An investigation of the role of food democracy in food security policy and research outcomes in South Africa

by

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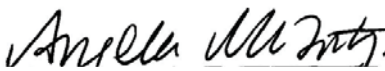
DEDICATION

In recognition of your determination, resilience, spirit, ingenuity and rich heritage, this thesis is dedicated to the rural people who work tirelessly to put food on our tables.

DECLARATION

I, Angela Margret McIntyre, declare that the thesis, which I hereby submit for the degree of Doctor of Philosophy in Rural Development Planning at the University of Pretoria, is my own work and has not been previously submitted by me for a degree at this or any other tertiary institution.

Signed_____  _____ 11 November, 2018

ABSTRACT

Food insecurity in South Africa is framed by historically and spatially entrenched socioeconomic inequality, and driven by shocks and stresses from a globally integrated food system. Although the government has introduced an array of social protection measures on a scale unique among developing countries, and unparalleled in Sub-Saharan Africa, food insecurity and malnutrition are widespread and persistent, manifesting as concurrent underweight and obesity. Over the years, efforts to better characterise and understand South Africa's food security situation have generated data and information that quantify problems and reveal broad patterns of deprivation. However, these studies offer few insights into local food environments or the interactions of people with the food system. Policy processes have been neither inclusive nor consultative, stalling progress towards the fulfilment of the constitutional right to food. The purpose of this research is to explore current policies and policymaking processes with reference to South Africa's poorest rural communities using a food democracy-informed approach. The study is informed by a review of multidisciplinary literature on food security and nutrition policy, social history and current global food politics. Field research and community consultations investigated three specific objectives. The first specific objective set out to explore the potential for structural transformation in policy and the role of food insecure citizens in food security policy processes, using a narrative analysis of the 2014 Household Food and Nutrition Security Strategy for South Africa. The second specific objective explored the food consumption patterns of rural households in four of the poorest communities in South Africa. The study drew on a formal survey as part of a larger commissioned team project and extended the insight from this quantitative data through fieldwork to gather qualitative data. The second objective involved further analysis of the data using a framework of food citizenship to understand the agency of rural poor people in shaping local food systems. For the third objective, the project data were then subject to participatory validation and interpretation with the communities to explore the potential of knowledge co-creation with food security policy stakeholders.

Together, the findings of these three components of the study demonstrated why research and policymaking should be more inclusive and representative of the most food insecure. The policy review revealed that, although the state recognises the need for structural changes, the parameters are constrained and processes are unclear, while citizens are viewed not as stakeholders but instead as welfare beneficiaries, charity recipients, and passive consumers. Analysis in the second objective showed that, in spite of many obstacles and challenges, poor rural people are active agents in shaping local food systems. For the third objective, the fieldwork and participatory data validation and interpretation showed the potential of co-creation of knowledge with communities to enrich understandings of food insecurity, while potentially also contributing to solutions to rural food security and nutrition problems. The study concluded that prevailing policy approaches miss opportunities to create transformation through more inclusive processes, which would help the country progress towards the fulfilment of the right to food. Relying solely on quantitative data limits the transformative potential of engagement. Even multidisciplinary food security and nutrition data can be further enriched through knowledge co-creation with communities. As multi-faceted stakeholders with multiple roles as food producers, consumers, workers and entrepreneurs and social protection beneficiaries, community members have the capacity to actively negotiate local food environments and shifting social and economic situations. Rural people are both entitled to, and necessary to inclusive policy making, research and problem-solving. Food democracy has an important role in food security policy and research and should be informing approaches to both.

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Chapter 1 – Introduction

1.1 Introduction

The 21st century is witnessing the emergence of a seemingly contradictory phenomenon in Sub-Saharan Africa in the concurrence of overweight and undernutrition. While this is broadly understood to be the outcome of global economic, agricultural and food supply changes, very little is understood about the pathways of these nutrition outcomes. Even less is known about the ways local food systems contribute to rising levels of obesity and perpetuate high levels of childhood stunting. It is rare to find references to overweight or obesity in African policy instruments. In most policies, a conventional food security lens defines approaches to hunger and malnutrition, although burdens of malnutrition have changed dramatically in just a few decades (Popkin, Adair and Ng, 2012). Top-down policy measures have offered sweeping, but often poorly-targeted social protection measures. These often fall short of reaching social transformation objectives, leaving the structural causes of food insecurity untouched, and missing opportunities to transform local food systems to improve nutrition and food security.

South African food security policy narratives remain constrained and tentative, falling short of articulating a clear model of how many different factors converge to perpetuate hunger and malnutrition (Hendriks, 2013; Drimie, 2016). Little is known about the confluence of climate change impacts, natural resource, and biodiversity depletion, the complex problem of land reform, and the effects of globalisation on food security outcomes. Complexity and uncertainty are compelling reasons to take more multidisciplinary and inclusive approaches to understanding hunger and malnutrition, yet policies remain state-centric, driven from the top and palliative rather than transformative. The South African government is in urgent need of alternative approaches to its food insecurity and malnutrition challenges, negotiating the uncertain terrains of globalisation and climate change, against the historical backdrop of apartheid and deeply entrenched inequalities. Conventional measures aimed at agricultural productivity and market liberalisation have largely bypassed the rural poor, leaving behind intractable food insecurity, the modern, global

public health problem of obesity and the vestiges of third world hunger, as well as malnutrition, expressed as childhood stunting.

By now, it is well accepted that food security and economic growth sometimes take divergent pathways. Besides investments in poverty alleviation, health, water and sanitation, food security is also anchored in transparent, accountable and participatory governance and respect for human rights (Food and Agriculture Organisation of the United Nations (FAO), 2009). It is broadly acknowledged that the agricultural technologies of the past half century, while promoting certain kinds of productivity, have raised many concerns around environmental sustainability and have done little to address the structural inequalities that perpetuate food insecurity (Gómez *et al.*, 2013). Yet the smallholders working within local food systems, who still produce the majority of the world's food, tend to be overlooked by policies and considered obsolete and inevitable casualties of modernisation (Murphy, 2008). Their contributions to household food security and nutrition are often poorly understood, resulting in lost policy opportunities to support and enhance existing capacity (Hendriks et al., forthcoming).

In the wake of the 2008 global food crisis, alternative discourses around food, hunger, and malnutrition have begun to work their way into mainstream policy forums. For activist food movements contesting food systems, conventional food security policy offers only palliative measures, serving to stabilise and perpetuate a regime that is responsible for global hunger (Holt-Giménez and Shattuck, 2011). For some, solutions to hunger and malnutrition can only come about with deep structural reform of the global food system, and rights-based entitlements to land and productive resources (Holt-Giménez and Shattuck, 2011). Others remain staidly committed to the belief that more of the same – freer trade, more open markets, and more sophisticated technology – might eventually result in inclusive economic prosperity (Kerr, 2012; Sage, 2013)

These tensions and contradictions have long been the centre of discussions on global inequalities, but are emerging strongly at the centre of contemporary food policy discourses in both low and high-income countries. These concerns are echoed in public health circles, where the rate at which obesity has risen due to nutrition transitions has outstripped policy reform. Popkin (1993) explains nutrition transition as shifts have occurred in dietary and physical activity patterns. These changes

are reflected in nutritional outcomes, including changes in average stature and body composition. Modern societies seem to be converging on a diet high in saturated fat, sugar, and refined foods and low in fibre, often termed the 'western diet.' Many see this dietary pattern to be associated with high levels of chronic and degenerative diseases and reduced disability-free time.

Through an epidemiological lens, nutrition transition explains how globalising food systems, poor diet quality, and more sedentary activity patterns partly explains rising obesity levels in high, middle, and low income countries. Policymakers are left to grapple with a problem that is challenging us to think differently, not only about food security, but also public health, trade, sovereignty, climate, ecological diversity, and sustainability. What models of governance and what kinds of policies can possibly begin to address such complexity and interrelatedness? These tensions, contradictions and complexity make food insecurity and malnutrition an exemplary candidate for a transdisciplinary study approach (Drimie and McLachlan, 2013). Transdisciplinarity is defined as:

> …a reflexive research approach that addresses societal problems by means of interdisciplinary collaboration as well as the collaboration between researchers and extra-scientific actors; its aim is to enable mutual learning processes between science and society; integration is the main cognitive challenge of the research process. (Jahn, Bergmann and Keil, 2012, p. 4).

Transdisciplinary study opens possibilities for inclusiveness in incorporating different forms of knowledge, novel processes, and diverse stakeholders, allowing us to explore the many facets of food systems. This the kind of research and policymaking is needed for progress towards making the right to food a reality.

1.2 Problem statement

South Africa's post-1994 development policies have attempted to redress historical injustices in poor rural areas through transformation, redistribution and the establishment of decentralised, participatory mechanisms governing land, water, and other natural resources. The African National

Congress-led government has introduced an array of social protection measures on a scale unique among developing countries and unparalleled in Sub-Saharan Africa. Despite these measures, there is widespread food insecurity and persistent malnutrition, manifesting as concurrent childhood stunting and obesity. Over the years, efforts to better characterise and understand South Africa's food security situation have generated data and information that quantify the problem to some degree, but offer few insights into local food environments or the interactions of people with the food system. Food is where many socio-economic and environmental issues meet (Drimie and McLachlan, 2013). Doing so in such diverse contexts makes it obvious that local food systems ought to be the focus of research and policy.

New processes are also needed to progress the country towards realising the constitutional right to food. In 2010, United Nations Special Rapporteur on the Right to Food, Olivier De Schutter, conducted a mission to South Africa, reporting on progress towards fulfilling the right to food. Acknowledging progressive legal frameworks, policy initiatives and wide-reaching social assistance programmes, the report also recognised that South Africa still struggles with deeply-rooted inequalities. A rights-based approach to improving food security and nutrition needs to support South Africa's vulnerable, rural, agrarian people, namely the 2.5 million households in the former homelands practicing subsistence or small-scale farming (De Schutter, 2012).

According to the former UN Special Rapporteur, this means favouring the participation of these groups in the design of policies, defining beneficiaries as rights holders who can claim services from the government, and moves towards a more bottom-up approach to agricultural support (De Schutter, 2014). De Schutter recommended that food security strategies be inclusive, participatory and accountable, including communities and small producers and more substantial civil society oversight:

> […] in order to allow all stakeholders (from the producers to the end consumers) to arrive at a joint diagnosis of which improvements could be made to rebuild the local food system and to propose certain social innovations (De Schutter, 2014, p 16).

In this sense, the right to food is not necessarily an end state to be fulfilled, but a different "way of doing things" (De Schutter, 2009, p. 1) that needs to permeate all facets and levels of decision-making around food. It is more than a set of legal entitlements. It involves processes that are "more bottom up than top down, more democratic than technocratic, and participatory rather than exclusive" (De Schutter, 2009, p. 1).

South Africa is one of the first countries to constitutionalise the right to food, and to develop specific instruments for the interpretation and fulfilment of this right, but complexity, policy contradictions, and political economies complicate stakeholder, and especially public, engagement. There is potential for more inclusive and participatory processes in food policymaking so as to contribute to alleviating South Africa's complex hunger and malnutrition problem, but these possibilities are still overlooked. Understandings of local social, environmental and political determinants of food insecurity, as well as people's experiences of hunger and their strategies to cope, are ideal for transdisciplinary approaches. These should include participatory processes for designing and interpreting research, as well as developing and implementing food security strategies, so as to ensure they are grounded in the realities and resonate with the capabilities of the rural, agrarian poor, and in the process, opening new spaces for food democracy.

1.3 Research objectives

The purpose of this research is to explore current policies and policymaking processes with reference to South Africa's poorest rural communities, using a food democracy-informed approach. The research explored three distinct perspectives on food insecurity and malnutrition: 1) the conventional scientific perspectives that informs the evidence on which policy currently aspires to be built; 2) the perspective contained in most recent food security and nutrition policy instruments; and 3) community perspectives drawn from fieldwork. The study was informed by a review of multidisciplinary literature on food security and nutrition policy, social history and

current global food politics, and involved field research and community consultations as part of a larger commissioned study, viz. the *The current rain-fed and irrigated production of food crops and its potential to meet the all-year-round nutritional requirements of rural poor people in North West, Limpopo, KwaZulu-Natal and the Eastern Cape*, hereafter referred to as the 'WRC project' (Hendriks *et al.*, 2016) in pursuit three specific objectives.

The first objective was to explore the potential for structural transformation in policy and the role of food insecure citizens in food security policy processes using narrative analysis of the Household Food and Nutrition Security Strategy for South Africa and the National Food and Nutrition Security Policy and Implementation Plan (RSA, 2014). This then presents the findings of an analysis and conclusions about the parameters of change envisioned in policies, and whether the voices of the most vulnerable are heard in transformation processes.

The second objective drew on the WRC findings and extended the insight from quantitative data through fieldwork to gather more qualitative data. This involved the participatory validation and interpretation with the participating communities in order to learn how poor rural people understand food insecurity and to demonstrate the value of knowledge co-creation with key food security policy stakeholders.

For the third objective, qualitative and quantitative data from the WRC project were subject to further analysis using a framework of food citizenship to understand the agency of rural poor people in shaping local food systems, showing the ways in which people work actively to overcome challenges using limited resources and capabilities. These and other local conditions and contextual factors are the foundations on which food security and nutrition interventions, including the transformation of local food systems, must be built.

The specific questions addressed in the research are:

- Do food and nutrition security policies propose structural transformations to address underlying causes of food insecurity and malnutrition, and are processes of change inclusive of those most vulnerable to food insecurity?

- What insights can be gained by examining food security data through the lens of food democracy?

- Does participatory and inclusive research enhance our understanding of malnutrition and food insecurity?

These research questions were formulated independently of the main WRC Project, which afforded opportunities for secondary data analysis, and for the researcher to lead the validation and interpretation process, from which most of the original data and insights in this study arise.

1.4 Suppositions

Although the right to food is guaranteed by the South African Constitution, post-apartheid transformation and democratisation processes were never directed explicitly at the transformation of the food system. State-driven sectoral reforms around land, markets, social protection, and health have fallen short of significantly improving food security and nutrition outcomes. Alternative food movements with social justice agendas are developing new understandings and engagement processes for addressing food insecurity and malnutrition, which are relevant to the South African context.

Top-down food security and nutrition policy blueprints, neglect of rural development, and non-interference in an increasingly concentrated and corporatised food system leave rural people adversely incorporated and excluded from decisions pertaining to their food system, food security, and nutrition. Policy instruments do not reflect the agency and citizenship of poor, rural communities as stakeholders and knowledge keepers in local food systems. Policy approaches to the problem have been discordant and even contradictory, with little long-term evaluation data to attribute policy successes or failures. The food system, meanwhile, has evolved in such a way that

food consumption patterns, alongside shifting livelihood patterns, urbanisation and more sedentary lifestyles, drive nutrition transition in both rural and urban areas. New food security policy instruments need to interpret and implement the Constitutional right to food, amidst the uncertainty of beleaguered agrarian reform, chronically high unemployment, and moribund rural economies. South Africa food and nutrition security policy instruments contain many different narratives. Thematic analysis employing food activist and counter-hegemonic food movement perspectives looks for transformative potential in the parameters and processes of change contained in policies.

The food security and nutrition strategy and policy were developed without public consultation, do not set forth institutional frameworks, platforms for dialogue or frameworks for monitoring and evaluation. This reflects both an incomplete understanding of the dynamics of rural food insecurity and a propensity for top-down policymaking. Together, these have contributed to a patchwork of poorly-coordinated food security interventions, with uneven results. An alternative to the 'blueprint' approach to food insecurity that attempts to correct patterns of deficit identified in national-level statistics is to inform strategies through local knowledge and understandings of existing assets and capabilities. The diverse ways in which rural poor people engage with and shape their food systems, through production, processing, and consumption and through formal and informal channels, can form the foundations on which to rebuild broken food systems sustainably. Diversity and inclusion are essential ingredients for transformation, growth and sustainability. Meaningful public engagement on food security issues with active, informed citizens begins with recognising poor rural communities as more than subjects of policy, beneficiaries of programmes, and recipients of charity. They are food producers, consumers, entrepreneurs and welfare recipients all at once: that is, multi-faceted stakeholders in a complex food system.

Food insecurity in South Africa's socio-economically deprived areas is indicated by food inaccessibility, poor dietary diversity, rising rates of overweight and obesity, and persistent childhood stunting. Although high-level diagnoses of income poverty and nutrition transition may be broadly accurate, they offer little insight into the role of local food systems in nutrition and food security. Food security data needs to be interpreted within unique environmental, cultural, and governance contexts if the aim is to rebuild local food systems.

Experiences and perceptions of the pathways and determinants of nutrition and food security are shaped by histories, geographies, and cultures. Food security research that is participatory and grounded in the realities of poor, rural communities can generate unique insights and opens a wider range of policy options than statistical illustrations of deficits. Addressing food insecurity and nutrition by rebuilding local food systems needs to draw on local knowledge and practices. A transdisciplinary approach to food security research and policymaking demands the co-creation of knowledge with diverse fields of stakeholders. The validation and interpretation of research findings can help to ensure that they accurately represent complex situations and provoke discussions that yield important, contextual, and qualitative information. Research should be of both technical and political value to vulnerable communities to (i) enhance people's understanding of their food security situation; (ii) guide the implementation of programmes; (iii) hold local authorities to account; and (iv) build democratic participation in food systems.

The overall assumption of this study is that South Africa's pathway to both the right to food and food security would be better supported by approaches to research and policymaking that builds food democracy and embraces the country's economic, cultural and natural diversity. Food security policymakers in South Africa are missing opportunities to meet food security challenges by rebuilding local food systems if they fail to incorporate inclusive processes into policy, strategy, and programme design and review. Involving the people most vulnerable to food insecurity and malnutrition in the diagnosis of their conditions contributes to the understanding of localised drivers of food insecurity, where citizens can in turn gain greater agency through their participation in knowledge creation and decision-making. There is no doubt that changing the view of poor rural people from passive subjects to active agents reveals the assets and capabilities that will drive the transformation of food systems for better food security and nutrition.

1.5 Contribution to knowledge

There is limited theoretical or empirical exploration of alternative, participatory, and more inclusive approaches to food security policy and research in South African and African contexts, as well as into how these might inform food security strategy and policy to promote the progressive

realisation of the right to food. This study explores the possibilities suggested by United Nations Special Rapporteur on the Right to Food Olivier De Schutter's idea of 'joint diagnosis' and of the right to food as a different way of doing things (De Schutter, 2014), or a collection of processes grounded in inclusive consultation, rather than top-down decision-making. While there is a substantial and growing body of work on the constitutional right to food and imperatives for policies, strategies and programmes that promote the progressive realisation of this right, policy instruments have not yet been examined through the lenses of activist food movements currently challenging food systems.

The food sovereignty and food justice movements have interpreted the right to food to include innovative processes and by redefining parameters of change. Bottom-up innovations are needed in the South African context, amidst discordant policies and governance challenges. The notion of food citizenship is rarely mentioned in the context of South Africa food security and nutrition literature. Explored in the context of poor rural communities, the idea helps cast people as stakeholders in food security, rather than as merely victims of hunger and malnutrition. South African citizens have both political and technical contributions to make to food security research and policymaking.

Transdisciplinary approaches to food security and malnutrition incorporating teams of natural and social sciences are still a novelty in South Africa. Transdisciplinary studies involving the co-creation of knowledge with citizens in contexts where food security and nutrition challenges occur remain rare. Localised characteristics of malnutrition and food insecurity and local, lived experiences and unique natural and social assets on which local food systems depend, ought to be incorporated into both research and policymaking.

1.6 Limitations of the study

This study was limited in several ways. First, there were neither the time nor resources to investigate the ways in which local governance structures and a wider field of stakeholders (district municipalities, the private sector and civil society actors, for example) might be engaged in local food system consultations and transformation. The study results were interpreted and validated by community representatives, cooperative members, and only very few representatives from local government (Agriculture, Forestry and Fisheries, Department of Social Development, Education), and so representation was limited. However, such a comprehensive study was only possible because of the ongoing community engagement and long-term investment of the South African non-profit organisation LIMA Rural Development. LIMA staff played host, facilitator, and mediator between the research team, community members, and local authorities, benefiting from collaborative relationships developed over 30 years of presence in rural South African communities (see text box 5.6).

Secondly, the theoretical and methodological approach includes approaches from different natural and social sciences, working across knowledge systems and at social interfaces to solve multifaceted problems. This means that, although this study incorporates ideas from historical studies, political economy, agricultural economics, sociology and anthropology, none of these fields gets the full theoretical development expected in a doctoral thesis for each discipline. Instead, the research accompanied various phases of the WRC allowing for the accumulation of knowledge and ideas to be fed back to research 'subjects' in the final, validation and interpretation phase a way that introduces them, albeit late in the research process, as co-creators of knowledge, aimed at solving a complex social problem. As information emerged and resonated with literature and theory, different perspectives were brought in, especially where the literature on South Africa is particularly rich, for example, in the field of social history. Due to the wide-ranging interpretations of terminology and the diversity of discipline-specific terms, a glossary is provided on page 156.

Thirdly, the introduction of participatory Indigenous knowledge and research methodology into the transdisciplinary mix of the WRC study did not occurred from the outset of the study, although there were participatory elements throughout, in the form of focus groups and key informant interviews. It was introduced only in the validation phase, in the consensual approach to facilitation, in the form of inviting interpretations of data (albeit generated by western, scientific research paradigms) and by eliciting recommendations for further research. An in-depth explanation of the relationship between Indigenous and Western knowledge systems, is offered in the methodology section of Chapter Four. As such, this study offers only a glimpse of the potential role of transdisciplinary and Indigenous methodologies in food security in South Africa. Lessons learned and recommendations on how food security and nutrition research can be better informed by Indigenous and local knowledge (ILK) are in Section 5.1.1.

Finally, a practical limitation was the short timeframe for the validation workshops caused by the coincidence of the WRC project deadline, and industrial action and protests at the University of Pretoria campus in early 2016. The planning and execution of the workshops may have benefitted from the input of the whole research team, a longer timeframe and a wider sample, including local government representatives and other stakeholders in local food systems. This was not possible in the context.

1.7 Thesis outline

This chapter presents the introduction and problem statement, purpose and specific objectives of the thesis, the three research questions, and their underlying suppositions. It summarises the contribution to the literature and limitations of the study. Chapter Two reviews literature pertaining to food security, nutrition and food systems, as well as social justice and rights-based approaches to food crisis and transformation. Chapter Three provides an overview of the food security and nutrition context of South Africa, supported by current food systems and food security policy analyses. In Chapter Four, a narrative analysis of current food security and nutrition policy instruments examines the parameters and processes of change in order to assess their transformative potential. Chapter Five presents the participatory analysis and interpretation of food security and nutrition data from the Water Research Commission of South Africa study entitled

The current rain-fed and irrigated production of food crops and its potential to meet the all-year-round nutritional requirements of rural poor people in North West, Limpopo, KwaZulu-Natal and the Eastern Cape. The final chapter presents a synthesis of the study with results, conclusions and recommendations for food security research and policymaking.

1.8 Role of the researcher

The researcher was a member of the WRC project team from the inception to the publication of the final study, participating in the formulation of questionnaires, planning, qualitative data collection, analysis, validation and interpretation and drafting of the final report. This role included developing study site profiles from secondary demographic data sources, district-level policy documents, site observations, and key informant discussions. The researcher worked in a team with Dr. Annemarie Viljoen, and facilitators and translators from LIMA Rural Development in the qualitative research (two rounds of food consumption focus groups in the four study sites and discussions on historical changes in food systems); conducted site tours and key informant interviews with local small-scale producers, and worked on analysis and presentation of the qualitative data.

The researcher lead in the current study, being sole author of the literature review, and lead researcher, and submitted to the Journal of Southern African Studies as the first author of Chapter Four, the article entitled *Are South Africa's food and nutrition policies transformative?* The researcher lead the validation and interpretation phase of the study, including planning, logistics, data collection, analysis and drafting, supported by a post-doctoral researcher and LIMA Rural Development facilitators and interpreters. The researcher was also first author of Chapter Five, published in the Global Journal of Health Sciences as *Interpreting food security data with rural South African Communities*.

Chapter 2 – Global perspectives on hunger and malnutrition

2.1 Introduction

Food systems are being contested across the world in many ways. This suggests that processes – rather than paradigms – distinguish food movements from one another, and offer a multitude of lessons to policymakers on food system transformation. Changing food systems to better meet nutrition and food security demands implies sweeping changes, but is seems unlikely that these will be the result of centrally designed policy blueprints. Civil society groups are confronting policy failure – and food system failure – with alternative paradigms for food production, consumption but more importantly, with the processes governing these. These are beginning to take root in South Africa, a country with a distinguished history of activist-led regime change, at a time of climate unpredictability and extreme drought, social discontent and persistent unemployment. South Africa's food system was never explicitly a target for democratic reform, despite the adoption of the right to food within the democratic constitution. The aim of this review is to survey diverse approaches to hunger, food crises, food insecurity, and malnutrition, and whether these resonate in the context of South Africa's vulnerable communities and policy context.

This chapter samples the literature relevant to food security, nutrition, food movements, and the right to food, to build a transdisciplinary approach to nutrition and food insecurity, then attempts to ground this in the reality of South Africa's most food-insecure rural households and communities. This builds an understanding of malnutrition and food insecurity as complex social problems that cannot be solved with policy blueprints, but which instead need to be defined conjointly, incorporating awareness of the constraints and capabilities of poor, rural households and communities. Transdisciplinarity thus holds the potential to deepen democracy and progress the nation towards food security, and the fulfilment of the right to food by bringing both equity considerations and broader accountability into research and policy.

Food security is a contested idea (discussed later) with variable definitions, but the one used here is drawn from the 1996 World Food Summit:

> A situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (FAO, no date).

The term malnutrition is also used in accordance with the FAO definition:

> an abnormal physiological condition caused by deficiencies, excesses or imbalances in energy and/or nutrients necessary for an active, healthy life (FAO, no date).

Malnutrition and food insecurity in South Africa have complex and interrelated causes cutting across health, environment, social, and food and agriculture sectors (Drimie and McLachlan, 2013). Achieving food security amidst ongoing transformation and economic and political uncertainty requires sophisticated and innovative policies and strategies that work collaboratively, rather than with a 'centrist' approach (Pereira and Ruysenaar, 2012). Progress towards realising the Constitutional right to food is a participatory and democratic undertaking, according to UN Special Rapporteur on the Right to Food:

> […] a key condition for the success of such strategies is that participation is encouraged at a local level, in order to allow all stakeholders (from the producers to the end consumers) to arrive at a joint diagnosis, of which improvements could be made to rebuild the local food system, and to propose certain social innovations. Local initiatives informed by social participation will be better informed and therefore more effective in reaching their objectives, and they will result in a more transparent and accountable use of resources (De Schutter, 2014:16).

Delivering on the right to food requires reforms to food systems that are failing to address, in some cases exacerbating, malnutrition, and food insecurity (De Schutter, 2009). The idea of food system failure is the basis of critiques posed by the UN Special Rapporteur on the Right to Food, and a growing number of local and internationally-articulated civil society-based food movements (Holt-Giménez and Shattuck, 2011). Food security, or more specifically, 'zero hunger', is an important nexus within the Sustainable Development Goals, and the subject of innovative inquiries into the

complex interrelationships of ecological, social, and industrial systems, underpinned by the need for different, and more inclusive, relationships between actors (McCollum *et al.*, 2017).

The "broken food system" narrative holds that a profit-driven, global food system controlled by corporate monopolies, held in place by unaccountable governments, is bound to global trade agreements and failing to feed the world's population sustainably (Holt-Giménez and Peabody, 2008). Industry concentration and monopolies are facilitated by trade liberalisation, commodity speculation and accumulation through dispossession, which marginalises smaller scale food producers and destroys livelihoods (Araghi, 2009). This undermines local economies and decimates local food cultures, while the mass-produced, processed food replacing traditional diets has detrimental effects on ecosystems and human health (Holt-Giménez and Peabody, 2008). Climate change, resource depletion and social inequality influence food consumption in poorly understood ways (Sage, 2013). Many of these ideas have come together in the Sustainable Development Goals, which acknowledge important interconnections between food security, agricultural production, water, energy, land use and health (McCollum *et al.*, 2017).

One outcome of the broken system is the post-Green Revolution[1] diet, which meets the caloric or energy needs of the world's population at the expense of dietary diversity, food cultures, ecosystems, smallholder and family farmers and human health (Gómez *et al.*, 2013). The growth of modern retailing and manufacturing, as well as shifting value chains, also contribute to changing consumption patterns in low and middle-income countries, driving nutrition transitions (Popkin, Adair and Ng, 2012). Nutrition transition is evident in rising rates of obesity are an indicator of increasing consumption of mass-produced, energy-dense and micronutrient-poor foods, as well as more sedentary lifestyles linked to urbanisation (Popkin, Adair and Ng, 2012). The combination of micronutrient deficiencies, growing obesity levels and persistent protein-energy under-nutrition – the 'triple burden' of malnutrition – mostly affects low and middle-income countries (LMICs), although there is currently no country in the world that does not suffer at least one of the three forms of malnutrition (Gómez *et al.*, 2013).

[1] The Green Revolution refers to a period beginning in the 1960s with the spread of high-yielding wheat and rice varieties across Asia, resulting in almost half the land in developing countries being sown with the new varieties within 20 years. Although yields increased dramatically, so did the use of mineral fertilizers, pesticides and irrigation.

2.1 Food systems and food regimes

The Committee on World Food Security High Level Panel of Experts (HLPE) explains that a food system

> […] gathers all the elements (environment, people, inputs, processes, infrastructures, institutions, etc.) and activities that relate to the production, processing, distribution, preparation and consumption of food, and the output of these activities, including socio-economic and environmental outcomes (HLPE, 2014, p. 23).

From historical perspective, food systems are shaped by successive food regimes, or

> [...] stable periodic arrangements in the production and circulation of food on a world scale, associated with various forms of hegemony in the world economy (McMichael, 2009a, p. 1).

Empires governing colonial and settler state production, feeding early industrialisation, were the force of the first regime, followed by a second regime influenced by American Cold War geopolitics conducted through food aid (Friedmann, 1995). According to McMichael (2009), agriculture and food play a strategic role in the global capitalist economy, through relations of production and consumption particular to stable periods of accumulation and configurations of geopolitical power, across time and space. Distinctive food regimes are associated with colonisation and the industrial revolution as well as the cold war period, where surplus production was used strategically as an aid, and the current, globalised, corporate food regime, governed by world trade regulations and agreements.

Widespread, racialised land dispossession shaped South Africa's modern food system, by reducing and eliminating Indigenous productive capacity to create the wage-dependent labour reserves that supported industrial development under colonial and apartheid governments (O'Laughlin *et al.*, 2013). The costs of social reproduction of the industrial workforce were externalised by the

apartheid state with the creation of independent homelands (O'Laughlin *et al.,* 2013). Provisioning came to depend on remittances from wage labour small-scale and household subsistence production (Araghi, 2009). The current 'corporate food regime,' is maintained by a neoliberal order, driving market liberalisation, holding states accountable to global trade agreements, and compelled to fully integrate agricultural commodities (Burch and Lawrence, 2009; McMichael, 2009b).

Successive food regimes have had historical, social, ecological and nutritional dimensions, and the current trajectory of commodification are no exception (McMichael, 2009b). Economic growth, driven by neo-colonial power structures, creates precarious and inequitable food systems, as surplus capital searches for new places to invest, or 'spatio-temporal fixes' to resolve its crises of accumulation (Harvey, 2004). In this way, continued economic growth has come to rely on the dispossession of people from land and increasing corporate concentration and integration. Livelihoods, cultures and landscapes are changed to create greater uniformity of production and consumption throughout the food system.

These relations of food production and consumption, organised by settler-colonial, cold war-era and modern, corporate agricultural and industrial expansion, have created deeply-entrenched health and economic disparities (Greenberg, 2013; O'Laughlin *et al.*, 2013). Poor, rural South Africans participate in a globally-integrated consumer economy on relatively disadvantaged terms (Neves and Du Toit (2013). The former homelands are epicentres of food insecurity and malnutrition because of these precarious and piecemeal livelihoods. From the perspectives of poor rural people, food systems are filled with constraints that limit opportunities, perpetuate food insecurity and drive malnutrition.

Figure 1, based on the HLPE (2017) food systems model, illustrates the ways in which food systems contribute to food security and malnutrition for among South Africa's rural poor. Environmental, political, technological, and socio-cultural drivers shape food supply chains, food environments and consumer behaviour to influence dietary quantity, quality, diversity, and safety and shape nutrition outcomes.

But to see rural areas purely as places lacking formal employment opportunities with stagnant rural economies is a narrow, deficit-based and top-down view. It takes resourcefulness, social networks, and energy and ingenuity to survive adversity, suggesting great potential in removing barriers and enabling people. Political, programmatic and institutional actions need to be informed by the perspectives of the rural poor they serve, in order to build on local capabilities. The constitutional right to food should be understood as a legal imperative to reform food systems where they interfere or inhibit rights, and as a basis for the most vulnerable to claim entitlements. Along with Food Security and Nutrition Strategy and Policy directives to build resilient local food systems, this creates both a legal and technical necessity for inclusive and participatory consultation with those most vulnerable to food insecurity and malnutrition.

