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A growing city: agriculture and food security in the growing urban context

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2013-08-02
http://hdl.handle.net/10539/12970

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Image source: Dr. Seuss, 1971

Thneedville

Cultivating Thneedville's Creation

To Grow, One Must Eat

Sowing the Seeds of Change

Chapter: 2

Cultivating Thneedville's Creation

...a culture accustomed to causing damage... (Benyus, 1997: 47)

In his book The Lorax (1971), Dr Seuss beautifully describes the "perfect" industrial city and its growth. He imagines a young entrepreneur, the Once-ler, exploring the countryside looking for opportunities, and when he happens upon a magnificent scenery of truffula trees and wonderful creatures he realises the potential the trees have for creating a Thneed, which is a "Fine-Something-That-All-People-Need". He manages to sell it for a good price. This leads to the development of an industrial town aimed at making large amounts of money at the expense of the trees. The "Fine-Something-That-All-People-Need" is a rather apt description of the assortment of manufactured goods in urban developments. As a side-note, urban and rural can be defined according to production specialisation: the rural in agriculture and the urban in manufacturing (Harris et al. 1970). The Lorax is the guardian of the forest and "speaks for the trees." He voiced his disapproval of the Once-ler cutting down the trees. The Once-ler meant no harm in developing his Thneed factory, but his approach to systems was short-sighted, and the factory and town had to grow by "biggering and biggering and biggering" until eventually all the truffula trees were cut down.

This is strikingly similar to how many modern cities have developed and grown. Growth in all forms has determined our cities; be it population growth, industrial and production growth, economic growth, physical growth and land consumption, densification and so on. Modern cities continue "biggering and biggering and biggering". It is all about growth – the end goal of the city and the activities therein is growth. So this calls for a study on how the various forms of growth occur and the ramifications they have on the sundry contextual and systematic factors.

City growth is not a new phenomenon – it has been going on for centuries. The cities we live in today were typically founded where there are resources for living off and making a living off. They are often structured around flow, where it is the flow of a river or of goods being transported in and out. Johannesburg is based around the reef of gold and train tracks for moving gold. Johannesburg boomed in the early twentieth century. This was an exciting period of wildly imagined prosperity through the discovery of gold, a similar excitement to that of the Once-ler upon discovering the truffula trees.

Self (1957: 20), in speaking about the issues of modernist urban growth (which is the foundation on which Johannesburg was built) tells of its structure:

> At its centre are the main business, shopping and entertainment areas and the transport terminals.

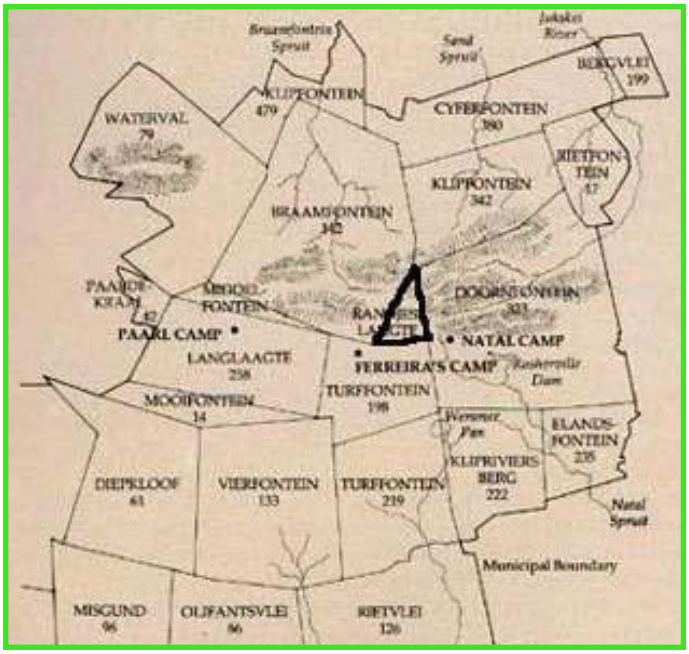


Fig. 2.1: Early Johannesburg and the Uitvalgrond. (Source: Melville Koppies Nature Reserve, 2012)


Fig. 2.2: Johannesburg Inner City density. (Source: Global Post, 2012)

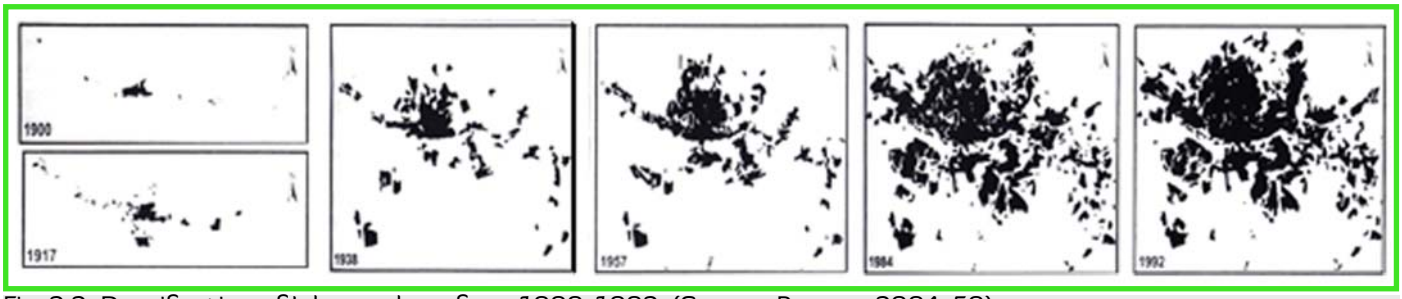


Fig. 2.3: Densification of Johannesburg from 1900-1992. (Source: Beavon, 2004: 50)

> Near the centre, and adjoining the railways and river or canals, are a high proportion of the industries... Interspersed with this industry are still to be found rows of old slum dwellings... The city has swollen from the central core...

When looking at the structure of Johannesburg city and how it grew from the uitvalgrond triangle, similar traits can be seen to this description above. The city is dense in the central core, with many industries and commerce, while at the same time interspersed with poor quality housing conditions. Major industrial zones were then moved to the outskirts of the city, and suburban sprawl surrounds the city like a moat. This leads to the people living in suburban areas having to make long daily journeys to work in the city. Dr. Seuss describes Thneed-ville with increasing numbers and sizes of cars, much like what we see today.

The land in the dense core of the city is more expensive than land on the outskirts due to demand and availability. This leads to an outward city growth, enlarging the land area consumed by the city. Urban sprawl can be described with such characteristics as continuous urbanisation, the long daily journeying, and traffic chaos (Self, 1957: 181). It has damaging effects on the planning of a city. It causes the city to expand forever in low density and eats up agricultural land, while the centre becomes denser due to a lack of space. This has drawn major infrastructure such as supermarkets and shopping malls (which have a monopoly on food distribution) to the suburbs, leading to less access to food in the city centre. People in the city centre become distanced ever further from agriculture, and the access to food is left for those elite who can afford the lifestyle associated with suburban living, a lifestyle that includes higher living costs and further travel distances. But not everyone has a car or the benefit of transport, not everyone is able to go to the outskirts to source their food. With all the good land taken by commerce and industry in the city centre all that there is, is left-over land and properties which provide opportunity to serve the left-over people in the city centre.

