



**Title: Durban Climate Change Strategy
Food Security Theme Report: Draft for Public Comment**

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The Durban Climate Change Strategy (DCCS) project is funded and lead by the Environmental Planning and Climate Protection Department (EPCPD) and the Energy Office (EO) of eThekweni Municipality.

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Contents

Introduction.....	1
Section One: Current Status of Food Security.....	2
Defining food security and food systems.....	2
Food Security and Climate Change.....	3
Status Quo in Durban regarding Food Security.....	4
Section Two: Key Climate Change Challenges for Food Security Theme in Durban	5
Section Three: Vision and Aims for Food Security and Climate Change	6
Section Four: Food Security Strategies to achieve the aims.....	7

Introduction

The Environmental Planning and Climate Protection Department (EPCPD) and the Energy Office (EO) of eThekweni Municipality have commissioned Urban Earth, in association with FutureWorks!, to develop a city-wide climate change adaptation and mitigation strategy for Durban¹ through an inclusive and participatory process entitled the Durban Climate Change Strategy (DCCS).

During the initial consultation phases of the project seven key themes were identified for the strategy:

1. Biodiversity
2. Health
3. Food Security
4. Water
5. Sustainable Energy
6. Transport
7. Waste and Pollution

Separate public workshops were hosted for each theme to secure stakeholder input on the aims and strategies for each of the themes which will form the basis for the final content of the Durban Climate Change Strategy. In addition seven technical experts were procured by EPCPD and EO to provide expert technical advice on each of themes.

Section one and two of this report provides a summary of the food security and climate change context for Durban based on an introductory technical report from technical experts Warren and Renate van Niekerk from Africa Wide Consulting. The introductory technical report is available for download on the [DCCS website](#). Sections three and four, which outline a vision, aim and strategies for the food security theme, are based on both the input provided by stakeholders at the food security theme working group meeting held on 21 November 2013 and recommendations by technical experts Warren and Renate van Niekerk. The minutes of the working group meeting can be found in Appendix One of this document.

Interested stakeholders are invited to submit [online comments](#) on the report. Comments will be presented at a follow up food security theme meeting for stakeholders that will be held in 2014. Following that meeting amendments will be made to the theme report. The food security theme report will then be combined with the reports from other themes to form a draft climate change strategy document that will also be distributed for comment.

¹Including the eThekweni Municipal Area.

Section One: Current Status of Food Security

Defining food security and food systems

A widely accepted definition of food security was developed at the World Food Summit in 1996. It states that:

“Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life”

This definition reinforces the multidimensional nature of food security as described by the FAO’s food security policy guideline (FAO, 2006) and includes:

Food availability: The availability of sufficient quantities of food of appropriate quality, supplied through domestic production or imports (including food aid).

Food access: Access by individuals to adequate resources (entitlements) for acquiring appropriate foods for a nutritious diet.

Utilization: Utilization of food through adequate diet, clean water, sanitation and health care to reach a state of nutritional well-being.

Stability: Access to adequate food at all times. Sudden shocks (e.g. economic or climatic crisis) or cyclical events (e.g. drought) impact on food security stability.

The International Food Policy Research Institute (IFPRI) brings in the concept of sustainability in food security which is particularly relevant considering climate change. IFPRI’s 2020 Vision is a world where every person has access to sufficient food to sustain a healthy and productive life, where malnutrition is absent, and where food originates from efficient, effective, and low-cost food systems that are compatible with sustainable use of natural resources.

The African Food Security Urban Network (AFSUN) conducted a 6500 household baseline survey in low income areas of eleven Southern African cities in nine countries in 2008 to determine how the urban poor access food (Frayne *et al.*, 2010). The measures used to assess food security were: the Household Food Insecurity Access Scale (HFIAS), Dietary Diversity (HDDS) and Months of Inadequate Household Food Provisioning (MIHFP). 77% of households were found to be moderately or severely food insecure. They also found that poor households spend on average 49.6% of their monthly income on food, indicating that urban food insecurity is a major issue in Southern African cities. South Africa is becoming urbanized at rates never experienced before and this does not bode well for urban poverty and food insecurity (Van der Merwe, 2011).