2.2 Food system transformation

By the UN Special Rapporteur's account, as well as that of food and agrarian activists, the right to food will not be realised without structural changes that transform food systems from the ground up. Strategies in support of realisation ought to be the outcome of inclusive democratic processes and adequate accountability mechanisms:

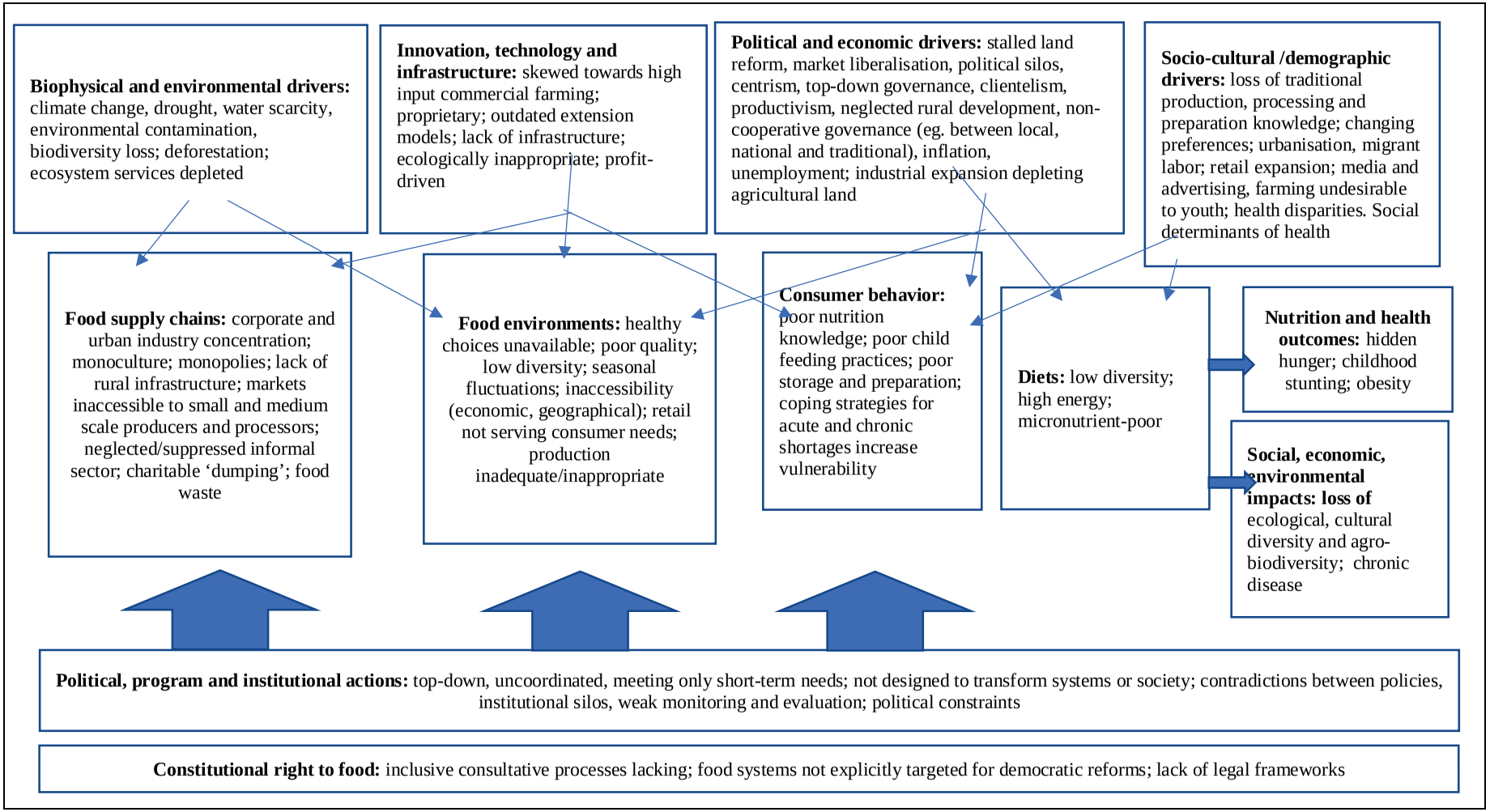
> National strategies grounded in the right to food should be conceived as participatory processes, co-designed by all relevant stakeholders, including, in particular the groups most affected by hunger and malnutrition – smallholder producers, fisherfolk, pastoralists, Indigenous people, the urban poor, migrants and agricultural workers […] (De Schutter, 2014).

Many South African social policies carry historical, political and social narratives that serve to anchor problems and solutions in past oppression, and to remedy social and political exclusion and geographical segregation. Inclusiveness in policy-making remains one of many governance challenges facing South Africa today and food security policy is no exception. But although food security policies and programmes have been guided by international and national commitments such as the Millennium Development Goals and the Constitutional Right to Food, they are rarely informed by broad-based, conclusive consultations. The impetus for change often comes from

coalitions of public and parastatal, non-profit and private entities (Hendriks, 2014). The narratives contained in food security policies are as likely to be grounded in ideologies and vested interests in public-private partnerships, as they are in empirical evidence and sound evaluation (Resnick *et al.*, 2015). However transformative their goals or inclusive their mandates, implementing policies is constrained by the fiscal and managerial capacities of government institutions (Resnick *et al.*, 2015).

There are conflicts and contradictions in food security policy, just as there are in the health, education, agrarian and water sectors, often because transformative and redistribute social agendas collide with neo-liberal economic policies (Bond, 2005; Hart, 2008). Open markets see the import of increasingly mass-produced, poor quality food and the export of high quality food to foreign niche markets (Hendriks, 2013). The economic benefits of the land reform process have not materialised for the majority of rural poor people. The numbers of citizens benefiting from social protection schemes outstrip those who are decently employed, calling sustainability into question (Hendriks, 2013). The ultimate contradiction, though, and a universal challenge for policymakers in low-income nutrition transition contexts, is the juxtaposition of obesity undernutrition, manifesting in South Africa as rising obesity rates and childhood stunting. Policy narratives must somehow accommodate the complexity, contradictions and polarities of this food security context, while defining pathways and parameters of change.

Figure 1. Food systems drivers of food insecurity and malnutrition in poor rural communities



2.3 Uniformity and diversity

Food systems are the main drivers of nutrition transitions, which have negative outcomes when they contribute to food environments in which healthy choices are out of the reach of economically disadvantaged, or adversely incorporated people. When traditional and Indigenous food systems are affected by displacement, land appropriation or cultural assimilation, for example, healthy food is substituted with cheap, micronutrient-poor, high energy foods (Damman, Eide and Kuhnlein, 2008). Wild foods, or 'country foods' hunted, fished and gathered contribute to the diets of Indigenous people, but these are under threat from colonisation, knowledge loss, deforestation, land expropriation for industrial expansion, and climate change. Similarly, smallholder and subsistence farmers have also traditionally been custodians of agro-ecological diversity as well as important contributors to household food security (Perfecto, Vandermeer and Wright, 2009). Species diversity in agriculture has, overall diminished with the modernisation of food systems, with dietary diversity diminishing correspondingly (Lachat *et al.*, 2017). Localised, unique agrarian and Indigenous livelihood strategies that include small-scale production and careful ecological stewardship have been shown to contribute to better nutrition outcomes (Hendriks *et al.*, 2016). Greater diversity of species in agricultural and livelihood systems involved in food production contributes to dietary diversity and nutrition outcomes but also resilience to environmental changes, market shocks, and disease outbreaks (Lachat *et al.*, 2017).

Globally, the number of countries dependent on food imports is growing, due to national and regional trade and energy policies that disfavour local production, creating a globalised food system that is precariously susceptible to shocks and stresses (Suweis *et al.*, 2015). The more food supplies and availability are tied to global markets, the more directly consumers are impacted by volatility. When food availability is tightly coupled with global markets, countries with higher reliance on food imports (meaning availability is tightly linked to global markets), show less resilience to crises (Suweis *et al.*, 2015). For the poor, shocks usually mean greater reliance on bland staples and diminished dietary quality. This is because the global food system, under the direction of profit-making enterprise, has evolved to efficiently supply energy needs, to produce raw materials for processing and animal feeds rather than balanced, nutritious diets of culturally appropriate fresh food (Gómez *et al.*, 2013). As global consumption of energy-dense foods has

increased, so has the interdependence of countries on markets trading a relatively small range of food crops (Khoury *et al.*, 2014).

Malnutrition and food insecurity can be telling of broken food systems, and how they are governed. Food system governance, as well as food production and consumption, all contribute to rising levels of obesity in low and middle-income countries. Nutrition transitions are attributed to changing eating, drinking, and physical activity patterns (Popkin, Adair and Ng, 2012). Post-Green Revolution food systems are also marked by the increasing availability of processed, energy-dense but micronutrient-poor diets comprised of industrial formulations of oils, fats, sugars, preservatives and cosmetic additives (Gómez *et al.*, 2013; Monteiro *et al.*, 2013). Manufactured food, and foods not prepared at home, constitute a high proportion of the diets of people in LMICs over the past decade (Ng and Dunford, 2013). These eating patterns often replace minimally processed foods, including grains, legumes, pulses, and fruits and vegetables, while there is an increase in the overall intake of added sugars, fats, and sodium, a decrease in proteins and fibre.

The modern 'global diet' or the 'Green Revolution diet,' as it might be described from a food regime (McMichael, 2009b) perspective, began to appear on the menus of more and more South Africans with the growth of multinational corporate influence under South Africa's economic liberalisation agenda (Igumbor *et al.*, 2012). Although multinational food companies were present and corporate consolidation was underway well before arrival of democracy, the acquisition and proliferation of big retail food chains and fast food has accelerated over the past two decades (Greenberg, 2010; Igumbor *et al.*, 2012). South Africans are eating more, cheaper, energy-dense, manufactured foods, while fresh, healthy food tends to be less affordable in both urban and rural environments (Temple *et al.*, 2011). Poor rural South Africans living on low incomes rely on cheap, energy-dense, but not necessarily 'fast' or highly processed foods (Temple *et al.*, 2011). The diets of poor rural South Africans are in fact monotonous, composed of refined cereals and white sugar, but no less obesogenic than the urban junk diet (Hendriks *et al.*, 2016).

One effect of 'big retail' on the nutrition and food security of the poor that is worth mentioning is the palliative approach to food insecurity that has evolved with the changing retail landscape. In recent years, in addition to initiating a variety of charitable corporate social responsibility projects,

retailers have come to play a prominent role in social protection as a major supplier of food to both government and civil society food safety nets. In some cases, this involves the channelling of 'rescued' food waste through charities like FoodBank SA, which, in South Africa, amounts to some 1.4 million meals per day, equalling 513 meals per year (Warshawsky, 2016). Institutionalised, entrenched food distribution to meet short-term needs de-politicises hunger masks the root causes, and can delay the structural transformations needed to build food security (Hendriks and McIntyre, 2014). Food aid serves to mitigate the impacts of a concentrated corporate food system, but may also be undermining the vibrant local food systems envisioned in South African development planning and food security and nutrition policy instruments (RSA, 2014; Hendriks, 2015).

At the same time, the local potential for improving dietary diversity, nutrition and food security is overlooked. Little attention is paid to the role and possibilities for small-scale and subsistence agriculture to revitalise local economies, diversify livelihoods, generate employment, and enhance household food security (Hendriks, 2015). The driving agricultural development paradigm is corporate and commercial, where the disappearance or absorption of inefficient smaller producers is taken as inevitable (Murphy, 2008).

Local production systems, food cultures and many localised forms of participation in food systems are dramatically impacted by trade, agriculture and land use policies, with unpredictable consequences. Local food systems were dramatically impacted by the green revolution, for example through the conversion of forest to cropland in low-income tropical regions with high biodiversity (Ericksen, 2008). In South Africa, land dispossession under the 1913 Natives Land Act began a trajectory of consolidation, intensification and commercialisation that deeply and negatively impacted agricultural, livelihood and cultural diversity, as well as food consumption and nutrition (Hendriks, 2014).

Distinctive, local food cultures once maintained diversity not only in dietary terms, but also in terms of food production, processing and preparation methods, serving to regulate consumption and prevent food waste and preserve ecosystems (Perfecto, Vandermeer and Wright, 2009; Weiler *et al.*, 2015). As knowledge and practices vanish, and people are integrated into a bigger, more

homogenous food system, alternative strategies to cope with shocks and stresses also disappear (Lachat *et al.*, 2017).

Nutrition transitions are also ushered in by changing food systems (Popkin, 1993; Maxwell and Slater, 2003). As traditional and Indigenous food systems disappear, there are often reductions in dietary diversity as traditional foods are replaced by cheap, abundant energy. Wild foods, or 'country foods' hunted, fished and gathered contribute significantly to the diets of many Indigenous people, but these are under threat from knowledge loss, deforestation, land expropriation for industrial expansion and climate change (Damman, Eide and Kuhnlein, 2008). Smallholder and subsistence farmers have also traditionally been custodians of diverse seed varieties (agro-biodiversity) and local environmental knowledge, making them adaptable contributors to household food security and species diversity in agriculture has, overall diminished with the modernisation of food systems (Kaiser, 2012). Greater diversity of species in food production contributes to dietary diversity and nutrition outcomes, but also resilience to environmental changes, market shocks, and disease outbreaks (Lachat *et al.*, 2018).

Food movements work on the understanding that putting food, rather than profitability, productivity or nutrients first, generates: critical awareness of where food comes from; how it gets to markets; and who has relatively more or less of it. Successful initiatives for making fresh, healthy food affordable and accessible is often the work of food activists and innovative civil society partnerships enabled by progressive policies, rather than government engineering of food systems (Renting, Schermer and Rossi, 2012). At the heart of many food movements' agendas is the idea of citizens regaining control over food systems, or food democracy, which can encompass a range of ideas, from sovereign control over land and resources, to justice for workers, responsible environmental stewardship and valuing local food cultures, to community garden projects (Wittman, 2010). Dietary diversity and nutrition, biodiversity, cultural diversity and political pluralism and inclusiveness are building blocks for human health, ecological and economic resilience, and social peace.

The case for diversity is not an argument for regression to the past, or for the exact replication of pre-industrial food systems. There is growing evidence that agricultural production aiming to

promote dietary diversity, especially when complemented with community development initiatives such as improved water and sanitation, can have better impacts on nutrition outcomes for mothers and children than single interventions to address individual deficiencies (Ruel, Quisumbing and Balagamwala, 2018). Nutrition-sensitive agriculture programmes, however, are more successful when they are designed to overcome local constraints, for example women's social status, cultural and social norms, and political and environmental factors (Ruel, Quisumbing and Balagamwala, 2018).

The failure to include people in consultative processes around the diagnosis of food security challenges and in designing solutions is a constraint on food security policy and programmes. Monocentric, top-down planning does not recognise local constraints and capabilities and is unlikely to be effective in identifying what, among the wide range of options for improving nutrition through agricultural production, will be most effective in particular contexts. Including a diversity of stakeholders at different levels, through different kinds of processes, is a prerequisite to the acceptability and sustainability of any intervention.

2.4 Transformation processes

Local, regional and globally-connected food movements began articulating demands for democracy, transparency, and accountability in food systems decades ago, rallying and gaining momentum alongside World Trade Organisation negotiations and the 2008 global food crisis (McMichael, 2009a; Holt-Giménez and Shattuck, 2011). Food democracy-based movements seek to make food systems more responsive to citizens by changing people from passive subjects to active agents in shaping agro-food policies (Hassanein, 2003). Whether local or global, food democracy movements have in common the goal of opening up democratic spaces to make food systems more accountable.

The food movements that have emerged in recent decades challenge inequity, environmental destruction, biodiversity loss, cultural assimilation, and corporate domination found a champion in former United Nations Special Rapporteur on the right to Food, Olivier De Schutter, who brought focus to the need for new processes:

> The right to food is a method; it is a way of doing things, which is more bottom up than top down, more democratic than technocratic, and participatory rather than exclusive (De Schutter, 2009).

The challenge of food system transformation is one of conflicting values and uncertain outcomes, which, in pluralistic modern societies is met with politics; "the arena in which we deal with disagreements over values" (Hassanein, 2003:79). Food movements share the criticism that this political arena has long been inaccessible to ordinary citizens. What should be accountable decision-making is left to remote and unaccountable entities: global financial institutions and multinational corporations that control whole supply chains, from land to local supermarkets. Even states that are parties to trade and aid agreements, with imposed structural reforms and loan conditionalities, lose sovereignty over their domestic economies. This can interfere with government unaccountability to citizens, while food systems are left to globalised free market logic (Rosset, 2008).

Taking back the food system involves reclaiming the spaces where democratic participation in food policy can take place, locally, nationally and internationally (Hassanein, 2003). For some, this means mobilising 'food citizenship,' which:

> [...] eschews the passive and confining roles of "consumer" or "producer" or "worker". By contesting the commodification of food in this way, the pressure by social movements to democratise the dominant food system challenges the forces seeking control of the system and the very structure of capital itself (Hassanein, 2003, p. 85).

Food citizenship supports the democratisation of food systems by re-asserting local autonomy and re-generating diversity through economic, political, cultural and social processes (Pimbert, 2006).

The right to food is enshrined in the South African Constitution, but, as for other socio-economic rights, its realisation hangs in the balance while the state grapples with deep, historically-rooted inequalities, conflicting economic priorities, and policy contradictions. Malnutrition and food

insecurity stem from the social, environmental and geographical legacies of colonialism and apartheid, which are perpetuated by shocks and stresses of a volatile global economy, as well as the governance challenges of democratic transformation (Hart, 2008). There was never a post-apartheid agenda for the transformation, much less the democratisation of the food system, unlike other systems fulfilling socio-economic constitutional obligation, such as the health and education systems. At the same time, food activism in South Africa has been relatively slow in organising and articulating agendas, with a national food sovereignty movement only emerging in 2014 (SAFSC, 2018).

2.5 Reform, progress and radical change

Within the general notion that food systems ought to be subject to more democratic control are different paradigms and processes for change. Shown in Table 1, Holt-Gimenez and Shattuck's 2011) classification of reformist, progressive and radical food movements draws on Karl Polanyi's 'double movement,' thesis describing a dialectical process whereby industrial societies self-correct through the re-assertion of control over markets through regulation (Polanyi, 1944; Munck, 2010). The idea of a totally free market was, for Polanyi, a dystopian one, where perfectly free markets would be socially and environmentally unsustainable, and therefore self-annihilating (Polanyi, 1944). So-called 'free' markets, in reality, are nothing if not carefully managed, where Polanyi argues, "The road to the free market was opened and kept open by an enormous increase in continuous centrally organised and controlled interventionism" (1944, p. 146).

Palliative measures, such as food aid, corporate-sponsored food banks, and big philanthropy partnerships with agro-industry, as well as working alongside the UN agencies and the World Bank, are regime responses to inequities and crises generated by the system. Reformism within the constraints of the food regime allows for 'green capitalism,' and its niche markets for fair trade and organic produce for the affluent. Together, these make up a regime-stabilising complex that aims to reign in the excesses of the free market without fundamental changes to the food system (Holt-Giménez and Shattuck, 2011).

This ‘corporate’ food regime (McMichael, 2009b) is antithetical to progressive and radical food movements, although certain local food movements and affluent niche markets sometimes share principles with local food and food justice movements pertaining to fair trade and production systems. The line in the sand is drawn where civil society institutions, such as local food policy councils, farmworker and labour movements, and community organisations come to occupy the political spaces where structural injustices can be changed. This could be seen as progression or a continuum. The radical end of this continuum is disconnection from its opposite, the corporate food regime. This involves popular control over land and resources, the disbandment of agro-industrial monopolies, and substantive participation in food policymaking (Holt-Giménez and Shattuck, 2011).

By de-commodifying and socially re-embedding food systems, food movements challenge market fundamentalism in ways that are transformative rather than palliative, (Giménez and Shattuck, 2011). Alleviating food insecurity and malnutrition in poor, urban America, for example, demands systemic change:

> The abysmal wages, unemployment, skewed patterns of ownership and inner-city blight, and the economic devastation that has been historically visited on these communities are the result of structural racism and class struggles lost (Holt-Giménez, 2010, p. 4).

Food plays an integral role in social justice, an idea captured by the Institute for Agriculture and Trade Policy (IATP):

> Food justice is the right of communities everywhere to produce, process, distribute, access, and eat good food regardless of race, class, gender, ethnicity, citizenship, ability, religion, or community (IATP, 2013, p. 1).

The basis of the food justice movement is the right to food, with emphasis on safety nets, sustainable livelihoods, and locally-sourced food (Giménez and Shattuck, 2011). Food justice

offers pathways for community empowerment in the food system through education, organisation and capacity building, but also pursues structural changes to address the causes of food inequity. Among the key institutions working for food justice are local food policy councils, fair trade organisations, Slow Food chapters, farmworker organisations and trade unions (Holt-Giménez, 2010).

The Institute for Agriculture and Trade Policy (IATP, 2013) developed food justice principles based on six themes: historical trauma; local foods; community development and public investment; hunger relief, health disparities and the industrial food system; land, labour and immigration; and a toxin-free and climate-just food system.

- 'Historical trauma' captures the idea that past and current food regimes are built on cultural genocides, racism, classism, sexism, and violent land expropriation (IATP, 2013).

- Food systems need to respect local and Indigenous rights over land and resources, rights to sustainable livelihoods, control over the production and exchange of food and local ownership of value chains.

- Articulating food production and consumption issues at the community level through consultative processes can change the dynamics of accountability, from 'government to citizens as recipients of assistance' to 'government agencies as service providers supporting local development.'

- Equitable access to health care, education, decent wages and democratic processes are part of a just food system.

- Surplus dumping (including in the guise of aid) adversely impacts local agricultural development and inhibits fair and equitable trade.

- Land is central to a just food system, in that all people should have access to places, knowledge and means to produce or procure their own food (IATP, 2013).

- Fair immigration and labour practices, job security and occupational safety should protect food and agricultural workforces from exploitation (IATP, 2013).

- A toxin-free and climate-just food system is independent of fossil-fuels, works agro-ecologically, and is subject to policy processes that include well-informed communities not disproportionately influenced by corporations (IATP, 2013).

The notion of food sovereignty radicalises these ideas further, with calls for control over political systems and means of production. Defined in the Nyeleni Declaration of 2007, it is

> [...] the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems. It puts the aspirations and needs of those who produce, distribute and consume food at the heart of food systems and policies rather than the demands of markets and corporations (La Via Campesina, 2007).

Food sovereignty has in common many principles with food justice, but more strongly reflect its agrarian or peasant origins, and therefore has a focus on production systems. The right to healthy and culturally appropriate food is undermined by the global trends of commodification and speculation, and so diverse, local food providers must be valued and protected from land dispossession, exploitation, and gender-based violence. Food systems should be localised, and productive resources and commons (including those that are genetic in nature) must be protected from privatisation. Natural systems must be protected from damage by using ecological production methods (La Via Campesina, 1996).

Not all countries have retained the broad base of ‘peasant’ farmers found in those with strong food sovereignty movements. In fact, many are undergoing prolonged periods of de-agrarianisation. Bryceson (1996, p. 1) explains de-agrarianisation as a process of reorientation of livelihoods, work and economic activity, with a movement away from agrarian settlement patterns, accompanied by a shrinking proportion of population living in rural areas. De-agrarianisation is evidenced by

diminishing food self-sufficiency and increasing non-agricultural labour in relation to agricultural labour, where agricultural output per capita decreases in relation to non-agricultural output.

The absence of peasantry does not preclude the democratisation of the food system based on food sovereignty principles. Food sovereignty is not a call to re-ruralise and de-industrialise; it rather poses alternatives to market-driven logics of commercialisation, intensification, and industrialisation, explained as an alternative regime with its own approaches to global food security, national development, technology, and environmental stewardship (Wittman, 2010).

Food movements contest food systems from places that are distinctive geographically, culturally, technologically and environmentally using different processes, as well as through many different acts of food production and consumption. The strength and endurance of food movements, for example, the food sovereignty movement, derives from its inclusiveness in embracing different ways of contesting the global food regime. For agrarian people in low-income countries, this can mean struggles for control over land and resources.

Table 1. Food regime and food movements

	Corporate food regime		Food movements	
Politics	Neoliberal	Reformist	Progressive	Radical
Discourse	Food enterprise	Food security	Food justice	Food sovereignty
Orientation	Corporate	Development	Empowerment	Entitlement
Model	Overproduction, corporate concentration, unregulated markets and monopolies, monocultures, GMOs, agro-fuels, mass global consumption of industrial food, phasing out peasant and family agriculture and local retail	Mainstreaming/certification of niche markets (organic, fair, local, sustainable), maintaining northern agricultural subsidies, sustainable roundtables for agro-fuels, soy, forest products, etc., market-led land reform	Agro-ecologically produced local food, investment in underserved communities, new business models and community benefit packages for production, processing and retail, better wages for agricultural workers, solidarity economies, land and food access	Dismantle corporate agri-foods monopoly power, parity, redistributive land reform, community rights to water and seed, regionally-based food systems, democratisation of food systems, sustainable livelihoods, protection from dumping/overproduction, agro-ecological management to mitigated climate change, regulated markets and supply

Adapted from Holt-Giménez, 2010.

For Indigenous people, it might mean revitalisation of traditional food cultures, and 'decolonising' local governance. For European or North American small farmers, it could mean defending local food cultures from being regulated out of existence, or guaranteeing the survival of a family farm for the next generation. In all of these are the common themes of self-determination, inclusiveness, re-definition of local food systems, and alternative forms of governance and decision-making. The last of these is important in both the creation and sustainability of transformations.

2.6 Food security

The right to food, and food security, are two widely accepted, but also widely varying and contested ideas in international and national policy arenas. Long and detailed negotiations to produce globally-accepted definitions nonetheless leaves them subject to multiple and sometimes conflicting interpretations. Although there are variations in definition, food security is nonetheless an internationally-accepted, long-standing global food policy concept. The definition used here is:

> […] a situation where all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active healthy life (FAO, 2012).

Interpretations of food security are still contested, for instance, by Holt-Gimenez (2010), who warns that there can be a 'reformist' discourse, serving to stabilise the global profit-driven food regime. Schanbacher (2013) sees the co-option of the food security narrative by the institutions aligned with the food regime. These include the World Trade Organisation, the World Bank and International Monetary Fund, as well as Big Philanthropy (corporate charitable foundations) collaborating with the agro-industry. The 'regime' approaches the problem of hunger with profit-making solutions that ostensibly feed growing populations, while boosting economic growth through free-flowing, global markets, and comparative advantage.

Pertinent to this issue, the approach to food insecurity and malnutrition of critics of the Green Revolution draw attention to the equitability of access to the tools of intensification and the many

unintended environmental and social impacts of technologies deployed in the name of food security (Kerr, 2012). Among these are negative trajectories in population nutrition driven by mass production of cheap energy (Gómez *et al.*, 2013). Many other critiques have been levelled at food security-driven efforts. Gendered roles in food systems, for example access to programmes and underlying policy biases towards men in agriculture and women in nutrition, are strategic considerations that can easily evade supply and production-driven approaches (Mkandawire, Hendriks and Mkandawire-Vahlmu, 2017). Power imbalances between social and political actors are pervasive, from households, to the international policy arena and (Mooney and Hunt, 2009). Food security, however, can also be conceived as a continuum, wherein sustainable, availability, accessibility and utilisation of food for culturally appropriate, healthy diets is achieved through social transformation (Hendriks, 2015).

These and other critiques are also about the processes by which definitions are reached and how they are adopted and interpreted in policies, strategies and programmes. High-level trade negotiations and global policy forums can seem distant and removed from local food systems. To remedy this, the idea of food security can be grounded in places and processes. Jarosz (2013) suggests that food security is subject to plural interpretations and need not be antithetical to transformation:

> Food security and food sovereignty discourses are tied to distinctive political and economic histories, ecologies, and identities at the national and local levels. They are differentially deployed depending upon geographic context and the political economy of development and underdevelopment. Both discourses are dynamic and changing in relation to the wider political and cultural economies of food system dynamics across scale (Jarosz, 2014, p. 169).

This proposes that the shifting interpretations of, and relations between, food security and food sovereignty are subject to different ‘geographies’ and ‘scales.’ Different configurations of individual rights and responsibilities, collective entitlements and capabilities within different natural, social and political environments determine their interpretation. In the arenas of national and international policy, the discourses may be divergent and oppositional because, for example,

of the difficulty of reaching consensus on issues such as intellectual property (i.e. genetically modified organisms), environmental and labour standards, and trade obligations. Locally, diverse social organisations and human values underpin local food systems in ways that that global policy language does not capture (Jarosz, 2014). Furthermore, when state sovereignty falls under neoliberal discipline, critics argue that the ability of states to act on behalf of citizens is seriously compromised (Rosset, 2008). When food systems are beyond the reach of democratic participation, stakeholders are excluded, and often these are the vulnerable constituencies to whom food security matters most (Rosset, 2008).

Greater stakeholder inclusivity and diversity can bring more possibilities for technically, political and culturally informed approaches to food security. Approaching food security locally opens it up to new meanings. A territorial approach enables the understanding of food security as a diverse set of experiences unique to local contexts, with solutions requiring local knowledge and actors (Cistulli *et al.*, 2014; Riley and Legwegoh, 2014). By "embedding economic activity in geographical space, by making the activity more dependent on local economic conditions and advantages," this approach focuses diagnosis, interventions and accountability at a local level (Cistulli *et al.*, 2014 p. 887). Sonnino et al. (2016) argue that:

> […] macro-level debates on food security have tended to rely on spatially aggregated and quantum arguments around demand and supply factors, without embedding (and indeed grounding) their narratives in the real and diversely assembled places in which food production, processing and consumption practices (always) occur (Sonnino, Marsden and Moragues-Faus, 2016, p.1)

Place-based approaches pay attention to scale and context. Sonnino et al. (2016) argue that most food security narratives are fixed to levels of analysis and proposes instead that efforts to refine the food security agenda should start by recognising places as mediators, bringing more diversity and complexity into the understanding of food insecurity (Sonnino, Marsden and Moragues-Faus, 2016).

2.7 The right to food

The right to food is defined by the United Nations Office of the Human Rights Commissioner as:

> […] the right to have regular, permanent and unrestricted access, either directly or by means of financial purchases, to quantitatively and qualitatively adequate and sufficient food corresponding to the cultural traditions of the people to which the consumer belongs, and which ensure a physical and mental, individual and collective, fulfilling and dignified life free of fear (United Nations, 2002).

Interpreting and implementing the right to food is covered by an extensive body of literature that is not reviewed here, beyond a few points of contestation.

The FAO Voluntary Guidelines to Support the Progressive Realisation of the Right to Adequate Food in the Context of National Food Security (FAO, 2005) give a developmental interpretation. Built on international law and drawing chiefly from the International Covenant on Economic and Social Rights (United Nations, 2002), the Guidelines constitute a set of recommendations on how to implement obligations under Article 11, which obliges States Parties to recognise the right to adequate living standards, including food, clothing and housing, and to take steps to ensure their continuous improvement. The guidelines mention the importance of international cooperation and specific programmes:

> […] to improve methods of production, conservation and distribution of food by making full use of technical and scientific knowledge, by disseminating knowledge of the principles of nutrition and by developing or reforming agrarian systems in such a way as to achieve the most efficient development and utilisation of natural resources; Taking into account the problems of both food-importing and food-exporting countries, to ensure an equitable distribution of world food supplies in relation to need (United Nations, 2002).

Germann (2006) suggests the right to food is interpreted in the Guidelines prevents it from being an effect instrument with which to contest violation by states and non-state actors or "an instrument to manage the problem of world hunger rather than serving to contest and transform its underlying structural conditions" (Germann, 2006 p. 4). This describes a scenario where the right to food simply becomes a programme of trade and economics:

> [...] with its human rights content largely suppressed, recast as a policy goal and molded into a policy approach – [it] is neutralised as a challenge and brought into conformity with the neoliberal project of globalisation (Germann, 2006 p. 4).

According to De Schutter (2011), the issue is not whether the right to food becomes a development agenda, but whether that agenda is decided by processes inclusive of rights holders. Unsustainable patterns of production and consumption call for food system reform, in particular the re-building of local food systems. This implies not only more inclusive policy processes, but suggests political, scientific, technical and market interventions are subject to democratic control, while policy process in themselves should contribute to deepening democracy and empowerment (De Schutter, 2009, 2011). These ideas are embodied in the PANTHER framework (participation, accountability, non-discrimination, transparency, empowerment and rule of law) developed by FAO, employed in right to food assessment (FAO, 2009).

While there has generally been limited progress on the part of states towards the realisation of the right to food, alternative food movements have expanded the understanding of the right to food as a form of "more inclusive participation of citizens in the governance of food and agriculture" and "a transition to more localised food systems" (Lambek and Claeys, 2016, p. 743). Food movements have pioneered models for transforming food systems in response to the lack of progress on the part of states, contributing to new narratives on structural change, defining new rights, developing new institutions and governance practices (Lambek and Claeys, 2016).

2.8 Food citizenship: Food democracy in practice

Underlying the health and social justice problems connected to food systems and food security are value conflicts in wider political systems that need to be resolved with the participation of informed, active and empowered citizens (Hassanein, 2003). Food citizenship is understood here as "food-related behaviours that support, rather than threaten, the development of a democratic, socially and economically just, and environmentally sustainable food system" (Wilkins, 2005, p. 271). Getting to nutrition and food security requires people to move beyond the role of passive consumers, recipients of charity or otherwise the silent objects of food policy (Wilkins, 2005). Food citizenship supports the democratisation of food systems by re-asserting local autonomy and re-generating diversity through economic, political, cultural and social processes (Pimbert, 2006). It constitutes food democracy in practice, which, in consumer societies:

> …counters aspects of food systems that diminish control, choices and erode food-related skills, such as corporate control over the food chain, providing consumers with limited product information; manipulation of the supermarket environment; and emphasis on processed and convenience foods – which demand less skill of shoppers and eaters – over less-processed ones (Welsh and MacRae, 1998 p. 237).