The transport problem in the big cities has grown worse in both a social and technical sense (Self, 1957: 28). More people are travelling longer distances to their place of



Fig. 2.4: Cresta Mall in suburban area. A typical scene in Johannesburg. (Source: Google Maps, 2012)

work in the central areas. Suburban sprawl creates other less tangible social drawbacks than those of long journeys and traffic congestion. These revolve around the impoverishment of local life, the eclipse of "neighbourliness", the defects of the "functionless suburb", and so on (Self, 1957: 29). This lessening sense of community has negative impacts on the quality of life; and quality of life is an important factor in health and wellbeing. The cumulative drawbacks of too much concentration are becoming increasingly plain. Traffic congestion is a potent source of extra costs and delays, and the long journeys of the workers are responsible for much absenteeism and ill-health (Self, 1957: 31). A system based on a model of failure is bound to stop growing sooner or later.

Residents with jobs have to commute exceptional distances to the city centres. This imposes big costs on themselves, as well as on businesses and the environment because of the travel time involved (Turok, 2011). Existing public infrastructure is often overloaded, and schools and health centres are overcrowded. The quality of life is worsened by the extreme densities and lack of space for expansion.

Self (1957: 20) describes a twilight zone where rural and urban blur, and says "the outward growth of suburbia overwhelmed the vestiges of rurality... The twilight zone has increasingly been displaced further afield." The displacement of this twilight zone, not only in Johannesburg but in Gauteng, has transformed the province into one big city, with 97% of its population living in urban centres (SouthAfrica.info, 2012). The urban area extends virtually uninterrupted east and west of Johannesburg through a number of towns: Roodepoort and Krugersdorp on the west and Germiston, Springs, Boksburg and Benoni on the east (SouthAfrica.info, 2012).

A large area of the province falls within the so-called Maize Triangle. The districts of Bronkhorstspruit, Cullinan and Heidelberg hold important agricultural land, where ground-nuts, sunflowers, cotton and sorghum are produced (SouthAfrica.info, 2012). Food, food processing and beverages make up around R9.9-billion of the province's economy (SouthAfrica.info, 2012). While this shows a strong agricultural industry this could easily change. Loss of productive land from growing city footprints is a concern at a time of such urban population growth (Wells et al., 2011: 15). There is also the concern of unequal distribution with half of South Africa's agriprocessing companies operating in Gauteng (SouthAfrica.info, 2012).

City population grows through natural increase—the ex-



Fig. 2.5: Commuter congestion, (Source: Funky Doodle Donkey, 2011)

cess of births over deaths—and because the in-migration of people from other cities, rural areas, or countries is greater than out-migration (Population Reference Bureau, 2012). Gauteng comprises the largest share of the South African population. Approximately 11.3 million people (22.4%) live in this province (Statistics South Africa, 2011: 2).

It is projected that 71.3% of South Africans will be living in cities by 2030 (The Guardian, 2012). There is a rapid movement to urban areas reflecting the desire of rural inhabitants to improve their economic situation with the expected urban wage exceeding the rural wage (Cornwell et al., 2004: 2). Rukini (2011: 211) describes this movement as premature since most of these people do not have jobs or homes in the urban-industrial sector and most do not possess the life and economic skills to be gainfully employed in the urban areas. Migration is mainly governed by the location of employment (Self, 1957: 49). It is a normal element of population growth in most societies, but the scale of movement in developing countries may have undesirable consequences for overall poverty and development (Cornwell et al., 2004: 2). Migration is an important demographic process in shaping the age structure and distribution of the provincial population (Statistics South Africa, 2011: 2).

Rural-to-urban migrants are significantly more likely to end up in the informal sector of cities (Cornwell et al., 2004: 15). Poor people will make up a large part of future urban growth (Population reference Bureau, 2007). "Poverty" is a term used by Greater Johannesburg (2000) to describe people living below the bread line and unable to sustain themselves in terms of the basic necessities of life, being income generation, food, shelter, opportunities, health and education. Urban poverty is particularly problematic in the Johannesburg Inner City area, and the situation is aggravated by informal and illegal settlements, and migration into the area (Greater Johannesburg, 2000). The Johannesburg Inner City has high population numbers and is overcrowded (Greater Johannesburg, 2000). Female-headed African households are the poorest, and the income situation is worst from the Johannesburg CBD and the south of Roodepoort through to the far southern areas (Greater Johannesburg, 2000). In the southern parts of the Johannesburg Inner City education levels are lower than to the north, with up to 70% of people in some areas having matric only, and up to 30% having no education at all (Greater Johannesburg, 2000). The lack of education further affects people's ability to find employment and subsequently income in order to afford food.

As for our economic systems, they are set up to grow and expand as Herman Daly explains in The 11th Hour (DiCaprio, 2007), and the cost of this growth is displacement of the biosphere. Stephen Schneider, also in The 11th Hour, states that the object of business is growth, as if growth

Estimated provincial migration streams, 2006–2011

Province	Out-migration	In-migration	Net migration
EC	329 714	114 899	-214 815
FS	118 640	92 748	-25 892
GP	308 063	675 139	367 076
KZN	196 933	198 355	1 422
LP	238 545	96 117	-142 428
MP	164 905	120 746	-44 159
NC	60 585	42 993	-17 592
NW	179 462	160 294	-19 168
WC	110 937	206 493	95 556

Fig. 2.6: Migration to urban areas for each province in South Africa. (Source: Statistics SA, 2011)

Country	2030	2020	2010	2000	1990	1980	1970	1960	1950
South Africa	71.3	66.6	61.7	56.9	52	48.4	47.8	46.6	42.2

Fig. 2.7: Percentage of people living in cities in South Africa over time. (Source: The Guardian, 2012)

was an end. He further explains that growth is rather a means to an end, and the end is quality of life – there it is again. He says, "If we can get the end back – quality of life – then we have to look at the contradictions because the wrong kind of growth reduces our quality of life." Our cities are excellently designed for short-term gain and growth, and are great examples of how to make short-term success. But this seems too short-sighted. I ask, what good is today's money in the face of tomorrow's depletion; or what good the success of one system at the loss of many others?

> Without stronger interventions by local and provincial planners and infrastructure providers, current patterns will be entrenched well into the future, threatening the [Gauteng] region's long-term viability. (Turok, 2011)

The effects of Thneed-ville's growth are shown in factors that reduce quality of life, such as pollution of air and water from factory wastes and fossil fuels, destruction of the natural environment and loss of biodiversity (which both improve quality of life), until all that is left is a hazy blur in the landscape. The growth of a city can arguably be described as urban desertification. I use this word because of the effect it has on the natural environment – it destroys the biosphere and creates a large expanse of little to no biodiversity. Furthermore, it puts strain on food and water supply and consumption through high demand in an isolated area, a strain experienced in desert conditions. The Population Reference Bureau (2007) states how urbanization affects the environment:

> Urban people change their environment through their consumption of food, energy, water, and land. In turn, the polluted urban environment affects the health and quality of life of the urban population. People who live in urban areas have very different consumption patterns than residents of rural areas. For example, urban populations consume much more food, energy, and durable goods than rural populations. By extension, the energy consumption for electricity, transportation, cooking, and heating is much higher in urban areas than in rural villages.

The physical characteristics of urbanity are overstimulation, noise, smoke, and stench. The social repercussions of urban growth are not altogether pleasant either. Cumberlidge et al. (2007: 11) say that mass urbanization creates social upheaval and puts strain on infrastructure. Despite the positive economic and social externalities of large cities, a highly concentrated population, such as the Johannesburg inner city, brings social costs such as congestion, pollution and crime. Resultant high unemployment leads to migrants creating their own employment through informal labour-intensive services and production (Cumberlidge et al., 2007: 11).