Food systems are described as dynamic interactions between and within the bio-geophysical and human environments that lead to the production, processing, preparation and consumption of food (Ziervogel and Ericksen, 2010). The dimensions and complexities

involved in food security and food systems are illustrated in Figure 1 and indicate that food security cannot be divorced from global, regional, national and municipal context. It furthermore brings in the concepts of food quality and preference. The consumption of a variety of nutrient-rich food is especially important in the light of the Aids pandemic in South Africa (Crush et al., 2010).

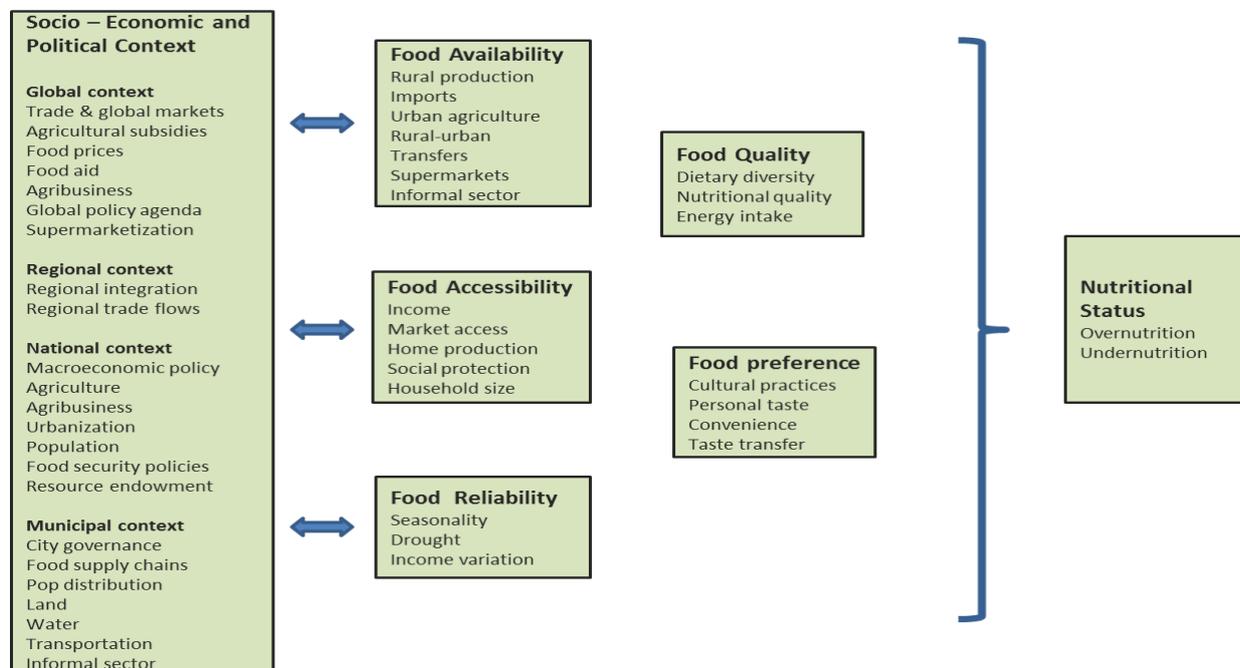


Figure 1 The dimensions of urban and rural food security (adapted from Frayne et al., 2010)

Food Security and Climate Change

Climate change is predicted to cause a 3-4°C temperature rise and an increase in severe weather events in Durban (Naidu, Hounscome and Iyer, 2006). Climate change is expected to negatively affect existing levels of urban food security and these are likely to fall disproportionately on the poor (Ziervogel and Frayne, 2011). The focus on climate change impacts on food security has been primarily on food availability and production (Ziervogel and Ericksen, 2010). It is however important to consider the effects of climate change on food access, utilization and stability (Table 1)

Table 1 Potential Impacts of Climate Change on Food Systems and Food Security (adapted from Ziervogel and Frayne, 2011; Ziervogel and Ericksen, 2010 and FAO 2008,)