The concept of food citizenship developed initially in the context of western consumer societies among groups of people making responsible and informed choices about what they eat. Citizens are able to consider the environmental impacts of their food, for example, from the use of pesticides or travel distances. They consider the treatment of animals, terms of trade, conditions of agricultural workers and support for local communities. These considerations alone, however, seem add up to a restricted notion of food citizenship, associated with consumerism and eve affluence, or at least sufficient food availability and accessibility to permit choices between ethically and unethically produced food.

The notion of food citizenship has been somewhat narrowly deployed in terms of consumers exercising choices to minimise adverse effects and modulate the inequality and injustices that are effects of a globalised global food systems. There is an inherent 'us and them' duality this: 'We, the affluent consumers of the west, consider you, the less fortunate (people) without voices, in our decisions.' But food citizenship can be considered more than a privilege, in being the expression

of a wider set of rights and obligations, including both rights holders and duty bearers. It adapts to different contexts, capacities, assets and opportunities, where citizens might have less influence on food systems purely through purchasing power, but where these citizens may hold alternative forms of agency.

Food citizenship may be seen as the practice of food democracy: the re-assertion of rights ranges from merely being represented in political processes to changing ownership of the actual means of production, processing, and distribution of food (de Tavernier, 2012; Renting, Schermer and Rossi, 2012). The idea of the food citizenship in low-income countries where there is widespread food insecurity and malnutrition is not well-developed, in spite of the growing body of literature on food movements, agrarian activism, food sovereignty, and food justice.

The legacy of food insecurity and malnutrition in poor countries is notorious for famines, food shortages, bread riots, aid dependency, harsh structural adjustment measures (and more recently, land-grabbing), susceptibility to volatile markets, and climate change. This legacy has arguably even led countries to enshrine the right to food in their constitutions. This makes the idea of food citizens as holders of rights and obligations in food insecure countries worthy of examination.

Food citizenship becomes an important component realising the right to food, not only because citizens are rights holders, but because of the technical approaches to addressing food insecurity and malnutrition. Increasingly, local food systems in both high and low-income countries to food security and nutrition are a site of intervention led by activists, involving communities themselves, and often supported by government initiatives. Rebuilding local food systems, according to former United Nations Special Rapporteur on the Right to Food Olivier de Schutter, requires participatory and inclusive diagnosis of problems, social innovation, and bottom-up accountability (De Schutter, 2014).

In the context of hunger, malnutrition and food insecurity, food citizenship under the constitutional right to food takes on different meanings. Social justice and equity in access to food have social, political, and economic determinants beyond the control of the individual, which shape the entitlements, capabilities, and choices that influence food security. Food citizenship in this context

is useful for the characterisation of rural, agrarian poor people as stakeholders in the wide range of policies that impact them. But very often they are categorised in policy's top-down perspective as merely subjects: welfare beneficiaries, charity recipients, or simply passive consumers. Seen from a bottom-up perspective, poor rural people, and their food systems feel the impacts of many factors that fall outside the scope of food security policy, and respond and interact in ways that differ widely from place to place. With these diversity and accountability imperatives in mind, policy relying on statistical abstractions to design sweeping, centrally-managed reforms seems both inadequate and undemocratic.

Food citizenship is a banner under which activists – most in low-income communities within high-income countries – have mobilised for social action within food systems, but the idea translates easily, beginning with the exercise of locating places and acts of food citizenship. The idea has been developed mainly with reference to civic food networks in high-income countries in Europe and North America. These are loosely defined as civil society networks with some of these aims and characteristics, where they:

• are changing relationships between producers and consumers;
• form networks involving food production, distribution and consumption practices, as well as other interested actors;
• attempt to drive processes of change in agri-food governance mechanisms with greater civil society roles in relation to market forces and the state;
• are linked to urban-rural relations and shifting locations of production and consumption;
• are involved in knowledge transfer and changing values, underpinning new preferences and practices; and
• form links with other social movements or civil society institutions where innovation and experimentation takes place (Renting, Schermer and Rossi, 2012).

Civic food networks can be forms of exchange and cooperation that are outside, or on the peripheries of formal agri-food systems, with both political and technical agendas:

> […] (re)constructing alternative forms of provisioning, which may result from a very close interaction and mutual influence between producers and consumers or even a physical identity of both roles […] and […] civic engagement into shaping public opinion, culture, institutions and policies by communication, lobbying and political activism (Renting *et al.*, 2012: 300).

An example of CFNs in a western context include community supported agriculture, where consumers make 'investments' in local farming, sharing risks and having a say in production, including buying cooperatives. Consumers may become involved to some degree in production, as a way of sharing labour but also with the aim of re-skilling or improving food knowledge. In some cases there is appropriation, where consumers become producers, for example in community garden schemes. All involve a deliberate choice to increase presence in, or influence on, value chains although not aimed at self-sufficiency. CFNs may be involved (sometimes exclusively) in advocacy and political engagement with food systems and food policy through lobbying or protest action. Sometimes there exist institutional frameworks, local government or community spaces space for dialogues between different actors (Renting, Schermer and Rossi, 2012).

2.9 Conclusion

Multiple, interconnected local food systems relying on different resources, technologies and transaction, shaped by multiple cultures and ecosystems, and governed by diverse groups of stakeholders, present a more resilient scenario than huge, highly concentrated food enterprises responding to a volatile global commodity markets trading intensively-farmed raw materials for food processing. Although these polararised (and emotive) scenarios may seem exaggerated, they represent parameters of broader discourses on the sustainability and equity of food systems that have emerged with the global food crisis and the concurrent crisis of climate change.

The only certainty in the midst of such complexity is that food security, or fulfilment of the right to food, are unlikely to result from top-down political decision-making, driven by the criteria of market efficiency or motivated by a master body of statistical evidence, any more than it will come about from a single magical vitamin pill to cure malnutrition. Changing the trajectory of the on-

going food crisis means first accepting the certainty that food systems are malfunctioning, with dire consequences and unforeseen risks. It could also mean letting go of the idea that complex, interconnected food systems can, or even should, be changed, by remotely tweaking markets with any degree of predictability, let alone to produce sustainable or equitable outcomes.

On many more levels, there is evidence that diversity makes for healthier, stronger, more resilient individuals and households, more sustainable ecosystems, and more equitable political systems. The question that arises is as to how to restore, create or promote diversity in a food system with such powerful forces driving uniformity, concentration, and consolidation. It has long been recognised that market efficiency does not sustainably and equitably guarantee food security, and that boosting grain yields through intensified monocultural production does not promote better nutrition. Conglomeration within food systems concentrates too much control in the hands of too few people, making food systems ungovernable and unable to meet the needs of wide varieties of citizens. To have supermarket chains as a singular and dominant retail source of food is to risk monopolies, leaving communities underserved, or relying on convenience food.

Not considering the importance of dietary diversity in nutrition interventions poses other problems. Measures to meet severe nutritional deficiencies, through supplementation, for example, have an important place on the food security spectrum, but non-food interventions (sprinkles, supplements or other nutrient-based interventions), along with biofortification of particular crops, have little effect on the drivers of malnutrition and food insecurity. Health and food systems are interconnected by more than nutrients. Food and food systems carry a wide spectrum of human values, both measurable and unmeasurable. The collapse of food systems has social and economic consequences more far-reaching and as dire as malnutrition. Loss of land, social ties, cultures and local knowledge, as well as poor health, are all consequences of industrialising food systems. A better understanding of these impacts is gained through participatory forms of knowledge creation

Social protection measures, while an essential part of food security and nutrition, can also have unintended consequences. The idea of adverse incorporation captures that, without structural changes, the capabilities of poor people are enhanced only to the point where they can buy themselves into inadequate housing, poor diets, and the certainty of no social mobility. Emergency

measures to meet immediate food needs would seem uncontroversial, but over time, short-term needs can become long-term needs. This is less about creating dependency than it is about food dumping creating disturbances in local markets. More importantly, charity or is not rights-driven. Philanthropy is not a substitute for the responsibilities of government duty-bearers, and, as Karl Polanyi famously pointed out, can serve to stabilise and perpetuate destructive systems by softening the edges of the worst injustices.

Food movements, such as the food sovereignty and food justice movements, have brought the focus of the food crisis to related environmental, social justice and human rights concerns while emphasising the need to change underlying power structures and processes. This focus, in turn, reveals the need to recognise that human and non-human interests (ecosystems, biodiversity) are underrepresented and undervalued in political and economic transactions around food. New forums and processes are needed to resolve value conflicts, and these need to embrace the diversity of stakeholders and interests. The idea of food democracy, although not particularly well-defined, suggest the opening of new and more inclusive political spaces, accessible to those most affected and most vulnerable, where matters of food can be negotiated and conflicts resolved. Most importantly, though, it is an idea open to a diversity of interpretations and possibilities for practice as food citizenship.

Chapter 3 – Evidence of malnutrition and food insecurity in South Africa

3.1 Introduction

A general understanding of patterns of malnutrition and food insecurity across South Africa's diverse regions and cultures, but a comparatively poor understanding of local contexts, has limited policies to top-down approaches (Pereira and Ruysenaar, 2012; Drimie and McLachlan, 2013; Hendriks, 2013). Understanding food insecurity involves examining systemic causes – poverty, unemployment, climate change and price volatility, for example – but remotely manipulating supply and demand does not address root causes or change underlying structures. Views 'from above' show patterns of malnutrition and food insecurity, views on the ground reveal the assets, activities, and interactions that are of poor rural people in shaping food systems, which are also critical to rebuilding local food systems (Sonnino, Marsden and Moragues-Faus, 2016).

Transdisciplinary, place-based and food movements' approaches to understanding food insecurity open up wider ranges of possibilities for addressing hunger and malnutrition than the limited tools of top-down decision-making. A more accurate picture of why people experience hunger and malnutrition includes a localised understanding of what people actually eat, where their food comes from, and what shapes their interactions with food systems. Local knowledge, assets, capabilities, and sources of resilience inherent in environmental and social systems add to the diversity of policy options. But these are made available only through inclusive and consultative processes.

This chapter compares perspectives on malnutrition and food insecurity in South Africa to illustrate the need for transdisciplinary approaches, but also to expose a major gap in our understanding regarding how South Africans interact with, and thereby shape, their local food systems. The seeds of food citizenship are present in even the poorest communities. Policy needs to create enabling local environments and supporting processes in which people can be active participants in improving their own food security, rather taking a uniform, 'blueprint' approach to rural development that holds particular assumptions about local conditions.

3.2 Food security and nutrition: views from the top

Around one quarter of South Africans, or between 13-15 million people are food insecure (Stats SA, 2015). Food insecurity is viewed by the South African state as a constraint to development, and has implemented a number of different programmes and initiatives (Battersby, 2011). These have spanned the agriculture, health, employment and social sectors, targeting incomes, food production and consumer and eating behaviours (Hendriks, 2014). Two new policy instruments were rolled out in 2013 and 2014, viz. a National Food and Nutrition Security Policy and a National Household Food Security and Nutrition Strategy. These are intended to further interpret and promote the constitutional right to food in Section27(1)(b) of the Constitution stating that "everyone has the right to have access to sufficient food and water" (Republic of South Africa, 1996). The state, in section 27(2), "must take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of each of these rights" (RSA, 1996).

The policy and strategy also intended to elaborate on the National Development Plan's (NPC, 2012) call to citizens, civil society and the private sector to create sustainable local food systems to promote agricultural development, job creation, improve food access and availability and address malnutrition. Food security is understood to be tied to other development issues, such as poverty, increasing fuel and food prices, sources of income, social protection, rural and urban development, changing household structures, land, health, education, water and sanitation (National Department of Health (DoH), 2016). Table 2 summarises available food security and nutrition statistics for South Africa up to the year 2015.

Malnutrition manifesting as childhood stunting (growth faltering) and obesity, are important focal points of the instruments. National statistics show that little progress has been made in reducing childhood stunting, which persistently affects around one fifth to one quarter of children under five (DoH, 2016). Of equal concern to nutrition, policymakers are increasing levels of overweight and obesity among adults (68% among adult women) and children (13% of children under five) and the numbers of children who are stunted, or short for their age (24.4% among children aged 1-3).

According to the Department of Health, less than one quarter (23%) of South African children are fed what is considered to be the minimum acceptable diet (see Box 1).

Stunting and obesity have terrible consequences for child development and overall longevity. Stunted children are unable to fulfil their physical and cognitive potential and are predisposed to obesity and chronic illnesses later in life (Martorell and Zongrone, 2012). Obesity itself is a well-known risk factor for chronic disease, including cardiovascular diseases such as hypertension and diabetes, as well as cancers. Both obesity and stunting are linked to poor quality diets that are high-energy but micronutrient (vitamin and mineral) poor. Most of South Africa's poor are thought to be living in this state of chronic food insecurity, described as hidden hunger (Hendriks, 2014).

Table 2. Food security and nutrition indicators for South Africa

Indicator	Unit	Latest available status[a]	Data source
Households living in extreme poverty	%	21.7	Stats SA (2015a)
Households without enough income to purchase adequate food and non-food items	%	37[a]	Stats SA (2015b)
Gini co-efficient	%	0.69	Stats SA (2015a)
Unemployment	%	25	Stats SA (2015a)
Childhood stunting < 60 months	%	26.4	Shisana et al. (2013)
Anaemia in women (16 to 35 years old)	%	23.1	Shisana et al. (2013)
Low birth weight babies < 2.5 kg	%	13	DoH (2012)
Children < 9 years old overweight or obese	%	14	Shisana et al. (2013)
Exclusive breastfeeding in the first six months	%	37	Labadarios et al. (2011)
Childhood wasting 1 to 3 years	%	2.2	Shisana et al. (2013)
Households living on less than the lower bound of poverty (R779 per month)	%	53.8[a]	Stats SA (2015a)
Households experiencing hunger	%	13.1	Stats SA (2015b)
Households experiencing severe inadequate access to food	%	5.9[a]	Stats SA (2015b)
Households experiencing inadequate access to food	%	16.6[a]	Stats SA (2015b)
Life expectancy	Years	62.2	Dorrington et al. (2014)
Maternal mortality ratio	Per 100 000 live births	174	DoH (2012)
Neonatal mortality rate	Per 1 000 live births	15	DoH (2012)
Infant mortality rate	Per 1 000 live births	27	DoH (2012)
Mortality rate of children under 5 years	Per 1 000 live births	41	DoH (2012)
Vitamin A supplementation of children < 60 months	% coverage rate	54	DoH (2012)
Obese women > 15 years old	%	24.8	Shisana et al. (2013)

Table 2. Food security and nutrition indicators for South Africa

Indicator	Unit	Latest available status[a]	Data source
Overweight women > 15 years old	%	39.2	Shisana et al. (2013)
Non-communicable diseases (NCD) mortality rate females	Per 100 000	98.1	WHO (2011a)
NCD mortality rate males	Per 100 000	92.4	WHO (2011a)
Population receiving social grants	%	32[a]	DSD (2014)
Household with access to piped or tap water	%	86	Stats SA (2015a)
Household with access to sanitation	%	79.5	Stats SA (2015a)

Source: Hendriks et al. (2016)

[a] No targets and benchmarks exist for these indicators.

Legend:

Good progress based on available data from previous assessment

Slow progress based on available data from previous assessment

No progress or deteriorated based on available data from previous assessment

Box 1. Minimum acceptable diet for children

The minimum acceptable diet, according to the South African Department of Health (2016), meets the following criteria:

1. Breastfeeding, or not breastfeeding, and receiving two or more feedings of commercial infant formula; fresh, tinned, or powdered animal milk; or yogurt.

2. Fed with foods from four or more of the following groups: a.) infant formula, milk other than breast milk, and cheese or yoghurt or other milk products; b.) foods made from grains, roots, and tubers, including porridge and fortified baby food from grains; c.) vitamin A-rich fruits and vegetables; d.) other fruits and vegetables; e.) eggs; f.) meat, poultry, fish, and shellfish (and organ meats); and g.) legumes and nuts.

3. Fed the minimum recommended number of times per day according to their age and breastfeeding status:
a. For breastfed children, minimum meal frequency is receiving solid or semisolid food at least twice a day for infants age 6-8 months, and at least three times a day for children age 9-23 months.
b. For non-breastfed children age 6-23 months, minimum meal frequency is receiving solid or semisolid food or milk feeds at least four times a day.

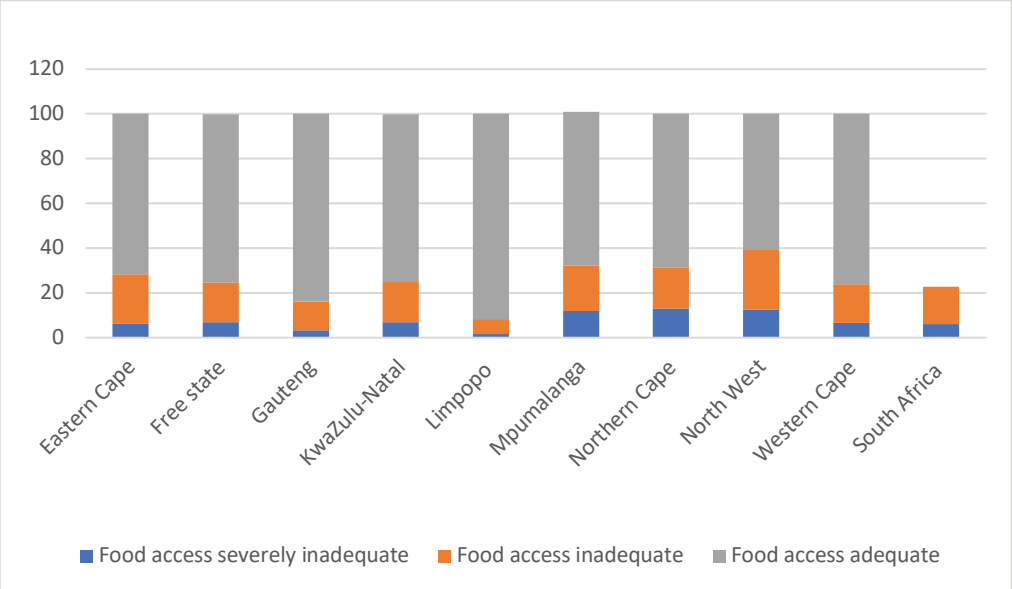
Source: South African Department of Health, 2016 Demographic and Health Survey

3.3 Determinants of malnutrition

Poor dietary diversity is thought to be an important factor in malnutrition in South Africa, contributing to both micronutrient malnutrition and obesity (Shisana *et al.*, 2014). Much of the poor population sits at the 'hidden hunger' point of food insecurity – suspended between chronic hunger and uncertainty about the future – relying on inadequate, semi-adequate or obesogenic food intake consisting of low-cost, micronutrient deficient foods (Hendriks, 2015).

National data from the General Household Survey show that over one in five (22.6 %) of South African households experience inadequate or severely inadequate access to food (Statistics South Africa, 2015). Overall, household food security studies spanning several decades point to the unaffordability, and therefore inaccessibility of food, as a primary cause of food insecurity (Misselhorn and Hendriks, 2017). Nationally, over one fifth of households across the country experience inadequate access to food. Figure 2 illustrates food accessibility across the provinces.

Figure 2. Percentages of households with adequate access to food, by province



(Statistics South Africa, 2015)

Obesity rates are also on the rise in poor rural communities, where 'fast' and 'junk' foods are not widely available or affordable, and activity patterns are not well known. The coincidence of childhood stunting with adult (caregiver) obesity in some households is predicted by low socioeconomic status, including low mothers' educational attainment (Steyn *et al.*, 2005). Both obesity and stunting are linked to diet quality and dietary diversity.

A modernising food system and rising obesity rates would suggest that South Africa is undergoing a similar pattern of nutrition transition to other low- and middle-income countries (Kruger *et al.*, 2005; Tathiah *et al.*, 2013). Rapid retail expansion has meant that food in general – including more processed, energy-dense, micronutrient-poor food – has become more accessible and affordable to poor South Africans through economies of scale, particularly where distribution costs are high (Igumbor *et al.*, 2012). There is evidence though, that poor South Africans in urban areas are eating more energy-dense and manufactured foods, because healthier options are less affordable (Temple *et al.*, 2011).

Poor rural South Africans also rely mainly on purchased food (Pereira, Cuneo and Twine, 2014). This is not entirely linked to recent supermarket expansion, where food staples bought from 'trading stores' constitutes a near-century-old feature of the rural South African food environments of the former homelands (Pereira, Cuneo and Twine, 2014). Smaller towns with fewer shops may have fewer healthier options (only white, rather than whole grain breads for example), and these tend to be more expensive. Even where supermarkets offer a wide variety of choice, choosing healthy alternatives (leaner, higher fibre, lower sugar foods) can more than double the grocery costs of a family (Temple *et al.*, 2011). For families in the lowest income bracket, this could mean that 98% of household income is spent on food (Temple *et al.*, 2011).

Among rural, poor agrarian people, food consumption also fluctuates seasonally, which is sometimes linked to seasonality of home food production and changing household expenses related to schooling costs and seasonal celebrations (Hendriks *et al.*, 2016). Household production contributes to dietary diversity and nutrition in poor rural communities, where there is support (irrigation for example) and collaboration (such as small cooperatives) and where surplus production supplements household income (Hendriks *et al.*, 2016).

3.4 Structural causes of food insecurity

These economic policies have an adverse effect on livelihoods and employment in rural areas, also shaping local food systems, local food environments, and impacting food security and nutrition of the poor along multiple pathways. In 2015, nearly a third of South Africans were recipients of means-tested social grants in the form of cash transfers to the elderly, disabled, caregivers of dependent children, and 21.7% rely on grants as their main source of income (GHS, 2015). In 2016, over half of South Africans lived below the poverty line of R779 per month, and 21.7% live in extreme poverty (DoH, 2016). Because so many South Africans rely on purchased food, income poverty is the most immediate barrier to accessing food.

It has been suggested that South Africa's wider policy context is counterproductive to food security strategies and goals (Drimie, 2016). Deregulation, liberalisation and competition have affected rural economies negatively, forcing farmers and workers out of farm employment and promoted consolidation. South Africa's growth path:

> …is part of a vicious cycle as the liberalisation and deregulation policies, encapsulated in many agriculture-focused policies, in turn drive farm consolidation and exclusion. As expected, bigger and better positioned players have benefited: agribusiness, processors and powerful supermarkets increasingly control agriculture. The benefits to the big players further intensify marginalisation of small, emergent black farmers, leading to a further livelihood loss and unemployment in rural areas, and deepening rural poverty and inequality (Drimie, 2016, p.7).

Rural livelihoods are diverse, with shifting combinations of household and small-scale production, reliance on social grants, migrant work, and informal sector activity (Du Toit and Neves, 2007). Among the most vulnerable are rural communities in the former 'homelands' or reserves, is the vestige of economic and political exclusion, and wholesale land dispossession. The food system is similarly a product of settler-colonial, cold war-era and modern, corporate agricultural and industrial expansion, which organised and reproduced relations of food production and

consumption, contributing to deeply-entrenched health disparities (Greenberg, 2013; Laughlin *et al.*, 2013). For many poor South Africans, food insecurity is an effect not of exclusion from the mainstream economy but of adverse incorporation:[2]

> South Africa's subalterns have long been incorporated into commodity relations: as consumers, social grant recipients, low-waged workers, informal-sector survivalists or the dependents of these groups (Neves and Du Toit, 2013, p. 95).

Adverse incorporation is further explained by Wood (2000, p. 16):

> In contexts of highly imperfect markets, corrupt state practices, and patriarchal norms, poor people (especially women and children) face a problematic search for security in income flows and stable access to stocks and services. They are obliged to manage this vulnerability through investing in and maintaining forms of social capital which produce desirable short-term, immediate outcomes and practical needs while postponing and putting at permanent risk more desirable forms of social capital which offer the strategic prospect of supporting needs and maintaining rights in the longer term.

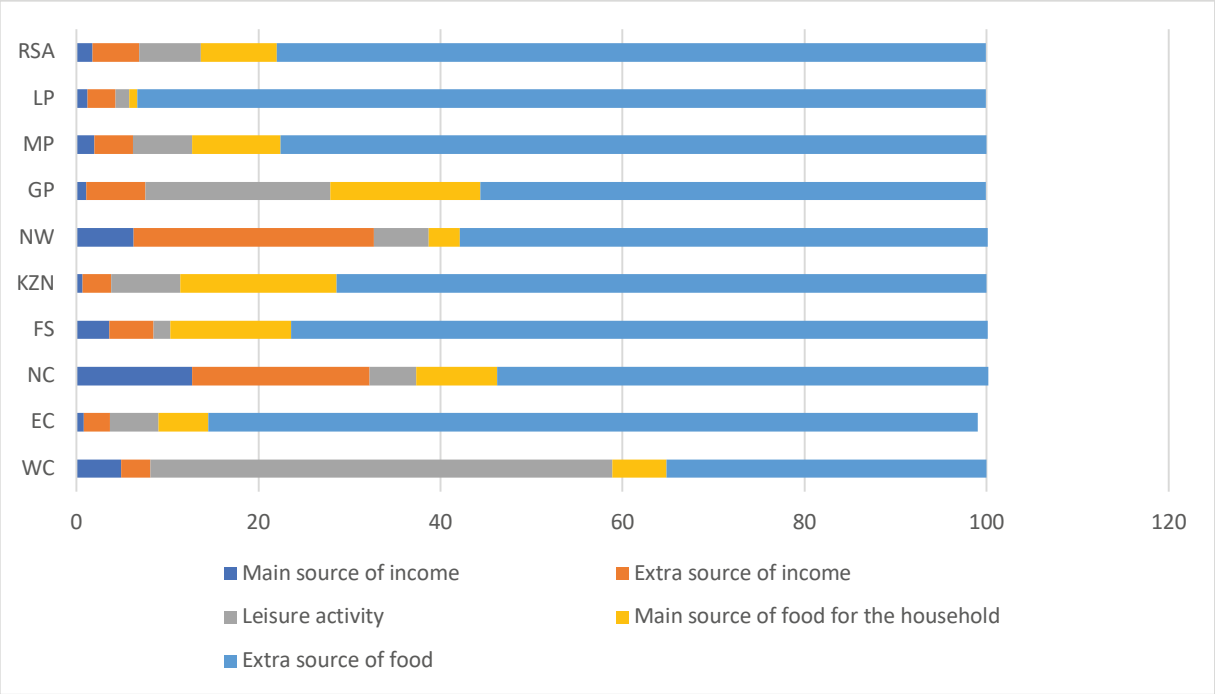
The experience of adverse incorporation into commodity relations is a way of understanding food insecurity systemically. For example, the dependence on purchased food, including the bland, processed or energy-dense cereals that are affordable to those relying mainly on social grants could mean that poor dietary diversity and malnutrition are outcomes of adverse incorporation. Wider and more localised food systems, livelihoods, food security and health outcomes are interconnected in ways that are eluding food security interventions in South Africa.

3.4 The role of local food systems

United Nations Special Rapporteur on the Right to Food Olivier De Schutter's report on his 2012 mission to South Africa highlighted enduring social inequality and poverty in the rural, agrarian subsistence sector. This "third world" of farming, highly vulnerable as it is to food insecurity, and largely excluded from agricultural support schemes, represents lost potential as an excluded stakeholder group in rural food security (De Schutter, 2012). The National Development Plan, also refers to sustainable local food systems as a starting point for food security, poverty alleviation and rural development (De Schutter, 2012).

As a stakeholder group, small-scale food producers may at first Although the overall proportion of South Africans farming is less than one fifth of the population (16.9% according to the 2015 General Household Survey), over 90% of these do so in backyard gardens. Over three quarters (77.9%) of producers in South Africa do so as a way to supplement food (StatsSA 2015b). Reasons for agricultural production by province are illustrated in Figure 3.

Figure 3. Reasons for agricultural production by province



Source: Statistics South Africa, 2016.

The rural poor, who rely partly on household production, experience periodic or seasonal food shortages, where dietary diversity fluctuates considerably (Hendriks *et al.*, forthcoming). But small-scale food production continues to contribute to the dietary diversity of the most vulnerable (Hendriks *et al.*, forthcoming), potentially playing an important part in the rebuilding of local food systems referred to in both the Food Security and Nutrition Policy and Strategy (RSA, 2014). Despite the policy focus on local food systems, to date, there is no systematic attempt to survey or inventory food systems at the local level, aside from numerical approximations of productivity. Conventional metrics like yields per hectare of course reveal that compared to intensive or industrial scales, small scale and subsistence farming is less productive. But as for food security metrics that once measured only calorie intake, numbers do not always capture all the values of interest, whether to the government or the rural poor themselves.

3.5 Synopsis

To decision-makers working with statistical data within their particular sectors, food security shows patterns and dimensions that are understood in particular ways, and which elicit certain sectoral responses. To the public health nutritionist, stunting and obesity are issues of food consumption (utilisation) to be addressed with supplementation to ensure children get the recommended nutrients for growth and development and nutrition education to promote healthier, less obesogenic diets, without understanding the limitations posed by poverty and food environments. The agricultural policymaker might approach the problems of food insecurity and malnutrition from the perspective of productivity, without fully understanding the complexity of livelihoods and issues of accessibility or even cultural preferences. An economist may see the potential for growth and income generation by more efficient use of land and resources, and sees making smallholder farmers more competitive as the solutions, perhaps overlooking the cultural and other non-monetary values that hold local food systems together. The social development specialist understands the economic and social vulnerability of the rural poor, but may fail to see the ways in which people actively maximise the use of their resources in order to overcome obstacles created by the many other policies that shape food and nutrition security.

None of these top-down, sectoral perspectives fully represents the position of the rural poor as stakeholders in food security. De Schutter's 'third world' of farming is in fact comprised of over four million (potentially food insecure) food-producing people who need to be included in decision-making about food security, on equal footing with the other stakeholders in building a food system that meets the needs of South Africans. This is a legal imperative of the constitutional right to food, as well as a missing policy perspective on food security of those who have thrived in the face of adversity, neglect, and hardship for far too long.

Chapter 4 – Policy perspectives malnutrition and food in security

4.1. Introduction

The right to food is enshrined in the South African constitution. However, the country faces complex food insecurity and malnutrition challenges stemming from the social, environmental and geographical legacies of colonialism and apartheid. Food insecurity and malnutrition are exacerbated by shocks and stresses of the volatile global economy, as well as climate change. South Africa is geographically, culturally and economically diverse, with middle-income status and extreme inequality. Formal and informal economies overlap in a globally integrated food system, retaining some traditional, rural, agrarian modes of production and food cultures. Household and subsistence food production is widespread, although few South Africans derive their primary livelihood from agriculture. Rural agrarian communities are among the most vulnerable to food insecurity. Malnutrition among this population shows as hidden hunger (adequate energy consumption and micronutrient deficiency), with concurrent high levels of overweight and obesity, as well as childhood growth faltering, or stunting (Shisana *et al.*, 2014). These outcomes have complex, interrelated drivers, cutting across health, environment, economic, food and agriculture sectors, exacerbated over the years by public sector underinvestment in agriculture and rural development (Drimie and McLachlan, 2013).

In 2013, the Department of Agriculture, Forestry and Fisheries produced two new policy instruments, replacing the 2002 Integrated Food Security Strategy, in the form of The National Policy on Food and Nutrition Security (DSD, 2013; RSA, 2013), and the Household Food and Nutrition Security Strategy for South Africa (DSD, 2013). These were intended to more decisively interpret, institutionalise and progressively realise the constitutional right to food, with the need to accommodate considerable economic and political uncertainty, diversity, complexity, and ideological polarity posing significant challenges in the South African policy environment. South Africa's food system, which, unlike the social sectors in South Africa, was never explicitly targeted for democratic reform. This paper examines the state's narratives of causes, risks and remedies for food insecurity in the 2013 National Food and Nutrition Security Policy. These narratives also lay out the trajectories and parameters of change in the 2013 Strategy. The objective of this analysis

is to draw conclusions about whether the South African government is indeed taking a transformative approach to food and nutrition security in the policies and thereby treating the underlying causes of food insecurity, or, whether it is merely addressing the symptoms of this issue.

4.2 Narrative policy analysis

In trying to manage complexity, uncertainty and polarisation around social problems, policy narratives incorporate diverse and sometimes conflicting stories (Roe, 1994). The aim of narrative analysis is to identify the coherent and complete 'stories,' with beginnings, middles and ends, that contain the arguments and the beliefs about causes and effects that anchor policymaking (Jones and McBeth, 2010). Using a narrative approach to policy analysis highlights complexity, uncertainty, controversy, and polarisation (Roe, 1994). Policies contain dominant narratives, counter-narratives and 'metanarratives,' or the over-arching stories that unify contrary ideas,

> […] which underwrite and stabilise the assumptions for policymaking in situations that persist with many unknowns, a high degree of interdependence and little, if any, agreement (Roe, 1994:36).

The use of this analytical method here demonstrates the ways in which policymakers articulate the historical and structural causes of food insecurity, identify potential political, legal and technical fixes, portray costs and benefits, and make use of, or indeed, overlook, evidence from various disciplines and bodies of knowledge.