Fig. 2.8: Urban decay in Faraday, Johannesburg. (Source: author, 2012)



Fig. 2.9: Urban decay, Johannesburg. (Source: South Africa Magazine, 2011)

Urban decay is on the increase in Africa as the over-stretched infrastructure breeds ill-health, crime and social breakdown of family structures (Rukini, 2011: 211). Moreover, the migration from rural to urban is largely by young adults, which drains the rural areas of the young and energetic force that is desperately needed for agricultural development in these areas (Rukini, 2011:211). Thus if agriculture can be introduced into the city, it can provide employment opportunities for those from the rural-to-urban migration group who have the skills, and it can lead to social repair and healing, not merely physical.

The effect of urban growth on agriculture means that agriculture gets pushed further and further away from the urban centres since all too often land that is good for agriculture is desirable for cities (Alexander et al., 1977), and vaster quantities of the produce go to concentrated areas. Food distribution is unequal. The food is then required to be transported further to reach the consumer, increasing the cost of the food through the transportation costs, and contributing more carbon dioxide into the saturated atmosphere. "It is said that the appetite of the city is insatiable – that if extended it will sprawl rapidly and gobble up good farmland" (Self, 1957: 52). Thneed-ville's hinterland was a barren and lifeless wasteland. Our cities have the capacity and seem to be on the path to creating the same description of hinterland.

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Fig. 2.10: Typical urban decay in Newtown, Johannesburg. (Source: WeAreSignals, 2010)

To Grow, One Must Eat

While supermarkets dominate agro-food value chains, some of their practices might be sustaining high food prices rather than ensuring food is affordable. (Altman et al., 2009: 26)

In order for something to grow it needs food – that is, nutrients and resources. For Thneed-ville this meant consuming the truffula trees; for a city such as Johannesburg it means expansion through the removal of the natural environment, fuelled by coal and oil based infrastructure. For people, the very life form that inhabits a city, it means food – agriculture. But as shown in the previous section of this thesis, agriculture is being pushed further away from cities. Sometimes what helps distinguish urban from rural areas is the extent to which it is non-agricultural (Population Reference Bureau, 2007). But how then does a city provide food for its denizens and what are the surrounding securities?

In the case of Johannesburg, food from outlying rural farms is grown through monoculture crops using petroleum based chemical fertilizers and pesticides (Suzuki, 2012). It is then transported to the Fresh Produce Market in City Deep and sold by agents on behalf of the farmer. The agents determine the price and sell it to supermarkets, other food retailers and informal traders. Then the food is transported again, packaged and finally sold to the consumer. This model works for the most part, but it increases the costs and does not reach all the people in the city – access to food depends on how food markets and distribution systems function, rather than on total agricultural output (Altman et al., 2009: 8).

The major concern at the moment around food security is money. The factors affecting the cost of food include fossil fuels used in making and transporting the fertilizers, transportation costs from the farms, the agents at the market, and food sellers. Domestic electricity supply constraints and rising oil prices are also areas of concern in this regard and the power of agents within the agro-food chain, namely supermarkets, processors and distributors (Altman et al., 2009: 8). As a result of fuel prices and inflation, the cost of food also increases. Inflation, driven by rising food prices, is already straining social harmony in some countries (Flannery, 2009: 50). Other concerns of sufficient food production include crop yields, soil fecundity, food quality, and population growth. Intensive farming, synthetic chemical fertilizer use, soil erosion and salinization all reduce the amount of organic matter that soils



Fig. 2.11: Johannesburg Fresh Produce Market. (Source: author, 2012)

contain (Suzuki, 2012) thereby affecting the ability for the soils to yield good crops. Agricultural production has been declining for decades in many areas through the departure of the farming population (Self, 1957: 114), as well as through the expansion of the city into prime agricultural land, turning it into a concrete desert. The most recent studies show that food supplies will be difficult or impossible to maintain as the century wears on (Flannery, 2009: 116).

Today's farmer has a huge spread, and because the fields are planted in one species or variety, and one growth stage, the losses, when they come, are catastrophic (Benyus, 1997: 12). They have no insurance against drought, pests, floods, hail and soil erosion. These are ultimately unadaptable systems of produce, yet nature and plants have the capacity to adapt if left to grow naturally. Our crops are dependent on us, and we are dependent on petroleum (Benyus, 1997: 20). Yet we cover up the failures of our systems, masking them with a Band-Aid, rather than addressing the root of the problem.

> Fertilizer...masks the real problem of soil erosion caused by a till agriculture of annuals. Pesticides mask...the inherent brittleness of genetically identical monocultures. Money borrowed to pay for the fossil-fuel inputs masks...the fact that industrial agriculture not only destroys the soil and water, it strangles rural communities... Every day, our soil, our crops, and our people grow a little more vulnerable... there is nothing more sacred than the pact between humans and the land that gives them their food. (Benyus, 1997: 20)

At last count, leaching pesticide residues made agriculture the number-one polluting industry [in the U.S.] (Benyus, 1997: 19). This residue affects groundwater, which leads to higher risks of developing leukemia, lymphoma, and other cancers (Benyus, 1997: 19). Cornell University ecologist David Pimentel reckons that society spends ten kilocalories of hydrocarbons to produce one kilocalorie of food (Benyus, 1997: 19). That means each person eats the equivalent of thirteen barrels of oil a year.

All these difficulties in food production and the methods of distribution, affect access to food. There are many hungry and malnourished people in the cities. This is cause for concern because sufficient, nutritionally adequate food is a core basic human need, and a critical success factor for human development of any kind (Altman et al., 2009: 11). The capacity of developing countries to sustain agricultur-

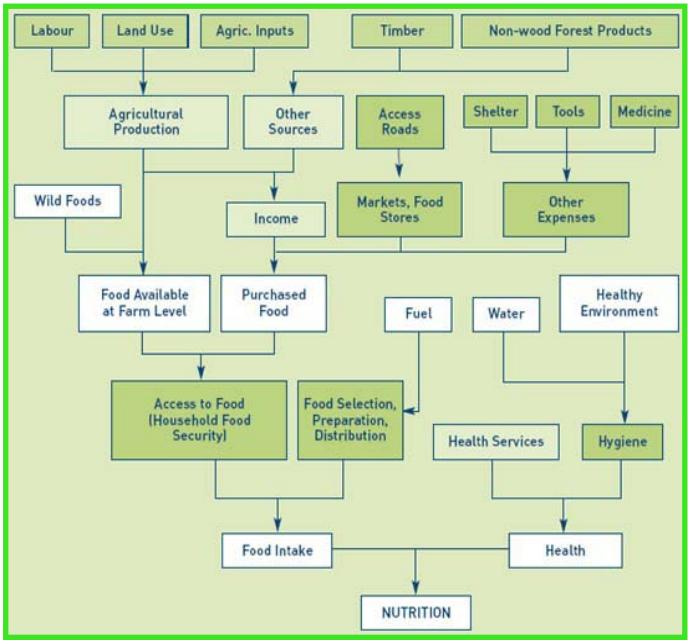


Fig. 2.12: Factors affecting food security and nutrition. (Source: FAO, unknown)



Fig. 2.13: Spraying of pesticides on a farm. (Source: All Green To Me, 2009)



Fig. 2.14: Spraying fertiliser on a farm. It is concerning that a mask is necessary. (Source: Firstpost, 2012)

al production is already challenged. The poor, those most likely to experience malnutrition, are likely to suffer further (Dow et al., 2006: 58). Globally, more than 925million people do not have enough food to eat (Hunger Notes, 2012). In South Africa approximately 5½million people (11%) suffer from hunger often or always (Altman et al., 2009: 11), and 33% of the population are at risk of hunger (Labadarios et al., 2009). South Africa is expected to see a decrease in cereal yields of over 50% by 2080 (Dow et al., 2006: 58). More than 30% of seriously hungry households live in a few urban districts, namely, Cape Town, Ekurhuleni and Johannesburg (Altman et al., 2009: 16).

