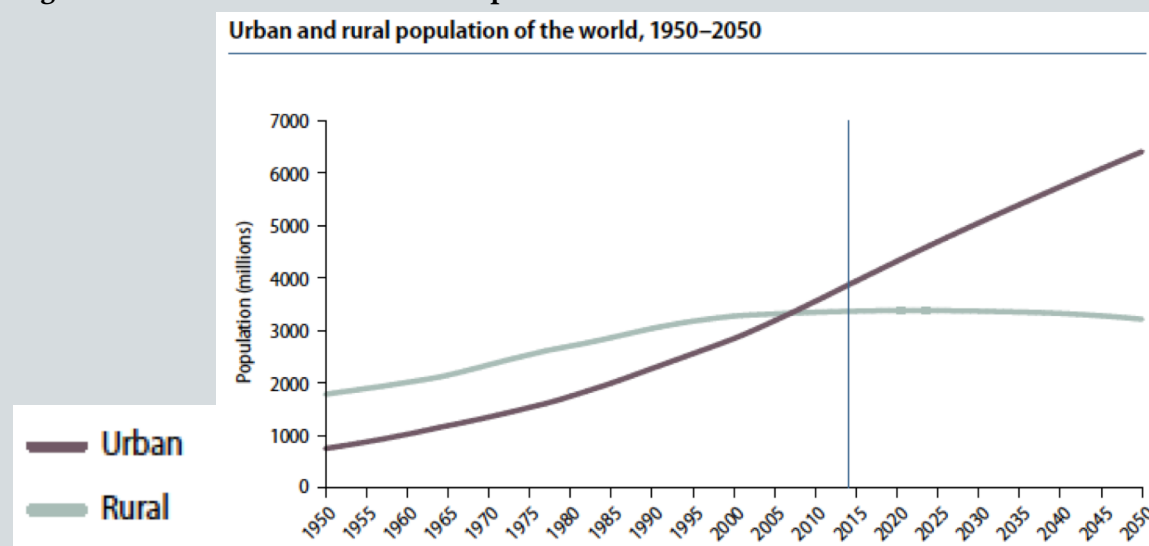
The continuing trend towards becoming a global urban society will result in more than 66% of humans residing in urban areas by 2050. The world went from 30% in 1950 to the current 54%. Latin America and the Caribbean is the second most urban region after North America with 80% (UNDESA 2014).

This concentration of humans and human activities in cities has also led to a concentration of energy and goods consumption and environmental impacts associated with this concentration. This does not mean that urban societies are inherently unsustainable (Martino 2009), in fact it could represent an unprecedented opportunity to improve our sustainability record (OECD 2014).

Box 1 Latin America and the Caribbean (LAC) Urban Situation

LAC population has turned from mainly rural in the 1950s to more than 80% urban currently and will keep growing during the next decades (CEPAL STAT). This makes LAC the most urbanized region in the world. Although approximately 250 million urban citizens in LAC live in cities with more than 200,000, an important percentage live in small and medium sized cities, which receive much less attention and resources but face the same environmental challenges, are growing at faster rates and absorbing most of the urban population growth. (Libertun de Duren and Guerrero Compeán 2015).

Figure 1. Global Urban and Rural Population. Source: UNDESA 2014



Although the absolute number of people living in slums has remained hard to reduce, the percentage of the total urban population living in slums the early 1990s was 30%. The figure has gone down to 29% in 2000 and is currently close to 20%. Despite the rapid rural to urban migration and the variations in living conditions of many urban citizens, studies have shown that in Latin America, unlike in North America, there is no difference in life satisfaction between residents of urban and rural areas (Valente and Berry 2016).



Another result of urbanization has been that urban dwellers can become increasingly isolated from nature and that feedback from natural environments is harder to perceive. This reduction of the interaction with natural environments can have repercussions in the way humans perceive nature and societies' relation to it.

Exposure to natural environments, particularly at early stages in life, is linked to environmental awareness. For urban dwellers, city parks and green areas might be the only places where they can interact with natural environments.

The objective of this work is to discuss the linkages between education, green urban planning and urban parks in the Latin American and Caribbean context.

I argue that well planned urban parks and green areas not only provide ecosystem services that improve the mental and physical health of citizens. These areas are also needed as spaces for nature exposure and to serve as centres for urban environmental education that go beyond experiencing nature. In order to fulfil the potential environmental awareness and behavioural implications of green spaces, urban planning processes need to focus on sustainability and embrace multidisciplinary approaches.

The path towards becoming a global sustainable society is strictly tied to the sustainability of urban societies. The growing percentage of people living in urban areas and the potential of cities to become sustainability hubs place them as key to achieve environmental, social and economic sustainability.

2 Environmental education and urban parks

In many cities worldwide parks can be key locations for a variety of formal, informal and even collateral or non-intended environmental education activities. The discussion on environmental education and urban parks and green areas is presented here as part of the framework of urban environmental education.

Urban environmental education is a growing field with a diverse profile of providers, “receivers”, methods and sites (Russ and Krasny 2015; Lauber et al 2013). Providers include schools, community organizations, municipalities, botanical gardens, youth programs, etc. The audience is as broad as intended by the providers and goes from captive to casual. The sites include parks, green areas, boulevards, zoos, etc. All these factors have something in common; they can be instruments for generating environmental awareness, pro-environmental behaviour and better understanding of urban ecosystems. Here we focus on the role of urban parks and green areas for environmental education and the importance of parks as providers of feedback.