Narrative Policy Framework analysis acknowledges the variable meanings derived from different social constructions, which are bound by beliefs, norms and ideologies, while narratives are still universal in their basic character, plot and outcome elements. These are in turn understood differently on different levels, namely the micro (individual level) meso (group and coalitional level), and macro (cultural and institutional) level (Jones, McBeth and Shanahan, 2014:10). Policy change occurs by working with(in) these metanarratives, rather than by simply posing challenges as critiques that offer no alternatives. Policies themselves can contain multiple narratives of the

same or closely linked phenomena, presented in ways that manage complexity, uncertainty, controversy and polarisation (Roe, 1994).

In this case, two recent policy documents, the National Policy on Food and Nutrition Security (DSD, 2013; RSA, 2013) and the Household Food and Nutrition Security Strategy for South Africa (DSD, 2013) were chosen because of their expressed purpose of progressing South African towards the realisation of the right to food. The texts were subjected to a line-by-line thematic analysis, and coded by the four discourses explained in Table 3: neoliberal, reformist, progressive and radical. Coded selections were then grouped and interpreted with reference to (1) global literature on structural drivers of food insecurity, explained in the following section; and (2) the food and nutrition security context of South Africa's most food insecure population explained in section 4.4. (see Appendix III for the detailed narrative analysis).

4.3 Pathways to food security and the right to food

Food security and nutrition policies are more and more common in the wake of the 2008 global economic crisis, which saw food riots erupting in dozens of countries. Several national governments, Brazil, India and South Africa among them, have enshrined the right to food in national constitutions and advanced towards fulfilment through social protection measures such as feeding schemes, cash transfers, and production measures. However, according to Lambek and Claeys (2016), progress is stalled by a crisis of accountability with regard to respecting and protecting the right to food. Policy contradictions, unfair trade rules governing food systems, unchecked power of transnational corporations, repression of social protest, as well as dissent, and a lack of participatory and rights-based governance structures, all disrupt and interfere with people's capabilities for feeding themselves (Lambek and Claeys, 2016, p. 765). Progress towards fulfilling the right to food is only partial, ensuring that people have access to adequate food, but not addressing the systemic causes of hunger and food insecurity and poverty, or creating more sustainable and equitable food systems (Lambek and Claeys, 2016). Participatory governance structures in policymaking have both technical and political value. The more stakeholders participate, the greater the incentives to politicians to act in the public interests, where stakeholders

usually have a good understanding what can and cannot work to improve their welfare (Henning, 2018).

Policy incoherence arises because states often fail to consider the human rights impact incurred due to political and economic decision-making in both global and national contexts, for example by adopting trade agreements, building major infrastructure or industrial developments, or undertaking macro-economic adjustments (Lambek and Claeys, 2016). These can impact the right to food along the complex array of pathways and feedback loops crisscrossing food systems, interacting with biophysical and environmental, technological and sociocultural and demographic drivers (illustrated in Figure 1, Chapter 1). A wide array of narratives can emerge from this complexity, holding uncertainty managing polarisation of agendas among different food system stakeholders.

The idea that failing food systems need to be rebuilt through inclusive and consultative processes is at the core of critiques posed by various activist and civil society-based food movements gaining prominence in the wake of the 2008 financial crisis. The 'broken food system' narrative tells of corporate monopolies, held in place by unaccountable governments, engaged in wholly profit-driven, industrial-scale production of food that is culturally dis-embedded, environmentally unsustainable, and nutritionally inadequate (Holt-Giménez and Peabody, 2008). Industry concentration is facilitated by trade liberalisation, commodity speculation, and accumulation of land and resources at the expense of smaller scale food producers (Araghi, 2009). The interconnectedness of markets and homogeneity of food supplies (reliance on a limited number of globally-traded food commodities) increases vulnerability to shocks and stresses, such as global market fluctuations and climate change (Barthel, Crumley and Svedin, 2013; Lachat *et al.*, 2017). Diversity of production methods diminishes across local food systems, economies and food cultures, reducing dietary diversity, and affecting nutrition outcomes (Holt-Gimenez and Peabody, 2008; Khoury *et al.*, 2014).

In dietary terms, these changes are implicated in nutrition transitions in low and middle-income countries (LMICs), where rising rates of obesity are attributed to increasing consumption of mass-produced, energy-dense and micronutrient-poor foods, as well as more sedentary lifestyles linked

to urbanisation (Popkin, 2015). The prevalence in LMICs of non-communicable diseases such as diabetes and hypertension, once associated with affluence, has risen considerably in the past three decades, driven by Green Revolution technologies and global agricultural trade (Popkin, 2015). Post-Green Revolution diets fulfil the caloric or energy needs of much of the world's population, but the massive expansion of a small number of intensively farmed commodity crops occurred at the expense of dietary diversity, food cultures, ecosystems, smallholder and family farmers and health (Kerr, 2012; Gómez *et al.*, 2013).

Governments are increasingly faced with pressure, activism and unrest over hunger and food insecurity, brought by a wide variety of civil-society based food movements. Some, like the peasant activist movement La via Campesina, are globally articulated. In recent years, civil society representation has increased in global policy forums, bringing with them agendas for wider representation, more democratic control and broader agendas for reform, tackling the globalised determinants of food security. Rights-based food movements have been important innovators in food governance, pushing the boundaries of civil society participation, opening new frontiers of government accountability and bringing fresh narratives of change (Lambek and Claeys, 2016). The call is for greater food democracy, in which

> …all members of an agro-food system have equal and effective opportunities for participation in shaping that system, as well as knowledge about the relevant alternative ways of designing and operating the system (Hassanein, 2003, p. 7).

Food democracy-based movements have been the vanguards of new discourses and narratives of transformation, as well as new forms of food citizenship (Wittman, Desmarais and Wiebe, 2010; Lambek and Claeys, 2016). Table 3 summarises some of the key narratives employed in alternative, food movements' approaches to changing food systems. This classification is a continuum, with a midpoint that divides 'reform' and 'transformation,' which Holt-Gimenez (2010) explains to be a division between measures that either stabilise systems, or change their underlying structures. There is a continuum of deepening structural reform, increasing entitlements, inclusiveness, and participation in control and decision-making with regard to food systems.

The neoliberal and reformist narratives concede that adjustments or regulations are sometimes necessary in order to correct excesses and ensure that the market continues to meet demands, but free markets most efficiently provide for the food needs of the population. Reforms keep in check the excesses of the market that might otherwise self-destruct (Polanyi, 1944). These come as cycles of liberalisation and regulation. In the food context, it can involve adjusting markets to meet changing consumer demands, supports within the agricultural sector, facilitating access to markets for certain producers, and responding to food and nutrition crises with charity (Polanyi, 1944; Holt-Giménez, 2010). Reformism accommodates controversy around deprivation by giving a prominent role to philanthropy, for example, public-private partnerships and corporate social investment initiatives. Meeting the short-term needs of the poor through private sector tax incentives keeps the welfare state in check and ensures the stability and perpetuity of the corporate food regime (McMichael, 2009b; Holt-Giménez, 2010). The role of social protection in the reformist narrative, besides meeting short-term needs of people in crisis, is to improve the productive capacity and purchasing power of the poor, enabling more capable navigation of the system, regardless of whether it is an equitable one.

Food justice and food sovereignty narratives prescribe systemic change, by shifting power, changing modes and places of food production, and by reforming the underlying structures to enable sustainable and equitable food systems (Holt-Giménez, 2010). The food justice narrative reports that in unequal societies, rights-based approaches to guaranteeing access to resources, workers' socio-economic rights, and addressing determinants of poverty will correct the socio-economic injustices inherent in market-based food systems (Giménez and Shattuck, 2011). The food crisis is heavily attributed to global corporate monopolies enclosing and commodifying resources, including land, water and seeds, to the detriment of small farmers, agricultural and ecological diversity and local food cultures. Democratic control over land, means of production and marketing will ensure that food systems work primarily to feed people in sustainable and culturally appropriate ways, rather than generating corporate profits. Food justice and sovereignty see food system transformation as a shift of power, entitlement and accountability through structural changes at different levels in the food system, from local to global (Holt-Giménezand Peabody, 2008).

4.4 The context of malnutrition and food insecurity

Malnutrition resulting from nutrition transition in South Africa is evidenced by a growing number of overweight and obese adults; among women over 15 years of age 39.2% are overweight and over 24% obese, while 14% of children under nine are obese (Shisana *et al.*, 2014). Poor quality diets contribute to persistent levels of stunting (growth faltering), affecting 26.4% of children five and under (Shisana *et al.*, 2014). Most South Africans are meeting their dietary energy needs, but the quality of diets is poor, likely owing to the higher costs of nutritious food compared to cheaper, refined, energy dense and nutrient poor food (Temple *et al.*, 2011). Retail expansion in recent years may have improved the accessibility and affordability of certain foods, including staples and other mass-produced and processed items but this has not guaranteed food security and has exacerbated malnutrition (Igumbor *et al.*, 2012). It is significant that obesity rates are among the highest the poorest rural communities, where agriculture is not modernising, lifestyles are not significantly more sedentary and people little or no access to fast food (Steyn *et al.*, 2005, 2011).

Nutrition outcomes in South Africa have not significantly improved overall since 1994. The most widely-accessed social protection intervention (the huge cash transfer program known as 'social grants'), food parcels to meet short term needs and a multitude of programs aimed at improving household, small and medium-scale agricultural production are not moving people out of entrenched in poverty (Hendriks, 2014). Food security researchers point to the state-centric, top-down approach to food security interventions, poor sectoral coordination and policy contradictions, calling for new approaches to governance (Greenberg, 2010; Pereira and Ruysenaar, 2012; S. L. Hendriks, 2013; Pereira, 2014).

Table 3. Food systems transformation narratives

Discourse	Politics	Narratives	
Neoliberal	Neoliberal	Productivity and purchasing power contribute to economic growth while eliminating hunger and poverty; open markets ensure food availability accessibility most efficiently; malnutrition is the result of lack of knowledge and poor lifestyle choices; charity is for the deserving poor.	Regime stabilisation: providing access to food
Reformist	Reformist	Household food security improves with purchasing power and productivity; open markets ensure accessibility most efficiently but consumers and producers sometimes need support to access these; modernisation and incorporation of small producers; nutrition outcomes are the result of lifestyle choices but people need guidance on how to make healthier ones; philanthropy through corporate incentives supports the neediest.	
Progressive	Empowerment	Underserved communities need investments in sustainable local food systems (production, processing and retail) and new business models; better wages for agricultural workers, access to land and inputs and guaranteed access to adequate nutritious food; nutrition is a social justice issue.	Food system transformation: respecting and protecting the right to food
Radical	Entitlement	Corporate agri-foods monopoly power must be dismantled and land redistributed, communities need guaranteed rights to water and seed, guaranteed sustainable livelihoods, protection from food dumping / overproduction, agro-ecological management is needed to mitigate climate change, markets and food supplies should be regulated; nutrition and health have holistic determinants linked diverse, ecologically and culturally appropriate local food systems.	

Adapted from Holt-Gimenez, 2010.

National-level data tends to reveal broad patterns of deficit and deprivation, which tend to be addressed with measures aimed at reducing economic inequality, for example by cash transfers through the social grant program to the elderly, disabled and caregivers of dependent children. Economic, social and political relations remain unchanged by these measures, and the marginal increase in purchasing power serves only to more deeply incorporate the poor into a monetised economy with few opportunities for mobility (Du Toit and Neves, 2007). Efforts to increase smallholder productivity have floundered due to poor policy coordination, while the ineffectuality of the land reform process to rural poverty alleviation is notorious (Aliber and Cousins, 2013).

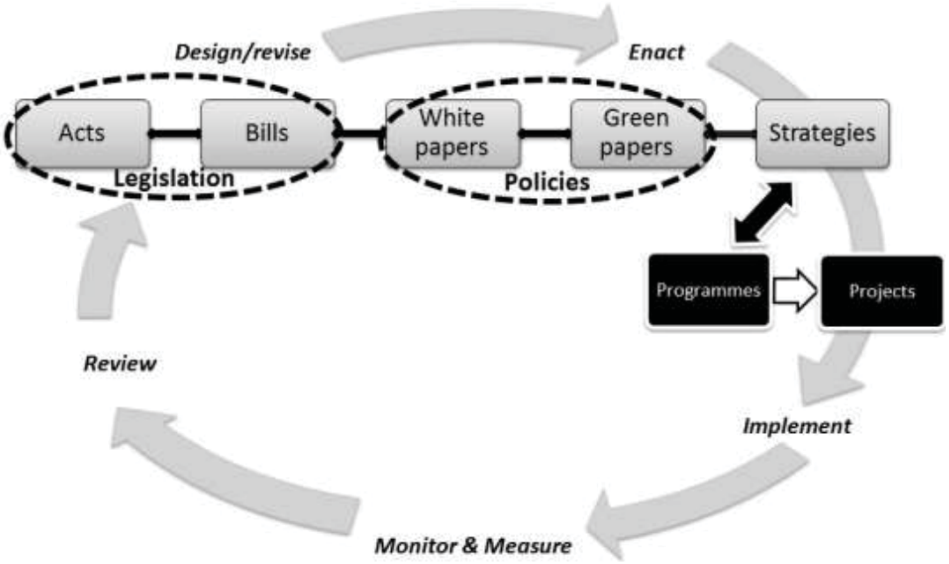
Agriculture nonetheless persists in the former homelands in a subsidiary role, as it did in the years of apartheid and the migrant labour system, making variable contributions to nutrition, food consumption and social and cultural life (du Toit and Neves, 2007). Despite shortages of land and a lack of support, small-scale and subsistence farming (including household production) still play an important role in livelihoods, food security and nutrition, with some four million South Africans estimated to be farming on this scale (Aliber and Cousins, 2013). The potential (in and some cases, the futility) of subsistence production is a recurring theme in food security research and policy throughout food-insecure sub-Saharan Africa attracting the attention of United Nations Special Rapporteur on the Right to Food, Olivier De Schutter, who visited South Africa in 2012. De Schutter recognised the progress made on the right too food through social protection but drew attention to South Africa's food security challenge in terms of the processes necessary for progress towards fulfilling the constitutional right to food. De Schutter's recommendation was for more inclusive stakeholder engagement in the diagnosis of problems and innovation of solutions (De Schutter, 2014, p. 16). South Africa's agricultural sector included a third world of farming, a class of rural agrarian poor people who would be key stakeholders in the processes leading to realisation of the right to food. These citizens needed to be defined as rights holders to whom the Government incurs obligations in order to

> […] improve the responsiveness of the policies to the real needs of the beneficiaries—moving towards a more bottom-up approach to agricultural support—as well as as their ability to deliver results (De Schutter, 2012, p. 10).

De Schutter's recommendations added to the emerging meta-narrative of poverty, malnutrition and food insecurity: that post-apartheid reforms in the agricultural, social and economic sectors were not adding up. The constitutional right to food needed to be interpreted with policies and strategies reflecting South Africa's wider transformative agenda. The anticipated parameters and processes for change were set out in two new policy instruments, the Household Food and Nutrition Security Strategy for South Africa (Department of Agriculture, Forestry and Fisheries (DAFF) and Department of Social Development (DSD), 2013) and the National Food and Nutrition Security Policy (RSA, 2014).

The Policy and Strategy were developed largely without public consultation and suggest a murky understanding of what a policy actually is (Hendriks, 2013). In terms of the basic tenets of policymaking (see Figure 4), the two documents fall short of articulating clear strategic directions, informing legislative frameworks, establishing platforms for dialogue and measures for accountability (Hendriks, 2013).

Figure 4. The policy cycle



Source: Hendriks, 2013, p.5

4.5 The National Policy on Food and Nutrition Security – defining the challenge

The 2013 National Policy on Food and Nutrition (summarised in Box 2) sets out a range of risks and threats include climate change, global markets and internal policy conflicts. These in turn impact the dimensions of food security dimensions of food availability, accessibility (entitlements to food), utilisation (related to preparation, intra-household allocation and consumption) and stability (regularity and predictability of food supplies). Food prices limit accessibility and markets negatively affect availability, while dietary diversity and micronutrient deficiencies (linked to food affordability) are the main concerns around utilisation.

Box 2. Summary of the 2013 National Policy on Food and Nutrition Security

2013 National Policy on Food and Nutrition Security

Definition: The 2013 National Policy on Food and Nutrition Security defines food security as 'access to and control over the physical, social and economic means to ensure sufficient, safe and nutritious food at all times, for all South Africans, in order to meet the dietary requirements for a healthy life.'

Assessment: The assessment of food security in South Africa points out that national food self-sufficiency is not a guarantee of food security. Citizens lack the knowledge and resources to make safe and nutritious food choices, while safety nets are not working optimally. Timely, adequate and relevant information for analysis, monitoring, evaluation and reporting on food security are lacking. Currently, food insecurity is measured using the Hunger Index, derived from the National Food Consumption Survey, anthropometric measures of overweight / obesity, underweight and stunting.

Availability, accessibility, utilisation and stability: Food availability is influenced by tradable commodity self-sufficiency (product which are imported and exported) and increasing demand. Emerging producers have been excluded by market deregulation and competition. Poverty, unemployment and high food prices (even higher for rural consumers) limit food accessibility. Dietary diversity, micronutrient deficiencies and nutrition knowledge are the main utilisation concerns. The stability of food supplies affected by natural, market political and economic forces and vulnerability to climate change, while South African farmers receive little support or protection compared to farmers in other countries.

Threats: Overall, globalisation and international trade regimes (affecting growth and food price volatility), climate change, and the poor storage and distribution of food threaten food security. Productivity is threatened by climate

change, poor land management and urban and industrial development, while there are limited opportunities for small producers to access markets.

Policy Pillars

• **Food assistance**: improved nutritional safety nets, nutrition and feeding programmes, emergency food relief, private sector, Community Bases Organisations and Non-government Organisations interventions.

• **Improved nutrition education**, including District level nutrition services providing consumer literacy and assisting with better food management and improved meal planning.

• **Alignment of investment in agriculture towards local economic development,** provision or subsidisation of inputs and support services for increased food production, more effective food storage and distribution networks, eliminate waste.

• **Improved market participation** of the emerging agricultural sector through public-private partnerships, a government food purchase programme that supports smallholder farmers, implementation of the Agri-BEE Charter (Black Economic Empowerment), which requires agro-processing industries to broaden their supply bases to include the emerging agricultural sector.

• **Food and Nutrition Security Risk Management**, investment in research and technology to respond to production challenges such as climate change and bio- energy, protection of prime agricultural land, limitations on alienation for mining, game farming, and property development; improved food security information management systems would also be required, scientific reviews of the state of food security.

Main strategies: The strategic goal of the National Food and Nutrition Security Policy is to ensure the availability, accessibility and affordability of safe and nutritious food at national and household levels.

• Increased and better targeted public spending in social programmes which impact on food security;

• Increase food production and distribution, including increased access to production inputs for the emerging agricultural sector;

• Leverage Government food procurement to support community-based food production initiatives and smallholders; and

• Strategic use of market interventions and trade measures which will promote food security.

(RSA, 2014)

The narrative situates South Africa in a global context where it has limited control (over markets and climate change), inefficient infrastructure and a highly consolidated food sector where small producers, including emerging farmers, cannot compete.

Box 3. Summary of the National Policy for Food and Nutrition Security Implementation Plan

Definition: The 2013 National Policy for Food and Nutrition Security Draft Implementation Plan defines food security as "a state where all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active healthy life (RSA, 2014, p. 51)"

Underlying causes: The persistence of food insecurity and malnutrition "[…] reflect[s] underlying social and economic conditions at household, community and national levels that might be supported by political, economic and ideological structures." This is attributed to "poorly executed institutional arrangement and uncoordinated and disintegrated strategies emphasis on agricultural productivity rather than multi-dimensional aspects of food and nutrition security cross-cutting integration and alignment of sectors for improved food and nutrition security (RSA, 2014, p.9)."

Food security programs and interventions SWOT analysis: The strengths, weaknesses, opportunities and threats analysis focuses heavily on structures, collaborations and capacities across government agencies, suggesting that although the structure in place are sufficient, there is a lack of coherence and coordination. Collaboration with civil society and other stakeholders present opportunities as does and enabling social and political environment for public and civil society participation. Poverty-related problems in rural communities are seen as development opportunities.

Institutional arrangements: Changes are inter-governmentally focussed, with added vertical structures that include provincial and district food security committees. A greater role for civil society as partners in service provision is envisioned in all the strategic objectives.

Monitoring and evaluation: This is explained as "comprehensive appraisal, coordinated and harmonised analysis that looks at the medium and long term impacts of a policy and exposes areas which worked, not worked and issues which should be done differently in future implementation" (RSA, p.18). Participants in evaluation will include local communities, government departments, donor partners, civil society, local governments, non-governmental organisations and community based organisations that will undertake "assessments of poverty, food insecurity and malnutrition status over the implementation period. Community based monitoring and evaluation would therefore be crucial in the implementation of activities." (RSA, 2014, P. 18)

Finance and business model: Catalytic investment by government and development partners will be specially targeted at strategic areas that provide leverage for the farmers and private sector to operate competitively (RSA, 2014, p. 20).

Outcomes: (1) improved access to food through social protection and development programs/ schemes; (2)

improved health, nutrition and hygiene; (3) an integrated multi-sectoral food and nutrition security early warning and monitoring information system; (4) establishment of food value chains for improved rural economies; and (4) strengthened food safety and quality control standards within local food value chains.

But an over-arching reformist narrative says that the market is still the best way to ensure food insecurity, but certain economic adjustments will have positive effects on the levels of hunger, food insecurity and malnutrition. The policy goes on to point out more specific problems related to the dimensions of food insecurity, availability, accessibility, utilisation and stability, linking all but utilisation to market efficiency and competitiveness. The utilisation problem of dietary diversity and micronutrient deficiency is a highly specific one and there is no clear proposal of how market adjustments might ensure that people are consuming the right variety of foods to ensure a nutritionally adequate diet.

Three reformist policy pillars, two of which refer to adjustments to markets and productivity, and one to social protection, aim to correct the excesses and inequities of the market. The third, leveraging government food procurement to guarantee markets for community-based food production deviates from this narrative quite significantly. By proposing a parallel, protected market based on entitlement (privileging local food systems) rather than market efficiency it suggest a kind of structural transformation, perhaps falling into the category of 'food justice.' But the processes by which this magnitude of change would happen are unclear, and the focus is very clearly on production, adhering to the 'driver of economic growth' narrative. The strategy section of the policy simply repeats the objectives of increasing production, privileging certain producers and intervening in markets. The metanarrative holding this policy together could be 'food security can be overcome if food production at all levels becomes more competitive".

An opportunity to elaborate on strategic approaches to the most food insecure sectors of the population comes in the form of the policy implementation plan (summarised in Box 3) and the 2013 Household Food and Nutrition Security Strategy for South Africa (summarised in Box 4).

4.6 The 2013 Policy Implementation Plan

According to the implementation plan, policy contradictions and an over-emphasis on agricultural productivity have meant that the underlying causes of food insecurity remain unchanged. On the first count, the plan outlines in detail new institutional arrangements and partnerships to ensure better coordination. But it does not elaborate further on policy coordination, for example by introducing measures to correct incentives of a de-regulated market to continually increase productivity. Production systems are still a primary focus of intervention with schemes to uplift and integrate producers into markets, as well as establishing a parallel food market linking public institutions to small-scale and emerging producers. In effect, a reformist narrative assumes that improving competitiveness in an agricultural-driven economy will promote food security. The plan even offers a state-designed blueprint to boost productivity and guarantee market access with 'catalytic' investments. These are backed up by horizontal and vertical institutional arrangements for better coordination.

The approach to food insecure sectors of the population is the focus of outcome one, improved access to food through social protection and development programs. This draws in the social development and health sectors, emphasising coordination, targeting and amplification of existing interventions such as social grants, the National School Nutrition Program, food distribution, breastfeeding promotion and nutritional supplementation. But it also has a production focus with livestock counts and grain and vegetable tonnage, bringing underutilised land into use and bringing more of it under irrigation.

The plan states the importance of community participation (in monitoring and evaluation) and involvement of the general public (under institutional arrangements), although the mechanisms for these are unspecified:

> Participation of the general public in this implementation plan is very important because all the interventions and programs proposed in this plan are implemented at their level. The community needs to be involved at all levels of program intervention and project implementation. There is a need of a community buy-in and ownership of

> programmes and intervention to improve reliability and sustainability (RSA, 2014, p. 16) .

By this definition of community involvement, participation begins only at the stages of intervention and implementation, excluding beneficiaries from the design phase. This appears to mean persuading communities to accept plans and programs that have already been designed without their participation, making ownership and sustainability more difficult. Community monitoring and evaluation could work to facilitate this, provided evaluation frameworks measure the value of programs to community members, by their own criteria, rather than simply supplying abstract, national-level progress indicators.

The reformist metanarrative of the implementation plan is an ambitious one that seems to say 'with enough coordination and support, everyone can participate in a centrally-planned production model to make South Africa more competitive.'

4.7 The 2014 National Household Food and Nutrition Security Strategy: addressing vulnerability

This draft strategy is focused at the level of household food security, on the population that is most food insecure and susceptible to malnutrition. It establishes that 5-15% of the population is chronically undernourished and increasing numbers experience other forms of malnutrition associated with dietary choices and diversity (DAFF and DSD, 2013). Over one quarter of children under five suffer from stunting as a result of prolonged malnutrition. This is persistent, despite a range of measures that includes social grants, feeding programs, food parcels, fortification of dietary staples (mainly wheat flour and maize in South Africa), support for household and small scale agricultural production, and food price controls (DAFF and DSD, 2013). The diets of the food insecure are characterised by too many low-quality calories and little diversity, which may be contributing to the burdens of undernutrition and obesity. Household experiences of hunger fluctuate and many are at risk of temporary under-nutrition from shocks such as such as food price spikes, job loss, and deaths (DAFF and DSD, 2013).

The Strategy attributes steady indicators over two decades to a range of government programmes that have prevented food insecurity and malnutrition from worsening. These include social grants, which reach 43% of households; the National School Nutrition Programme benefitting nine million learners; statutory fortification of maize and wheat flour; food parcels addressing acute needs; and a range of civil society initiatives. FoodBank South Africa receives a special mention, for its supply of 'rescued' food to NGOs for distribution to households throughout the country. In summary, the Strategy aims to reinforce existing measures through better targeting and coordination of responses, which will be based on improved information and by establishing new government structures, described in the Strategy summary in Box 5 (DAFF and DSD, 2013).

Reform within the status quo is again the default narrative, aiming to make existing initiatives "more robust" (DAFF and DSD, 2013, p. 4). The intent of supporting household production and small-scale producers is again to increase production, with the underlying narrative that this will enable food insecure people to better thrive within the existing system, whose basic structure and function does not need to change. Purchasing power can further be increased by more effective distribution of social grants, and shocks and stresses eased with charitable food distribution. Other interventions such as supplementation, fortification and 'micronutrient sprinkles' (DAFF and DSD, 2013, p. 4), while possibly having nutritional outcomes, still evade equity issues and the underlying structural causes of hunger and malnutrition.

Box 4. Summary of the National Household Nutrition and Food Security Strategy

Improvements to current interventions: Building on the NSNP with additional breakfasts and food vouchers**;** maintaining and refining the fortification program, possibly with 'micro-nutrient sprinkles'; better targeting of food parcels and vouchers; adding more nutritious foods.

New initiatives: A more robust network of food distribution centres; nutrition programmes in Early Childhood Development Centres (ECDs)

New advisory and working groups:

- Ministerial Household Food Security Advisory Committee
- National Working Groups

-Meeting immediate nutritional needs of the most vulnerable and food insecure

-Food fortification

-Improving access and affordability of food

-Support for Small Scale Producers, including Family Production

- National and Provincial Food Security Forums
- Household Food and Nutrition Security Coordination Office

Short-term steps:

- Establish new structures
- Strengthen the NSNP
- Expand the existing network of food distribution
- Develop and test mechanisms to support ECD centre nutrition programme
- Initiate a national early warning system for food and nutrition insecurity
- Strengthen the National Food Fortification Programme

Medium-term recommendations for government: Ensure the ongoing monitoring and refinement of the Strategy and its components, along with consistency and adequate funding for anthropometric and food consumption surveys.

(DAFF and DSD, 2013).

4.8 Conclusions

South African food and nutrition security policy instruments build on the claim that programmes and interventions have positively impacted food security and nutrition, mainly by reducing experiences of hunger. However, the current food system provides poor diets that perpetuate stunting, and promote obesity. The poor are also kept on the margins of the formal economy by economic immobility, and high unemployment leaves people disadvantaged, eking out livelihoods within a monetised economy. The solution, according to policy narratives, seems to be to incorporate everyone into to the agriculture-as-engine-of-growth development plan. With enough new structures and coordination, the plan will stimulate even the most moribund rural economies to grow efficient, competitive local food systems that bring food security and adequate nutrition, erasing inequities, social injustices along the way. For those who cannot keep up, there are social

grants, food distribution systems, and therapeutic nutrition programmes. Not only are there no structural changes, but it seems the some of the risks of the current system are to be amplified with more aggressive commodification and marketisation of rural life needed to make South Africa a competitor in a global economy, where low and middle-income countries feel the worst shocks of market volatility, climate change, and negotiate trade agreements, from disadvantaged positions.

Local food systems are identified in both the Policy and Strategy, as sites of interventions for improving food and nutrition security, resonating with the recommendations of Olivier De Schutter (2012). But a top-down economic blueprint for rebuilding local food systems seems risky, given the constitutional imperative to respect and protect existing livelihoods. For poor rural people, these are complex, including capacities and interests developed over years of coping with political, environmental and social adversity, which add up to stakeholder interests that deserve at least as much credence as those of corporations and government departments. Poor rural people, and all other South Africans, ought to have a say in what local food systems will look like, not only because of the constitutional imperative, but also because their realities and experiences should be informing the design of programs and policies. Poor rural communities are not *terra nullius*, no-man's land, where inert populations wait to 'buy in' to a centrally planned vision of rural reality.

Restricted parameters of structural change are matched with exclusionary processes. Much of the rationale in the policies derives from the unacceptably high number of poor, hungry, and malnourished people. Citizens of poor rural communities face many barriers and disadvantages, surviving by patching together livelihoods out of social protection, formal employment, informal sector work, migrant work, household production and social reciprocity networks. But this also makes them multi-faceted stakeholders in the full range of policy sectors that underpin food systems and drive food in security and malnutrition. Still, they are not named among the significant roleplayers, the Department of Social Development, the Department of Basic Education, and the Department of Health, where secondary departments could include Department of Agriculture, Forestry and Fisheries, the Department of Rural Development and Land Reform, Water Affairs, and Science and Technology, local government and the private sector, through corporate social investment. Anywhere role-players, information and proposed institutional frameworks appear in the policy instruments are potentially appropriate places to introduce changes in consultation and

decision-making processes to include public engagement with these key stakeholders. If support for rebuilding local food systems is to be "in sync with communities" (DAFF and DSD, 2013:4), there must be more specific arrangements for public engagement.

By default, citizens become objects of policy interventions, programme participants, welfare beneficiaries or recipients of charity, rather than active partners in transformation. A more transformative counter-narrative would hold that the complexity and diversity of local food systems and the imperative of the constitutional right to food compel strategic interventions in food security, to be guided from the ground up. Protecting and respecting the right to food in poor rural communities may, or may not, require fundamental changes to the food system, but this will never be known, or be realised, if poor rural people are not co-creators of knowledge and co-designers of policies and programmes.

From the comfort zone of top-down decision making, the strategy assures us that the current economic model holds the potential to eliminate malnutrition, food insecurity and poverty. At the same time, the strategy overlooks opportunities and imperatives for deepening democracy and accountability. The key policy stakeholders in question are South Africa's most food insecure communities. Experiences from other countries show that communities can be effectively engaged in strategies and actions for addressing hunger and malnutrition, in governance and technical collaborations with civil society organisations working for food justice, food sovereignty, and more equitable and sustainable food systems.

Food democracy does not necessarily imply immediate, cataclysmic change. Community food forums, such as community food security committees, local food charters, or other localised mechanisms for mobilising people around food security are unlikely to generate controversy and would therefore be a relatively risk-free governance innovation. South Africa has diverse ecosystems, food cultures, and both traditional and modern farming systems, operating on multiple scales. Engaging communities would inject much-needed geographical, economic and social diversity – and therefore greater sustainability – into solutions for improving food security.

Public engagement on food security is a much-needed step in South Africa's democratic reform process and in the struggle against hunger and malnutrition. It will certainly be complex, time-consuming, and painstaking. But South Africa is a place of marked ingenuity, innovation, and resilience, as well as rich geographical and cultural diversity. Approaching this diversity as an asset on which to build local resilience, rather than an obstacle to overcome with centrist blueprints, would shift the role of poor rural South Africans from passive consumers, welfare beneficiaries and charity recipients to policy stakeholders to whom decision-makers are accountable.

Chapter 5 – Community perspectives on malnutrition and food insecurity

5.1 Introduction

South Africa is a geographically and culturally diverse, middle–income country experiencing chronic food insecurity. While this is both a rural and urban problem, it is concentrated in rural, former homeland (native reserve) areas. Food security and social protection policies in South Africa have had some success in alleviating extreme poverty and hunger, but are failing to address chronic food insecurity in rural communities.

This chapter demonstrates some of the ways in which food security research can be enhanced by participatory methods, including the validation and interpretation of research findings. It describes the outcomes of facilitated discussions with rural community groups of as part of a study exploring the rain-fed and irrigated small-scale production in rural, former homeland regions of South Africa, bringing new insights to pathways between environmental and social change, food security, and nutrition outcomes, and how rural people shape local food systems.