Climate Change Scenario: Increase in Temperature	
Food System Impacts	Food Security Impacts
<p><i>Food Production:</i></p> <ul style="list-style-type: none"> • Shift in agro-ecological zones • Change in crops grown per area • Decrease in yield due to heat stress • Increased weed pressure • Increased disease pressure • Heat stress impact on animal productivity • Reduction in fish number (coastal) 	<p><i>Food availability:</i></p> <ul style="list-style-type: none"> • Overall decrease in food supply • Shorter shelf life for perishable products reduces availability <p><i>Food accessibility:</i></p> <ul style="list-style-type: none"> • Reduced availability leads to increase in food prices which would make food less affordable, particularly for urban populations <p><i>Food utilization:</i></p>

<p><i>Food Processing:</i></p> <ul style="list-style-type: none"> • Increased need for cooling of perishable products • Change in postharvest losses <p><i>Food Distribution:</i></p> <ul style="list-style-type: none"> • Shorter shelf life of perishables • Improved refrigeration needed <p><i>Food Consumption:</i></p> <ul style="list-style-type: none"> • Food perishes quicker, requires more preservation or refrigeration 	<ul style="list-style-type: none"> • Need to eat food sooner with shorter shelf life • Might require more fluid intake • Change in food types consumed <p><i>Food Stability:</i></p> <ul style="list-style-type: none"> • Reduction in stability of food supply due to decreased availability • Potential greater seasonal variation in supply
Climate Change Scenario: Increase in Severe Weather events e.g. storms and floods	
Food System Impacts	Food Security Impacts
<p><i>Food Consumption:</i></p> <ul style="list-style-type: none"> • Change in growing conditions (damaged crops, lower yields; soil erosion) • Impact on livestock health <p><i>Food processing:</i></p> <ul style="list-style-type: none"> • Damaged storage facilities and processing plants <p><i>Food Distribution:</i></p> <ul style="list-style-type: none"> • Damage to transport network <p><i>Food Consumption:</i></p> <ul style="list-style-type: none"> • Food basket composition changed • Increased water-related health risks and cleanliness of food 	<p><i>Food availability:</i></p> <ul style="list-style-type: none"> • Decrease in food availability • Increased need for food aid • Increase in food imports <p><i>Food accessibility:</i></p> <ul style="list-style-type: none"> • Increase in food prices make food less affordable • Food supply chains can be affected, resulting in allocation problems <p><i>Food utilization:</i></p> <ul style="list-style-type: none"> • Food safety problems due to spoilage or emergency rations being used • Preferred foods not available <p><i>Food Stability</i></p> <ul style="list-style-type: none"> • Overall decrease in food stability

Status Quo in Durban regarding Food Security

At present, the data for South African cities relating to food security status at household level is fragmentary and inadequate (Crush and Frayne, 2010) and this is also true for Durban. The The African Food Security Urban Network (AFSUN) survey probably provides the best available data to extrapolate from. The data for a range of food security parameters for the South African cities included in the survey are presented in Table 2

Table 2 A range of food security parameters as assessed by the AFSUN survey (Compiled from Crush and Frayne, 2010a and 2010b)

Food security parameter	Cape Town	Msunduzi	Johannesburg
Mean per capita HH income (US\$/day)	1	1	3
Food purchase as % of HH expenditure	54.8	52.2	49.1
HH Food Insecurity Access Prevalence			
<i>Food secure %</i>	15	7	44
<i>Mildly food insecure %</i>	5	6	14
<i>Moderately food insecure %</i>	12	27	15
<i>Severely Food insecure %</i>	68	60	27
Source used by HH to obtain food (%)			
<i>Supermarket</i>	94	97	96
<i>Small shop / restaurant / take away</i>	75	40	80
<i>Informal market / street food</i>	66	42	85
<i>Home-grown food</i>	5	30	9

<i>Shared meals with other HH</i>	45	18	14
<i>Food provided by other HH</i>	34	21	13
<i>Community food kitchen</i>	6	1	9
Urban agric. as source of income (%)	4	2	0

The AFSUN data presented above and discussed in further detail by Crush and Frayne (2010a and 2010b) and Frayne and co-workers (2010) make the following points clear:

- Four out five households sampled in all 11 cities are food insecure;
- Poor households spend approximately 50% of their monthly income on food;
- There is a temporal dimension to urban food security. Food insecurity is usually highest in January (after Christmas) and during the winter period;
- Dietary diversity is poor, with people eating mostly starch;
- As can be expected, there is a direct correlation between poverty and food insecurity. Statistics South Africa reported an unemployment rate of 30.2% (and a youth unemployment rate of 39%) in 2011 (<http://beta2.statssa.gov.za/>), indicating that food insecurity is likely to be a significant problem;
- Increasing food price increases have negatively impacted four out of five households surveyed;
- Food security has a gender dimension to it, with female centred households the most food insecure;
- Urban agriculture is an important source of food amongst poor households

Section Two: Key Climate Change Challenges for Food Security Theme in Durban

Due to increasing urbanisation and the high poverty rate currently experienced in informal settlements in Durban, food security status should be a concern for the eThekweni Municipality. The compounding effect of climate change as illustrated in **Table 1** will only lead to a reduction in all aspects of food security status, including food availability, access, utilization and stability. The following are key challenges facing Durban (adapted from Ziervogel and Frayne, 2011; Crush and Frayne, 2010a and 2010b; Ziervogel and Frayne, 2011; Ziervogel and Ericksen, 2010; FAO 2008 and DoA, 2002):

- *Rapid urbanization, especially into informal settlements.* Food insecurity in informal settlements is common, and informal living conditions are not ‘robust’ enough to withstand climate change conditions, which leads to a never-ending circle of poor living conditions and food insecurity.
- *High unemployment.* Poor households are characterized by few income-earners, and many dependants, making them vulnerable to food insecurity, and this will only be exacerbated by climate change
- *Support networks and disaster management systems.* Climate change related disasters, such as an increase in storms or floods can substantially threaten food security of households, both from an availability and access perspective. These disasters are

likely to increase in frequency and magnitude as climate change progresses. *Transport network disruption.* Disruption of the transport network during extreme weather events such as storms and floods will negatively influence food aid distribution. If transport infrastructure is not repaired timeously after such an event, it can lead to long-term reduction in food availability.

- *Reduction in agricultural productivity and viability.* Climate change will have a negative impact on current agricultural productivity due to heat stress, increase in disease incidence and soil erosion. This may impact rural as well as urban areas.

Section Three: Vision and Aims for Food Security and Climate Change

The following preliminary vision and aims are proposed for the food security and climate change component of the DCCS:

Vision:

Durban residents have a robust and resilient food security status in terms of availability, access, and utilization of food in the face of climate change

Aims:

1. Durban has robust local food production systems that are able to withstand future climate threats.
2. Durban has adequate food distribution and marketing networks (physical access to food) in place to adapt to climate change.
3. Durban residents have economic access to food in the face of climate change.
4. Durban residents are able to utilize food in the best possible manner in the light of climate change.
5. Durban is prepared for climate related disasters or events and is able to supply its residents with adequate food during these disasters.

Section Four: Food Security Strategies to achieve the aims

Participants in the stakeholder workshop identified a number of strategies that could contribute to achieving the food security vision and aims. These strategies were combined with recommendations from the food security technical experts and have been synthesised to provide the list in the table below. For further background reading on food security and climate change in Durban see the technical introductory report available on the DCCS website

Aim	Proposed Strategies
Durban has robust local food production systems that are able to withstand future climate threats	<ul style="list-style-type: none"> • Promote ecological and sustainable farming practices as an overarching approach • Raise awareness and provide widespread training for farmers and communities on how to farm sustainably using techniques such as crop rotation, companion planting, organic farming, permaculture, roof gardening, permanent crops, open pollinated seeds, and regenerative agricultural planning. • Educate farmers and communities to use water more efficiently through the promotion of rainwater harvesting technologies, retention ponds, catch-pits, drip irrigation and storage during dry periods. • Promote the separation of green and organic waste for composting and mulching which prevents methane generation from organic waste at landfill sites. • Seeds should not be genetically modified and heirloom seed saving should be encouraged. • Cooperation amongst small-scale growers should be encouraged and supported. • There should be a shift from fossil fuel driven monoculture to small scale communal farming. • Indigenous knowledge is drawn upon to produce food in a changing climate. • Urban development projects must include reservation of space for food cultivation and proper utilisation of land • Integrate departments and sectors to work together to develop local policy and laws on agricultural practices that integrates efforts and removes obstacles. • Localise food production and distribution through the preservation of agricultural hubs and small scale local community farming efforts • Research and identify crops that are better suited to new climatic patterns. • Educate communities and farmers on alternative crops that are more suited to Durban’s changing climate. • Identify crops that are pest and disease resilient • Provide access to awareness and education on climate change and its effect on food production and