The lack of direct socio-ecological feedbacks has been described as one important factor in the build-up of the ecological crises. Feedback mechanisms have served as adjustment alerts in many societies that have developed sustainable socio-ecological systems. Modern urban societies, though dependent on their hinterlands for development, have been able to temporarily detach themselves from negative environmental feedback through a complex network of transportation and communication.

As Gifford (2011) puts it in his environmental psychology approach to climate change action, many behaviours that were resistant to behaviour change have been transformed. In the case of environmental behaviour, “in your face feedback” is one of a combination of measures needed to encourage pro-environmental behaviour.

Urban parks and green areas can become spaces that, in addition to generating ecosystem services and exposing citizens to nature, provide in your face environmental feedback for urban citizens. This feedback can be as simple as actions related to vegetation, such as by letting grass go through its natural process and wilt when there is a drought. Just by viewing this, the park users will become visually aware of water shortages, and it may encourage them to improve the efficiency of their water consumption at home.

Feedback can be connected to other environmental issues of importance to the city or the area surrounding the park and can be inserted in the education proposal that each park wants to develop. A proposal to develop a waste to energy plant in Denmark serves as an example of the use of such in your face feedback that can be adapted to parks.

An international competition was held in 2010 in Copenhagen to develop a new power plant. The proposals from Bjarke Ingels Group approached the project through the concept of hedonistic sustainability. Their proposal included a “giant structure in an exoskeleton whose winding roof would serve as an artificial ski slope”. As skiers ascend the structure they would face inwards so they could see how their own waste was managed. In addition the “plant’s smokestack would be fitted with a giant piston that would blow a smoke ring into the sky each time it produced an extra ton of CO₂, providing a whimsical reminder of the product of Copenhageners’ consumptive habits.” (Montgomery 2013: 252).

The power plant is evidently far from being a park or a green area, but it serves to exemplify that areas dedicated to leisure or other uses can at the same time provide information and feedback to its users, without affecting their enjoyment of the area. At the same time this kind of approaches can make parks go beyond becoming a gathering place that provides infrastructure for environmental education activities and be planned as centres for participatory activities that encourage community engagement in civic affairs (see Irazábal et al 2015).

Box 2 Planning and environmental education activities in urban parks

Consultation with park managers, environmental educators and municipality representatives from 3 different parks in the region (Parque de las Naciones in San Luis, Argentina, Parque Farroupilha in Sao Paulo, Brazil and Inbioparque in San José, Costa Rica) show that there is a need to strengthen coordination between municipalities and park management authorities in relation to urban planning and management of the park and surroundings. The need to improve coordination at different levels (municipality and parks) also applies to environmental education.

In San Luis, there was a general level of coordination between park management and urban planning as the park was conceived to become a green lung for the city. Moreover, the construction of bike lanes in the park was done in the context of a provincial program. The provincial government established a program to provide a bike and a helmet to every student from primary school to first year in university. In this context the park hosted every year a bike festival day. This is a case of the park being a host for environmentally related activities planned at the municipal level, not a coordination of park objectives and management with urban planning objectives.

In the case of Farroupilha, there is no coordination with the municipality in regards to urban planning issues in relation to the park. On the other hand, many of the environmental education activities that take place in the park are coordinated with the Center for Environmental Education and Information (CEIA), which is the municipality's environmental education institution. CEIA is integrated by several different government divisions and therefore is able to coordinate environmental education throughout the municipality.

As a result of this interaction, many activities have been created in the park and information has been generated about park use and perceptions among users. Among the environmental education activities developed in the park, Jaqueline Lessa Maciel highlighted presentations and walking tours as the most important and notorious:

Walking tours organized by CEIA that take place in this and other parks include stops and discussions around many of the park environmental features, the relationship between humans and nature, the difference between native and exotic species, among other issues.

Several persons that have been using the park for more than 40 years and were invited to participate

declined because they considered they knew every corner of the park. After being encouraged to participate most confessed they had seen things in the park they had not noticed before and that after the walking tours their perception of environmental features in the park had changed. This goes in line with part of the literature analysed above, which stated that the use of signalling and providing information had to be complementary to the establishment of natural features in the parks.

The use of urban parks and green areas as feedback mechanisms is also complementary to the importance parks can have in the generation of sense of place. Sense of place can be defined as “a composite of place attachment (degree to which a place evokes emotions and attracts a person) and place meaning (how people describe a place)” Withrow-Clark et al 2015: 51; Kudryavtsev et al 2012). Sense of place has been proven to encourage pro-environmental behaviour (Kudryavtsev et al (2012). As Withrow-Clark et al (2015) point out, green spaces in urban areas, such as creeks, riparian forests, urban wetlands, parks, etc. are fundamental for the generation of sense of place.

Environmental education programs can “be designed to contribute to and reinforce positive feedbacks represented by already existing stewardship communities of practice, rather than act independently of the urban or other social-ecological systems in which education takes place.” (Tidball and Krasny 2010: 12) In addition to parks and green spaces, special consideration should be given also to built environment and their role in education. Parks can be treated as built environment and as such also serve as gathering spaces, much as the Greek agora.

In sum, despite the fact that ecological conditions in urban areas can be heavily altered by humans, green areas and parks offer opportunities for environmental education. Urban environmental education can be tailor made for the characteristics of urban social-ecological systems (Lauber et al 2012).