A significant number of people in South Africa may be considered resource poor and therefore food insecure although South Africa is considered to be food self-sufficient (Bonti-Ankomah, 2001: 3). Income security is an essential ingredient to address food insecurity (Altman et al., 2009: 7). Food security means adequate nutrition, access to food, the ability to sustain a healthy and productive life, and low cost food systems (Beery, 2012). People's access to food is largely dependent on their ability to earn an income. "It is essential that creative and meaningful solutions are found to drawing marginalised work-seekers into economic participation as part of a long term poverty reduction and food security strategy" (Altman et al., 2009: 7). The majority of unemployed are black African women, and working women tend to earn less than men (Altman et al., 2009: 23). About one third of young women have HIV, which means their nutritional needs must be urgently met if they are to actively participate as mothers and breadwinners (Altman et al., 2009: 23).

HIV and AIDS exacerbate food insecurity by acting as a long-term stressor that typically affects the economically active household members. It directly reduces their ability to seek employment or remain employed, thus negatively affecting household income and the means to purchase food (Altman et al., 2009: 24). Afflicted people may be ostracised with the result that they and/or their families' food security status is negatively affected as social support networks fail to function (Altman et al., 2009: 24). Antiretroviral therapy may increase the appetite of the patient and result in other members of the household consuming less food, thereby worsening an already precarious situation (Altman et al., 2009: 24).

> Hunger and under-nutrition are both outcomes of inadequate food intake but their meanings differ. Hunger is commonly associated with 'not eating enough food'. Under-nutrition, on the other hand, refers to the lack of sufficient micro-nutrients such as key vitamins, iron, and zinc. In children, a severe and/or chronic lack of adequate nutrition can manifest in underweight and stunting. Outcomes can include irreversible changes in child development: poor cognitive development, weak educational performance, increased risk of morbidity and impaired immune functions. (Altman et al., 2009: 13)

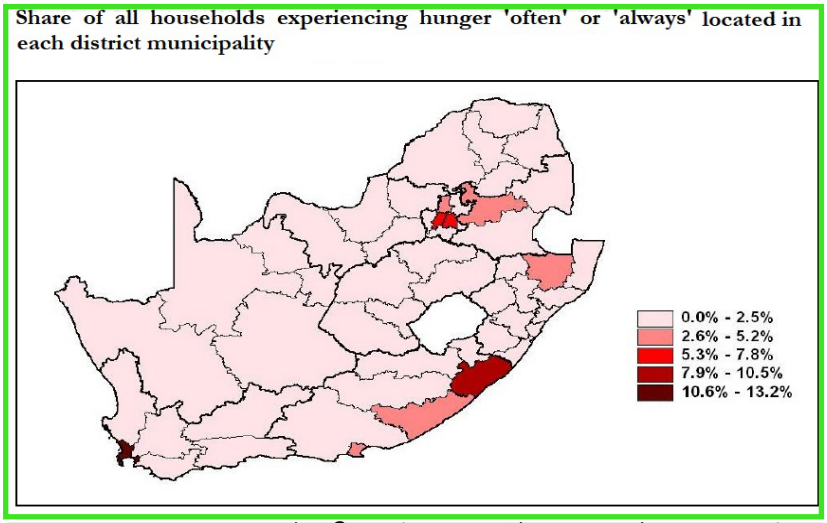


Fig. 2.15: Hunger in South Africa. (Source: Altman et al., 2009: 16)

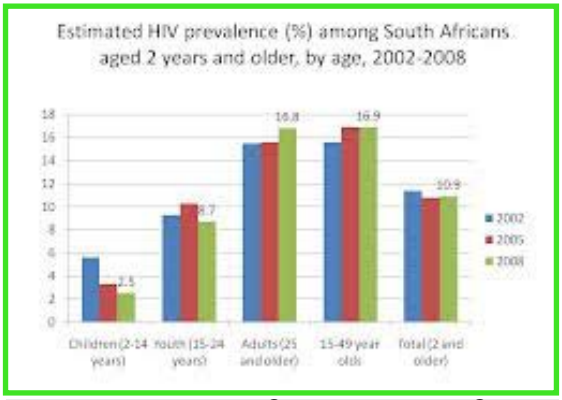


Fig. 2.16: Prevalence of AIDS in South Africa. (Source: South Africa for Dummies, unknown)

Within the urban context of Johannesburg, about 70% of people purchase their food from informal traders (Beery, 2012). Furthermore, most of the food that is distributed throughout Johannesburg is delivered to the Johannesburg Fresh Produce Market by rural farmers. According to the De Villiers Agency at the market informal traders comprise about 30% of the sales at this market.

Jacobs (2009) finds that approximately 80% of households could not afford to buy a basic nutritional basket of food costing an average of R 262 per person per month (at 2005 prices). One in four urban households spend enough on food to afford a nutritionally adequate food basket (Altman et al., 2009: 13). Over 50% of seriously hungry people could be reached by focusing intervention in the three densely populated urban areas of Cape Town, Ekurhuleni and Johannesburg (Altman et al., 2009: 16). Altman et al. (2009: 19) further say:

> Based on the available evidence, which is incomplete, the addition of urban agriculture to household food security could be as low as 33% and as high as 80%. In South Africa, the pace of urbanization is not expected to slow down. How this rising population of city dwellers access nutritionally adequate food is bound to become a major concern. Investigating the potential of urban farming to address food insecurity around the cities must be on the food policy agenda.

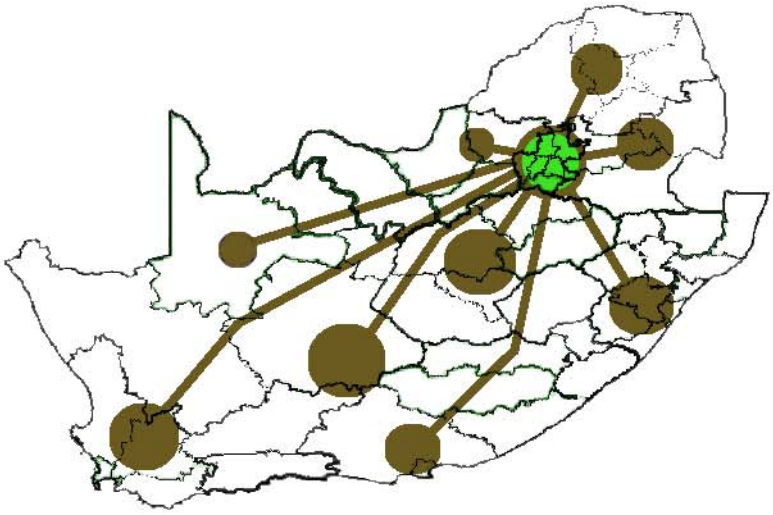
Lowering the cost of food and better consumer education should enable households to consume more diverse and nutritionally adequate foods. (Altman et al., 2009: 6)

Urban agriculture is done mainly by middle-aged and elderly women and is limited to the production of crops in home gardens, open urban spaces and group gardens (Altman et al., 2009:24). Thus, urban agricultural interventions should aim especially to address the needs of women. Interventions may serve different functions to assist in socialisation and the building of social networks; this is extremely valuable for the women involved in these projects (Altman et al., 2009:24), particularly so if they are infected with HIV and suffer breakdowns in their social networks.

