

Brownfield Planning: A tool for economically and socially effective sustainable urban development

Garry Smith

Introduction:

Brownfield Planning applies methods and technologies which clean up abandoned former industrial land to development of plans for urban renewal. The remediation of inner-urban land has evolved in the global North from an initial public health protection measure to an effective planning tool for economic and social development and environment improvement.

Governments, including Australian and US examples, have recognized the benefits of facilitating and coordinating Brownfield development to achieve urban environment and public health protection. This paper describes the potential additional benefit of using Brownfield Planning for reducing urban carbon emission.

Adoption of widespread Brownfield Planning policy in Africa will address one of the most important goals of planning in developing countries, that of urban development and renewal. Its application to mitigating climate change impacts of cities offers an avenue for reduction of constraints on manufacturing industry in a post-Copenhagen world. This paper contends that adoption of Brownfield policies and market incentives offers the global South a mechanism for fair participation in global climate change accords.

Why should African and Global South countries not realise climate change carbon emission mitigation credits from urban renewal and well-planned urban development?



FIGURE 1: Olympics 2000 residential precinct built on a Brownfield Site (Source: Waste Services NSW)

Cities, towns and communities in the global North have historically enjoyed prosperity as a result of industrial activities. Large manufacturing facilities were commonly located in inner urban areas, particularly on valuable foreshore land where waterways were used as key transport routes. Some health problems associated with the 'legacy' sites of polluting industries has caused public concern. The decline of heavy industries near populated residential areas has frequently led to abandoned and underutilized facilities, sometimes resulting in increased local crime and unemployment. In the global South, similar urban growth land uses are evident. However the opportunity exists with economic development in the South to utilise Brownfield as a tool in city growth.

The development of abandoned former industrial land, which typically is located within and adjacent high density urban areas, offers an effective planning approach for integrating urban renewal, infrastructure improvement, and Transit Oriented Development (TOD). These represent important economic and social Brownfield Planning outcomes. However the clear potential for Brownfield Planning to significantly reduce national carbon emissions on a large scale has rarely been documented or measured.

Brownfield activity may directly contribute to reducing urban sprawl through:

- reducing migration of urban populations to suburban and peri-urban communities, thereby reducing pressure on peri-urban natural landscapes
- keeping infill development within the city's existing boundaries thus preserving peri-urban waterways and open space

Governments internationally are recognizing the benefits of innovative Brownfield redevelopment strategies for addressing environmental and public health protection while contributing to economic development and community revitalisation. In practice, the importance of land value to re-use of land means that the planning and science of Brownfield development affect Brownfield site economic viability. In view of the major benefits of Brownfield to urban growth, governments in many nations are increasingly taking steps to facilitate the reuse of Brownfield sites.

Brownfield Practice:

Internationally a number of industries are associated with the potential for causing land contamination. These include:

- oil installations (e.g. oil depots, petrol filling stations);
- gas works;
- power plants;
- shipyards/boatyards;
- chemical manufacturing/processing plants;
- steel mills/metal workshops;
- car repairing/dismantling workshops; and
- scrapyards.

This list illustrates the number and diversity of land use activities which may affect environmental quality in both small local industries and in larger industrial regions, including in global South societies. The list also illustrates the locational opportunities which Brownfield sites offer, from smaller residential suburban location to larger foreshore or inner city industrial estate sites.

As Brownfield development becomes a central component of urban planning and renewal, a planning phenomenon which is increasingly evident is the 'co-location effect' of Brownfield sites (ICMA 2003). Co-location is the phenomenon whereby the redevelopment of Brownfield sites leads to the nearby development of adjacent properties which, like Brownfield, may be proving challenging for redevelopment. The phenomenon demonstrates how adjacent sites and vacant properties may be revitalised together with Brownfield sites, through local government planning processes, and in partnership with communities and national governments.



FIGURE 2 : Colocated Developments (circled) which followed the Brownfield Site of the 2000 Olympics Games (square).