Park planning and design and environmental education have to be part of the same process in order to be successful. Studies conducted in parks in Paris by Shwartz et al have shown that park interventions are much more effective if they are accompanied with complementary information. They increased the biodiversity in several parks and noted that when information was also included it helped increase awareness and connect people to nature (Shwartz et al 2014b). This aspect was highlighted by Lessa Maciel (personal communication January 2016) in the Farroupilha park in Brazil. Long term park users (more than 25 years) were surprised by their limited knowledge of the park when offered information by park educators.

3 Nature, urban parks and green areas

In addition to their role as places for feedback mechanisms in urban areas, green areas and urban parks are important for human well-being in cities. Nature's, or the view of it, effect on human health has been observed and reported in scientific literature for decades.

In their review of human-environment interactions in urban green spaces, Kabish *et. al.* (2015: 27) present a graph showing the sharp increase in papers published on the subject (see below), indicating a growing interest in the issue.

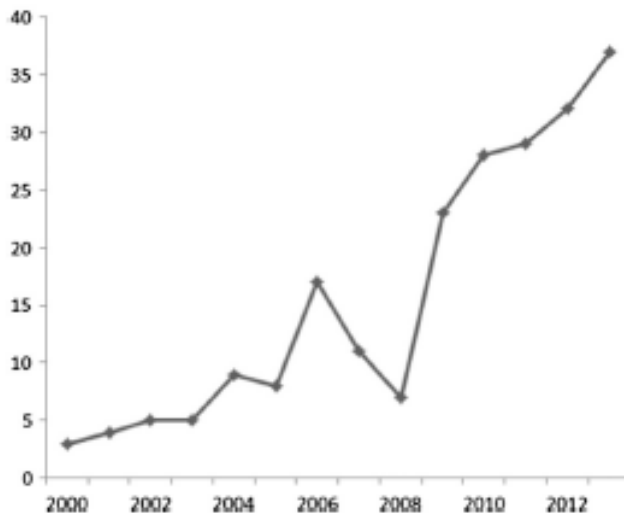


Fig. 1. Number of published studies per year (2000–2013). Note: We included the year 2013 in this figure and also in all analyses. However, we are aware that may not all potential papers from 2013 might have been published at the time of the review.

One of the most cited examples is Ulrich's (1984) study of how a view through a hospital window facing a natural environment influenced recovery from surgery. Not only the patients left hospital sooner than those with a window facing a wall, which have gone through the same surgical procedure, they also requested fewer painkillers.

In an earlier less cited study, Moore (1980) had shown a similar effect on prison inmates and demand for health care services. In a more recent study of more than 100 public high schools in Michigan, Matsuoka (2010) showed a consistent and positive relationship between exposure to natural landscapes and student performance in high school, including better results in standardized tests and graduation rates. African American children in low-income public housing project in Chicago with views of trees and green space have exhibited "superior attention capacities and impulse control than similar children living in non green apartments" (Faber Taylor *et. al.* 2002 cited in Strife and Downey 2009: 7).

The positive effects of nature on health and well-being are logically not limited to landscape views. Groeneweggen *et. al.* (2006) used data from Holland's national health surveys and GIS to conduct a nationwide study of the effects that living closer to green spaces have on health. They concluded that those living close to green urban areas have better health profiles than those living farther away. Takano *et. al.*

(2002) found a lower mortality rate among elderly individuals with higher walkable green space in the proximity of their homes in megacities.

In addition to the evidence on positive effects on physical and mental health, recent studies have shown a positive impact on overall well-being and self-assessments of life satisfaction. A study by White *et. al.* (2013) used data from a national survey in the UK to collect data for 18 years (1991 to 2008) from over 10,000 people. They found that compared with those living in areas with less green space and controlling for individual and regional covariates, “individuals are happier when living in urban areas with greater amounts of green space.... show significantly lower mental distress (as indexed by GHQ scores) and significantly higher well-being (as indexed by life-satisfaction ratings)” (page 927).

Trees and gardening activities have also been shown to have an effect. Sullivan *et. al.* (2004) found that large trees in public housing projects of Chicago impact the social behaviour of urban residents. Large trees are an incentive to spend time outdoors, which has led to more social interaction among neighbours and stronger bonds in relation to other housing projects without large trees. Wood *et. al.* (2015) have shown that in the UK “allotment gardening can play a key role in promoting mental well-being and could be used as a preventive health measure”.

Urban parks and green areas are clearly linked to positive impacts on human well-being, by improving mental and physical health, strengthening social interaction and positively influencing property prices in the vicinity (Bolitzer and Netusil 2000; Kabisch *et. al.* 2015; Atiqul 2011).