South Africa's poorest rural communities show rising levels of obesity and persistent rates of childhood stunting (Shisana *et al.*, 2014). Among women over 15 years of age, 39.2% are overweight, and over 24% are obese, while 14% of children under nine are obese, and 26.4% are stunted (Shisana *et al.*, 2014). Most South Africans seem to be meeting their dietary energy needs, but the quality of diets is of concern (Temple *et al.*, 2011). While rising obesity rates have been attributed to nutrition transition in urbanising populations in developing countries (Popkin, Adair and Ng, 2012), they are harder to explain in rural, agrarian settings, where, for example in South Africa, obesity coexists with childhood stunting, often within the same households.

Although food security is universally defined as "when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences" (FAO, 2008), it is in reality a diverse set of experiences, unique to geographical spaces and local economic conditions (Cistulli *et al.*, 2014; Riley and Legwegoh, 2014).

Experiences of food insecurity are widely variable and shaped by local social, economic, and political environments, as well as interactions with food systems (Hendriks, 2015). Rural livelihoods in South Africa entail shifting combinations of wage labour, subsistence and small-scale agriculture, and access to different social protection measures (Laughlin *et al.*, 2013; Neves and Du Toit, 2013). Inadequate information and highly centralised policymaking have produced one-size-fits-all strategies and policies that overlook local environments, community-level constraints and capabilities.

In food security assessments, household or community members are usually subjects responding to enumerators with long lists of questions, and are given limited opportunities for explanatory or additional contextual information. This experience can be intimidating, invasive and inhibiting, rather than inclusive and empowering. Including communities in discussions and interpretations of research findings in an appropriate setting, using accessible media, opens up the possibilities for new interpretations, further questions and even new policy directions.

Realising the constitutional right to food in South Africa requires food and nutrition security strategies and interventions to incorporate new kinds of consultation and forms of governance that focus diagnosis, interventions and accountability at a local level (Pereira and Ruysenaar, 2012). Former UN Special Rapporteur on the Right to Food, Olivier de Schutter, has suggested that food and nutrition security strategies in South Africa need to be more inclusive, participatory and accountable, including communities and small producers and civil society oversight

> […] in order to allow all stakeholders (from the producers to the end consumers) to arrive at a joint diagnosis of which improvements could be made to rebuild the local food system and to propose certain social innovations (De Schutter, 2014, p. 16).

This suggests greater inclusion of communities in research processes, not just as subjects, but as participants in the co-creation of knowledge through the design, execution, analysis and dissemination of research. Participatory and inclusive food security research is an important part of the renegotiation of power in food systems, transforming people from passive consumers or beneficiaries, into food citizens (Wilkins, 2005). In a food democracy,

> […] all members of an agro-food system have equal and effective opportunities for participation in shaping that system, as well as knowledge about the relevant alternative ways of designing and operating the system (Hassanein, 2003, p. 7).

Research can be of both technical and political value to advancing the right to food, as guidance for the implementation and evaluation of programmes, but also as evidence for holding authorities to account for policy commitments in agriculture, food security, and nutrition, both locally and nationally. South Africa's most recent food security policy instruments, the Household Food and Nutrition Security Strategy for South Africa and the National Food and Nutrition Security Policy and Implementation Plan (RSA, 2014), were developed without public consultation. This raises a number of political and technical concern, placing food security outside South Africa's wider processes of democratic reform. It overlooks local contexts: ecological and cultural diversity, and pockets of innovation and resilience, as well as constraints. Approaching diversity as an asset on which to build local resilience, rather than as an obstacle to overcome with centrist blueprints, would shift the role of poor rural South Africans from passive consumers, welfare beneficiaries, and charity recipients, to policy stakeholders to whom decision-makers remain accountable.

Using research in more participatory and empowering ways raises a number of challenges for rural communities, who face numerous barriers to accessing information. There are few, institutionalised, dedicated forums for people to participate in local decision-making, and translating data into accessible formats requires innovative presentations. Literacy, especially among the older generation of rural South Africans in some areas, is low, and opportunities for engaging with data relevant to their livelihoods and health are few. While it is generally accepted that research evidence needs to be translated into forms accessible to policymakers, consideration is rarely given to the information needs of poor, rural people. It is simply assumed that research, if it is brought to the attention of the right people, will eventually support communities through evidence-informed policy change. Occasionally, evidence generated by research is used for mobilising communities around important issues, finding local solutions, and holding local office holders accountable. As HIV/AIDS activists demonstrated recently in South Africa, a critical mass

of scientific literacy among citizens can create the groundswell necessary for change when governments are unresponsive or recalcitrant (Heywood, 2009).

5.1.1 Indigenous and local knowledge, participatory research and transdisciplinarity

Food insecurity among Indigenous communities often has socio-cultural drivers:

> […] food choices, although deeply personal, also reflect cultures, rituals and social traditions. Food is an important part of culture, particularly for Indigenous peoples: the types of foods we consume and the way we prepare and eat those foods, with whom and where, are repositories of traditions and shape cultural identity. Food systems and food environments are consistently shaping cultures and traditions and vice versa (HLPE, 2017, p. 14).

Indigenous/local and Western scientific knowledge systems can both deepen understandings of food insecurity and malnutrition. Indigenous and local knowledge (ILK) systems include empirical, as well as hereditary and spiritual knowledge, and are relational, informed by a world view that recognises the interdependency of human, non-human and non-living entities (Romm, 2014). This worldview offers explanation for phenomena such as poor health, crop failure, and even complex climate change that recognises disharmonies and imbalances in human-natural systems as a key cause. In methodology, Indigenous-led research tends to be not only participatory and inclusive, but also involves communal deliberation and consensual processes, including traditional knowledge keepers (of plant and animal lore, medicine and oral history for example), as well as laypersons, in the consideration of social problems.

It is rare, but not unheard of, for research to be informed primarily by Indigenous knowledge systems (IKS), epistemologies, and methods. Most often, Indigenous methods are associated with emancipatory and transformative agendas, frequently in the areas of health and healing (Cram and Mertens, 2016; Chilisa, 2017), but intersect with food security and nutrition. Access to traditional food and medicine, participation in traditional food and healing systems and in their preservation and resurgence, have multiple, interconnected holistic health benefits. In addition to adding to

dietary diversity (Batal et al., 2005), access to traditional food and participation in traditional food systems is associated with healthy activity, greater access to land and resources, more diverse and resilient livelihoods, better mental health and cultural and linguistic integrity and continuity (which are in turn, contributors to holistic wellness), self-determination and sovereignty (Wildcat et al. 2014). Indigenous food and healing systems, and their importance in relation to holistic to social determinants of health, are important places for action on reconciliation and decolonisation (O'Neil et al., 2016). Indigenous communities, particularly in North America, Australia, and New Zealand, host community programmes to promote health through improving nutrition and food security, asserting food sovereignty (control over food systems) and revitalising traditional food, and medicine knowledge.

Colonisation suppresses cultural knowledge and practices by severing learning pathways, introducing western education, banning traditional practices, and the expropriating the lands and resources on which traditional subsistence was based. The disruption of social ties through forced or labour migration dilutes traditional knowledge, and leaves knowledge keepers few and far between. The food sovereignty movement intersects frequently with the revitalisation, transmission and translation of traditional knowledge of subsistence, food and medicine and their associated customs and protocols. The role of experiential and holistic community-led research can support communities in the reconnection of food, culture and land, and is increasingly employed in health promotion efforts in the Americas and Australasia (Wildcat et al., 2014; Robidoux et al., 2017; Sonnino, et al., 2016).

When emancipatory research often combines Western and Indigenous methods with deliberate attention to elevation or privileging of Indigenous knowledge that has been marginalised by colonial process, or which has been exploited without reciprocal benefit to communities, respect for community rights or recognition and representation of traditional knowledge-keepers (Chilisa, 2017). Chilisa (2017) illustrates the characteristics and applications of Indigenous in relation to Western research methodologies, shown in Table 4.

South Africa unfortunately offers fertile terrain for investigating the intersections of racialised poverty and social exclusion, and scientific and cultural imperialism. Wylie's (2001) historical

account of hunger under the former apartheid regime describes the dismantling of Indigenous food systems, not only by land expropriation but by the assertion of white / western cultural, scientific and moral superiority. In a perniciously paternalistic and negligent manner, the State attributed African poverty and malnutrition to a deficit of rational thought, initiative, and character (Wylie, 2001). At the same time, African farming and food production was dismissed as inefficient and primitive, and quashed by policies aiming to create labour surpluses for mining. Racial and cultural essentialism were deployed to reason that black South Africans could be satisfied with next to nothing – poor quality food, burdensome housing and criminally harsh working conditions – in order to realise the doctrine of separate development (Wylie, 2001).

Table 4 - Indigenous and western research approaches

Indigenous research approach	**Relation between ILK and western science**	**Applications**	**Value systems**
Least I=Indigenous	Western science dominates	Conventional research	Conventional ethics
Integrative	Integration of knowledges	Academic and community collaborative research North-South collaborative research Participatory, multi-epistemological research Participatory problem solving	Inclusiveness Build relationships between knowledge systems, communities /academics and people/ecological systems
Predominantly Indigenous		Indigenous research	Values spirituality, relationships, collectivity, communality

Third space		Sustainability science research	Hybridized practices and knowledge

Adapted from Chilisa, 2017, p. 822

The role and potential of ILK in food security in modern rural South Africa is underexplored. IK features in research related to biotech and pharmaceutical industries, gendered aspects of agricultural technology and the food sovereignty movement. In what has is labelled 'biopiracy,' ethno-botanical knowledge has been co-opted for economic gain, notably by the biotech and pharmaceutical industries, with no financial benefit to Indigenous knowledge holders, who do not hold formal intellectual property rights (Daya and Vink, 2006). Indigenous knowledge is valued by conservation practitioners working in collaboration with local communities (Adams and Sandbrook, 2013). A few localised studies document the role of ILK in subsistence (Maroyi, 2017) and relevance to climate change, but there is yet little no understanding ILK as an asset to food security. Women's ILK and experiences tend to be excluded from development debates and local-level ageicutural initiatives, although women are often users and adapters of new and old technologies in the pursuit of subsistence (Gumede, 2009). The emerging food sovereignty movement in South Africa understands the use of ILK as a political choice and a rejection the dominant food regime and an assertion of self-determination and control over food systems (Ngcoya and Kumarakulasingam, 2017). Managing and transferring ILK faces many challenges and obstacles, but often, so does accessing external knowledge, where extension services are poor (Lwoga, et al., 2011). Participatory approaches to knowledge production and dissemination can bring traditional and modern knowledge systems together in complementary ways (Lwoga, et al., 2011). While transdisciplinary research, such as sustainability science, includes stakeholders outside academia, this does not automatically include Indigenous knowledge holders (Chilisa, 2017).

South Africa's pathway to fulfilling the right to food crosses large communities of geographically and economically marginalised people, who, despite democratic reforms, continue to be excluded from participation in land, agricultural and food policymaking. Yet there are many possible ways in which rural, agrarian people's realities can enrich research and inform food insecurity policies,

strategies, and programmes. This paper interprets qualitative and quantitative data from a three-year, multi-disciplinary, multi-territorial research project on the potential of rain-fed and irrigated production of food crops to meet the year-round nutritional requirements of rural poor people in South Africa, with the objective of developing food democracy perspectives on food security research and policymaking. As such, it is only a tentative exploration of the potential for bringing ILK to food security – 'integrative' according to Chilisa's classification (Table 4). Nonetheless, it suggests that there is great potential in engaging more deeply with traditional knowledge systems in order to define research problems, illuminate pathways and determinants of food security and nutrition, and to generate solutions.

5.2 Methods

The three-year study took place in communities in four sites selected in the poorest local municipalities in South Africa, selected from the North West, Limpopo, KwaZulu-Natal, and Eastern Cape provinces. It aimed to explore the consumption and production patterns of rural households in in order to understand the potential for crop production to overcome dietary inadequacies and lead to better nutrition of rural household members. The project also generated a set of options for strengthening rain-fed and irrigated production in the rural areas under investigation. Knowing the contribution of home or smallholder grown foods to total dietary intake and nutritional requirements in some of South Africa's least food secure communities is important to the design of food security and agricultural policies, and to the understanding of the effectiveness of South Africa's social protection measures, which are among the most comprehensive in Sub-Saharan Africa. A local non-governmental organisation LIMA Rural Development was engaged to facilitate relationships within communities and their leadership.

Box 5. Lima Rural Development

Lima is an integrated rural development non-governmental organisation established in 1989, with the long-term objective of seeking investment opportunities for poor rural communities that make a tangible difference to people's lives, enhancing skills and livelihoods. Lima's approach is to embed qualified development facilitators in the areas of education, agriculture and infrastructure development to support community-led development processes. Programmes are initiated with consultative planning processes, and aim to develop of strong local institutional capacity, ensuring that community priorities are followed and met. Lima has a long-term presence within their communities, and is supported by a comprehensive network of public, private and community partners. Long-established networks, partnerships and relationships in eight provinces and in Lesotho have made it possible for Lima to achieve broad community impact and sustainability. In food security, Lima supports other food security NGOs with technical support and farmer mobilisation, supporting and increasing food production in vulnerable households through the provision of nutrition education, basic agricultural training, and infrastructural grants. Projects have been identified through integrated stakeholder forums in each of these areas, with beneficiaries including AIDS support groups, aged persons' clubs, community-based caregivers, homes for orphaned and disabled children, women, youth and schools. See https://lima.org.za/

5.2.1 Study sample

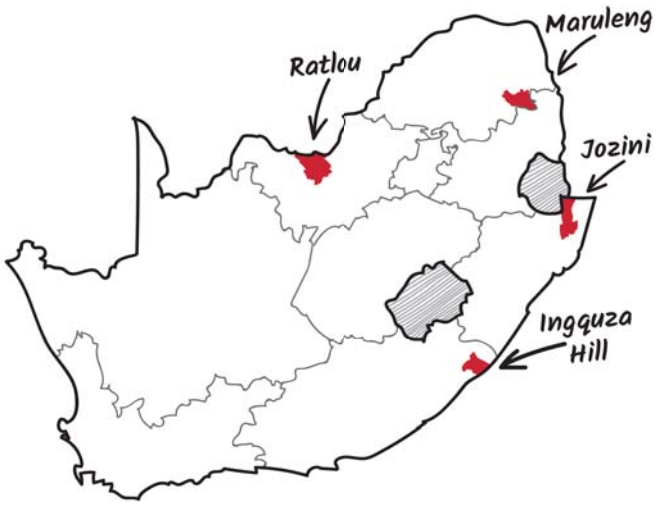
The poorest local municipalities in each of the four poorest provinces were identified as Ingquza Hill in the Eastern Cape, Jozini in KwaZulu-Natal, Maruleng in Limpopo, and Ratlou in the Northwest Province, as shown in Figure 4. This was done using the Heath Systems Trust Deprivation Index, a measure of relative deprivation of populations derived from a set of demographic and socio-economic variables obtained from the national survey data (Massyn *et al.*, 2014).

Two panel surveys were conducted at each site; one in the drier and less agriculturally productive winter months, and one in the summer months. The survey captured information about household

crop production, food consumption, a range of food security indicators, and anthropometric measurements of children aged between 24 and 59 months and their female caregivers.

Focus group discussions (FGDs) with household producers and small cooperative members were held in each community to discuss food consumption and production practices, to explore precautionary behaviour adopted when faced with food shortages and to determine whether there had been changes in food production and consumption over time.

Figure 5. Map showing WRC study areas



At the end of the project, community members were invited to validate and interpret panel survey data, which included numbers of households cultivating and irrigating crops, measures dietary diversity across seasons, anthropometrics of children under five, and adult female caregivers.

A full description of the sampling and data analysis methods is included in Appendix I.

5.2.2 Description of study areas

With the exception of Ratlou, most households in the study engaged in some kind of home production, although the relative importance of this to livelihoods varied widely. For some, it meant seasonal availability of small amounts of vegetables, while for others, succeeded in growing quantities of staples and produce that contributed significantly to dietary diversity and household food security. The four project sites were culturally, linguistically, and geographically distinctive. In each region, focus group discussions in food production, preparation and consumption, which included foods that were consumed in the past, or which were slowly disappearing from. The regions had unique food traditions, which were described in rich detail in the qualitative component of the study, but these accounts were contradicted by the bland uniformity of the diets described in the household surveys.

Ingquza Hill, an isiXhosa-speaking community in the Eastern Cape, is distinguished by its surrounding vast tracts of terraced farmland, formerly planted with maize and other staples, but now largely disused and sometimes eroded. Household subsistence farmers now work on small, fenced home gardens, producing vegetables, and keeping small livestock. A few, often elderly, people still use traditional ox-drawn ploughs and sledges to work the terraces, but for the most part, the terraced land lies fallow, and has been this way for several decades. Subsistence agriculture predominates in Ingquza Hill, a coastal biome that is also home to dune forests, swamp forests and coastal forests that are exploited by local communities for fuel and food.

Jozini (KwaZulu-Natal) contained most of the surveyed households that were engaged in somewhat larger-scale crop production, for example, more than a half hectare. Focus group participants explained that extensive communal grazing was available in the past (approximately before 1990). Grazing had declined over the years, where fewer people had their own cattle and land to cultivate, such that foods formerly produced now need to be purchased. A large irrigation scheme enables year-round production in cooperative gardens for some in this tropical region of South Africa.

In the tropical district of Maruleng, agriculture played a greater role in livelihoods than in the other study sites, with more diverse and vibrant involvement in household, subsistence and smallholder production, as well as a greater variety of crops and more involved local management of resources. A few Maruleng producers reported farming on larger private plots and produced more staples than did the Eastern Cape and KwaZulu-Natal groups. Some households were farming maize on plots of up to six hectares, producing enough to feed their families for the entire year without the need to purchase. Their main constraints were considered to be to be inputs such as fertiliser and mechanised tillage (the use of tractors), which were considered too expensive. The Mopani District has a number of small, community-managed irrigation schemes fed by mountain springs, which are in various states of disrepair.

In Ratlou District Municipality, the two selected communities shared the same typical arid bushveld type landscape. With the exception of a few large farms, limited crop production was observed. In the focus group discussions, participants confirmed that nowadays, only a few people engage in limited crop production, concurring with the study finding that only about 6% of households practised home gardening. Previously, many households followed the Tswana tradition of cultivating crops for household use at the *masimo* (traditional cultivation fields outside a Tswana village). Some of the older focus group participants in Madibogo remembered that maize was grown on large farms in the area during the time when Madibogo was part of the Bophuthatswana homeland. In recent years, the scale of maize production in this area has decreased, to the extent that the grain silos near the railway station in Madibogo are no longer in use. Diminishing home production was attributed to low rainfall in recent years and the growing scarcity of water. Nearby rivers had dried up, and only a few households had access to boreholes.

5.2.3 Food production, preparation, and consumption in the study areas

The food consumption focus groups supported the findings of the panel surveys (Figure 6), namely that most of the households consumed bland, but energy-rich diets of maize porridge and bread, either commercial or home-made from white flour. Occasionally there were rice or potatoes and sauces of tomato, cabbage or green vegetables, which could be bought, home-grown or occasionally wild-harvested, and prepared with cooking oil. Animal and other proteins as well as

fresh fruits were ‘payday’ foods – affordable when there was an influx of cash, usually at the time of social grant payments. Limiting nutrient-rich ‘extras’ was a strategy to stretch food budgets to last the whole month.

Households grew produce for home consumption, and even sold some for income, but this was the case where households had the additional benefit of access to irrigation or working in small cooperatives. In this daily quest for household food security, people were far from passive. Changing food choices, new kinds of social networks, changing urban-rural relations, knowledge transfers, new value propositions, and links with civil society movements, all shape local food systems in ways that involved local people’s agency, and, which respond to wider political, social and environmental changes.

Social reciprocity networks and collective work have long been important buffers against shocks and stresses. In the past, though, greater diversity and scales of farming meant more family members were involved in local food production, and families worked larger plots collectively. With dwindling local production and increased reliance on purchased food, collective work has changed. Young people are no longer interested in farming or compelled to participate in family production, attending school and aspiring to urban lifestyles instead. Household production is less a family enterprise, and more an activity of older women, although children are still involved in food preparation.

Being in charge of household nutrition and food security in this cash-oriented economy has generated different forms of collectivity, for example, to leverage purchasing power. *Stockvels* are revolving savings clubs, in which each member in turn receives the collective savings of the group. Funeral societies are important ways to leverage resources by ensuring that there is cash on hand for both burial costs and feasts, when there is a death in the community. Food and feasts on special occasions are socially important, but expensive, so community members would contribute in cases where immediate family could not afford these.

Local institutions, such as early childhood education centres and church groups, grow gardens for their own consumption and for selling. Some community development organisations gave

technical and financial support to local nutrition and food security projects. While there is some government support for household and small-scale food production, there is considerable initiative involved in gaining access to land, water and labour.

Initiatives for small collectives, buying co-ops and small-scale farming using alternative, agro-ecological methods indicate things are being organised outside formal channels and institutions. In some cases, small farmers were actively keeping alive traditional methods, saving and exchanging seeds, using animal traction, hand-milling grains, and preserving food traditions. This kind of deliberate holistic preservation and resurgence of traditional food systems, bound up in social reciprocity networks, has become rare, but indicates pockets of resilience and a potentially vibrant form of food citizenship.

Government decision-making forums or other spaces where household members could participate in discussions related to production, food security or local uses of productive resources such as land and water, were not explored in the focus groups. Most of the study areas were under systems of dual governance, a combination of traditional and municipal authority and local governance structures' involvement in nutrition and food security is typically weak in a highly monocentric policy sphere and there are few platforms for inclusive engagement of food insecure people.

Table 5 summarizes the changes over time in food production, procurement and consumption described by community members and links these to food citizenship and food security and nutrition.

Table 5. Food citizenship, nutrition and food security

Sites of food citizenship	Past	Current	Nutrition and food security links
Relationships between producers and consumers / consumers are producers	Relied on small retailers (trading stores) More home production of staple crops More livestock and milk produced More Indigenous/wild food harvested	More presence of supermarket chains and fast food franchises Reliance on purchased staples Surplus from small gardens traded or sold for income	Consumption sensitive to income /price shocks Greater availability of highly processed foods Reduced dietary diversity (DD) More sugar, salt and oil in food
Networks involving food production, distribution and consumption practices, collective production or purchasing.	Social reciprocity networks around local production Local food culture/traditional food in celebrations More family members involved in production	Youth disinterest in farming/children attending school Farming is for elderly people Stokvels (buying cooperatives) Church and school gardens Irrigation projects Funeral societies School and early childhood centre meals Informal sector livelihoods School / ECD feeding programs Food charity	Higher dependency/unemployment strains household resources Lost production and utilisation knowledge = lost dietary diversity Collectives buffer shocks and stresses Meal programmes reduce stress on households

Sites of food citizenship	Past	Current	Nutrition and food security links
Agri-food governance mechanisms / civil society roles in relation to market forces and the state	Social and family networks Traditional authority	Independent civil-society groups mostly involved in service delivery rather than advocacy; public engagement forums absent.	Weak local nutrition and food security governance. Communities are 'subjects' of programmes and policies whose outcomes are uncertain.
Urban-rural relations and shifting locations of production and consumption;	Migrant labour and regular remittances subsidise production	Rural-urban migration Urban food culture spreading Moving closer to towns and cities to access services and shops	More dependent on purchased food Shift to cheap processed food Diminishing home production = loss of DD
Knowledge (transfers) and (changing) values underpinning preferences and practices	Traditional food production and processing Knowledge of wild harvesting Seasonal harvest cycles	More store-bought foods now considered 'traditional' Traditional food associated more exclusively with special occasions Fast food is aspirational for youth Diminished food skills	Preference for high sugar/fat/salt content processed foods DD diminished Resilience lowered
Links with other social movements or civil society institutions where innovation and experimentation takes place	Family and homestead-based production	Agro-ecology and food sovereignty connections Community development organisations Church and school co-ops Farmer-to-farmer networks	New food skills and production methods Diversified livelihoods=resilience

School gardens and small cooperatives are forms of self-organisation, but are sometimes supported by non-profit, community development or faith-based organisations. These provide services that change producer-consumer relations. Although they hardly shift the status quo of power in the food system, they are still nascent forms of food citizenship with impacts on food security and nutrition.

There is knowledge-seeking, experimentation and cultural continuity or resurgence (traditional production methods and crops, illustrated in Figures 8-10 among farmers. Producing crops under prevailing constraints has demonstration value and farmers-to-farmer knowledge exchange will spread new practices, or perhaps revitalise old ones, with or without the support of local extension services.

Few, if any, of these past or current innovations and exercises of citizen agency are referred to in the National Household Food and Nutrition Security Strategy for South Africa (DAFF and DSD 2014) or its parent policy, the Nations Food Security Policy for South Africa (DAFF 2014). Both these policy instruments mention supporting local food systems and households, but only in the context of stimulating economic growth or augmenting existing food assistance.

5.3 Procedures for validation workshops

The initial WRC study was commissioned to inform the WRC's research agenda, specifically the need to identify crops with maximum nutrients from water input. The validation phase was added by the research team with the aim of grounding recommendations to the WRC in community perceptions. The current study expanded on this aim by asking community members to interpret those results with which they agreed. This gave community stakeholders an opportunity to engage in discussions with the researchers and to interpret findings within their own realms of knowledge and experience. The four workshops were held in February of 2016. Varying levels of literacy among the participants required presentations of numerical, quantitative data in accessible forms. A graphic designer prepared a series of posters and brochures specific to each research site. The

four-page brochures contain a brief introduction to the research project, and a map indicating the four districts and highlighting the one featured in the brochure; graphics presenting data on irrigation, household dietary diversity, including frequency of consumption of food over seven days and seasonal consumption of different food groups; anthropometry of adult female caregivers and children; key nutrition messages; and recommended irrigated and non-irrigated crops for summer and winter for optimal dietary diversity (Figures 11-16).

Farmers and growers, community garden project workers and rural development and extension workers, as well as some of the focus group participants from earlier rounds of qualitative data collection, were invited to the workshops. Also in attendance were some of the survey enumerators, who were familiar with the field research and helped with facilitation and explanations of the pictographs. The main oral presentations were given in local languages (isiZulu, isiXhosa, Sepedi and Setswana) by members of the research team or LIMA workers, who were native speakers.

After presentations of each set of findings, the participants were divided into groups of five or six people to discuss the research findings among themselves with the assistance of facilitators, after which they shared their interpretations with the group in an open discussion. This method of small 'talking circles' followed by a plenary reflects a process of reaching consensus or agreement on answers to the questions, rather than eliciting individual replies that could be quantified. In this way, all of the views of the participants come to be represented. For many of the participants, expressing individual views in front of a group and in the presence of outsiders would be both intimidating and culturally in appropriate.

The discussion questions given to the groups were:

- Is the information being presented an accurate depiction of the situation or context in the community?
- Are there foods in the recommended list for growing and eating that the community would not grow for reasons of preference, taste, culture?

- Are there foods in the recommended list for growing and eating that the community would not grow for reasons related to agronomic factors? And what are these factors?
- Have the foods you grow and eat changed over time – are there things that you eat less frequently or have disappeared from your diet and why?

5.4 Results of the validation workshops

The validation and interpretation of data took place in the final phase of the project, and was the last contact of the researchers with the communities. Participants in each workshop commented that this was their first experience of researchers returning to the community to present findings and invite discussion. People needed encouragement to speak up and to challenge the so-called 'experts,' but once the workshop process and the data, in graphic forms, were adequately explained, there was generous participation. Summaries of the findings, the graphic presentations and discussions are presented below, according to the topics in the brochure presentations, namely irrigation, food consumption, nutrition and cultivation, followed by key general interpretations and comments. In many cases, there was unanimous agreement on the findings; sometimes this was accompanied by affirmative comments or explanations, but not always. In instances where participants contested the research findings, they offered explanations for why they disagreed.

5.4.1 Crops and irrigation

Figure 5 illustrates that nine in ten surveyed households in Ingquza Hill and Jozini were engaged in crop production (90%). More than eight out of ten (82%) of the surveyed households in Maruleng were engaged in cropping. Very few households (four) surveyed in Ratlou were engaged in home gardening. All community gardens were irrigated, while 78% of farmland (usually plots of more than ½ hectare) and 75% of school gardens were irrigated. Just less than half (47%) of home gardens were irrigated. Irrigation was taken to mean any application of supplemental irrigation – from overhead sprinklers using pumps, flood irrigation from irrigation schemes, municipal water from taps or rain tanks (seen at many Ingquza Hill homesteads), to using a hose pipe or watering can with water drawn from rivers, tributaries, springs, wells, boreholes and tanks.

The highest proportion of household gardens was found at Ingquza Hill (92% of the sample in this area). In Maruleng, 78% of gardens were home gardens. Very few households were engaged with cooperative school gardens – only two in Ingquza Hill and two in Jozini. One household in Ingquza Hill was involved in a community garden. Half of the home gardens in Ingquza Hill were irrigated. Some 19 households in Jozini were involved in community gardens, which drew water for irrigation from the large Mjindi Irrigation Scheme at Makhathini. Larger plots (typically over a hectare) were farmed in Jozini on the irrigation scheme and mostly under rain-fed conditions in Maruleng.

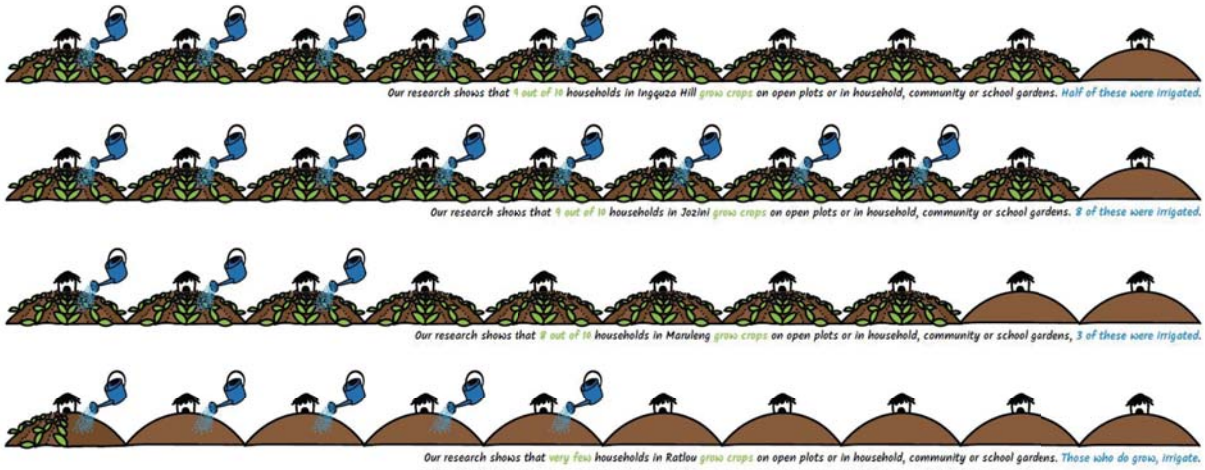
The irrigation research findings (Table 6 and Figure 11) were affirmed by participants in Ratlou and Maruleng, but contested by those in Jozini and Ingquza Hill. Participants in the Jozini workshop explained that fewer people were irrigating their crops than reported, because the large local irrigation scheme fed by the Pongolapoort dam had been in disrepair for some time. In Ingquza Hill, participants suggested that the only households that irrigated cultivated crops were those who produced to sell, for example to the school feeding scheme. They also pointed out that hand irrigation was most common, but very fewer people were doing this due to the scarcity of water in prevailing drought conditions.

Table 6. Households cropping and irrigating

Scale of production		Whole sample		Ingquza Hill		Jozini		Maruleng		Ratlou	
		Involved in cropping	If cropping, irrigating crops	Involved in cropping	If cropping, irrigating crops	Involved in cropping	If cropping, irrigating crops	Involved in cropping	If cropping, irrigating crops	Involved in cropping	If cropping, irrigating crops
Engaged in crop production	Sample size	349	228	68	53	141	122	67	49	65	4
	Yes	242	150	61	26	126	113	51	9	4	2
	Proportion (%)	71.2	65.8	89.7	49.1	89.4	92.6	82.1	18.4	6.2	50.0
Farmland	Sample size	242	73	-	-	126	62	50	11	-	-
	Yes	75	57	-	-	64	54	10	3	-	-
	Proportion (%)	31.1	78.1	-	-	50.8	87.1	20.0	27.3	-	-
Home gardens	Sample size	242	112	61	50	126	19	51	39	4	4
	Yes	120	53	56	25	20	18	40	8	4	2
	Proportion (%)	49.6	47.3	91.8	50.0	15.9	94.7	78.4	20.5	100	50.0
School gardens	Sample size	242	4	61	2	126	2	-	-	-	-
	Yes	4	3	2	1	2	2	-	-	-	-
	Proportion (%)	1.7	75	3.3	50.0	1.6	100	-	-	-	-
Communal gardens	Sample size	242	18	61	-	126	18	-	-	-	-
	Yes	20	18	1	-	19	-	-	-	-	-
	Proportion (%)	8.3	100	1.6	-	15.1	100	-	-	-	-

Source: Hendriks, et al., 2016, p.42

Figure 6. Households growing and irrigating crops presentation



Overall, people acknowledged a general trend towards fewer households cultivating. This was explained by drought or diminishing rainfall over a long period of time, as well as restricted or difficult access to surface water. Otherwise, the people who did not plant might also be child-headed households or 'lazy people.' It was alleged by several participants in different regions that the introduction of social grants (means-tested government cash transfers for the elderly, disabled and support of young children), had edged people towards abandoning cultivation altogether.