Co-location reflects advantages in 'leveraging' the economic value of Brownfield development through, for example (ICMA 2003):

- enabling assessment, remediation, and redevelopment of Brownfield and other adjacent sites so that the condition of one property does not negatively impact on the potential of another
- combining resources to create a package of planning and remediation tools and programmes to revitalise areas with distressed properties
- improving cost effectiveness of area-based planning
- improving funding for infrastructure improvement such as new roads or public transport
- creating a critical mass of people or activities to make transport access effective

Essential components of successful Brownfield development include:

- Finding financing
- Accurate cleanup estimates
- Effective community involvement
- Successful negotiation with regulators

- Cost-effective and efficient cleanup

Institutional controls for contaminated sites management include:

- zoning regulations, banning certain uses from sensitive areas
- Site restrictions limiting land use in areas that are prone to natural hazards such as flood or earthquake
- Proprietary controls including deeds of restriction on current land usage and easements whereby the site owner transfers only limited ownership of a property area.

Opportunities for the Global South:

The problem of abandoned, idle, and under-used industrial and commercial land, where redevelopment is complicated by environmental contamination, impacts widely within southern African municipal boundaries. Examples may be found within most highly urbanised and industrialised African and other global South municipalities. By their very nature Brownfield are therefore inseparable from issues of social and economic development (Van Rooyen 2001).

Development of effective Brownfield policies in Africa offers a tool to directly respond to global South urban development needs including housing and social service delivery; job generation and economic development; infrastructure provision; environmental and natural resource management; and social inclusiveness.

A U.S. Conference of Mayors report (U.S. Conference of Mayors 2010) identifies numerous examples in the United States of prosperous cities which experience a redevelopment renaissance and residential boom followed by economic decline and an increase in foreclosed properties. Brownfield policy development in the USA and elsewhere has focused renewed interest in renewal of city centres where residents live closer to their jobs and have lower commuting costs. Brownfield properties enhance redevelopment value, increase green technology, and reduce energy costs, as cities remediate and redevelop properties rather than 'start from scratch'.

A recently published Conference of Mayors survey is the eighth in a series of reports that document progress and impediments to Brownfield redevelopment in the United States. Highlights of the survey included:

→ Over 46 percent of the survey respondents stated that if Brownfield's were redeveloped, they could realize nearly \$688 million to \$1.66 billion annually in additional tax revenues.

→ 106 cities responded that over 230,223 new jobs could be created on Brownfield sites if their brownfield sites were redeveloped, an increase of 39,000 from last year's report.

→ There were 59 cities that reported 75,000 new jobs have already been created from redeveloped Brownfield's. These jobs include 19,761 pre-development and 55,085 jobs post development.

→ More than one-half of the cities surveyed reported offering incentives to encourage Brownfield redevelopment through tax credits, low interest loans, and infrastructure upgrades. Additionally, the Conference's survey found that many states are working with cities on Brownfield issues.

Federal Programs	Dept. of Agriculture	Appalachian Regional Commission	Army Corps of Engineers- Dept. of Defense	Office of Economic Adjustment- Dept. of Defense	Economic Development Administration- Dept. of Commerce	Dept. of Energy	EPA	Federal Housing Finance Board	General Services Administration
OVERALL COMMUNITY AND ECONOMIC DEVELOPMENT									
Brightfields/Sustainability							-		
Community Engagement/Education		*					+\$		
Public Health		*					+\$		
Smart Growth							+\$		
SPECIFIC COMMUNITY / ECONOMIC DEVELOPMENT									
Commercial/Industrial		+\$			\$		+\$		*
DoD/BRAC				+\$			-		*
Historic/Cultural Preservation			*				+\$		*
Job Training		\$			\$		+\$		
Low-income Housing							+\$	\$	
Mine-scarred Lands		+\$	*				+\$		
Ports/Waterfront			*				\$		
Railfields							\$		
Residential							+\$	\$	
Rural	+\$	+\$					+\$		
Tribal							+\$		
QUALITY OF LIFE / REDEVELOPMENT ENHANCEMENTS									
Bike Paths							+\$		
Greenspace	+\$						+\$		
Parks/Recreation							+\$		
Species/Habitats							+\$		
Urban Forest	+\$						+\$		
SITE PREPARATION FOR REDEVELOPMENT									
Assessment		*			\$		+\$		
Cleanup			*		\$		+\$		
Demolition			*		\$		+\$		
Project Financing	\$				\$		\$		
Planning	*	*		+\$			-		
Structural Rehabilitation				+\$					
Transportation Infrastructure									
Water Infrastructure	*		*				\$		
Other Infrastructure	*	\$	*	+\$					

FIGURE 3: US Agencies and Programmes Contributing to Brownfield Policy Implementation (Source: United States Environmental Protection Agency (2005))

According to experience described by the Mayors' Conference, Brownfield provide a tool for urban and city centre redevelopment, providing additional resources, additional jobs, and a growth in the tax base, often preserving green and open space.