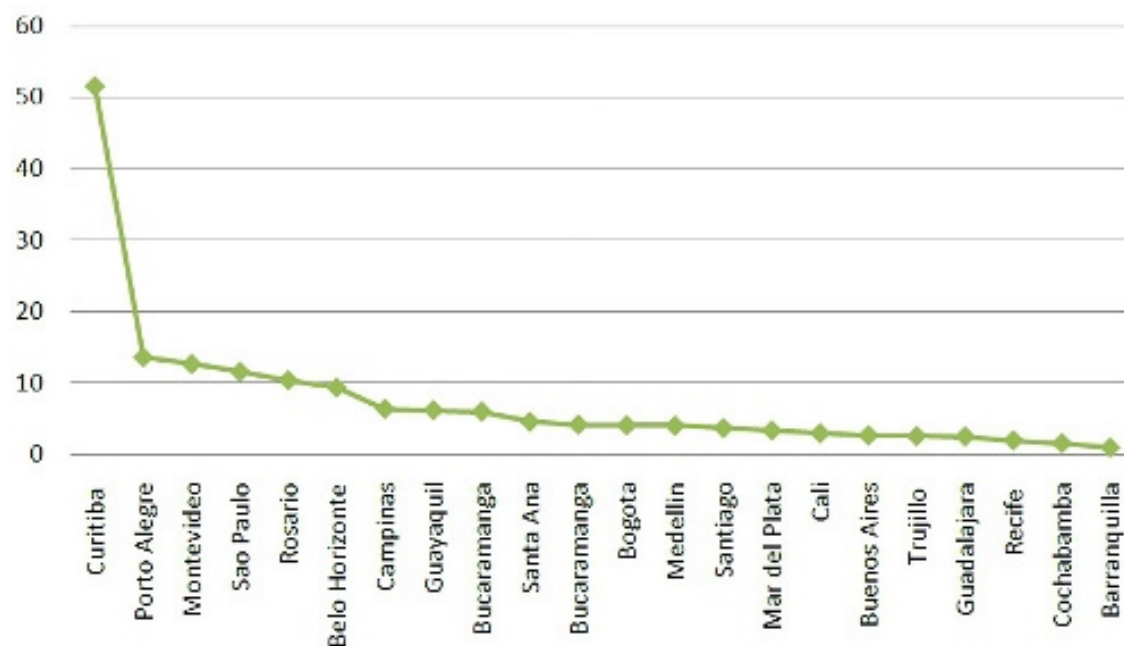
Box 3: Green areas in LAC

There are no regional indicators available to provide a descriptive overview of the green areas that exist in Latin American cities. An IDB project used self reported information from cities that are part of the *Iniciativa de Ciudades Emergentes y Sostenibles* project and compiled information on green space per capita in a few select cities. While Curitiba, Brazil has over 50 square meters per capita in green space, at the other end, Barranguilla, Colombia has less than 2 square meters per capita of the same.

Square meters per capita do not provide adequate indication of access, usability and inclusivity of existing green spaces. Neither it reflects the ecological value of the areas. The actual use of green spaces by urban citizens depends on several other factors associated to location, accessibility, transportation, and other factors. For example, Parra *et al* (2010) found that in Bogotá the use of parks by older adults was positively associated with mix use areas (e.i. areas that were designed to have multiple purposes).

The geographical distribution of green space is a key element to consider in addition to square meters per capita. Even in the highly regarded case of Curitiba, almost 50% of Curitiba residents don't make use of these spaces due to lack of proximity (Martinez, *et al.*, 2016) which points to issues with transportation, the unequal distribution of green space and its concentration in high income neighbourhoods.

Figure 2 Green Space per Capita in Selected Cities.



Source: <http://blogs.iadb.org/ciudadessostenibles/2012/06/28/la-ciudades-latinoamericanas-poseen-suficiente-espacio-verde-publico-que-es-suficiente-existe-un-minimo/>

These parks are also linked to several environmental benefits, including lowering the magnitude of the urban heat effect (Georgescu *et. al.* 2014); trapping dust and smoke particles, reducing air and noise pollution, etc (Kabisch *et. al.* 2015; Atiqul 2011).

The effect of urban parks, green areas and trees on biodiversity has been discussed for several decades. There is no doubt that they have a positive effect on **urban** biodiversity and that, without their existence, exposure to nature in cities would be significantly reduced. What is questioned is the contribution that cities can have on broader conservation efforts. Shwartz *et. al.* (2014a) conducted a multidisciplinary literature review that included almost 800 papers and concluded that only a few studies demonstrate that these environments can host viable populations of rare or endangered species or provide corridors for natural populations. Therefore conservation efforts should be placed in other areas that are more promising in the long term.

This does not mean that we should not conceive urban parks, green areas and even tree selection with biodiversity and conservation in mind. The fact that there is no proof of significant contribution to the preservation of rare and endangered species does not mean that other native species cannot benefit from parks and that urban dwellers are not positively influenced by these species. Rather than a shortcoming, this should be presented as an opportunity. Instead of managing some of these areas with a sometimes narrow, and expensive, restoration objective, urban parks can also be adapted to people's preferences and



therefore increase interaction with nature (see also Botkin 1990). This has important implications for urban environmental education.

Urban park users might not be craving for contact with pristine nature. This does not diminish the influence that contact with novel ecosystems in urban parks can have on their perception of the environment and the generation of environmental consciousness. Integrating the natural and biodiversity planning of urban parks with a more “relaxed” vision that incorporates user preferences, synchronizing them with biodiversity planning can have a positive effect on the educational role of urban parks.

4 Nature and Pro-environmental behaviour

In the previous two sections we presented the important role of green areas and urban parks as places for feedback and for the provision of ecosystem services and with it their contribution to urban citizens' well being. The existence of these areas can also have a long term positive effect on how urban citizens relate to the environment and on their environmental behaviour.

Most researches believe that pro-environmental behaviour, which can be referred to as "behaviour that harms the environment as little as possible, or even benefits the environment" (Steg and Vlek 2009: 309), is marginally linked to environmental knowledge and awareness (Kollmuss and Agyeman 2002). McPherson and Mayer (2014) on the other hand have shown that connectedness to nature is an important predictor of environmentally responsible behaviour (see also Chochola 2009, and Gosling and Williams 2010).