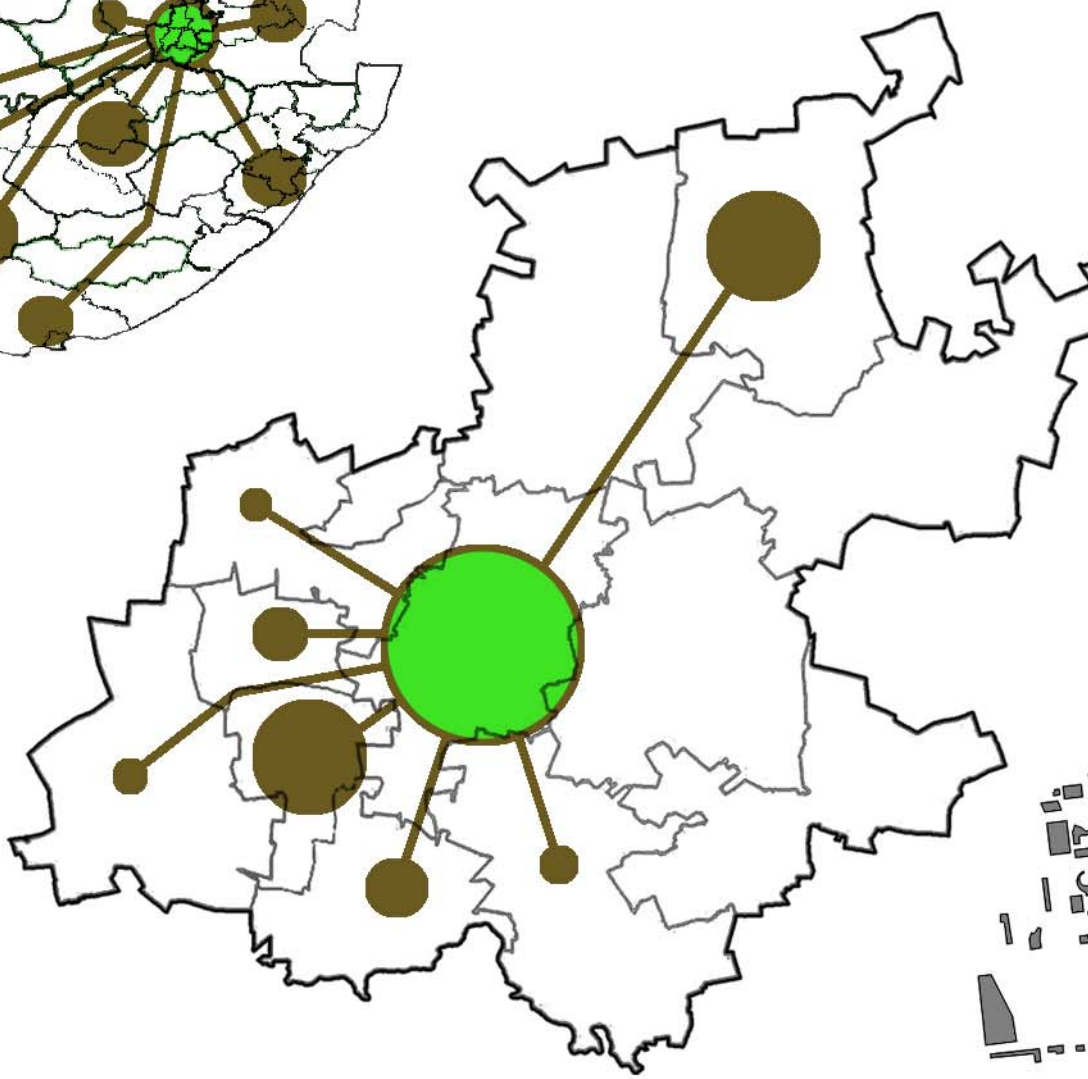
What follows on the next few pages is a study on the production, supply, and distribution of food in Johannesburg.



Fig. 2.17: Food in Johannesburg. Metro Mall is to the left, an innovation for growing food out of recycled paint cans found near the Neighbourgoods Market in Braamfontein is in the middle, and Joubert Park is on the right. (Source: author, 2012)



South Africa



Gauteng



Western Cape
- grapes
- deciduous fruit
- wheat
- citrus
- mixed farming

Northern Cape
- citrus
- grazing
- mixed farming

Eastern Cape
- deciduous fruit
- citrus
- subtropical fruit
- grazing
- mixed farming

North West
- maize
- grazing
- mixed farming

Kwa-Zulu Natal
- sugar cane
- citrus
- subtropical fruit
- grazing
- mixed farming

Mpumulanga
- maize
- deciduous fruit
- citrus
- subtropical fruit

Free State
- maize
- deciduous fruit

Limpopo
- citrus
- subtropical fruit
- grazing
- mixed farming

Gauteng
- deciduous fruit
- mixed farming (very little agriculture)

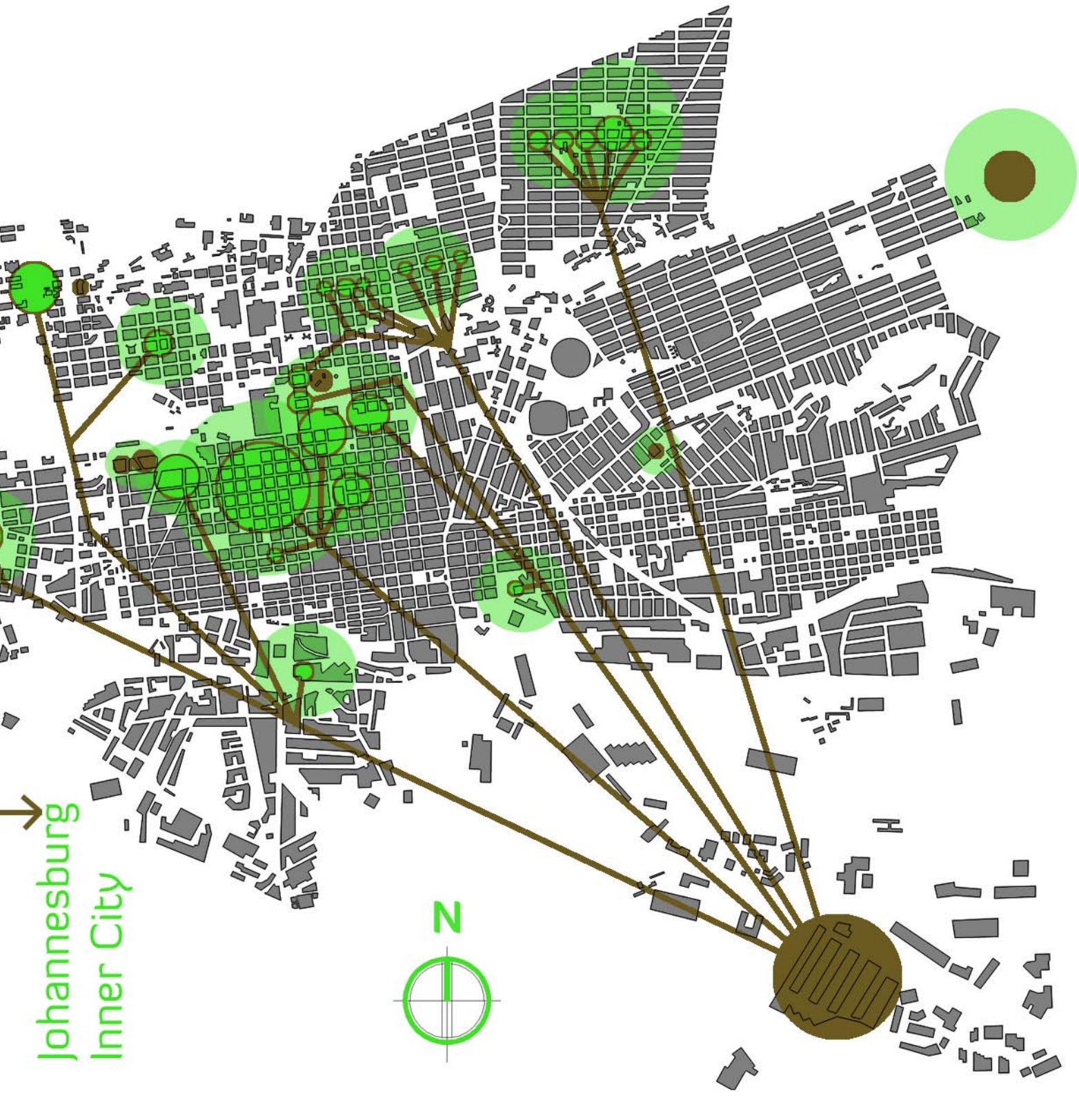
- Food Production/ Distribution Points
- Food Destination Points
- Radius of Influence on Pedestrians