5.4.2 Consumption patterns

The survey results showed that the majority of households consumed foods from only four to eight of 14 food groups (Table 7 and Figure 6). Only 32% of the households surveyed had consumed food from eight or more food groups in the previous day in summer, while 20% of the households had consumed food from these food groups in the previous day in winter.

Meals in all communities consisted mostly of starch (maize meal) with daily consumption of refined sugar. People reported difficulties in managing their household grocery supplies, and serving diversified meals, where 'some foods are finished sooner than others' and so households relied on only starch-based staples for most of the month.

Table 7. Household dietary diversity scores from 24-hour recall

Site	Season	Sample size	Minimum	Maximum	Mean	Standard error	Standard deviation
Total sample	Summer	159	2	14	7.4	0.327	4.122
	Winter	187	1	14	6.0	0.221	3.021
Ingquza Hill	Summer	55	2	12	4.6	0.289	2.146
	Winter	69	2	10	5.0	0.245	2.036
Jozini	Summer	116	2	14	10.2	0.378	4.070
	Winter	82	2	14	7.3	0.401	3.629
Maruleng	Summer	36	3	7	4.1	0.164	0.984
	Winter	56	2	8	4.8	0.208	1.558
Ratlou	Summer	55	1	7	4.2	0.174	1.290
	Winter	64	1	9	4.7	0.215	1.719
Non-cropping	Summer	101	1	14	6.0	0.399	4.014
	Winter	81	2	9	4.7	0.178	1.603
Cropping	Summer	159	2	14	7.4	0.327	4.122
	Winter	187	1	14	6.0	0.221	3.021
Irrigating	Summer	95	2	14	8.9	0.421	4.099
	Winter	105	2	14	7.2	0.325	3.331

Hendriks et al., 2016, p.60

Figure 7. Dietary diversity data presentationFigure **8**. Presentations of dietary diversity data

The consumption findings were found to be accurate by the Ratlou participants, who explained that the long distance from markets and supermarkets meant infrequent access to fresh fruits and vegetables. Some people lived more than 100 kilometres from the closest small town and traveling was expensive (roughly R125 or around US$10.00 per return trip by public transport). There were few backyard gardens, because water was not available in this arid region, but even where boreholes and municipal supplies provided water, few people grew food. It was suggested that

climate change has made growing unpredictable, due to diminishing rain and more intense heat, which also made it more difficult to preserve perishable food. It was suggested that even in the shops food sometimes rots for this reason.

Participants in Maruleng agreed with the research findings and explained the lack of dietary diversity could be attributed to the shortage of money to buy different foods. Maize meal was usually the only food that could be made to last the whole month after other items ran out.

Participants in Jozini also agreed with the findings presented and explained that most of the vegetables they ate were grown close to the dam (reservoir) or river, where hand irrigation made year-round production possible. Otherwise, vegetables were not eaten because they were too expensive to buy. The communities relying on rain-fed production did not eat many fruits and vegetables in summer because they could no longer be grown in this region owing to drought and were too costly to purchase. Fruits such as bananas, which are widely cultivated commercially in the region, were also too expensive for households to grow or purchase.

5.4.3 Nutritional status

The Body Mass Index (BMI) of female caregivers of small children in the households surveyed was calculated as:

$$\frac{\text{Weight in kg}}{\text{Height in meters}^2}.$$

Just over one in five of the female caregivers (22%) was overweight, and 37% were classified as obese (BMI over 30). Combined, the proportion of overweight and obese female caregivers was 59 percent. Proportionately, fewer cases of underweight women were found, although 19% of the caregivers in Maruleng were underweight (Table 8 and Figure 7).

Table 8. BMI of Female, non-pregnant caregivers

	Total sample	Ingquza Hill	Jozini	Maruleng	Ratlou
Sample size	175	37	54	21	63
BMI	Percentage				
Underweight (BMI ≤ 18.5)	8.6	0.0	9.3	19.0	9.5
Normal (BMI 18.5 to 24.9)	32.6	40.5	27.8	23.8	34.9

Hendriks, et al, 2016, p. 95

Figure 9. Female caregiver anthropometric data presentation

The rates of child stunting measured as height for age and indicated by z-scores ≤ 2 standard deviations below the norm, was 24% overall among children of 24 to 59 months generally confirmed the national statistics for this indicator of deprivation (Table 9 and Figure 8). Stunting was considerably lower in Maruleng than at the other sites. The reasons for this were not obvious, although it was found that many more rain-fed crops grew in this district. Overall, 15% of the children were overweight.

The participants in Ratlou agreed with the findings on the nutritional status of young children and their caregivers. They explained that poor nutrition resulted from a lack of farming. Producing crops was not possible, due to the inaccessibility of resources, including land, water, implements, seed and funds for other inputs, all of which determined the availability of food. They also blamed shocks and stresses such as crime, sickness, death, floods and drought. They explained that there used to be more dams (small, human-made surface water reservoirs) in the area when the rains were better, and it was suggested that the clouds 'don't really rain anymore.' Participants also suggested that people eat the wrong foods. They also claimed that there are 'a lot of chemicals in store-bought foods that result in people being overweight, sickly and generally in poor health'.

Table 9. Child anthropometric data

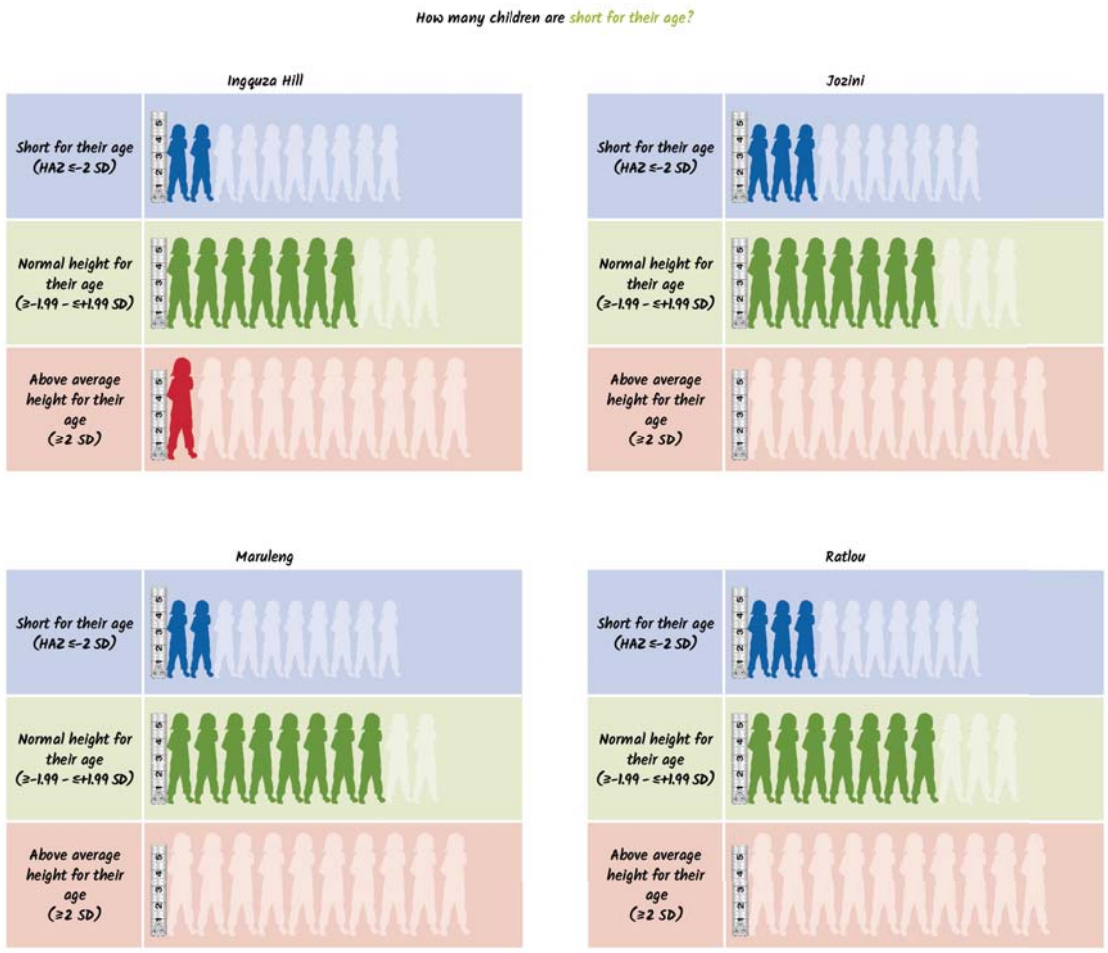
Sample	**Categories**	**Z-scores**				
		BAZ (%)	**HAZ (%)**	**MUACZ (%)**	**WAZ (%)**	**WHZ (%)**
Total	Sample size	285	314	357	326	286
	Below the norm ≤ -2SD	5.3	23.9	2.8	8.6	4.5
	Normal (-1.99 SD ≤ z ≤ +1.99 SD)	80.0	73.9	94.1	87.7	82.2
	Above the norm ≥ +2SD)	14.7	2.2	3.1	3.7	13.3
	Sample size	60	70	79	67	61

Ingquza Hill	Below the norm ≤ -2SD	10.0	24.3	2.5	10.4	8.2
	Normal (-1.99 SD ≤ z ≤ +1.99 SD)	75.0	74.3	96.2	86.6	77.0
	Above the norm ≥ +2SD)	15.0	1.4	1.3	3.0	14.8
Jozini	Sample size	96	104	116	110	96
	Below the norm ≤ -2SD	5.2	26.0	2.6	11.8	5.2
	Normal (-1.99 SD ≤ z ≤ +1.99 SD)	83.3	71.2	92.2	84.5	83.3
	Above the norm ≥ +2SD)	11.5	2.9	5.2	3.6	11.5
Maruleng	Sample size	51	54	63	58	51
	Below the norm ≤ -2SD	3.9	16.7	1.6	3.4	3.9
	Normal (-1.99 SD ≤ z ≤ +1.99 SD)	76.5	79.6	96.8	91.4	76.5
	Above the norm ≥ +2SD)	19.6	3.7	1.6	5.2	19.6
Ratlou	Sample size	74	82	95	87	75
	Below the norm ≤ -2SD	1.4	25.6	4.2	6.9	1.3
	Normal (-1.99 SD ≤ z ≤ +1.99 SD)	83.8	73.2	92.6	89.7	89.3
	Above the norm ≥ +2SD)	14.9	1.2	3.2	3.4	9.3

Hendriks et al., 2016, p. 96

Note: SD = Standard deviations above or below the norm; BAZ = BMI for age Z-score; HAZ = Height-for-age Z-score; MUACZ = Mid-upper arm circumference Z-score; WAZ = Weight-for-age Z-score; WHZ = Weight-for-height Z-score.

Figure 10. Child anthropometric data presentations



When people prepare their food incorrectly, it destroys the nutrition and the body cannot take up nutrients properly. Some households tend to buy the 'wrong foods or cannot afford to buy healthy ones'. Families are large and feeding so many mouths is unaffordable. Some claimed, on the other hand, that sometimes stunting or overweight simply reflects the body types people are born with, suggesting that these conditions are not dependent on nutrition and are beyond their control.

The participants in Maruleng considered the nutrition findings to be accurate, and blamed caregiver obesity and child stunting on the inability to grow or purchase a variety of healthy foods. They also suggested that obesity could also be passed along from mother to child when mothers eat too much.

The Jozini participants found the results accurate, offering a number of explanations for coexisting obesity and stunting. They stated that obese people ate too much junk food, such as potato chips, but they also ate too much meat, a lot of cooking oil or just too much food in general. They were also no longer working in the fields as much and did not exercise. Children were overweight because of a poor diet with too many carbohydrates, like their mothers, but short for their age, mostly because they resembled their short fathers. Women tended to be underweight, it was explained, when they didn't have water to irrigate and couldn't eat fresh vegetables, but it was agreed that most people didn't balance their diets and ate too much starch.

The participants in Ingquza Hill agreed with the overweight data, which was explained by people eating too much starch and not having balanced diets, because they did not have correct information on nutrition. They disagreed with the numbers of underweight children, suggesting that there were more of them in the community, suggesting that perhaps the researchers had missed many of the households with sick people. They also claimed that there are more tall children than the survey revealed, suggesting that one child could be taken from the 'short for age' graphic and added to the 'tall for age' as a way of making the research findings more accurate. This disagreement may have arisen from a misunderstanding of the concept of stunting.

5.4.4 Crops not grown or eaten for agronomic or cultural reasons

The study recommended crops based on their potential to improve nutrition, indicating where they would grow, and whether irrigation was required. The validation workshop presentation of recommended crops is shown in Table 10 and Figure 9. While no particular cultural reasons were given for not growing particular crops, it is probable that in some areas, crops have never been grown, because they are simply not preferred, nor have they been promoted or spontaneously taken up. The main reasons given for not growing crops, though, were water-related; either insufficient rainfall, or barriers to accessing irrigation and water sources. Participants in all four workshops suggested that crop size and diversity have been dwindling steadily over the years.

Table 10. Recommended crops

Recommended crop based on the potential to improve nutrition	Can it grow in Ingquza Hill?	Is it currently produced in Ingquza Hill?	Can it grow in Jozini?	Is it currently produced in Jozini?	Can it grow in Maruleng?	Is it currently produced in Maruleng?	Can it grow in Ratlou?	Is it currently produced in Ratlou?	Can it be produced under rain-fed conditions?	Can it be produced under irrigation conditions?
African leafy vegetables* ('wild' or cultivated)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Leaves, black jack#	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Leaves, cat's whiskers#	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Leaves, cowpea#	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Leaves, amaranth#	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Leaves, lambquarters#	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Leaves, nettle#	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Leaves, nightshade#	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Leaves, pumpkin#	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Leaves, sow thistle#	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Leaves, sweet potatoes#	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Amadumbe	Yes	Yes	Yes	Yes	No	No	No	No	No	Yes
Bambara groundnut	Yes	Not sure	Yes	No	Yes	Yes	Yes	Not sure	Yes	Yes
Beetroot* roots	Yes	Yes***	Yes	Yes	Yes**	Not sure	Yes**	Not sure	Yes**	Yes
Beetroot leaves	Yes	Yes***	Yes	Yes	Yes**	Not sure	Yes**	Not sure	Yes**	Yes
Broccoli	Yes	No***	Yes**	No	Yes**	No	Yes**	No	No	Yes
Cauliflower	Yes	No***	Yes**	No	Yes**	No	Yes**	No	No	Yes
Cabbage*	Yes	Yes***	Yes	Yes	Yes**	Yes	Yes**	Yes	Yes	Yes
Carrots	Yes	Yes	Yes	Yes	Yes**	Yes	Yes**	Not sure	Yes	Yes
Cowpeas leaves and beans	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Not sure	Yes	Yes
Cucumber* (field cucumber)	Yes	Not sure	Yes	No	Yes	Not sure	Yes	No	Yes	Yes
Dark orange pumpkin, butternut or squash*	Yes	Yes***	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Eggplant* (brinjal)	Yes	Not sure	Yes	No	Yes	Not sure	Yes	Not sure	Yes	Yes
Gem squash/ 'calabash'/other squash and pumpkin*	Yes	Yes***	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Green beans* leaves and beans	Yes	Yes***	Yes	Yes	Yes**	Yes	Yes**	Yes	Yes	Yes

Recommended crop based on the potential to improve nutrition	Can it grow in Ingquza Hill?	Is it currently produced in Ingquza Hill?	Can it grow in Jozini?	Is it currently produced in Jozini?	Can it grow in Maruleng?	Is it currently produced in Maruleng?	Can it grow in Ratlou?	Is it currently produced in Ratlou?	Can it be produced under rain-fed conditions?	Can it be produced under irrigation conditions?
Green peppers*	Yes	Yes***	Yes	Yes	Yes	Not sure	Yes	Not sure	Yes	Yes
Legumes* (dhal, dry beans etc.)	Yes	Yes***	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Source: Hendriks, et al., 2016, p.112

* The crop is prioritised for its nutritional content.

** The crop would do better with supplementary irrigation.

*** Farmers are interested in cultivating the crop.

The recommendations for Ratlou were contested on the grounds that virtually none of the recommended crops could be grown due to drought and a lack of water for irrigation. There were even drinking water shortages, such that to even think of planting crops requiring water was impossible. All the participants in Jozini agreed that all the recommended crops would require irrigation, except for legumes, loquat, melons, and *amadumbe* (taro), and sometimes pumpkins and butternut, depending on the area. The Ingquza Hill participants said the findings were not accurate, because all of the recommended crops needed supplementary irrigation, due to the drought, except for fruit trees. Crops like potatoes, beetroot and pineapples were not grown in Maruleng due to water shortages. In the Maruleng discussion, it was suggested that there are some people who are allergic to foods such as tomatoes and peanuts, who would not grow or consume these.

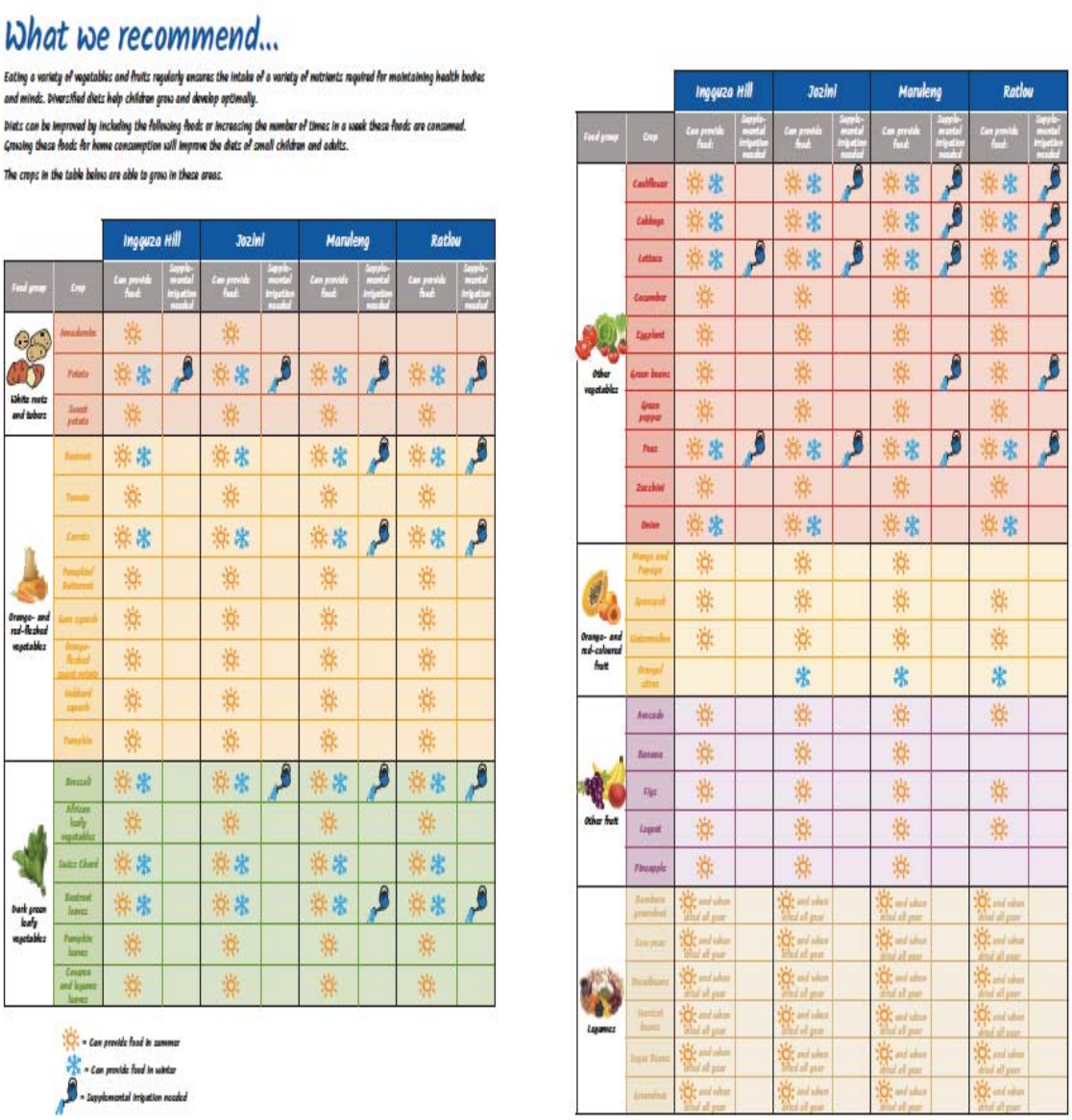
5.5 Community interpretations

In the shift from research subjects to co-creators of knowledge, the workshop participants offered interpretations of the study results that crossed the boundaries of the traditional disciplines of nutrition, agriculture or food security, drawing pathways between environmental changes and health that are unique to their communities. Figure 10 shows the key messages from the research, which were presented last in the workshops. Communities responded to this with explanations that

included concerns and questions about environmental changes, health, food accessibility and food safety.

In the initial round of focus group discussions prior to the validation workshops, the term ‘climate change’ was used in relation to changing crop production and then recurred in the validation workshops as one explanation for the findings on consumption, nutrition and crop recommendations. While ‘climate change’ was sometimes used interchangeably with ‘drought,’ it was apparent that the phenomenon being described was not simply the coincidence of a period of low rainfall with the timing of the research. Rainfall was reported to be less predictable, arriving either earlier or later in the season, and overall, the amount of rainfall had diminished. Besides changes in rainfall patterns, people described changes over decades in vegetation, especially in forest, veld (wild grasslands) and grazing lands, the availability of and accessibility to surface water, irrigation water, and water for household consumption. Other changes have occurred in social protection measures and entitlements to land and water, some universal, such as social grants; others more localised, such as major local developments impacting land use. People have responded to these with adaptations in their livelihood strategies, farming practices, as well as their food procurement and consumption patterns. Some or all of these factors emerged in the communities’ interpretations of the study findings on production, dietary diversity and nutrition outcomes described below.

Figure 11. Recommended crop presentation



Across the study sites, there was the perception that diets were more diverse, and healthier in the past:

> We used to produce many things like nuts, watermelon, pumpkins, and others – there were locusts and other foods. There is a lack of rain and we don't gather these things anymore. The diet was more diverse, and people were healthier. We also had access to medicinal herbs such as *ditlomma mago*, but this is no longer around. This was our medication for diabetes and hypertension. […] People were eating wild herbs and were healthy all the time - even the animals were healthier [Jozini workshop participant].

Figure 12. Key message presentation

Climate change, drought, or lack of rain were frequent explanations for the shift away from more wholesome, home-grown and prepared foods to shop-purchased, mass-produced products and this

was linked to nutrition and more general health outcomes. The stunting and obesity levels indicated by the data were often attributed to refined carbohydrate-based diets, consisting largely of maize meal and white sugar, with fewer fresh fruits and vegetables, both wild and cultivated, either available or accessible:

> The combination of foods in a plate, all starch, people do not have a good plate in front of them. Management of the household groceries is a problem – they might by all the foods but they are not combining them or not used in the appropriate quantities, some gets finished earlier than it is supposed to, then they rely only on the staples [Ratlou workshop participant].

> Even the fruit trees are not giving enough because of climate change – oranges have reduced, the spinach is no longer giving big leaves. Some of the traditional crops are no longer grown because of the changes – they used to rely on rain, even maize used to be grown on a larger scale, but no longer grown, and now there are only small vegetable plots [Jozini workshop participant].

Knowledge and diversity of wild-gathered foods and livestock husbandry influenced by changes in weather and ecosystems, food consumption patterns, and eventually preferences, began to changed. Lost procurement, production and preservation knowledge includes relates to both vegetable and animal food sources:

> We did not have fridges, but we had methods of preserving our food and cooling with a pot underground. We made sour and fresh milk. To sour the milk, we would use cowhides to make *lekuka* for fermenting milk. […] before this 'civilisation,' the main dish was sorghum porridge, prepared with fermented sorghum meal and the most common relish with this was milk – raw or soured. In summer or during rain, it would be Indigenous leafy vegetables but more and more they are difficult to find [Ratlou workshop participant].

The disappearance of traditional, small-scale farming and food knowledge, as well as the reliance on chemical inputs and biotechnology raised concerns health, safety, and sustainability:

> We had ways of preserving food to keep diseases away, for example using smoke. Now the agricultural products are full of poison. The food is full of pesticide, and this makes people unhealthy. People cannot afford to farm because they depend on chemicals and GMO seeds. They pay and pay, and owe money, and still cannot produce enough to eat [Ratlou workshop participant].

At the same time, the proliferation of easily prepared and processed foods through retail expansion into rural areas were thought to be turning people towards more modern foods and, alongside other lifestyle ambitions, away from the ardours of farming. Fast food from global franchises is readily available, even in the poorest districts, close to the supermarkets where people purchase their staples. Unlike their urban counterparts, though, many rural people simply do not have the income to afford to eat much of it. But even if it is often more aspirational than affordable, junk food, according to some, makes a notable contribution to unhealthy lifestyles:

> […] obese people a people eat junk food such as potato chips, but also too much meat and a lot of cooking oil or just too much food in general. They are no longer working in the fields, do not exercise, and eat too much [Jozini workshop participant].

In each of the workshops, there was at least one mention of the role of social grants in changing diets and even lifestyles. Although it was suggested that households not producing were among the least able to farm, some participants thought social grants (mean-tested cash transfers), could be making people idle:

> Fewer people are planting, but the ones who are not are likely to be of child-headed households or lazy people. Social grants have also caused people to abandon cultivating [Jozini workshop participant].

5.6 Discussion

This study has generated unique interpretations of the pathways of social, environmental and health-related changes as they are experienced and observed by people living in the most economically deprived regions of South Africa. These interpretations are linked by a broader, national, historical narrative of shifting livelihoods created by land dispossession and the creation of homelands, migrant labour, regime change, democratic reforms and new social protection measures, the far-reaching effects of globalisation and climate change. These phenomena have impacted nutrition and food security along pathways that are locally unique, exerting pressure on local environments, livelihoods and cultures.

The high levels of obesity found among adult female caregivers and of stunting among children were readily linked by the validation workshop participants to changes in the local environment. Environmental change was most evident in changing rainfall, water availability, and vegetation patterns over an extended period, which many people described as ‘climate change’. People saw this to be affecting health along a pathway of diminishing dietary diversity, growing reliance on purchased food and poverty. When there were more abundant and predictable rains, people recalled, there was greater crop diversity, more wild foods to be gathered, more livestock producing meat and milk and even different staples such as sorghum, which is still thought by many to be a ‘traditional’ grain, healthier than maize.

Decline in production was not the sole explanation for dietary and health changes, however. Certain crops that may have been suitable twenty or more years ago are no longer viable and wild plants and animals no longer thrive. They are seen to have been replaced with GMO seeds, chemical fertilizers and pesticides, which are thought to be expensive and unsustainable. Both the inputs and the outcomes of modern agriculture were sometimes mistrusted, because they expose people to chemicals and produce food suspected of making people weaker, and more susceptible to poor health.

People did not see these changes in isolation from other social and political changes. They also mentioned the introduction of social grants, changing work opportunities, and the arrival of large

supermarket and fast food chains in rural areas. Although the introduction of social grants and access to supermarkets have undoubtedly influenced food consumption patterns, it is unlikely that this has been a straightforward trade-off between producing and buying food. Historically, trading stores (rather than supermarkets) played an important role in food availability in the former homelands. Remittances from urban labour (rather than social grants) capitalised smallholder and subsistence farming, which in turn, subsidised the social reproduction of the migrant workforce. It is quite possible that grant money is used by pensioners (who are often also child caregivers) to subsidise household production. Elders with the knowledge and aptitude for cultivation might be spending some of their income on seeds and tools or investments in small livestock. The pensioner/household-head is a common role in South African households where working-age parents of young children move to towns and cities in search of paid employment. The lack of enthusiasm amongst the youth for farming is also seen to be contributing to a decline in subsistence production.

All these descriptions of change – shifts local environments, in farming and food consumption – ground wider, global phenomena such as food insecurity, nutrition transition and climate change in local environmental social and political contexts. Rural livelihoods are complex and shifting and high-level diagnoses often lack the insights necessary to inform effective support programmes. Local narratives, on the other hand, bring the elements together in cohesive and place-specific ways, suggesting that a considerably wider food security policy lens is needed to capture the diversity of challenges and possibilities of rural South Africa.

5.7 Conclusions

Over the course of the project, focus group and workshop participants often commented on the presence of researchers in their communities. On the one hand, they hoped that participating in the research would lead to change because their voices would finally be heard. At the validation workshops, people expressed gratitude to the researchers for returning to the research sites and sharing the findings, which they claimed was a rare occurrence. This was surprising considering that that these are among the poorest and therefore highest priority communities in South Africa,

which have repeatedly been the focus of not only agricultural, but health, education and sociological research. They are the communities who stand to most benefit from agrarian reform, but this needs to be informed by knowledge that is grounded in local realities rather than sweeping national development agendas. These are also the communities who are most able to benefit from access to the knowledge generated by research, but are often disregarded as potential co-creators of knowledge, and excluded from discussions regarding its interpretation and application.

With the exchange of information that took place in the validation workshops, civil society members, researchers, food producers, government extension, and social services workers and a few local administrators, albeit on a small scale, became 'food citizens' engaged in a joint diagnosis of food security. In light of the strides made through democratic transformation towards the achievement of other constitutionally-guaranteed rights, such as health and education, this approach is long overdue. Past experience has shown in South Africa and elsewhere that technical literacy can be an important driver of social change. The major shift brought about in the government's approach to HIVAIDS was mobilised by the treatment literacy movement, which, although often adversarial, created the demand and political pressure to change policy. The state needs first to recognise its citizens as partners, rather than as adversaries or beneficiaries.

Throughout this research project, there was an over-arching awareness that change is beyond the control of ordinary people, resulting in feelings of exclusion and marginalisation from a world that seems to afford the rural poor all the hazards and none of the benefits of modernisation. Changing local environments and weather, rising food prices, political turmoil, the expanding presence of retail chains, migration, and the effects of the HIV epidemic have created an atmosphere of deep uncertainty. Besides the material evidence and health consequences of food insecurity, these local conditions may be also deepening the subjective experiences of hunger. The notion that modern crops may actually be poisoned by the use of chemical fertilizers, pesticides and genetic modification is clearly a source of concern among rural agrarian people in South Africa. This in itself warrants a concerted effort to improve access to transparent information about food safety, farming methods, and nutrition by rural people.

Informed participation and decision-making are essential elements of food citizenship, but pose special challenges among culturally diverse communities, where literacy cannot yet be taken for granted. The absence of information, restricted choices, fears about food safety and growing disconnect from the sources of their food are fundamentally disempowering to both poor rural people and to the policymakers responsible for food security, nutrition, agriculture, and social protection.

For the Department of Agriculture, Forestry and Fisheries the extent of traditional knowledge and the existence of agro-ecological practices that might enhance resilience and sustainability can be better documented and disseminated. Food security policy instruments in South Africa need to be updated to address the state of chronic food insecurity indicated by coexistent obesity and stunting. Given the varied and unpredictable local environmental and socio-economic impacts of climate change, it has become imperative to explore alternative, more resilient production methods and where necessary, revise pedagogical models of agricultural extension and update the overall agronomic knowledge base. This should occur in conjunction with an exploration of water harvesting methods and with removing existing technical and political obstacles to access to water faced by subsistence and smallholder producers.

For social protection, the interplay between different livelihood components, for example combinations of reliance on social grants, food production, and other incomes, is of further interest, given the possibility that cash incomes are subsidising home or small-scale production, and these might be contributing to healthier food consumption patterns. In this case, support for small-scale and subsistence production in terms of inputs, extension and irrigation could potentially have a great impact, freeing up cash incomes for other investments, for example in processing and marketing, or simply for other household expenses such as education.

In a country where there is year-round production of fresh produce available in supermarkets, it is difficult to reconcile that these are largely inaccessible to the poor, who subsist on a lowest-common-denominator diet that barely permits families to meet their energy requirements. Also of concern is the fact that food prices in South Africa have risen sharply in recent years, a trend that will only worsen with drought, fuel price increases and currency devaluation, while social grants

remain static. With unprecedented control over food affordability and accessibility, the retail sector is worthy of a great deal more scrutiny for its potential role in enhancing food security.

Finally, food security research should be undertaken in ways that promotes food citizenship in South Africa. As an ethical requirement, research on production, consumption and nutrition that affects the health and livelihoods of the poor needs not only to be participatory, but be translated and disseminated into forms that reach not only policy makers, but also those who hold policymakers accountable.

5.8 Implications for research and policy

Achieving food security is a legal, technical and political imperative, which makes it a problem highly suited to transdisciplinary research (Drimie and McLachlan, 2013). A conventional approaches to food security often fails to grasp the complexity of interrelated causes (Candel, 2014; Foran *et al.,* 2014. In the case of South Africa, these emanate from power structures (e.g. government ministries) who are informed by discreet fields of knowledge (e.g. nutrition science, agronomy or economics) and also shaped by commercial interests (large food and agriculture conglomerates) (Drimie, 2016 Igumbor et al, 2012; Hendriks, 2013). The result is that food insecurity in South Africa is confronted with incomplete and contradictory policy instruments (Thow *et al.,* 2018).