	consumption especially in the poorest areas
Durban has adequate food distribution and marketing networks in place to adapt to climate change.	<ul style="list-style-type: none"> • Promote the decentralisation of the fresh produce marketing system through a system of distribution hubs that can supply small traders more effectively and efficiently • Establish food markets at transport hubs with local and other farmers supplying local communities • Provide support to informal traders i.e. micro-credit, shade, trading facilities that take account of climate change • Provide localised storage (and refrigeration) facilities for informal food marketers • Using food waste from processing/marketing facilities to provide clean energy (biogas generation) • Use the clean energy to power facilities in a localised manner that is independent of the energy grid
Durban residents have economic access to food in the face of climate change.	<ul style="list-style-type: none"> • Improve people's livelihoods by supporting entrepreneurial activities so that people can earn income and pay for food • Consider paying for certain activities with food coupons that people can trade in at designated food stores/facilities • Promote small business that enhances food security in the face of climate change
Durban residents are able to utilize food in the best possible manner in the light of climate change.	<ul style="list-style-type: none"> • Provide clean, safe drinking water to all communities and residences • Educate people on utilization and preparation of crop types that may be more appropriate for production under changed climatic conditions • Investigate and promote sustainable food preparation and preservation technologies • Provide refrigeration facilities at decentralised marketing hubs where small traders can pay for and store refrigerated food, thereby increasing the shelf life of foods and increasing the overall amount of food in storage • Ongoing education on healthy eating habits (e.g. eating orange rather than white sweet potato which has higher Vitamin A content)
Durban is prepared for climate related disasters or events and is able to supply its residents with adequate food during these disasters	<ul style="list-style-type: none"> • Link with existing food banks and promote more • Consider a system of smaller, localised food banks or fresh produce hubs that are able to effectively supply food locally to extreme weather disaster affected households • Establish emergency rations storage at such facilities • Consider alternative logistics methods for bringing food into the city and surrounding areas and distributing within • Investigate modern emergency ration food preservation

	<p>technologies/suppliers and promote industry around these</p> <ul style="list-style-type: none">• Promote the establishment of a decentralised system of potable water storage throughout the Ethekekwini area• Promote home-based potable water generation technologies
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Appendix One: Food Security Theme Working Group Meeting Minutes

Minutes of meeting held on 21st November 2013.

#	Item	Action
1.	<p>Welcome</p> <p>Margaret McKenzi welcomed stakeholders to the meeting and stated the eThekweni Municipality's Environmental Planning and Climate Protection Department (EPCPD) and eThekweni Municipality's Energy Office (EO) have been contracted out to Urban Earth and FutureWorks! to facilitate the development of the Strategy. Margaret explained that the purpose of the Durban Climate Change Strategy (DCCS) project is to develop a Climate Change Strategy document that will provide guidance for the city as a whole, to mitigate against and adapt to climate change. Margaret encouraged stakeholders to participate in the meeting as their comments will be used to identify aims and strategies for the Food Security theme. She then introduced Warren and Renate van Niekerk as the Technical experts to present at this meeting.</p>	
2.	<p>Introductions</p> <p>Amanda Botes provided a brief overview of the process that had been followed by the project up to this point. She explained that the project had been initiated with public consultation where stakeholders were asked to provide input on what should be the key focus areas of the strategy. The results of stakeholder feedback were then presented at a Reference Group meeting. The Reference Group was made up of a group of people who volunteered from different sectors to provide guidance to the strategy development process. Following advice from the Reference Group seven key themes were identified for the strategy:</p> <ol style="list-style-type: none"> 1. Biodiversity 2. Health 3. Food Security 4. Water 5. Sustainable Energy 	