We therefore know that education, broadly defined as to include communication of knowledge in various settings, dissemination of information directly and indirectly, as discussed in texts focused on behavioural insights, is one among many other factors that can move individuals and society towards pro-environmental behaviour. We know many of the factors leading to awareness and in a way to pro-environmental behaviour but we don't know how much weight each factor has and how direct or indirect the links are

As Boeve-de Pauw (2014: 1) puts it, "understanding the causation and change of human behaviour is a vastly complex matter..." Nevertheless, there is a body of literature describing different factors that relate to attitudes towards the environment and environmental behaviour. Steg and Vlek (2009) describe 4 key elements for the promotion of behaviour change in an effective way. These are (1) the selection of behaviour to be changed; (2) examining the factors that cause such behaviour; (3) the use of well-tuned interventions to change behaviour; (4) a systematic evaluation of interventions and the effects on behaviour.

Different studies have shown the factors or combination of factors that influence attitudes towards nature. Ewert et al (2005) found that appreciative outdoor activities, consumptive activities and witnessing negative environment events are significant factors. Chawla, in a study involving professional environmentalists in Kentucky and Norway found that the factors most frequently mentioned were childhood experiences in nature, experience of environmental destruction, family values, environmental organizations, role models and education (in that order).

Kudryavtsev et al (2012) show similar results in an urban context. Urban environmental education programs with high school students in New York successfully nurtured ecological place meaning.

Although cultural factors play a significant role in the determination of variables leading to pro-environmental behaviour, studies from various countries have reported the significance of nature involvement in the generation of environmental awareness. Katif et. al. 2013 cited in Hassan and Lee (2015) refer to the importance of education level as a factor in implementing sustainability in Kuala Lumpur. Celebi Oncu and Unluer (2014: 43) present results from Turkey indicating that "long term exposure to nature through a summer camp is an effective way of promoting children's emotional affinity



to nature as well as their ecological beliefs, both of which support their intentions to carry out environmentally friendly behaviours.”

As Wells and Lekies (2006: 1) conclude that, “childhood participation with nature may set an individual on a trajectory toward adult environmentalism. Specifically, childhood participation in “wild” nature such as hiking or playing in the woods, camping, and hunting or fishing, as well as participation with domesticated nature such as....have a positive relationship to adult environmental attitudes. “wild nature” participation is also positively associated with environmental behaviors.”

5 Green urban planning, infrastructure and sustainability

The previous sections have described the important effects that urban parks and green areas can have on the well being of urban dwellers, on their connection to nature and on the potential to influence environmental behaviour. For these areas to exist, urban planning has to make room for their development by making sustainability one of its core principles.

In their review of 9 future urban planning activities in 6 countries, John et. al. (2015: 86) found that, “there is ample evidence that urban visions are often not designed along a robust set of sustainability principles.” They conclude that urban visions “narrowly focus on optimizing the build environment...” Steinberg and Miranda (2000) reach similar conclusions in the case of Peru, where urban management is handled mainly by architects that in many cases lack adequate education and as a result end up “favouring physical interventions over social, political or economic interventions” (421).

It is important to keep their conclusion in mind - that focusing solely on physical interventions, even when these are considered “green” or have a green objective is not an appropriate path to sustainability. Montgomery (2013), after reviewing cases of cities (e.g. Copenhagen, Curitiba or Bogotá) considered environmental success, suggests that many have become environmental sustainability examples without aiming to do so. Bogota, which he calls “the green surprise”, is used as an example.

The former mayor of Bogotá, Enrique Peñalosa, was not motivated by environmental goals but the city ended up receiving various awards from environmental organizations. The objective was to improve citizens’ quality of life by living in a cleaner city with better transportation and more outdoor recreational opportunities. As a result there were also important GHG emission savings and green areas were created (Montgomery 2013). As Boston, an urban advisor on GHG reduction, puts it, they don’t ask civic leaders about GHG reduction aspirations when they start talking, they ask about their communities’ priorities.

This consideration is important in light of the criticism received by some green infrastructure proposals due to their lack of proper integration of social aspects, mainly as a result of top down approaches with limited participation (Irazábal et. al. 2015)

Urban green infrastructure proposals should therefore not be conceived in isolation from socio-economic aspects. Furthermore, the foundation of these proposals should be to pursue improvements in the living conditions of urban citizens, including those socially and geographically marginalized. However, for this kind of integrative analysis and planning to be conducted and executed, planning needs to be profoundly embedded in the cities’ administration.

This is partly a result of planning education models that are “weak in training in community planning, participation, negotiation, mediation, etc. Hence, it reproduces the rational model of planning, prioritizing technical rather than managerial and procedural knowledge.” (Irazabal 2009: 143).)

Urban planning and education

According to Irazabal, planning education in LAC is not up to speed with the main urban challenges of the region. The technical and technological lag has been diminishing recently but there is still a need to “expand negotiation, mediation, conflict resolution and consensus building skills... effectively coordinate

multidisciplinary teams with various forms of knowledge and knowledge production...and respond to growing environmental challenges in the...region (Irazabal 2009: 146)

It is essential to update the currently out-dated planning programs under which many planners are trained in “curricula that have not been revised for decades” (Ibid.). Moreover, much urban planning in LAC is done by architects without formal training as planners or urban designers. This process has started and not only are architectural programs including more courses on planning and urban design but also planning is being “recognized as an interdisciplinary field with connections to economics, political science, engineering, law, geography, etc.” (Ibid: 144).