Public engagement and inclusive consultations are necessary steps along the pathway to progressive realisation of the right to food. Public engagement continues to be a missing link in food security and related policies, throughout Africa. Historically, there have been few platforms anywhere on the continent for the engagement of the public in the governance of new technologies in health, agriculture, or even to contribute to these. As a result, public knowledge and agency are excluded when solving food security problems (Mugwagwa *et al.,* 2010). Market-led solutions alone are unlikely to solve the problems of hunger and public debate can bring alternative approaches to rebuilding agriculture (Holt-Gimenez, 2008). Advocacy and popular demand for policy changes are rarely drivers of policy change, which is especially problematic in view of rising rates of obesity and their underlying social and economic drivers (Huang et al., 2015).

Democratising food security research and policy-making could address some of these limitations. Defining problems and research questions at the societal level could ensure that local views are represented and local priorities are on policy agendas. Participatory and inclusive research methods can add lived experience to the knowledge and evidence informing policy (De Schutter, 2012). Protecting the rights of people to pursue food security as well as simply providing food through institutionalised charity demands a deeper understanding of food citizenship – the ways in which people exercise agency in food systems (Pimbert, 2006; Renting et al., 2012; Hassanein, 2008).

Chapter 6 – Conclusions

6.1 Synopsis

This study set out to examine the potential role of food democracy in policy processes and research related to alleviating hunger and malnutrition in South Africa, with reference to current food security policy and research. The South African National Food and Nutrition Security Strategy was taken an example of the ways the state constructs narratives of hunger and poverty and their underlying causes. The WRC project entitled *Current rain-fed and irrigated production of food crops and its potential to meet all year-round nutritional requirement of poor people in the North West, Limpopo, KwaZulu-Natal and Eastern Cape Provinces* offered an opportunity to the researcher to be part of a larger, transdisciplinary study, bringing a unique analytical lens and level of analysis to the extensive, comparative body of data and findings.

A literature review determined that the work of activist food movements brings a wider range of determinants of hunger and malnutrition to policy discourses. It widens the food policy stakeholder field, broadening the possibilities of policy responses. Food movements bring diverse perspectives into food security policymaking in a number of political and technical ways. Food sovereignty and food justice approaches can bring focus to citizens, and particularly smallholders, as rights holders rather than as a uniform, economically marginal group, vulnerable to hunger and malnutrition. This goes beyond the right to food, and considers rights to land, water and resources, as well as control over decision-making in food systems; opening up new pathways to food security through changes in regulations and processes that entitle people to become active agents in working towards their food security. Grounding processes in communities also reveals the multitude strategies for negotiating food insecurity that involve procuring, producing, and consuming food as part of livelihood patterns. A survey of the South African context found that understandings of food insecurity and malnutrition are informed largely by numerical data that show broad patterns of deprivation, but tell very little about the strategies used by local people to overcome food insecurity and how these shape local food systems. Dialogue about and understanding these strategies is essential in designing appropriate policies.

The literature review and a food security survey set the stage for study's three specific objectives. The first was to explore the potential for structural transformation in policy and the role of food insecure citizens in food security policy processes, using a narrative analysis of the 2014 Household Food and Nutrition Security Strategy for South Africa. For the second and third objectives, the study drew on the qualitative and quantitative data through fieldwork to gather qualitative data from the WRC project. The second objective sought to develop the idea of food citizenship in the context of poor, rural South African communities in order to understand the ways in which people are actively shaping their food systems to confront food insecurity. For the third objective, the findings of the WRC project were subject to participatory validation and interpretation with the communities so as to understand how poor rural people understand food insecurity and demonstrate the value of knowledge co-creation with food security policy stakeholders.

The study found that, while policy has transformative potential, there are both political and technical imperatives to include the most food insecure in the diagnosis of problems and design of solutions. The reasons for this are evident in the results of the remaining two research objectives. In terms of the second objective, the idea of food citizenship, developed in the context of poor rural communities, is useful for understanding the agency, assets, and capabilities that ought to be the basis for designing food security and nutrition interventions. The results of the third objective illustrated that participatory approaches to research, or knowledge co-creation, can yield richer, more contextualised understandings of food insecurity and malnutrition. These results are explained in further detail below.

The findings showed that narratives in government policy serve to manage uncertainty, complexity, and controversy. The National Household Food and Nutrition Security Strategy is no exception. Food democracy narratives did inform the Household Food and Nutrition Security Strategy for South Africa, but the Strategy misses the opportunity to bring essential processes and forms of knowledge into food security responses. The Strategy alludes to global and local economic, environmental, social, and political determinants of hunger and malnutrition in South Africa. In doing so, it incorporates fragments of activist food movement narratives, to the extent

that these help to explain the situation and allude to further possibilities of food system transformation. Although there are progressive and even radical references, the strategy prescribes little more than improved information management and more government structures. Improved information is still only aimed at responding more accurately to food insecurity within a largely productivist paradigm, limited to addressing food availability, predominantly with supply responses. These do not always specify structural changes to the food system, nor changes in processes that could contribute to the design of better food security responses. More multidisciplinary, consultative, and inclusive approaches could open up to a wider range of possibilities for policy options. Distinctive local factors driving food insecurity, livelihoods and interactions with food systems, or ways of discovering and incorporating these into planning are never brought into the discourse. This means that diverse contexts, with their particular constraints and opportunities, are treated uniformly in the strategy, making it a blueprint, rather than progressive tool for change. Together, these oversights might serve to prolong the disenfranchisement or rural poor people with regard to land and productive resources, which have yet to be addressed in food security policy and strategy in South Africa.

The WRC study took place in four project sites with culturally, linguistically and geographically distinctive communities possessing unique food traditions that were described in rich detail. This was contradicted by the bland uniformity of people's diets, described in food consumption surveys and focus groups. Food security and nutrition data showed broad similarities across the four communities, with similar levels of childhood stunting and adult obesity. With the exception of Ratlou, located in an arid environment with low agricultural potential, most households engaged in some kind of home production, but the relative importance of this to livelihoods varied widely in relation to other ways of procuring food. Changes over time in food culture, home production methods, food availability, accessibility, and usage told of diminishing dietary diversity. Community members attributed these changes to poverty, shifting configurations of livelihoods in which home-production played a decreasing role, and changes in local environments and weather patterns.

Participatory approaches, applied to the WRC project *Current rain-fed and irrigated production of food crops and its potential to meet all year-round nutritional requirement of poor people in the*

North West, Limpopo, KwaZulu-Natal and Eastern Cape Provinces enhanced the understanding of malnutrition and food insecurity in the four communities, through dialogue with community members. When research subjects become co-creators of knowledge, diversity of views reveals pathways and opens new possibilities, people's subjective accounts of hunger, malnutrition, and food insecurity invoke the daily activities of procuring, preparing and consuming food, and in the livelihood activities that make these possible. The foods people eat on a day-to-day basis, even if they are bland, uniform and lacking in nutritional value, are part of local stories of history, ecosystems, health and social change. These narratives, like policy narratives, serve to manage complexity, uncertainty and contradictions in people's lives. In this way, they link malnutrition and experiences of hunger to complex global phenomena, such as shifting food systems and climate change. Residents of poor rural communities draw pathways between social, political and natural phenomena, and their own health, and wellbeing that transverse the disciplines of land and resource management, agriculture, nutrition, biotechnology, ecology, history, and ethnography.

6.2 Conclusions

Together, the results of the enquiry into existing policy, the roles of citizens in shaping food systems and the participatory interpretation of food security data demonstrate that both research and policy can be enriched with more democratic, participatory, and inclusive approaches.

There is much policy focus on 'vulnerable' populations, making them one of the most important stakeholder groups in food security policymaking in South Africa, and yet the rural poor are largely peripheral to policy processes. To modify an expression coined by grassroots activists around the globe, it is largely policy that is "about them, without them." This limits the scope of policy responses and the relevance, adaptability, and sustainability of programmes. An important step on the pathway to realising the right to food is the development of inclusive and participatory processes for understanding and developing responses to hunger and malnutrition and for improving food security. Strategic approaches do not reflect the inclusiveness describe by De Schutter (2014, p. 16) as "joint diagnosis" of food security challenges.

While democratic transformation has made many inroads into institutions and processes, the agriculture and food sectors seem to remain circumscribed within the narrative that economic growth is the answer to food insecurity and malnutrition. Notwithstanding this, few measures have been taken to ensure that economic development initiatives are inclusive and build on local resources and capabilities. Localised initiatives, such as irrigation schemes, land reform-based projects and even food security programs themselves (for example the food bank initiatives) are vulnerable to capture by corporate (or other outside) interests, making them unresponsive to the needs of communities and unaccountable to citizens. At the same time, poor rural people are deeply incorporated into a commodified, cash-based economy in which they are highly disadvantaged. South Africa's food system, unlike the health and education systems, has evaded the reform agenda, making food insecurity an overall barrier to poverty reduction and social development.

The National Household Food and Nutrition Strategy shows few signs of having been informed by South Africa's considerable geographical, economic and social diversity, despite the use of 'households' in its title. This could be fairly attributed to inadequacies in information and surveillance capabilities. However, it also fails to recognise that geographic and cultural diversity and a rich history of dynamic livelihood adaptations are assets – and not deficits – on which to build food security and a more equitable food system. Poor South Africans suffer malnutrition and food insecurity amidst poorly-targeted or unsustainable state responses. Treating those who food insecure as a uniform group of charity recipients, beneficiaries of redistributive policies or passive consumers overlooks both the barriers to, and enablers of food security. Targeting interventions purely to correct patterns of deficits can have unexpected, and unwanted, outcomes. Identifying assets on which to build, and removing barriers, might be a better approach. This ineffectuality is partly due to incomplete or de-contextualised (in some cases one may be the result of the other) information, but also to the exclusion of the rural poor from knowledge creation and decision-making in local development and programmes affecting their livelihoods and food security.

Food insecurity is a social problem and the co-creation of knowledge together with those who experience it has both technical and political merit. The pathways between food security and nutrition outcomes and national level policies are extremely complex. No policy instrument can be expected to successfully navigate the terrain of food systems, natural environments, economic

inequality and social diversity, making inclusive processes important to research, along with policy design. Especially where incomplete information is a barrier to developing targeted responses, participatory processes can enrich knowledge of local contexts, identifying localised drivers and patterns of food insecurity, but also identifying local assets: the resources, organisations, and social and cultural practices on which food security programs can be built. Including poor rural people in research processes, as well as policy processes, helps to define their role as stakeholders in development agendas as well as citizens in a democracy.

Rural people make choices as food citizens, however constrained by economic, political, social and geographical barriers, unique to national and local contexts. Corporate influence, supermarkets, product information, marketing and food preferences, as well effects of as agrarian change, are all realities of the 'hybrid' rural South African consumer in the aftermath of apartheid. Adaptation has meant confronting new forms of adversity as well as taking up new social benefits. In the balance, food insecurity and malnutrition persist, because of barriers, disincentives, and few opportunities. These change over time with changing social and political contexts change, shaping dietary habits and nutrition outcomes.

Poor, rural South Africans are producers, consumers, entrepreneurs and welfare beneficiaries all at once – multi-faceted stakeholders, affected on different levels by the many policies that shape food systems. There are no governances spaces, local, or even national, in which the food system can be negotiated. Small collaborative efforts to diversify consumption, manage finances, access markets and improve production, though, suggest greater possibilities. These small, diverse initiatives will not fix a broken system, but they constitute the authentic social, environmental and political realities on which vibrant local food system will thrive.

Rural food insecurity is an outcome of many criss-crossing trajectories, viz. de-agrarianisation, adverse incorporation, neglect of rural development, unemployment, and epidemics. These conditions have shaped rural livelihoods in ways that are locally quite specific, and have elicited many variations of the third world of farming. What these have in common is that they have become an endangered survivalist activity that supports formal and informal employment, social

protection benefits and remittances. People persist in household production, collaboration, and traditional food cultures, which attest to values interconnected with economic productivity.

Within their limited capacity, with little recognition and almost no support, rural South Africans take small measures to make their local food systems more socially and economically just and environmentally sustainable. This is an enormous asset overlooked in food security policy and strategy. Food citizenship, in its current form, faces many barriers, too numerous to name, ingrained in the food system. However, the tallest barrier is the tendency towards top-down policymaking informed by (incomplete) national-level data that generates thinking about food security and nutrition as only deficits. It is reasonable, confronted by figures suggesting acute hunger, malnutrition, to try to meet immediate needs with food parcels and to meet chronic food insecurity by boosting incomes with cash transfers. But this approach to nutrition and food insecurity is process-blind, ignoring completely the potential of local people to contribute to solutions and overlooking the assets, capabilities and social networks on which to build programmes and strategies; and hopefully, over time, to influence them towards more effectively meeting the needs of citizens.

The lens on rural food security in poor rural communities in South Africa needs to change. Rebuilding local food systems is not solely the work of governments and central planning. It also requires active food citizens with the knowledge and resources to shape their food environments. There are considerable uncertainties, complexities and tensions in national policy and strategy, which are the products of a centralised decision-making model. From the community vantage point, challenges to food security are much clearer, although there are many vantage points, reflecting South Africa's great diversity. Diversity is the source of innovation, which means there is an important role for emerging social movements and civil society networks concerned with food, farming and rural livelihoods. Rather than wait for these to appear, nutrition and food security policymakers, analysts and researchers need to approach their work with a more inclusive scope in order to hear rural people's voices and see their potential. This would make food security responses asset-driven, rather than deficit-driven.

Table 11. Objectives, key questions and summary conclusions

Key questions and objectives	Corresponding chapters and summary conclusions
1. Explore the potential for structural transformation in policy and the role of food insecure citizens in food security policy processes using narrative analysis of the Household Food and Nutrition Security Strategy for South Africa and the National Food and Nutrition Security Policy and Implementation Plan (RSA, 2014). Key Question: Do food and nutrition security policies propose structural transformations to address underlying causes of food insecurity and malnutrition, and are processes of change inclusive of the most food insecure?	Chapter Four: the policy and strategy fall short of structural transformation and may even exacerbate the risks of the current system with more aggressive commodification and marketisation of rural life, where communities already have few buffers against market volatility, climate change and exist in a state of adverse incorporation. This is the result of the omission of public consultation in the formulation of the policies and the failure to recognise local diversity – the assets, capabilities and challenges – on which food security must be built.
2. Learn how poor rural people understand food insecurity and to demonstrate the value of knowledge co-creation with key food security policy stakeholders. Key Question: Does participatory and inclusive research enhance our understanding of malnutrition and food insecurity?	Chapter five: Informed participation and decision-making are essential elements of food citizenship, but pose special challenges among culturally diverse communities, where literacy cannot yet be taken for granted. The absence of information, restricted choices, fears about food safety and growing disconnect from the sources of their food are fundamentally disempowering to both poor rural people and to the policymakers responsible for food security, nutrition, agriculture, and social protection. There is potential for transdisciplinary research to play an empowering and emancipatory role in tackling South Africa's food insecurity problem.
3. Analysis of WRC project data using using a framework of food citizenship to understand the agency of rural poor people in shaping local food systems, showing the ways in which people work actively to overcome challenges using limited resources and capabilities.	Chapter Five: the findings suggest an over-arching awareness that change is beyond the control of ordinary people, resulting in feelings of exclusion and marginalisation from a world that seems to afford the rural poor all the hazards and

Key question: What insights can be gained by examining food security data through the lens of food democracy?	none of the benefits of modernisation. Changing local environments and weather, rising food prices, political turmoil, the expanding presence of retail chains, migration, the effects of the HIV epidemic – have created an atmosphere of deep uncertainty. People have nonetheless developed strategies and adaptation in attempting to shape their food systems.

6.3 Implications for research and policy

Food democracy is a novel approach to research and policy and still very much an 'umbrella' term that can cover a wide variety of concepts, including those explored in the literature review (Chapter 2) and the policy analysis. Methodological approaches to studies on the scale of the WRC study informed by food democracy are few. Food system democratisation, even in the world's oldest and best-developed democracies, is largely still an unknown concept, because food systems have been the domain of free enterprise in the Western world for centuries. As agricultural trade globalises, attempting to balance the right to profit of corporations and the right to food and livelihoods of citizens is the domain of governments (and increasingly, the terrain of activists). The role of governments and government research and policy institutions in making food systems more accountable to citizens is murky at best, and democratising food systems is may be perceived as a radical agenda.

As long as democratisation is not an explicit priority of food security and food system research and policy, research studies will not be informed or guided by the paradigms and processes of democratic participation. This is not to say they are not transformative in intent. There is little doubt that the Water Research Commission of South Africa's investigation into the role of irrigation in food security and nutrition is embedded in the broader agenda of democratic transformation and upliftment of rural, agrarian people. This is reflected in the concerns of the South African health, social development and agriculture sectors, encompassed in the perspectives on malnutrition and food insecurity Chapter 3.

However, democracy is about process, and so the processes of setting research priorities, defining research questions, developing methods, collecting and analysing data, validating and interpreting data, disseminating knowledge, and deciding which knowledge is to inform policy are all fair game. An exploration of South African food security policy narratives (Chapter 4) reveals power dynamics at work in policymaking that overlook and exclude citizens as active agents in shaping food policy, research agendas, and food systems themselves. The dominance of the corporate and reformist narratives together privilege the idea that stimulating free enterprise can turn excluded or adversely-incorporated people into drivers of economic growth, thereby improving livelihoods, food security and nutrition. This pathway is not evident in South Africa's poor rural communities, where the sole markers of economic growth prosperity are large supermarket and fast-food franchises and more deeply institutionalised food charity. This suggests, at the very least, some deficiencies in the policy process.

The WRC and the Institute for Food Nutrition and Wellbeing at the University of Pretoria are publicly-funded institutions, with particular developmental agendas, pathways of accountability and defined roles in policymaking. Within these, the researcher was afforded the space and opportunities to explore the idea of food democracy within the existing research priorities, questions, methods and processes. The best opportunity was found in the validation and interpretation of data at the end of the project, where the validation workshops employed an inclusive and consultative approach to generate Indigenous and local knowledge. Chapter 5 suggests that this kind of knowledge be elevated to the status of counterpart to the Western scientific data generated by the WRC project's main methods. The purpose of this is to offer a glimpse into local perspectives on food security and nutrition.

Together, these three perspectives: scientific/academic (Chapter 3), policy (Chapter 4) and ILK (Chapter 5) offer a map of the state of food security research and policy in South Africa. Mainstream research is rarely transdisciplinary, and therefore less effective at solving social problems; policy processes are non-inclusive and consultative, and must therefore rely on idealistic templates that transpose poorly on food-insecure rural communities. Institutions (the University of Pretoria IFNuW and the WRC) are creating space for alternative approaches to research,

recognising the potential of local knowledge and participation to bring diversity and democratic accountability to research and policy.

6.5 Recommendations

State-centric food security strategies and programmes have had limited successes in South Africa, and the need for innovation is clear. Lasting reforms, whether dismantling the corporate food regime or improving household nutrition and food security, are unlikely to be the result of either radical political agendas emanating from global networks or top-down policy directives. What has pushed systemic change in food systems is grassroots mobilisation, that is, the cultivation of citizenship where people live and work, building on what assets people have to meet the particular challenges they face.

The overall recommendation from this study is that South Africa is long overdue for public engagement on food security and on food system reform. When Special Rapporteur Olivier De Schutter (2009, p. 4) described the right to food as "a way of doing things, more bottom-up than top-down" it was an invitation to pause and consider the importance of processes in promoting rights as well as coming to technical solutions. Embedded in this observation is the recognition that, the greater the complexity of a given issue, the less likely it is to be resolved by centralised decision-making. The five recommendations that follow suggest new ways for policymakers and researchers to think about poor rural South Africans and their important role in solving the problems of food security and malnutrition.

The first recommendation is to re-examine policy narratives for the ways in which they categorise the rural poor and others living with food insecurity. Consistently categorising people as victims of poverty, charity recipients, or passive consumers, promotes thinking about how to feed people. Policies should include narratives about citizenship, rights and entitlements, reflecting the constitutional right to food, in order to promote thinking about how to empower citizens in the pursuit of food security.

The second recommendation is to engage poor rural communities in South Africa in consultations and decision-making processes pertaining to their own food security. To this effect, national and local governments ought to encourage, promote, and support community food forums, local food security committees, food charters or other localised processes, which are risk-free governance innovations.

The third recommendation is to begin considering diversity as an asset, rather than an obstacle. Carrying out inventories of local resources and knowledge, social networks and strategies employed by households and communities in pursuit of food security would create a baseline understanding of existing local food systems on which to build, and by which to monitor and evaluate food and nutrition security impact. Local assets, knowledge and resources are the foundations for investments in rebuilding local food systems. Where local knowledge, local resource management regimes, and networks relevant to sustainable food production hold possibilities for improving food security, these should be recognised, elevated and supported and enhanced through agricultural support programmes.

The fourth recommendation is to begin devolving food security assessment and planning to local government structures, with a strong focus on facilitating public engagement. They should be equipped with the knowledge, resources and methods to work with communities in participatory and inclusive ways and to elevate ILK. Civil society organisations should be enabled and supported in this capacity, moving into roles beyond the delivery of food charity and service provision to also become involved in processes, including public engagement.

The final recommendation is that food security research, including research methods, should involve the co-creation of knowledge with a diversity of stakeholders, including the rural poor. Part of this process is knowledge translation, which ensures that existing data pertaining to food security – health, nutrition, dietary diversity, agricultural science, and climate change – are made accessible to the public. History has shown in South African that access to information empowers people to change systems that do not serve them. Knowledge translation for empowered problem definition, problem-solving and decision-making should become a part of food security strategy.

6.6 Contribution to knowledge

This study makes original contributions to knowledge by using a novel combination of methods and perspectives to food security research and policy making in South Africa. Examining current policy narratives through the lens of food democracy revealed the limitations of current policy instruments in progressing the country towards the right to food. Drawing on the findings of the Water Research Commission project, it illustrated these limitations in two ways. Using the idea of food citizenship to describe the ways in which poor rural people actively shape food systems highlights the way that policies overlook their agency. Categorising food insecure people as passive recipients narrows the range of strategic responses to food and cash. It also overlooks the systemic problems that perpetuate food insecurity and malnutrition and ignores the resources, capabilities and strategies that result from people's struggles within a system that presents many obstacles and barriers. Finally, engaging rural people in research as co-creators of knowledge rather than simply as subjects or sources of data illustrated that, by not engaging them in diagnosis and problem-solving, policymakers overlook important determinants and pathway of food insecurity as well as local knowledge, assets and capabilities essential to rebuilding food systems.

6.7 Lessons learned and recommendations for improvement of the study

This study drew extensively on the broader WRC study, which was not designed to investigate processes, but to collect data that showed dynamic patterns and links between phenomena, and where a certain amount of adaptation was necessary. On the one hand, the study benefited enormously from a team of seasoned experts in agronomy, food security, nutrition and public health, which afforded rich opportunities to synthesise knowledge in a transdisciplinary way. On the other hand, opportunities to explore the questions needed to be grounded in the wider data collection process of the WRC project and were thereby limited. Given the same opportunity again, the researcher would participate more closely in the different research activities and be more engaged in the overall process, to take advantage of more interactions with different research team members and the communities.

Transdisciplinarity in food security and nutrition research is still new, and meeting the requirement to publish in a peer-reviewed journal was extremely challenging. Comments from reviewers of multiple submissions of the same paper would refer the work to another journal more suitable to the subject matter. Others would fixate on a single component of the study from one of several possible disciplines – nutrition or political economy or social history, for example – and comment that the methodology was incomplete. As a result, chapters were revised multiple times before one was finally accepted, which was a painstaking way of synthesising knowledge, but nonetheless, a good lesson in the challenges of transdisciplinarity. To overcome this challenge, a deeper theoretical exploration of transdisciplinarity could link the research more closely to literature and practice in this emerging field, possibly tapping into more publication opportunities.

The validation phase of the WRC study offered a fruitful but also limited opportunity explore possibilities of transdisciplinarity in food security, especially those pertaining to the possibilities of food democracy to poor, rural communities. As a validation exercise, it achieved the objective of verification of study results, but it also revealed the potential for more participatory and innovative research methods and policy processes. In hindsight, a longer timeframe for validation and interpretation with more stakeholder groups, such as local government and civil society organisations, would have further enriched the interpretation of the data. Building transdisciplinary methods into all phases of the project (including the definition of research questions) would have been ideal, but would have required the consultation of community and other stakeholders from the inception of the WRC project.

6.8 Recommendations for further research

Further research into enhancing food democracy for promoting food security should aim to exploring opportunities for engaging communities more actively in analysis and decision-making related to their food security, nutrition and food systems. The diversity across communities means that there may not be a single appropriate model for community engagement in food security and several possible questions could be considered.

How should local food systems in rural South Africa be defined, and who are the rights-holders and duty-bearers? Cultural and geographical diversity mean that stakeholder fields will vary widely, with not only poor rural household members, but also within larger industries, on commercial farms and at tourism sites, for example, sharing or competing for resources. Representation of poor, rural people in forums governing land and water surfaced as an issue in the WRC project and should be explored further.

Further research might include engaging communities in the identification of existing local knowledge and assets on which food security can be built – including agronomic, cultural (traditional and Indigenous food and plant knowledge), and organisational (such as formal and informal cooperatives and potential sites for food hubs). Policy-making ought to shift away from its fixation on correcting food supply and demand by remote manipulation, which can have unintended effects on local food systems and livelihoods. This means bringing finer focus to local food systems, practices, knowledge and structures that currently may only contribute in small ways to livelihoods, but, with the right support and the removal of obstacles, could help to move households out of chronic food insecurity and build resilience.

Exploring local governance contexts from a food systems perspective would reveal opportunities to raise the profile of food security concerns, and establish ongoing processes and forums for inclusive consultation and knowledge dissemination. Local government structures in South Africa face capacity challenges and complex power dynamics involving traditional authority and national structures with local jurisdiction. If food security governance becomes a priority, it must work with existing local structures and power dynamics, and not be an imposed blueprint that taxes local capacity and exacerbates existing tensions.

There are not only many disciplines relevant to food security, there are also different knowledge systems. Local food systems involve cultural beliefs and practices, cycles of ceremony, and social ties, which do not easily lend themselves to economic or agronomic food security models, but are nonetheless integral components of local food systems. Both research and policy can benefit from further exploration of co-creation of knowledge in support of food security and nutrition.

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GLOSSARY OF TERMS

Term	Definition	Source
access to food	The ability to access food physically, economically and socially, at individual or household level.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198) adapted from the Committee on World Food Security, FAO, 2012 (MD776) (http://www.fao.org/docrep/meeting/026/MD776E.pdf).
acute malnutrition	Recent, severe weight loss as a result of acute food deprivation with or without illness; it refers to wasting and/or nutritional oedema.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198) adapted from the Acute Malnutrition Summary Sheet, Save the Children Organization, 2010.
adverse incorporation	The concept of adverse incorporation "captures the ways in which localised livelihood strategies are enabled and constrained by economic, social and political relations over both time and space, in that they operate over lengthy periods and	du Toit, A. and Hickey, S. (2007) Adverse Incorporation, Social Exclusion, and Chronic

Term	Definition	Source
	within cycles, and at multiple spatial levels, from local to global. These relations are driven by inequalities of power." "In contexts of highly imperfect markets, corrupt state practices, and patriarchal norms, poor people (especially women and children) face a problematic search for security in income flows and stable access to stocks and services. They are obliged to manage this vulnerability through investing in and maintaining forms of social capital which produce desirable short-term, immediate outcomes and practical needs while postponing and putting at permanent risk more desirable forms of social capital which offer the strategic prospect of supporting needs and maintaining rights in the longer term" (Wood, 2000, p. 18)	Poverty, Chronic Poverty. doi: 10.1057/9781137316707.0012. Wood, G. (2000). 'Concepts and themes: landscaping social development'. Social Development SCOPE Paper 9. London: Department for International Development.
agrobiodiversity	The result of natural selection processes and the careful selection and inventive developments of farmers, herders and fishers over millennia. Agrobiodiversity is a vital sub-set of biodiversity. Many people's food and livelihood security depend on the sustained management of various biological resources that are important for food and agriculture.	What is agrobiodiversity? FAO, online at http://www.fao.org/docrep/007/y5609e/y5609e01.htm
agroecology	Agroecology is considered jointly as a science, a practice and a social movement. It encompasses the whole food system from the soil to the organisation of human	FAO Agroecology knowledge hub, online at

Term	Definition	Source
	societies. It is value-laden and based on core principles. It gives priority to action research, holistic and participatory approaches, and transdisciplinarity that is inclusive of different knowledge systems. As a practice, it is based on sustainable use of local renewable resources, local farmers' knowledge and priorities, wise use of biodiversity to provide ecosystem services and resilience, and solutions that provide multiple benefits (environmental, economic, social) from local to global. As a movement, it defends smallholders and family farming, farmers and rural communities, food sovereignty, local and short food supply chains, diversity of Indigenous seeds and breeds, healthy and quality food.	http://www.fao.org/agroecology/database/detail/en/c/893025/
balanced diet	A diet that provides an adequate amount and variety of food to meet a person's macro and micro-nutrient needs for a healthy, active life.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198) adapted from the Family Nutrition Guide, FAO, 2004 (http://www.fao.org/docrep/007/y5740e/y5740e00.htm).
big food	The multinational food and beverage industry with concentrated market power.	The PLoS Medicine Editors (2012) PLoS Medicine Series on Big Food: The Food Industry Is Ripe for Scrutiny.

Term	Definition	Source
		PLoS Med 9(6): e1001246. https://doi.org/10.1371/journal.pmed.1001246
BMI; body mass index; body mass index; body mass index; body mass index	A ratio of weight-for-height commonly used to classify underweight, normal weight, overweight and obesity in adults. The ratio of weight-for-height measured as the weight in kilograms divided by the square of height in metres. The ratio of weight-for-height measured as the weight in kilograms divided by the square of height in metres. A ratio of weight-for-height commonly used to classify underweight, normal weight, overweight and obesity in adults.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198); SOFI, Annex 3, FAO, 2013 (MI637); SOFI, Annex 3, FAO, 2013 (MI637); Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198).
chronic hunger	A state, lasting for a prolonged period of time, of an inability to acquire enough food, defined as a level of food intake insufficient to meet dietary energy requirements.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2014 (MI198_Sec1); FAO Web site, 2014 (http://www.fao.org/hunger/en/).

Term	Definition	Source
chronic malnutrition	An abnormal physiological condition caused by chronic deficiencies or imbalances in one or more nutrients. This condition may result in impaired physical and/or mental development.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198) adapted from The State of Food Insecurity in the world (SOFI), FAO, 2000 (X8200), (http://www.fao.org/docrep/x8200e/x8200e06.htm).
chronic undernutrition	An abnormal physiological condition whereby individuals do not consume sufficient food to meet dietary energy and nutrient requirements over a prolonged period of time.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198).
complementary feeding	Nourishment of an infant with foods in addition to breast milk or breast milk substitutes. When breast milk is no longer enough to meet the nutritional needs of the infant, complementary foods should be added to the diet of the child. Refers to the process that starts when breast milk alone is no longer sufficient to meet the nutritional requirements of an infant or young child, and therefore other foods and liquids are needed, along with breast milk.	Family Nutrition Guide, FAO, 2005 (Y5740), WHO, 2010 (http://www.who.int/nutrition/topics/complementary_feeding/en/index.html); PAHO/WHO (2003) Guiding Principles for Complementary Feeding of the Breastfed Child. Pan American Health Organisation/World

Term	Definition	Source
		Health Organization: Washington, DC.(http://www.who.int/maternal_child_adolescent/documents/a85622/en/); Nutrition Division/Meeting Programming and Documentation Service, FAO, 2014 (MI198_Sec2).
de-agrarianisation	Deagrarianisation is defined as a process of: (i) economic activity reorientation (livelihood); (ii) occupational adjustment (work activity); and (iii) spatial realignment of human settlement (residence) away from agrarian patterns. Overt and measurable manifestations of this process are: a diminishing degree of rural household food and basic needs self-sufficiency, a decline in agricultural labour relative to non-agricultural labour in rural households and in total national labour expenditure, a decrease in agricultural output per capita in the national economy relative to non-agricultural output, and a shrinking proportion of the total population residing in rural areas.	Bryceson, D. F. (1996) Deagrarianization and rural employment in sub-Saharan Africa: A sectoral perspective, *World Development*, pp. 97–111. doi: 10.1016/0305-750X(95)00119-W.
diet	The kinds of food that follow a particular pattern that a person or community eats.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2014 (MI198_Sec1); Oxford Dictionary, 2014.

Term	Definition	Source
dietary diversity	A measure of the variety of food from different food groups consumed over a reference period.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198) adapted from the International Symposium on Food and Nutrition Security: Food-based approaches for improving diets and raising levels of nutrition, FAO, 2010 (http://www.fao.org/ag/humannutrition/24259-0306025ae307fac11c643947408a112d.pdf) .
dietary energy requirement; DER	The amount of energy (from food) needed to maintain all physiological processes consistent with a healthy active lifestyle. The amount of dietary energy required by an individual to maintain body functions, health and normal activity. The amount of dietary energy required by an individual to maintain body functions, health and normal activity.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198) adapted from Human Energy Requirements: Report of a Joint FAO/WHO/UNU Expert Consultation, 2001

Term	Definition	Source
		(ftp://ftp.fao.org/docrep/fao/007/y5686e/y5686e00.pdf).; SOFI, Annex 3, FAO, 2013 (MI637).; SOFI, Annex 3, FAO, 2013 (MI637).
dietary intake; food intake	Amount and/or variety of food consumed in a unit of time, usually daily. Food intake is often referred to as food consumed or ingested by individuals.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2014 (MI198_Sec1) adapted from the Free Dictionary (http://medical-dictionary.thefreedictionary.com/food), 2014.
dietary pattern; food pattern	A combination of foods that are consumed over a period of time.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198_Sec1); USDA Food Patterns, 2011 (http://www.cnpp.usda.gov/Publications/USDAFoodPatterns/USDAFoodPatternsSummaryTable.pdf).