Food Production and Distribution

South Africa has a well developed farming sector, segmented into commercial farming and subsistence farming. About 12% of the country can be used for crop production. High-potential arable land comprises only 22% of total arable land - the rest is under irrigation.

The agro-industrial sector comprises about 12% of GDP.
Major import products include wheat, rice, vegetable oils and poultry meat.
In 2007, the producer price of field crops rose by 41,9%.
The livestock sector contributes up to 49% of agricultural output.

Source: www.southafrica.co.za



Types of Food Retail in Johanesburg

In Johannesburg inner city the primary form of food retail is informal trade. This is facilitated and managed by the Metropolitan Trading Company. Building structures house markets such as Yeovile, Faraday, Metro Mall, and Kwa Mai Mai. The Kerk Street market is sheltered only by a canopy.

Health begins and ends with nutrition. The people needing food the most are those with ill-health, therefore it is necessary to also note where the medical clinics, hospitals and health centres are.



Metro Mall



Oriental Plaza



Kerk Street



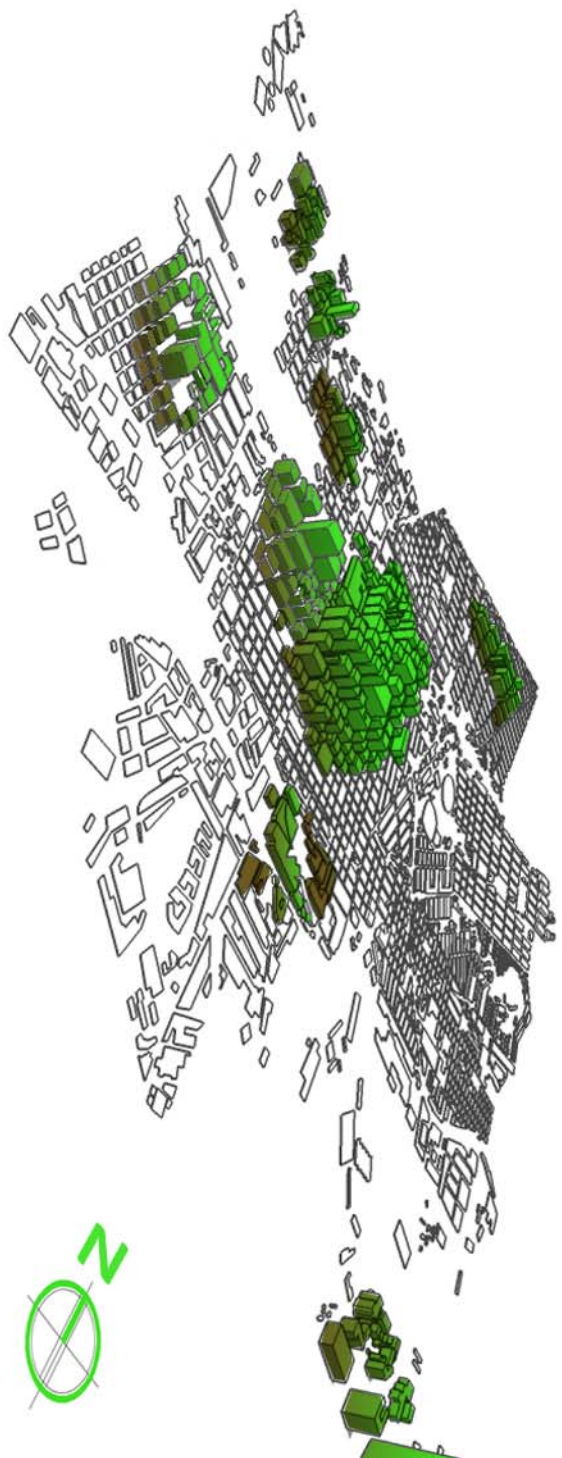


Faraday Market

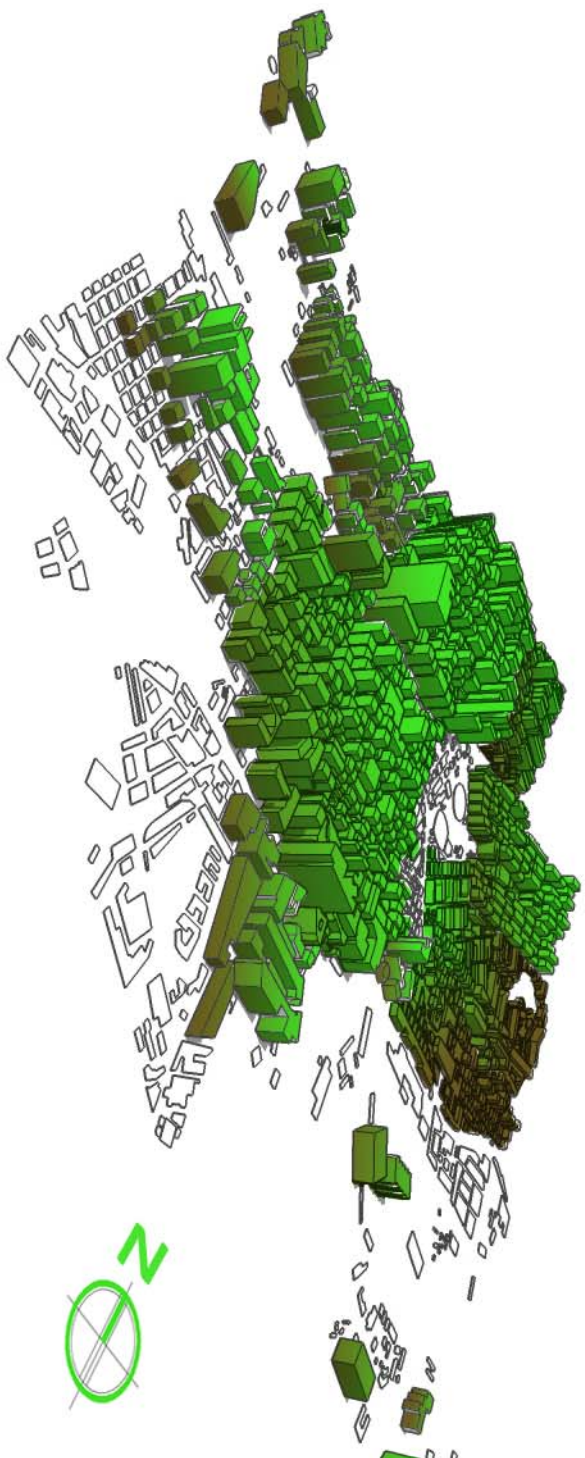
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Fresh Produce Market
Informal food trade
Micro food retail
Restaurants/fast foods
Food gardens/soup kitchens
Traditional medicine markets
Health clinics/institutes
Johannesburg Fresh Produce Market
Informal market near
Joubert Park
Yeoville Market