Practical implementation of Brownfield development requires consideration of a range of factors including the science of public health protection, the economic drivers of real estate development, and the land use regulation skills of urban planners. The ability today to carefully plan land uses and redevelopment options for affected properties allows for planning of viable risk-based remediation projects while providing liability protection for environmental regulatory requirements. Most countries which have utilised Brownfield methodologies have been required to establish cooperation between the activities of their planning and their environment protection agencies, and frame specific legislation to facilitate such cooperation and shared control.

Policy requirements include targeted government Brownfield remediation funding and developer incentives (funding for liability insurance, approvals fast-tracking, improved floorspace ratios etc). Revolving loan funding mechanisms and regulatory policy improvement are cost-neutral methods for governments to leverage significant private financial funding to the city.

Global South governments may guide urban development by embracing Brownfield Planning policy frameworks in African and global developing cities and by requiring government planning and development agencies to investigate and facilitate Brownfield development.

A Finnish study comparing urban sprawl and a 30-year scenario based on locating new housing much closer to employment and regional activity centres suggests that an estimated 48% of the reduction in GHG emissions city-wide from this more compact spatial development would come from efficiencies brought about by district heating of residential and service buildings and another 48% would come from reduced passenger travel within each commuting region. Development of the centralised-urban structure including use of Brownfield sites would result in an estimated reduction of 2.3 Mt CO₂ eq per annum in Finland. Much of this carbon reduction potential in cities may be realized by encouraging and managing city-wide Brownfield developments.

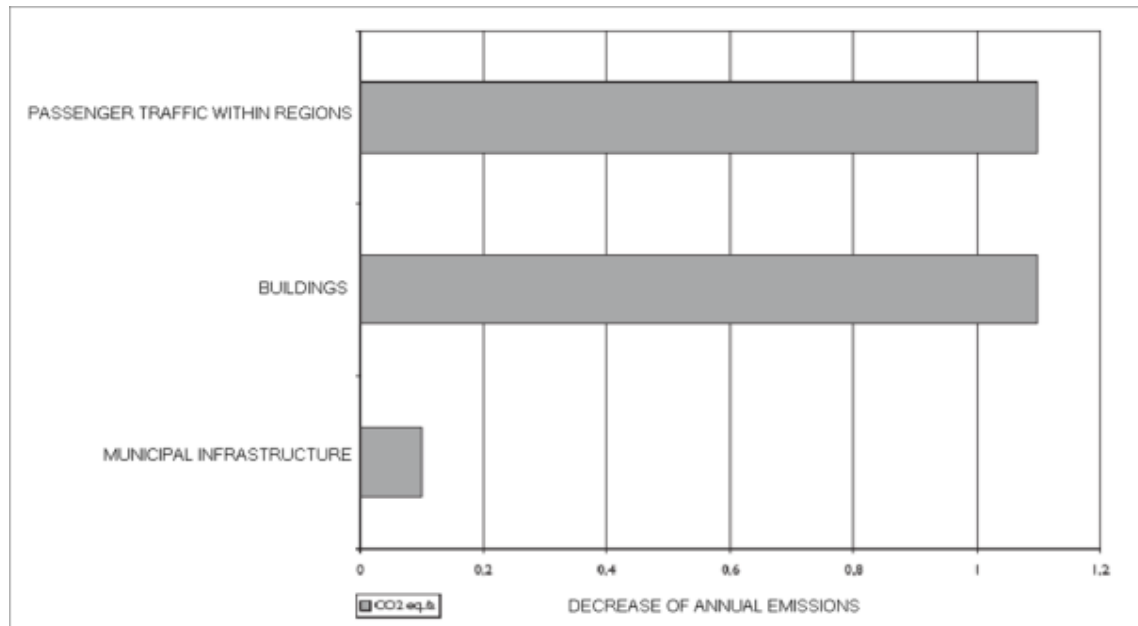


Figure 4: Compact City Carbon Emission Savings Estimates in Finland (Source: Finish Ministry of the Environment 2002)

Initial comparative studies for Australian capital cities indicates that efficient Brownfield development has potential to reduce Australia's national carbon emissions by some 1-2% compared with business as usual urban development.