Steinberg and Miranda (2000) suggest that urban and environmental management training should be strengthened among those professionals in charge of urban management. Encouraging the introduction of sustainability principles in professional curricula is important, however, the complexity of urban sustainability planning is such that only a multidisciplinary team can show the way towards visions and management with sustainability principles.

A team of economists, anthropologists, sociologists and social workers, no matter how environmentally strengthened their professional curricula might have been, is unlikely to come up with socio-economic urban visions that at the same time soundly tackle environmental concerns. For it to happen interdisciplinary teams including ecologists, environmentalists, environmental engineers, among others, need to be in place from the inception of the urban planning process. As Kabisch et. al. (2015: 32) conclude future urban green space, and I would say, urban planning, “needs to address interdisciplinary research using natural and social science expertise. This is especially needed for megacities in developing countries but should also be used in the developed world.”

Box 4 The urban planning examples of Curitiba and Bogotá

Two cities that are usually presented as successful case studies of urban sustainability in Latin America are Curitiba and Bogotá. Their success can be traced to the fact that both cities have a long-standing tradition of planning within the cities’ administration. This history goes back to the “Bogotá Futuro (1923-1925)” plan in the case of Bogotá and to the Agache Plan of 1943 (followed by the Master Plan of 1966) in the case of Curitiba (Miguel and Castro 2013; Macedo 2013).

In the case of Curitiba, there are many factors that coincided to make the emergence of Curitiba as an example of urban sustainability. These can be summarized as participation, planning capacity, and unprecedented credit availability. The last mayor of Curitiba before the military dictatorship conducted the process for the development of a master plan with a strong emphasis on participation. In terms of planning, the planning institute (IPPUC) has been a core element of Curitiba for several decades. Several of Curitiba’s mayors were IPPUC directors before being elected or appointed and drew staff from the IPPUC to their cabinets (Macedo 2013). As for funding, during the 1970s multilateral agencies and Brazil’s development banks provided necessary funds for infrastructure and transportation changes (Macedo 2013).

The case of Curitiba and the professional composition of the IPPUC also shows the importance of interdisciplinary teams. The origin of the creation of Curitiba's lakes is an interesting anecdote that illustrates the point. Kluppel worked at the IPPUC in the Public Works division and later with Lerner at the Public Works of the City of Curitiba. He describes himself at the time as a narrow-minded engineer trained to build infrastructure to control floods and constantly had to interact with architects to find new solutions. According to Kluppel, "interdisciplinary collaboration allowed [him] to see alternative solutions to urban problems that his engineering training had not provided. By the same token, his conversations with architects inspired solutions they might not have conceived without the influence of his engineering-based thinking (Macedo 2013: 342)."

One day, in a conversation with my colleagues, one of them said: 'What Curitiba needs is water, but we can't have a beach at 1,000 m altitude.' I was always thinking about drainage, so I said: 'We can't have a beach, but we can have lakes that can double as retention ponds and collect runoff from increasingly large impervious surfaces.' And so we decided to have a lake in every city park (taken from Macedo 2013: 342)

According to Lulle et al (2007) urban planning in Bogota in 1968 went from purely spatial to a more integral type of socioeconomic planning. In an interesting similarity with the case of Curitiba described above, financial, participatory and planning aspects were key for the successful planning of Bogota. The mayors from 1992 to the year 2000 contributed to develop all these aspects. Castro, mayor from 1992 to 1994 performed an important institutional and financial restructure; Mockus (1995 to 1997) was responsible for the promotion of a citizen culture in the city; and Peñalosa (1998 to 2000) centred its time in office in re-conquering public spaces.

The institutional, financial and planning background highlighted in the cases of Bogotá and Curitiba in the box are not examples of the typical situation in large Latin American cities, let alone in medium and small sized cities of the region.

Half of the world's urban population lives in cities with less than 500.000 inhabitants and these small or medium sized cities in Asia Pacific and in Africa are among the fastest growing settlements (UNDESA 2014). In Latin America, small and intermediate sized cities in the region "have enhanced their competitiveness and attractiveness as places to live.... Some small or intermediate cities undergo accelerated growth due to large-scale industrial investments." (UN HABITAT (2012: XIV)

How do most of these cities stand in comparison to the situation in Curitiba and Bogotá 4 or 5 decades ago? According to UN Habitat, "these cities... lack the technical capacity to lead a major urban development process" (IBID). In this situation they are in a weak position to negotiate with large investors and this is "most likely result is a multiplication of precarious settlements in these cities with their already-known consequences" (IBID).

UN Habitat's conclusion for Latin America is in line with Frank and Martinez-Vazquez (2015) on a global level analysis. They point out that "smaller jurisdictions...may lack the functional and fiscal capacity to be viable planning units. (298). They also warn about the danger of "incomplete decentralization reforms [which] often hamper development of subnational planning capacity" (402).

Box 5 Urban planning in the Caribbean

“Many national governments in the Caribbean have been creating urban development corporations to address the urban challenges they are facing. These are governmental agencies with powers to facilitate urban regeneration in specific areas in Jamaica, Antigua and Barbuda, and Trinidad and Tobago. The Urban Development Corporation (UDC) was formed in Jamaica in 1968, the St John's Development Company (SJDC) in Antigua and Barbuda was created in 1986, and the Urban Development Corporation of Trinidad and Tobago (UDeCOTT) was established in 1994. These bodies have far-reaching planning and development powers within specific areas” (Irazabal 2009: 68).