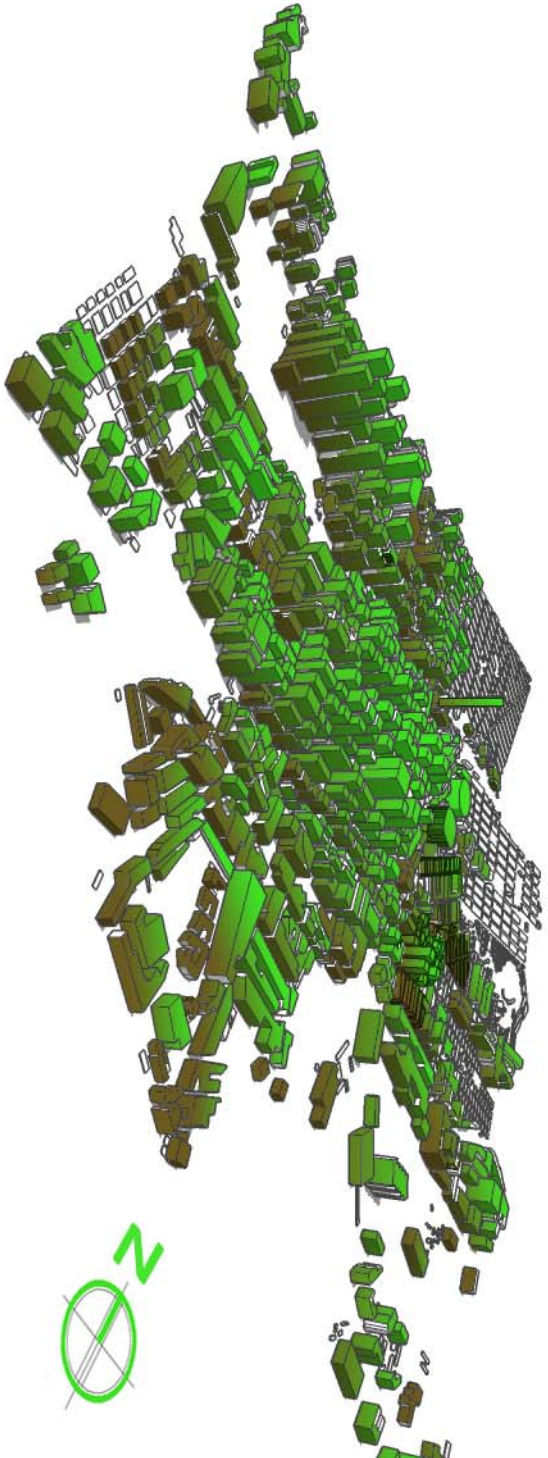
Food topography



Population topography



Building topography



Comparison of Inner City Densities



The buildings of the inner city are quite dense in the centre of the city and Braamfontein. To the west (Fordsburg and Mayfair) and south (Faraday, City Deep and Jeppe) the buildings are medium density. Yeoville and the Bezuidenhout areas are suburban in scale.



North Elevation



West Elevation



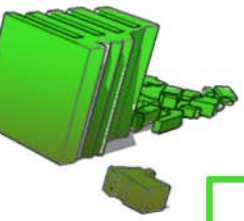
The population density of people living and working in the city generally follows the topography of the buildings, except in the south where there are few people, and in Hillbrow and Yeoville the density of population denies the low-rise scale of the buildings. Areas of greatest density are places where lots of people pass through such as Park Station and other transport nodes.



North Elevation



West Elevation



The density of food retail and distribution shows a completely different topography to that of the buildings and population. The peaks taper down according to proximity to food. The highest peak of food is the Fresh Produce Market to the south east of the city. Other dense areas of food are Kerk Street right in the centre, and Metro Mall near the Shunting Yards. Various other well established markets provide food to certain areas. Large parts of the city are not in close proximity to any food retail or production.



North Elevation



West Elevation

Urban agriculture is something that can be done as a separate practice to commercial monoculture, and not as an attempt to replace it. Global food security is at an all-time low (Flannery, 2009: 3) so it would be unwise to take away the food infrastructure that we do have, no matter how inefficient it may be. Trying to change those systems is another mammoth task on its own. Food insecurity and hunger among people prove that the current agricultural methods simply are not enough. As the city grows agricultural lands shrink and forests are cut down to allow for more farming. Eventually the last truffula tree in Thneed-ville could be felled. But if the city becomes a place of produce additionally to rural areas then the area for growing food increases without being further constricted by the city. Fifty years ago, there were approximately 2.5 acres of arable land for every person on earth, but by the middle of this century, there will be just half an acre of arable land per head (Flannery, 2009: 97). Unless we find ways to use that land sustainably and creatively, humanity has no future (Flannery, 2009: 97).

We are facing several crises at once: declining oil reserves, water shortages, ever more perilous food security, and, of course, climate change (Flannery, 2009: 65). Survival in the twenty-first century could depend on ways that address these issues simultaneously. Climate change and the failing of our food systems are not only serious and depressing issues, but an opportunity for doing something new and worthwhile. It is an opportunity for positive intervention and a positive thriving change in the culture of today. As the climate changes, people will be forced to adapt (Dow et al., 2006: 84). If done adaptively and sustainably, urban agriculture could optimistically allow for an ever increasing area of food production at the same rate as urban expansion.

"It is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change."
- Charles Darwin



Fig. 2.18: No more truffula trees in Thneed-ville. (Source: Dr. Seuss, 1971)



Fig. 2.19: Time for change. (Source: Idea Champions, 2012)

Sowing the Seeds of Change

Household food security is defined as access by all households at all times to adequate safe and nutritious food for a healthy and productive life (Bonti-Ankomah, 2001: 2). Food security can thus be said to have two components: ability to be self-sufficient in food production through own production, and accessibility to markets and ability to purchase food items (Bonti-Ankomah, 2001: 2).

An improved system of social protection that stabilises food consumption is needed. Some aspects of a social protection system involves ensuring receipt of social grants where households qualify, strategies to reduce and/or stabilise food prices, education for poor families to better plan their food purchases, and food gardens and "soup kitchens" (Altman et al., 2009: 26). Lowering the cost of food and better consumer education should enable households to consume more diverse and nutritionally adequate foods (Altman et al., 2009: 26). More context-specific support is required to strengthen own production of food, ideally low-cost, low-input and of high nutritional value (Altman et al., 2009:24). The healthier the individuals in a society are, the better it is for the economy.

Not surprisingly, studies have shown that chemical farming uses considerably more energy per unit of production than organic farms, which do not use these chemical inputs (Suzuki, 2012). These inputs increase the cost of food. In addition, the use of synthetic nitrogen fertilizers in soils produces nitrous oxide, a greenhouse gas that is approximately 300 times more powerful than carbon dioxide at trapping heat in the atmosphere (Suzuki 2012). Organic farms, on the other hand — which rely on natural manure and compost for fertilizer — store much more carbon in the soil, keeping it out of the atmosphere (Suzuki, 2012). Decentralised and diverse production of food is also better for food security in the face of disaster, building resilience to loss.