	<p>6. Transport</p> <p>7. Waste and Pollution</p> <p>Amanda explained that the DCCS project was in the process of hosting public working group meetings on each of the seven themes to develop aims and strategies for each of the themes. Seven technical experts have been procured by EPCPD and EO and will provide expert technical advice on each of themes. Amanda added that a second round of working group meetings will be held in the new year where stakeholders will get an opportunity to comment on the written theme report and add additional content. She explained that the strategy document then will be adopted by council.</p> <p>Amanda stated that the Food Security working group meeting was the last of the seven theme working group meetings to be held and introduced Warren and Renate van Niekerk as the technical expert responsible for providing advice on the Food Security theme.</p> <p>Amanda described the next steps in the new year.</p>	
<p>3.</p>	<p>Presentation</p> <p>Warren and Renate van Niekerk presented a summary of the Introductory Report for the Food Security Theme and focused on the following aspects:</p> <ul style="list-style-type: none"> • Definition of food security and food systems • The multi-dimensional nature of food and general facts • Food security and climate change • Climate change scenarios (food systems and security impacts) due to the increase in temperatures • Status quo of food security in Durban • The key food security challenges facing Durban • Strategies in Durban • Global strategies • Potential examples of climate change policy that can improve food security 	

	<p>The Food Security Presentation and Technical Report can be downloaded from the DCCS Website.</p>	
<p>4.</p>	<p>Comments and Questions</p> <p>The floor was then opened where stakeholders were invited to ask questions. The following issues were raised by stakeholders during discussion and responses made by the technical expert and eThekwini Municipality officials.</p> <p>The issue of where the food in Durban comes from was raised. It was said that there is a lot of food brought in and the eThekwini Municipality should look at where to access food from.</p> <p>An issue was raised that the Agricultural Unit has drawn up a document with strategies from which to draw from with regards to mitigating against climate change through carbon sequestration and that should be looked at.</p> <p>Another issue raised was that there are four food security departments working in isolation of each other when they should be working together.</p> <p>It was also said that the eThekwini Municipality needs to have a food policy and enforce legislation around food security.</p> <p>The point was made that the dry bulb temperature has increased and climate change is already happening so we need to start thinking fast and taking action now. It was said the DCCS is a practical discussion that will result in doing something.</p> <p>Another issue raised was that some organic committees are just talk shops and that sectors must work together.</p> <p>Other issues raised were that all food production is based on fossil fuel use and that the government must be accountable to reduce the damage caused to the environment. It was said that monoculture farming has destroyed the environment and that farming techniques not based on fossil fuel and not using GM seed use is needed.</p>	
<p>5.</p>	<p>Group Discussion</p> <p>Margaret McKenzie asked stakeholders to form groups of four people each. Groups were allowed 20 minutes for identifying strategies to address the key issues relating to Food Security and climate change, and five minutes to capture these strategies on key cards. The stakeholders were given flip chart sheets to record their discussions (See Appendix B) prior to noting</p>	

their top three strategies on key cards.

A representative of each group was then asked to present their group's top three strategies.

The various strategies proposed by the groups are presented below. They have been grouped into common areas:

Educate and train farmers

- Community training
 - Agriculture
 - New food introduction / prep
- Access to education and awareness on climate change in poorer areas but more information on climate change to the general public
- Awareness and training (*there's no point in growing things if you don't know how to*)
 - How to farm sustainably
 - Key line / regenerative agricultural planning
 - Sustainable approach

Support permaculture farming

- Support wide spread permaculture training (*Permaculture from the top down and down up*)
- Permaculture and organic farming in planning process

Promote sustainable farming

- Ecological and sustainable farming practice (*Overarching approach – everything must be sustainable*)
- Seeds sovereignty (*keep air loom seeds and keep biodiversity*)
- Separate green and organic waste
 - Compost, mulch, vermin compost reduces landfill, carbon dioxide and methane