Recently UN-Habitat published a series of Urban Profiles that included several countries and urban areas in the Caribbean. Among the profiled cities were All Saints and St Johns (both in 2011) in Antigua and Barbuda, Port of Spain in Trinidad and Tobago (2012) and Urban Profiles for entire countries as was the case with Jamaica (2012).

Synthesizing these profiles it can be concluded that many of the same urban challenges faced in the early 70s continue or have intensified and that there are limited human resources in relation to urban planning and that there is a general need to strengthen local level capacities for urban planning.

In the case of Port of Spain the urban profile for Trinidad and Tobago places the need to improve technical capacity of staff members and increase training among staff included in urban planning activities among the top priorities for the future.

Ramlall, after analysing planning instruments governing development in Port of Spain concludes that multiple factors explain why there has been slow progress towards sustainability in this city. Among these he mentions “poor implementation strategies, inadequate enforcement capabilities, insufficient allocation of resources as well as poor stakeholder relationships.” (Ramlall 2010: 10)

Several decades of urban planning instruments have not guaranteed the development of sustainable urban examples in many Caribbean countries. Implementation strategies, allocation of resources, and technical capacities in multidisciplinary teams are priorities that should be considered together with the consideration of governance structures that include participatory processes.

Analyses from Colombia (Fiszbein 1997) and Chile (OECD 2009) support these assessments, which show a lack of local capacities for integrated, multidisciplinary planning processes. In the case of Chile, the OECD analysis shows that sub national government staff have less formal training than central level staff mostly due to lack of financial resources. The study by Fiszbein (1997) in Colombia showed that at the beginning of the decentralization process there was a lack of professional staff at the municipal level in Colombia, and that well planned and developed decentralization, which included transfer of financial resources, allowed many of the municipalities to start hiring professional staff. In some small municipalities the employees/professionals ratio went from 62 to 7 or from 52 to 5 in only 6 years.



It is important to consider that even with complete decentralization most small and medium sized cities in Latin America will not be able to establish within its administration teams professionals from various disciplines to conduct medium term urban planning exercises that can cover all pillars of sustainability. Options should be considered to assist these small sized cities, which attract little attention but in LAC hold almost half of total urban population and are growing at faster rates than megalopolis.

As stated for the case of Chile, “sub-national governments have advantages in terms of making use of local knowledge, but the lack of human and institutional capacities can affect their performance” (OECD 2009: 200). Therefore, large cities should not consider their sustainability in isolation from the region when preparing their visions and planning (John et. al. 2015).

6 Discussion

The literature described in previous sections shows that urban parks and green areas contribute to increase citizens' environmental awareness and that there is plenty of evidence pointing to the many benefits that these areas bring to urban dwellers' well-being. These benefits include psychological, health, economic and social aspects.

On the other hand, experiences from the LAC, and other regions, show that there is still an enormous untapped potential in parks and green areas to become the platforms for the configuration of more sustainable urban visions and realities.

I argue that this potential can be exploited by delivering urban environmental education that is interrelated with city planning; rooted in parks and green areas; contextualized in citizens' daily urban realities; and therefore offering in your face feedback.

Urban environmental education needs to be developed in the context of each city's reality; it cannot be conceived and presented in a vacuum.

Environmental education should also have specific content related to the realities of each community, using environmental planning at the community scale to prepare the curricula and activities. The design of environmental education curricula and activities should be context specific. Urban environmental education that is not "ethnically, culturally, or geographically connected to the communities they serve...may privilege the educator's limited views and biased perspective of the environment over that of people who live in the community (Thomashow and Kessel 2015).

There is a need to involve urban planners and managers in environmental education and environmental educators in urban planning processes. By delivering urban environmental education that is context specific, links to urban planning are easier to establish and the involvement of urban planners and managers in environmental education is simplified.

There are many potential positive two-way outcomes from the collaboration between environmental educators and urban planners and managers. It provides an opportunity for information sharing and for participatory instances while at the same time it contextualizes environmental education geographically. Access to information and participatory process are key for efficient urban strategic planning (Steinberg and Mirada 2000; Steinberg 2005) and contextualization makes environmental education more effective (Thomashow and Kessel 2015).

Urban environmental education should also take full advantage of parks, as it has been demonstrated that even "relatively short yet intensive summer urban environmental education programs may significantly increase students' ecological place meaning, i.e. their perceptions of the presence and importance of nature in the local urban setting." Kudryavtsev et al 2012: 9). However, it should go beyond the use of park as mere infrastructure (or the use park infrastructure when available).

Parks should also take full advantage of formal environmental education activities. In Zamora's detailed study of the park, which included interviews with park users related to education the importance of coordinating with education authorities at the national level is mentioned. "It is considered of vital importance that the contents offered by Inbioparque coincide with the current environmental themes included in the curricula of the Ministry of Public Education" (Zamora 2012: 117 translated by the author). Parks that offer activities in parallel with the formal education curricula will be in a better position to attract urban educators and with it increase nature experience among formal students.

Another issue that came clear in communication with park managers is that parks seem to be used as location for presentation of case studies, examples, etc. but don't seem to be integrated into the city network, offering environmental education opportunities as one walks by. To put it in another way, in order to receive specific environmental education or information the users need to be taken, or have decided to visit these locations, with the specific purpose of receiving environmental education. Users of the areas that are present for leisure activities, from reading to jogging or even passing by do not passively receive educational and information inputs (remember the case of the garbage to energy ski facility mentioned above). Parks need to be transformed from holders of environmental education infrastructure to the infrastructure itself while holding equilibrium with the multiple objectives of conservation, pollution control, leisure space, among others.