In light of a possible Australian minimum target for reducing national carbon emissions of 5% compared to 2000 emissions by 2020, a 1-2% contribution would be significant. Furthermore, it is likely that developing countries will see benefit in carbon emission mitigation methods which support urban renewal.

Targeted Brownfield policy development offers an economically and socially effective approach to directly reduce urban carbon emissions on a large scale (Smith 2009). This raises two important questions:

- Why should global South cities not be eligible for carbon credits for transport planning improvement and for planning approaches which deliver effective anti-sprawl and carbon emission reduction outcomes?
- Might developing countries consider urban renewal-based approaches to carbon emissions reduction as a post-Copenhagen circuit-breaker accelerating accord development?
- Such policy approaches enhance social and economic capital while addressing climate change

Case Studies

Numerous Australian and US Brownfield Planning case-studies describe benefits for urban housing; jobs; infrastructure; social inclusion; and climate change mitigation (Smith, G 2008; USEPA 2005). African and other government planning policies should facilitate Brownfield development.

In the United States the governance and regulatory approach to Brownfield is based on well established real estate markets and on experience in suburban development, decentralized government and strong private property protection. From a contaminated sites remediation perspective, state environmental agencies now lie at the heart of US site cleanup decisions. Furthermore, state and federal efforts to address landowner and lender liability issues have established a system for private sector-led redevelopment efforts. Tax and financial incentives, as well as streamlined regulatory procedures, further support that approach.

Brownfield development in Australia is largely market-driven, there are no 'Superfunds' as in USA which have traditionally stimulated development of Brownfield and orphan sites. There are currently policy initiatives for urban renewal through Metropolitan Strategies and Regional settlement strategies which may generate market interest in Brownfield sites. However, without government funding incentives, developers become the key interest group for the issue and are the drivers of Brownfield projects.

The main policy change which has proven effective in the United States involves remediation funding and developer incentives (funding facilitates liability insurance, approvals fast-tracking, improved floorspace ratios etc). The US Government has achieved these outcomes through revolving loan funds and regulatory policy improvement.



Figure 5 East Perth Australia: A TOD-Brownfield Example

Conclusions:

Brownfield development policy will address one of the most important goals of planning in developing countries, that of urban development and renewal. It offers synergy between sectoral disciplines and reduction of constraints on manufacturing industry through mitigating climate change impacts of cities. Adoption of Brownfield policies and of market incentives offers the global South a mechanism for fair access to global climate change accords.

There exists an important opportunity for African governments to:

- identify the importance of the issue of urban structure to African efforts to address climate change.
- recognize the potential for specific government policy frameworks for Brownfield development to minimize city carbon emissions
- recommend that government departments consider the coordinated facilitation of Brownfield development
- recommend Brownfield development support from international development programs
- request international consideration of Brownfield-based urban renewal as a component of global South carbon off-sets for climate change mitigation.

Endnotes:

Finish Ministry of the Environment (2002) *Urban Form and Greenhouse Gas Emissions*, Edita Publishing, Edita, Helsinki

ICMA (2003) *Co-location: Facilitating Revitalisation Beyond Brownfield*, Washington D.C., International City/County Management Association

Smith G (2008) *Contributions of Brownfield Development to Urban Internal Expansion and Urban Renewal in Practice*, International Society of City and Regional Planning, Proceedings of the 44th Congress, September 2008, Dalian China, pp. 19-23.

Smith G (2009) *From Westernised to Low Carbon City: Climate Change Adaptation Lessons from Perth, Western Australia*, International Society of City and Regional Planners, ISoCaRP REVIEW 05 Low Carbon Cities, www.isocarp.org

U.S. Conference of Mayors (2010) *National Report on the Status of Brownfield sites in 150 American cities*, www.usmayors.org.

USEPA (2005) *Brownfield Federal Programme Guide*, Washington D.C. United States Environmental Protection Agency

Van Rooyen, EJ (2001) *Integrated development and the Brownfield phenomena*, Journal of Public Administration, vol. 36, no. 1, pp. 61-80. [<http://www.saapam.co.za/>]