	<ul style="list-style-type: none"> • Rainwater harvesting (<i>Without water we don't grow things</i>) <ul style="list-style-type: none"> ○ Retention ponds, swales and catch-pits • Efficient water storage and access <p>Improve management of food production</p> <ul style="list-style-type: none"> • Develop food security policy that integrates efforts and removes obstacles • Localised agricultural hubs (<i>food is coming from far off places</i>) • Strategy to localise food productions and distribution <ul style="list-style-type: none"> ○ Not destroy existing productive communities - like the airport farmers • Promote small scale and local production • Linking foods supply to transport hubs and promoting localisation 	
<p>6.</p>	<p>Discussion</p> <p>Margaret opened the floor for a final round of questions and comments to allow stakeholders the opportunity to mention any areas that had not been covered in the report backs.</p> <p>It was discussed that the eThekweni Municipality is not producing its own food and so reliant on transported food from places such as the Cape and Limpopo. It was asked what the implications of a natural disaster would be to the eThekweni Municipality.</p> <p>The last point made was that a developer in Hammersdale was given permission to build factories on 150ha of land that was originally grasslands. It was pointed out that those areas need to be rehabilitated and used for farming and that we need to plan land spaces to grow food.</p>	
<p>7.</p>	<p>Closure</p> <p>Margaret outlined the process going forward. This included the following:</p> <ul style="list-style-type: none"> • A short theme report summarising the content provided by the groups will be prepared. • The technical specialists, Warren and Renate van Niekerk will review 	

	<p>the report and provide comments and recommendations.</p> <ul style="list-style-type: none"> • The report will then be uploaded on the website and emailed to everyone for further comment. • A follow-up meeting will be held early next year to present the draft strategy and to collect any comments and suggestions on the food security component of the strategy • Information will be collated into a strategy document and will have public participation. <p>Margaret then closed the meeting, thanked everyone for their participation and ideas and thanked Warren and Renate for their input.</p>	
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Annex A: Flip chart sheet discussion notes - Strategies

Group 1

- Production strategies
 - Training in permaculture
 - Rain harvesting
 - Crop rotation
 - Companion planting
 - Access to seeds (non genetically modified) / heirloom
 - Encourage seeds saving
 - Localisation
 - Encourage roof gardens
- Access strategies
 - Establishing food markets at transport hubs
 - Data gathering

Group 2

- Ideas
 - Localisation
 - Targets for eThekweni food production
 - How much land is that
 - Small scale e.g. Cuba = 1ha / farm
 - Communal farming – increase production
 - Scale up – how?
 - Counter soil degradation – food forests
 - Permanent crops

- Open pollinated seed
- Ecological
 - Building on indigenous knowledge
 - Regulations that hinder:
 - Zoning that doesn't allow agriculture in 'park' space
 - Integration between departments
 - No GMO's, away from fossil fuel driven monoculture
 - Water issues
 - Storage in the soil
 - Collecting water
 - Safety of water used e.g. polluted rivers

Group 3

- Permaculture / organic agriculture including food forests
- Local policy and laws on agriculture and types of agriculture
- Reservation of land for agriculture, urban peri-urban and rural proper
 - Proper utilisation of land
 - No removal of current agri-hubs
- Access to education and awareness on climate change in poorer areas and everywhere
- Strategy to localise production and distribution

Group 4

- Localised agricultural hubs to sell within local communities - excess transported to other areas nearby
- Community training in good agricultural practice
- Look to countries e.g. Israel/Cuba for water scarce efficient farming
- Best plant storage is in ground-grow in city spaces
- Identify crops best suited to new climate patterns
- Water: use water more efficiently
 - Harvesting systems
 - Storage for dry periods
 - Drip irrigation
- Pest and disease resilient crops
- Urban development projects must include space for food cultivation

Group 5

Sustainable approach

- Rainwater harvesting
 - Retention ponds, swales and catch-pits
- Keyline rainwater harvesting
 - Rain water harvesting (slow, spread, sink) versus storm-water approach (pave, pipe, pollute)
- Separate green and organic waste
 - Compost, mulch – reduces landfill, carbon dioxide and methane
 - Vermicomposting
- Awareness and training
 - How to farm sustainably