Parks need to be more than spaces where environmental education is permitted or encouraged. Environmental education needs to be part of park planning and design within the broader framework of urban planning and design. For this to happen, "urban environmental educators should be familiar with their cities' ecosystems and capitalize on these biotic and abiotic features in order to create programs that are responsive to their communities' unique urban characteristics". (Elser et al 2015: 31).

Having said this, urban environmental education is much broader than biodiversity and ecosystems. Having manicured or relatively natural parks should not mask what happens with the rest of the city. On the contrary, parks should look for ways to communicate urban environmental information that create awareness of the cities state of the environment.

Box 6 The Role of Parks in Urban Society's Path to Environmental Behaviour

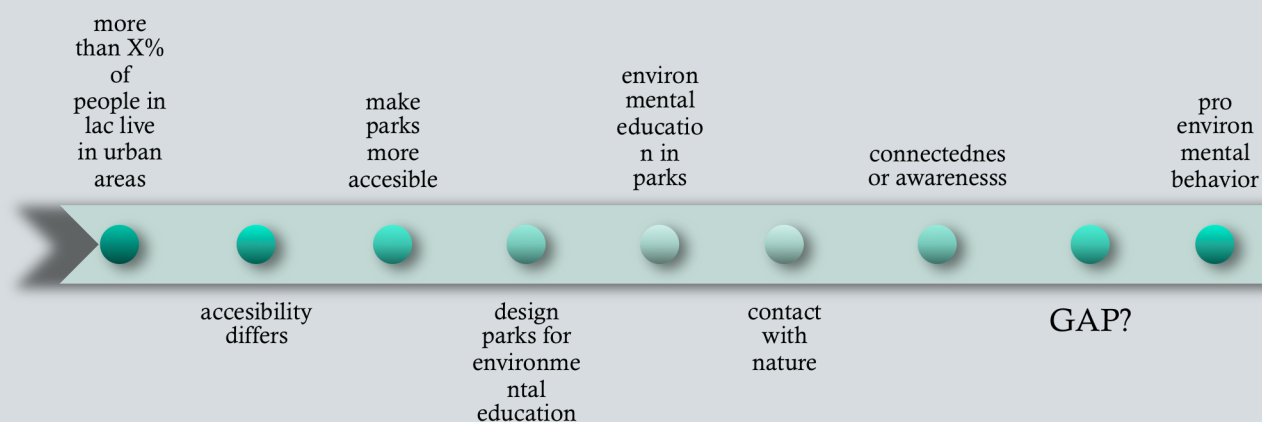


Figure 3 presents an extremely simplified and linear view of the links between the urban situation, parks and environmental behaviour. The creation, accessibility and design of parks with urban environmental education in mind can be part of the path towards more environmentally aware and nature connected citizens that contemplate environmental aspects in their daily life and decision making. There is however a discrepancy between attitude and behaviour. Being informed, aware or feeling connected to nature does not directly lead to changing behaviours (Kollmuss and Agyeman 2002). This gap has been linked to lack of direct experience, normative influences, change of attitudes throughout time, differences in the way attitudes and behaviour are measured (Rajecki 1982 in Kollmuss and Agyeman 2002). Table 1 below summarizes variables associated with pro-environmental behaviour by different researchers (most variables are taken from Kollmuss and Agyeman's 2002 review) and suggests how urban parks and green areas can represent an opportunity to overcome some of these barriers.

Variable	Description	Potential relation to parks
Knowledge of issues	Familiarity with a problem and its causes	Parks as places for information sharing (directly and indirectly), campaigns, etc
Knowledge of action strategies	There needs to be knowledge on what to do to reduce impact	Parks as places of information and for specific action
Locus of control and possibilities to act	Perception of ability to influence through his/her actions.	Offer space for interaction, and the opportunity for direct action with clear results.
Attitudes and values	Strong pro-environmental attitude related to behaviour	Contact with nature influences attitudes. Parks and green areas offer the opportunity for this contact with nature for urban dwellers
Verbal commitment	The process of communicating the willingness to act increases possibility of action	Places for information, environmental campaigns, etc
Individual sense of responsibility	People who have higher sense of personal responsibility are more likely to behave responsibly	
Environmental awareness and feedback	Knowledge of actions' impact on the environment and links between social and ecological systems	Places for information sharing and to witness some micro socio-ecological links



As exemplified earlier with the proposal for the incinerator in Copenhagen, communicating environmental information and creating the in your face feedback that urban dwellers many times don't receive, can be achieved without reducing leisure time in park and green spaces.

Well-planned parks can be especially beneficial to the poorest members of society (Mitchell & Popham, 2008). For this to happen they need to remain accessible and urban interventions have to go beyond the development of green physical interventions in order to address the persistency of environmental inequalities (Strife and Downey 2009).

It is key for urban planners to include social and economic aspects in the planning of parks (Steinber and Miranda 2000). Parks should be citizen oriented and bring many of the municipal services to park users, encouraging and facilitating the uses of parks and facilitating citizen-infrastructure interaction (Belanche et al 2016).

Jaime Lerner, former mayor of Curitiba compares urban interventions with acupuncture. Each needle recovers the energy of a sick or tired spot that gets revitalized together with its surroundings. "Some of this "magic" medicine can and should be applied in cities....just as doctors, urbanism is needed to make cities react" (in Silva Correia et al 2012: 48)

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