As for social change, immersion in nature has shown through scientific study to be a very effective stress reliever. It is not altogether a new science, having its roots in traditions like Buddhism, Romanticism and Transcendentalism (Smith, 2010: 36). During the time of the industrial revolution, the late 19th and early 20th centuries, the notion of unspoilt nature as a mental healer was fuelled on by the "rapid expansion of cities and growing concerns that the industrial revolution, with its dimly lit, poorly ventilated workplaces and overcrowded residences, was contributing to mental stress" (Selhub et al., 2012: 11) — stress is linked to ill-health, exacerbating the body's weaknesses. This time period, incidentally, is when Johannesburg (among other major cities) was in boom, growing into Thneed-ville. As shown above, the effects of Thneed-ville are distressingly negative in many ways. Hence there is a need to reintroduce nature — that which has been largely banished from Thneed-ville — to the urban fabric, and reconnect people with it through something known as biophilia, which will be discussed in more detail in the next chapter.

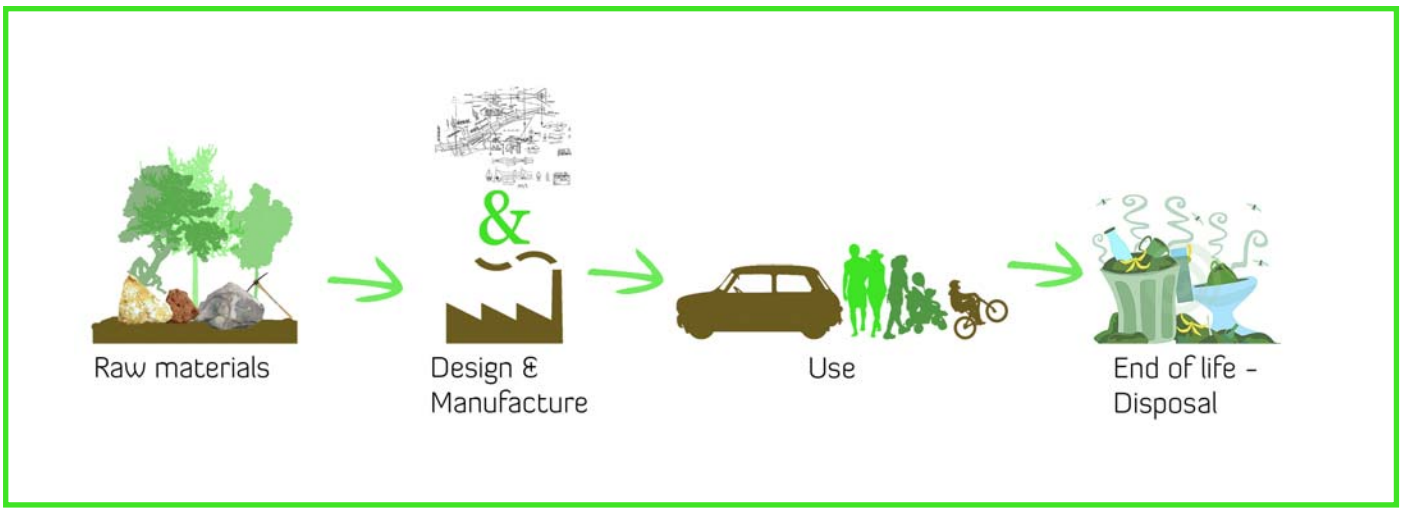


Fig. 2.20: Current linear flow of resources and materials. (Source: author, 2012)

What may benefit urban dwellers is a public green haven in the city, coupled with being able to produce their own food (or at least see their food being produced); a place where people can go to learn about food, nutrition and health; an appreciation for the elements that are vital to our survival. Without trees we cannot inhabit the earth. Without trees we rapidly create deserts and droughts, and the evidence for this is before our eyes. Without trees, the atmosphere will alter its composition, and life support systems will fail (Mollison, 1988: 138). This leads to an environmentally friendly and restorative model of future food growth and development growth, which can grow into a thriving interconnected system with our precious and life-giving resources.

...in nature "is the preservation of the world." — Henry David Thoreau

Thus it is necessary to learn from nature, which is in a constant state of dynamic non-equilibrium, but always alive! It is necessary to learn from life itself on how to live and build and grow. Nature is alive, it is the way things work on this planet, it is the entire system of all living things on earth. And in this system there is no such thing as waste. Indeed not even such as thing as death, for when something dies it is not the end of it but the beginning of something else, for what "dies" becomes fuel and food other life forms.

Hence I seek to make use of the dead and left-over spaces of the city and to learn from nature through biomimicry in order to reconnect people with life's systems. The goal is quality of life achieved through growth, and growth informed by life. Adaptability is important, since nature adapts through feedback loops. While the city as a whole changes and grows it does not adapt, it does not respond to the signals that affect it. The people in the city change and grow; the area it occupies changes and grows; the economics change and grow; but individual buildings remain the same, limiting the adaptability of the city. But they are stagnant entities trying to house dynamic life and they do not change or allow for change unless they are demolished or completely redeveloped. Architecture is that which creates the structures and playgrounds wherein people live their lives. Perhaps an architecture that can adapt and be flexible, one that grows, will lead to better quality of life.

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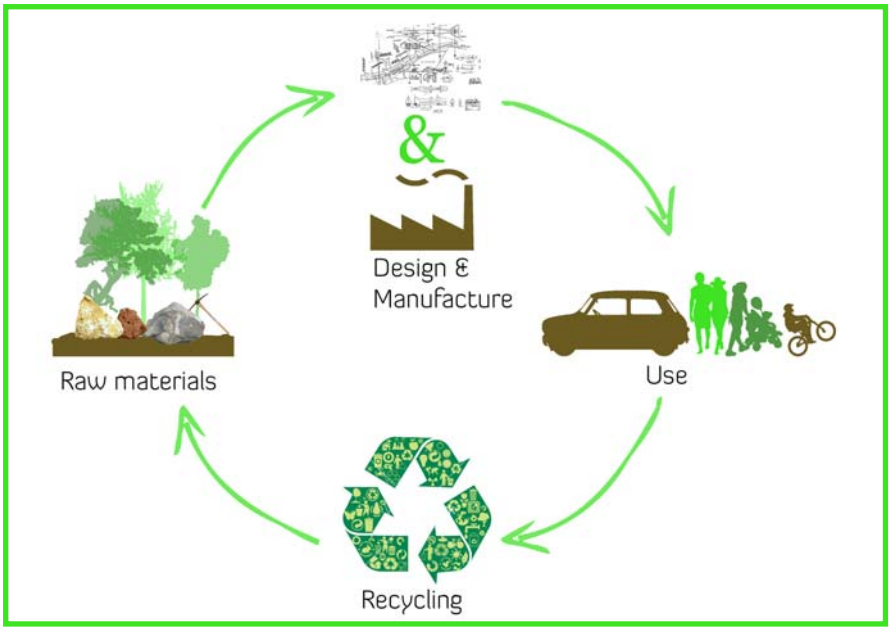


Fig. 2.21: Desired cyclical flow of materials and resources. Note that there is no garbage or disposal stage in the loop. This is because, as in nature, there is no such thing as death - only fuel for future life. This follows the cradle-to-cradle principle as described in William McDonough's and Michael Braungart's book Cradle to Cradle. (Source: author, 2012)