Term	Definition	Source
energy-dense food; energy food	Food with a high content of calories (energy) with respect to its mass or volume.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2014 (MI198_Sec1).
food and agriculture system	A system including food and non-food products that serves the production, processing, trade, marketing, consumption and disposal of goods that originate from agriculture, forestry, or fisheries. It also includes the inputs needed and outputs generated at each of these processes.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198) adapted from Sustainability Assessment of Food and Agriculture Systems (SAFA), Guidelines Natural Resources Management and Environment Department, 2012.
food and nutrition security; FNS	Exists when all people at all times have physical, social and economic access to food of sufficient quantity in calories and quality in terms of variety, diversity, nutrient content and safety to meet their dietary needs and food preferences for an active and healthy life, coupled with a sanitary environment, adequate health, education and care.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198) adapted from the definition of food security in the Declaration of the World Summit on Food Security,

Term	Definition	Source
		WSFS 2009/2, FAO, November 2009.
food availability	The amount of food physically available for consumption over a reference period.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198) adapted from the definition in UN Scaling Up Nutrition, UNHCR/WFP Guidelines, 2009.
food biodiversity	The diversity of plant, animal and other sources used for food, covering the genetic resources within species and between species.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2014 (MI198_Sec1) adapted from FAO/INFOODS Databases, Food Composition Database for Biodiversity; Version 2.1-BioFoodComp2.1 (http://www.fao.org/docrep/019/i3560e/i3560e.pdf), FAO, 2013.

Term	Definition	Source
food citizenship	The practice of engaging in food-related behaviours that support, rather than threaten, the development of a democratic, socially and economically just, and environmentally sustainable food system.	Wilkins, J. L. (2005) Eating Right Here: Moving from Consumer to Food Citizen, Agriculture and Human Values, 22(3), pp. 269–273. doi: 10.1007/s10460-005-6042-4.
food consumption	An estimate of the quantity and/or variety of a food or group of foods consumed by an individual, household or a specific population.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2014 (MI198_Sec2).
food democracy	Food democracy "[…] ideally means that all members of an agri-food system have equal and effective opportunities for participation in shaping that system, as well as knowledge about the relevant alternative ways of designing and operating the system" (Hassanein, 2003, p. 83).	Hassanein, N. (2003). Practicing food democracy: A pragmatic politics of transformation. *Journal of Rural Studies.* doi:10.1016/S0743-0167(02)00041-4.
food fortification; fortification of food	The addition of one (or more) essential nutrient(s) to a food whether or not it is normally contained in the food, for the purpose of preventing or correcting a deficiency of one or more nutrients in the population or specific population groups.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2014 (MI198_Sec1) adapted

Term	Definition	Source
		from the Guidelines on food fortification with micronutrients, WHO, 2006 (http://whqlibdoc.who.int/publications/2006/9241594012_eng.pdf).
food justice	Food Justice is communities exercising their right to grow, sell, and eat healthy food. Healthy food is fresh, nutritious, affordable, culturally appropriate, and grown locally with care for the well-being of the land, workers, and animals. People practicing food justice leads to a strong local food system, self-reliant communities, and a healthy environment.	Just Food, online at http://justfood.org/advocacy/what-is-food-justice
food regime	"Food regime analysis emerged to explain the strategic role of agriculture and food in the construction of the world capitalist economy. It identifies stable periods of capital accumulation associated with particular configurations of geopolitical power, conditioned by forms of agricultural production and consumption relations within and across national spaces. Contradictory relations within food regimes produce crisis, transformation, and transition to successor regimes. conceptualising key historical contradictions in particular food regimes that produce crisis, transformation and transition.. In this sense, food regime analysis brings a structured perspective to the understanding of agriculture and food's role in capital accumulation across time and space. In specifying patterns of circulation of food in the world economy it underlines the agri-food dimension of geo-politics."	McMichael, P. (2009) A food regime genealogy, *Journal of Peasant Studies, 36*(1), 139–169. doi: 10.1080/03066150902820354.

Term	Definition	Source
food security	A situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. Based on this definition, four food security dimensions can be identified: food availability, economic and physical access to food, food utilisation and stability over time.	SOFI, Annex 3, FAO, 2013 (MI637). Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198) adapted from Declaration of the World Summit on Food Security, WSFS 2009/2, FAO, November 2009 (http://www.fao.org/fileadmin/templates/wsfs/Summit/Docs/Final_Declaration/WSFS09_Declaration.pdf).
food sovereignty	Food sovereignty is the right of peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems.	La Via Campesina (2007) Declaration of Nyéléni, *Forum for Food Sovereignty*, (February). doi: http://dx.doi.org/10.1016/S0140-6736(79)90622-6.
food system	Food systems are the people and resources involved in producing, processing, distributing and consuming food and managing waste. ; Encompasses the ecosystem and all activities that relate to the production, processing, trade,	Nutrition Division/Meeting Programming and Documentation Service, FAO,

Term	Definition	Source
	distribution, preparation and consumption of food. A food system includes the inputs needed and outputs generated by each of these activities.; Encompasses the ecosystem and all activities that relate to the production, processing, trade, distribution, preparation and consumption of food. A food system includes the inputs needed and outputs generated by each of these activities.	2013 (MI198) adopted from the Centre for Agroecology and Sustainable Food Systems (http://casfs.ucsc.edu/).; Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198) adopted from HLPE e-consultation announcement (http://www.fao.org/fsnforum/cfs-hlpe/sites/cfs-hlpe/files/files/Food_losses_waste/topic_en_food_losses_waste.pdf).; Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198) adopted from HLPE e-consultation announcement (http://www.fao.org/fsnforum/cfs-hlpe/sites/cfs-

Term	Definition	Source
		hlpe/files/files/Food_losses_waste/topic_en_food_losses_waste.pdf).
hidden hunger	A chronic lack of vitamin(s) and/or mineral(s) often with no visible signs, so that those affected, or those who observe them, may not be aware of it.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198) adapted from Micronutrient Initiative's definition, 2012 (http://www.micronutrient.org/english/View.asp?x=573).
hunger	An uncomfortable or painful sensation caused by insufficient food consumption.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198) adapted from the Evaluation of FAO's Role and Work in Nutrition, Final Report, Office of Evaluation, FAO, 2011 (MB663) (http://www.fao.org/docrep/meeting/023/mb663E01.pdf).

Term	Definition	Source
infant	A child from birth up to 12 months of age.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2014 (MI198_Sec1).
livelihood	It comprises the capabilities, assets (natural, human, physical and financial) and activities required for survival and well-being.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198) adapted from Sustainable rural livelihoods: practical concepts for the 21st century, Chambers and Conway, 1992 (http://www.eldis.org/go/home&id=12998&type=Document).
local food	Local food refers to food that is produced near its point of consumption.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2014 (MI198_Sec1) adapted from Sustainability pathways. Selected topics of interest to sustainable food and agriculture, FAO, 2014

Term	Definition	Source
		(http://www.fao.org/nr/sustainability).
low birth weight; low weight at birth; LBW	Less than 2500 g (up to and including 2499 g).	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198) adopted from Health statistics and health information systems, World Health Organization, 2013 (http://www.who.int/healthinfo/statistics/indlowbirthweight/en/).
malnutrition	An abnormal physiological condition caused by deficiencies, excesses or imbalances in energy and/or nutrients necessary for an active, healthy life. An abnormal physiological condition caused by inadequate, unbalanced or excessive consumption of macronutrients and/or micronutrients. Malnutrition includes undernutrition and overnutrition as well as micronutrient deficiencies. An abnormal physiological condition caused by inadequate, unbalanced or excessive consumption of macronutrients and/or micronutrients. Malnutrition includes undernutrition and overnutrition as well as micronutrient deficiencies.	Nutrition Division/Meeting Programming and Documentation Service, FAO 2013 adopted from The state of food insecurity in the world (SOFI), FAO, 2000 (X8200) (http://www.fao.org/docrep/x8200e/x8200e06.htm).

Term	Definition	Source
	An abnormal physiological condition caused by deficiencies, excesses or imbalances in energy and/or nutrients necessary for an active, healthy life.	SOFI, Annex 3, FAO, 2013 (MI637); SOFI, Annex 3, FAO, 2013 (MI637). Nutrition Division/Meeting Programming and Documentation Service, FAO 2013 adopted from The state of food insecurity in the world (SOFI). FAO, 2000 (X8200) (http://www.fao.org/docrep/x8200e/x8200e06.htm).
micronutrient	Vitamins, minerals and certain other substances that are required by the body in small amounts. They are measured in milligrams or micrograms. Vitamins, minerals and certain other substances that are required in small amounts (milligrams or micrograms) by the body for normal physiological function.	SOFI, Annex 3, FAO, 2013 (MI637). Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198) adapted from FIVIMS's glossary, FAO, 2010

Term	Definition	Source
		(http://www.fivims.org/index.php?option=com_glossary&Itemid=31).
micronutrient deficiency; micronutrient malnutrition	Lack of vitamins, minerals and/or trace elements required in small amounts, which are essential for the proper functioning, growth and metabolism of a living organism.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2014 (MI198_Sec1) adapted from Nutrition Division, FAO, 2013 and CDC Science Ambassador (http://www.cdc.gov/excite/scienceambassador/ambassador_pgm/lessonplans/globalnutrfullerjones.pdf).
micronutrient-rich food	Food with a high micronutrient content with respect to its mass or volume.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198).
nutrient-dense food	Food with a high content of nutrients with respect to its mass or volume.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198).

Term	Definition	Source
nutrition	The intake of food, and the interplay of biological, social, and economic processes that influence the growth, function and repair of the body.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198) adapted from WHO's definition, Health topics, 2012 (http://www.who.int/topics/nutrition/en/).
nutrition assessment	Evaluation of nutritional status of individuals or population groups by using dietary assessment, anthropometry, biochemical indices and/or clinical examination.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2014 (MI198_Sec1).
nutrition education	The goal of nutrition education is to reinforce specific nutrition-related practices or behaviours to change habits that contribute to poor health; this is done by creating a motivation for change among people, to establish desirable food and nutrition behaviour for promotion and protection of good health. People are given help to learn new information about nutrition and to develop the attitudes, skills and confidence that they need to improve their nutrition practices. Refers to promoting healthy eating habits.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198) adapted from the definition of Nutrition Education in Linking Research, Theory and Practice. Dr. Isobel R. Contento, 2007 (http://www.ncbi.nlm.nih.gov/pubmed/18296331) and

Term	Definition	Source
	Any combination of educational strategies, accompanied by and contributing to an enabling environment, which together facilitate voluntary adoption of food choices and other food- and nutrition-related behaviours conducive to health and well-being.	Agriculture food and nutrition for Africa - A resource book for teachers of agriculture, FAO, 1997 (http://www.fao.org/docrep/W0078e/w0078e10.htm#P8930_608238).
nutrition intervention	Actions that are designed to address immediate and/or underlying determinants of nutrition among individuals and households.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2014 (MI198_Sec2).
nutrition literacy	The capacity to obtain, process, and understand nutrition information and principles.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198) adapted from the definition of the European Network for Promoting Schools, A good Nutrition Education Curriculum: The tripartite approach, FAO (ftp://ftp.fao.org/docrep/fao/009/a0333e/a0333e02_.pdf).

Term	Definition	Source
nutrition security	A situation that exists when secure access to an appropriately nutritious diet is coupled with a sanitary environment, adequate health services and care, in order to ensure a healthy and active life for all household members. Nutrition security differs from food security in that it also considers the aspects of adequate caring practices, health and hygiene in addition to dietary adequacy. Exists when all people at all times consume food of sufficient quantity in calories and quality in terms of variety, diversity, nutrient content and safety to meet their dietary needs and food preferences for an active and healthy life, coupled with a sanitary environment, adequate health, education and care.	SOFI, Annex 3, FAO, 2013 (MI637). Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198) adapted from the Evaluation of FAO's Role and Work in Nutrition. Final Report, Office of Evaluation, FAO, 2011 (MB663) (http://www.fao.org/docrep/meeting/023/mb663E01.pdf) and A Road Map for Scaling Up Nutrition (SUN), First edition, United Nations, September 2010 (http://unscn.org/files/Activities/SUN/SUN_Road_Map_english.pdf).

Term	Definition	Source
nutrition-sensitive	Designed to address the underlying determinants of nutrition (which include household food security, care for mothers and children and primary health care services and sanitation) but not necessarily a predominant goal.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198).
nutrition-sensitive agriculture	Agriculture that is sensitive to the incorporation of nutrition objectives, concerns and considerations to achieve food and nutrition security.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198) adapted from Briefing Paper, Bread for the World Institute, Number 20, 2012 (http://www.bread.org/institute/papers/nutrition-sensitive-interventions.pdf).
nutritional status	The physiological state of an individual that results from the relationship between nutrient intake, requirements and the body's ability to digest, absorb and utilise these nutrients. The physiological state of an individual that results from the relationship between nutrient intake and requirements and from the body's ability to digest, absorb and use these nutrients.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198) adapted from FIVIMS's glossary, FAO, 2010(http://www.fivims.org/index.php?option=com_glossary&

Term	Definition	Source
		Itemid=31).; SOFI, Annex 3, FAO, 2013 (MI637).
nutrition transition	Popkin (2018) explains nutrition transition as shifts have occurred in dietary and physical activity patterns. These changes are reflected in nutritional outcomes, including changes in average stature and body composition. Modern societies seem to be converging on a diet high in saturated fat, sugar, and refined foods and low in fibre, often termed the 'Western diet'. Many see this dietary pattern to be associated with high levels of chronic and degenerative diseases and reduced disability-free time.	The Nutrition Transition (2018) http://www.cpc.unc.edu/projects/nutrans/whatis
obesity	A body mass index (BMI) >30. Body weight that is pathologically above normal as a result of an excessive accumulation of fat in adipose tissue to the extent that health may be impaired.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198), adapted from WHO's definition, May 2012 (http://www.who.int/mediacentre/factsheets/fs311/en/).
overweight	Overweight and obesity: Body weight that is above normal for height as a result of an excessive accumulation of fat. It is usually a manifestation of over-nourishment. Overweight is defined as a BMI of more than 25 but less than 30 and obesity as a BMI of 30 or more. A body mass index (BMI) >25-30.	SOFI, Annex 3, FAO, 2013 (MI637).; Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198), adapted from WHO's definition, May

Term	Definition	Source
		2012 (http://www.who.int/mediacentre/factsheets/fs311/en/).
productivism	Productivism: in the food security context, this refers to "a commitment to an intensive, industrially-driven and expansionist agriculture with state support based primarily on output and increased productivity" (Lowe et al., 1993, p. 221)	Lowe et al. (1993). Regulating the new rural spaces: the uneven development of land, *Journal of Rural Studies, 9*(3), 205–222. doi: 10.1016/0743-0167(93)90067-T.
right to food	The right to have regular, permanent and unrestricted access, either directly or by means of financial purchases, to quantitatively and qualitatively adequate and sufficient food corresponding to the cultural traditions of the people to which the consumer belongs, and which ensure a physical and mental, individual and collective, fulfilling and dignified life free of fear.	United Nations Office of the High Commissioner, What are human rights? Online at https://www.ohchr.org/en/issues/food/pages/foodindex.aspx
severe malnutrition	Weight for age under -3z scores below the median of the WHO child growth standards.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198) adapted from WHO's definition (http://www.who.int/nutrition/topics/moderate_malnutrition/en/index.html)

Term	Definition	Source
staple food; dietary staple	Food that is eaten commonly and regularly in a country or community and in such quantities as to constitute the dominant part of the diet and supply a major proportion of energy needs.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2014 (MI198_Sec1) adapted from Food and Agriculture Organization, AGS Division, 1995; Dimensions of need. An atlas of food and agriculture, FAO, 2005 (http://www.fao.org/docrep/u8480e/U8480E07.htm) and the Interactive Terminology for Europe, EU, 2012 (http://iate.europa.eu/iatediff/SearchByQuery.do).
stunting; growth failure	Low height for age, reflecting a sustained past episode or episodes of undernutrition; low height-for-age, reflecting a sustained past episode or episodes of inadequate food intake.	SOFI, Annex 3, FAO, 2013 (MI637). Nutrition Division/Meeting Programming and Documentation Service, FAO,

Term	Definition	Source
		2013 (MI198) adapted from FIVIMS, FAO, 2010.
subsistence farming	“Typically, subsistence agriculture is characterized by a low-external input level and low productivity (per land and/or per labour). In these situations, agriculture is generally the dominant economic activity, thus allowing subsistence and agriculture to appear identical. The term "subsistence agriculture" is used synonymously with such concepts as traditional, small scale, peasant, low income, and resource poor, low-input or low technology farming.”	FAO Agroecology knowledge hub, online at http://www.fao.org/agroecology/database/detail/en/c/893025/
sustainable diet	Diets with low environmental impacts, which contribute to food and nutrition security for present and future generations.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2014 (MI198_Sec1; International Scientific Symposium on Biodiversity and Sustainable Diets: United against Hunger, FAO, 2010 (http://www.fao.org/ag/humannutrition/28506-0efe4aed57af34e2dbb8dc578d465df8b.pdf).
transitory food insecurity;	A sudden drop in the ability to access enough food to maintain good nutritional status. Transitory food insecurity occurs when a household or individual faces a	Nutrition Division/Meeting Programming and

Term	Definition	Source
temporary food insecurity; short-term hunger	temporary decline in the ability to meet food needs. Temporary food insecurity occurs for a limited time because of unforeseen and unpredictable circumstances (e.g. floods, civil unrest).	Documentation Service, FAO, 2014 (MI198_Sec1); Food Security Information for Action, Practical Guides, FAO, 2008 (http://www.fao.org/docrep/013/al936e/al936e00.pdf).; FIVIMS.
undernourishment; under-nourishment	Refers to food intake that is insufficient to meet dietary energy requirements continuously for an active and healthy life. A state, lasting for at least one year, of inability to acquire enough food, defined as a level of food intake insufficient to meet dietary energy requirements. For the purposes of this report, hunger was defined as being synonymous with chronic undernourishment. A state, lasting for at least one year, of inability to acquire enough food, defined as a level of food intake insufficient to meet dietary energy requirements. For the purposes of this report, hunger was defined as being synonymous with chronic undernourishment.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2014 (MI198_Sec1) adapted from SOFA, 2013 (http://www.fao.org/docrep/018/i3300e/i3300e00.htm). (http://millenniumindicators.un.org/unsd/mi/mi_series_results.asp?rowID=566); Clarification of commonly used terms relevant to the right to food, FAO, 2008.

Term	Definition	Source
	Under-nourishment is the measure for hunger compiled by FAO and refers to the proportion of the population whose dietary energy consumption is less than a pre-determined threshold. People suffering from under-nourishment are referred to as the undernourished.	Measurement and Assessment of Food Deprivation and Undernutrition, International Scientific Symposium, Rome, 26-28 June 2002, (http://www.fao.org/docrep/005/Y4249E/y4249e0m.htm). (http://millenniumindicators.un.org/unsd/mi/mi_series_results.asp?rowID=566); Clarification of commonly used terms relevant to the right to food, FAO, 2008. Measurement and Assessment of Food Deprivation and Undernutrition, International Scientific Symposium, Rome, 26-28 June 2002,

Term	Definition	Source
		(http://www.fao.org/docrep/005/Y4249E/y4249e0m.htm). Final Report Evaluation of FAO's Role and Work in Nutrition (FAO Office of Evaluation), 108th Programme Committee, June 2011 (MB663).
undernutrition	The outcome of undernourishment, and/or poor absorption and/or poor biological use of nutrients consumed as a result of repeated infectious disease. It includes being underweight for one's age, too short for one's age (stunted), dangerously thin for one's height (wasted) and deficient in vitamins and minerals (micronutrient malnutrition). The outcome of insufficient food intake and/or repeated infectious disease. It includes being underweight for one's age, too short for one's age (stunted), dangerously thin for one's height (wasted) and deficient in vitamins and minerals (micronutrient malnutrition).	SOFI, Annex 3, FAO, 2013 (MI637). Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198), adopted from Progress for Children, a Report Card on Nutrition No. 4, UNICEF, 2006 (http://www.unicef.org/progressforchildren/2006n4/undernutritiondefinition.html)

Term	Definition	Source
underutilised species	Varieties with under-exploited potential for contributing to food security, health (nutritional/medicinal), income generation, and ecosystem services.	Nutrition Division/Meeting Programming and Documentation Service, FAO, 2014 (MI198_Sec1); Global Facilitation Unit for Underutilised species (http://www.underutilized-species.org/spotlight/what_are_underutilized_species.asp).
wasting	Low weight for height, generally the result of weight loss associated with a recent period of starvation or disease. Low weight-for-height, generally the result of weight loss associated with a recent period of acute food deprivation, prolonged hunger or disease.	SOFI, Annex 3, FAO, 2013 (MI637). Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 (MI198) adapted from FIVIMS's glossary, FAO, 2010 (http://www.fivims.org/index.php?option=com_glossary&Itemid=31).

Adapted from Food and Agriculture Organization Term Portal, Available at: http://www.fao.org/faoterm/en/

APPENDIX I - SAMPLING AND DATA ANALYSIS

1. Identification of the Study Districts

This study began with a desk review of available literature, reports and other official and non-governmental organisation (NGO)-authored documents to profile the four provinces selected by the WRC for this study. Comparative data was collected on the following aspects:

- Demographics
- Education and training
- Sources of income and livelihoods
- Sociocultural dynamics (including food culture)
- Natural resources, institutional arrangements related to land
- Farming/gardening systems (including apportionment of produce)

The desk review identified the Integrated Sustainable Rural Development Programme (ISRDP) priority districts as the primary point for the selection of the study districts in the Eastern Cape, KwaZulu-Natal and Limpopo for this study. These districts represent the 18 rural nodes across South Africa in which South Africa's poorest citizens live (Harmse 2010; Stats SA 2016). No priority rural nodes exist in North West (Stats SA 2016).

1.1 Site Selection

Using these priority districts in the Eastern Cape, KwaZulu-Natal, Limpopo and the North West, data from the Heath Systems Trust (Day et al. 2012) Deprivation Index (DI) was used to identify the most deprived district in North West and then the most deprived municipalities in the district from each province. The DI provides a useful tool for identifying the poorest regions in the country. The DI is a measure of relative deprivation. The 2011 index was derived from a set of demographic and socio-economic variables from the 2007 Community Survey and the 2005 and 2006 General Household Surveys. Day et al. (2012) estimated the DI using Principal Component Analysis (PCA) from a set of key binomial variables for the following:

- Children who are below the age of five years

- Black Africans
- Female household heads
- Household heads with no formal education
- Working-age people who are unemployed (not working, whether looking for work or not – the official definition of unemployment in South Africa)
- People who live in a traditional dwelling, informal shack or tent
- People who have no piped water in their house or on site
- People who have a pit or bucket toilet or no form of toilet
- People who do not have access to electricity, gas or solar power for lighting, heating or cooking

(Day et al. 2012).

Although not direct food security indicators, many of these variables are also indicators of food insecurity and poverty. From this data, one district municipality per province was selected as the location for the study. The reports for the identified districts of the Community Rural Development Programme (CRDP) of the Department for Rural Development and Land Reform were also consulted to verify the selection of the most deprived areas. For KwaZulu-Natal, the district identified as having the highest level of child undernutrition (uMkhanyakude) did not have CRDP reports available at the time. The only available equivalent data for this district at the time were drawn from the Food Insecurity Vulnerability Information Monitoring System (FIVIMS) (NDA 2007) information sheets, using 2005 data. These information sheets confirmed that the level of deprivation in uMkhanyakude was the highest in the province.

The NFCS (Labadarios and Nel 2000; Labadarios 2000) reported that Hlabisa had the highest proportion of the population experiencing hunger in the 1999 and 2005 survey data for KwaZulu-Natal. However, the proportion of households receiving migrant income in Hlabisa was high relative to Jozini. Working in Hlabisa had budgetary implications for the study. Lima had a long-term working relationship with the Jozini community (as well as the sites in the Eastern Cape and Limpopo where the site selection coincidently identified communities where Lima has long-term relationships). This facilitated community access and allowed the research team the opportunity to build on a long-term development programme in the area rather than an interventionist, extractive

research approach. For these reasons, Jozini was selected as the preferred study area in KwaZulu-Natal.

Jozini, Ingquza Hill, Maruleng and Ratlou had the highest rates of child stunting per province. The four sites were distinctive with different land capabilities (see Table 4).

Except for Mopani, they also represented the most deprived districts according to the Health Systems Trust Barometer (Day et al. 2012). The Greater Sekhukhune District had a lower level of deprivation than Mopani and fell in the bottom percentile in the province. However, Mopani had a higher level of stunting – which is an important indicator of poverty and food insecurity. Therefore, Mopani was recommended as the study site for Limpopo over Greater Sekhukhune.

Initially, Port St Johns Local Municipality in the OR Tambo District was selected as the area for the Eastern Cape sample, but the undulating topography and the lack of farming settlements in this district required reconsideration of this site. In consultation with the WRC managers, Ingquza Hill was selected as having the next highest poverty rate and a suitable agricultural context.

Table 1. Justification for site selection

Province	KwaZulu-Natal	Eastern Cape	Limpopo	North West
District	uMkhanyakude	OR Tambo	Mopani District	Ngaka Modiri Molema (Ratlou Local Municipality 2010)
Local municipality	Jozini	Ingquza Hill	Maruleng Local Municipality	Ratlou
Agronomy	Tropical Ideal weather conditions for agricultural production. In some areas crops can grow year-round – two to three crop cycles a year are possible (Jozini Local Municipality 2012)	Coastal (mixed biome) Ingquza Hill is home to dune forests, swamp forests and coastal forests. Forests are used by local communities and receive little protection due to a lack of formal control. Subsistence agriculture is predominant (Ingquza Hill Local Municipality 2016)	Lowveld High agricultural potential with production of tropical and citrus fruit (Maruleng Local Municipality, 2012).	Grassland/semi-arid This is a semi-arid area with water scarcity.
Hydrology	Jozini Dam is a major source of drinking water for people, animals, and irrigation (Jozini Local Municipality 2012).	The area has one large river, the Umzimvubu River, two medium-sized rivers and a number of smaller coastal rivers with limited catchment areas that stretch	Located on the banks of the Blyde River (Maruleng Local Municipality 2012) A large population of communal	The community is highly dependent on scarce ground water. With the existence of two river systems, one to the north and one in the centre of the area, water tables are relatively low. Borehole water is available, especially in close proximity to the river

		60 km inland. The area receives above 800 mm of rainfall a year (OR Tambo District Municipality undated).	farmers is settled in an area between Hoedspruit and Tzaneen. Seven medium-sized irrigation schemes have been developed in the area, but only two remain functional.	systems. Agricultural activities should also be located close to water sources (Ratlou Local Municipality 2010). There used to be a dam at Mabule, but, due to floods, it has burst its wall, resulting in the lack of a secure water supply for the villagers.

2. Sample selection

Once the local municipalities were selected, a multistage stratified random sampling technique was applied to identify the communities and sample households for the quantitative survey and qualitative assessments. Enumeration area unit (EAU) orthophoto maps from the national statistics framework (Stats SA 2003) were obtained from Statistics South Africa (Stats SA). For the selected local municipalities, all EAUs classified as 'traditional residential' were listed. Random computer-generated numbers were used to select two EAUs per local municipality. The number of households per EAU was counted from the orthophoto maps provided by Stats SA. The sampled households were drawn using random computer-generated numbers from the total number of homesteads in each EAU (obtained from Stats SA). Initially, the research team had planned to sample 25 crop-producing and irrigating households per site. However, this was not possible. Where the EAUs were the sampling frame base (for the sites in Ingquza Hill, Maruleng and Ratlou and one site in Jozini), a list of at least 100 random household numbers were generated and the households were identified and approached in the order of the random sampling list. Where a household was unavailable or did not meet the criteria for inclusion (see below), the next household on the list was approached until at least 50 households per site were interviewed for the first round

of data collection. Contacting the households for the second round of data collection proved tricky, so there was natural attrition in the sample size.

In the case of KwaZulu-Natal, two different approaches were adopted to identify farmers from an irrigation scheme (called Makhatini Block 6B or Mjindi) and a second sample representing households not associated with an irrigation scheme. In the case of the irrigation scheme, a list of all farmers belonging to the scheme was obtained (407 members) and the households residing in Jozini (89 members) were identified. Random computer-generated numbers were used to identify a sample of 50 households. A replacement number list was drawn in the same manner and was used to substitute where farmers could not be located, were unavailable for interviews or unwilling to participate in the survey. Due to the process of substitution of additional randomly selected members, all 69 available qualifying households were interviewed from the members of the irrigation scheme. For the second group of farmers in KwaZulu-Natal who did not belong to the irrigation scheme, the same procedure was followed as for the other three provinces.
The Ingquza Hill area in the Eastern Cape is undulating, with multiple tributaries and rivulets. From an examination of the orthophoto map of the area, most households seemed to live within at least 2 km of a water source. For this reason, in this site, irrigating and non-irrigating areas were not identifiable. Similarly, at the Limpopo sites, households lived in formal housing settlements and farmed in areas beyond the township. In North West, no farming was visible at all from the orthophoto maps. This was confirmed by a site visit. It was therefore impossible to identify irrigating and non-irrigating households ahead of time, so a random sample was drawn from the total population of EAUs at two sites per municipality for these three provinces and one EAU in Jozini.

To be included in the survey, a household had to have at least one child aged between 24 and 59 months with a caregiver present in the homestead and willing to participate in the study. Finding qualifying households in Ratlou was difficult, due to the absence of children.

3. Questionnaire design

Surveys were studied to select appropriate questions for the quantitative survey. These surveys included the following:

- Stats SA General Household Survey
- South African Quality of Life Surveys
- Household Profiling Tool of the Department of Social Development (DSD)
- South African Community Surveys
- Living Standards Measurement
- Food Insecurity Vulnerability Information Monitoring System in South Africa (FIVIMS ZA)
- SA Census 2012 and 2013 questionnaires
- Stats SA Census of Commercial Agriculture questionnaire, 2012
- Surveys from other countries (demographic household surveys) including Malawi, Zambia and Uganda

Current food security tools were also reviewed. This included the Household Hunger Scale (Ballard et al. 2011) and the Food Sovereignty Assessment Tool (Bell-Sheeter 2004).

The survey tool was drafted in consultation with Stats SA, where staff members were kind enough to allow the use of the 2013 GHS as a basis for the current survey prior to the commencement of the 2013 GHS. The 2012 Stats SA census of commercial agriculture was drawn on for the agricultural production questions. The survey tool was drafted and digitised by a team member, loaded onto Samsung tablets and the data captured directly on the tablet. This allowed for instant data capturing into an Excel spread sheet for analysis. The University of Pretoria (UP) Ethics Committee granted ethical approval for the study (approval number EC130628-066).

Two panel surveys were conducted at each site – one in the drier and less agriculturally productive winter months and one in the summer months (see Table 5). The survey captured information about household crop production, food consumption, a range of food security indicators, and anthropometric measurements of children aged between 24 and 59 months and their female caregivers.

Quantitative data was collected through household surveys. Table 5 sets out the dates on which the surveys were conducted. Caregivers signed a standard informed consent agreement. Enumerators from the communities with at least 12 years of completed education were identified, recruited and trained for the fieldwork. The questions and terminology required for the survey were translated into the local language of the area. Glossaries of terms (see Appendix I) were prepared as a guide for the enumerators and field support staff, and were used in training.

The project's principal investigator checked each survey submission as it was submitted. Each submission was checked for errors and the survey coordinator was alerted of any errors, missing data or anomalies so that these could be corrected while the survey team was on site. The survey design's information technology expert was on call to manage technical glitches

Table 2. Dates of surveys

Province	District	Local municipality	Round	Season	Date	Location
Eastern Cape	OR Tambo	Ingquza Hill	Round 1	Summer	October 2013	KwaThahle Dubana
			Round 2	Winter	July 2014	25 Dubana 34 KwaThahle
KwaZulu-Natal	uMkhanyakude	Jozini	Round 1 Makatini Block 6B (irrigation scheme members)	Winter	July 2013	Makatini Block 6B Irrigation Scheme
			Round 2 for irrigation and Round 1 for non-irrigating	Summer	October/November 2014	Makatini Block 6B Irrigation Scheme KwaJobe
			Round 2 (non-members)	Winter	May 2015	KwaJobe
Limpopo	Maruleng	Mopani	Round 1	Summer	November 2014	Bochabelo Sedawa
			Round 2	Winter	May 2015	Bochabelo Sedawa

North West	Ngaka Modiri Molema	Ratlou	Round 1	Summer	November 2014	Madibogo Phitshane
			Round 2	Winter	June 2015	Madibogo Phitshane

4. Constraints faced during data collection

Tracing the households in the second round of data collection proved to be extremely difficult. Due to electioneering and disruptions of the national elections in April 2014, fieldwork had to be suspended between December 2013 and April 2014. This meant that the team was unable to survey consecutive summer and winter seasons at some of the sites. The delay also meant that some of the children who were under 59 months in the first round of data collection were older than 59 months on the second visit and could not be used in the survey for Round 2. Where possible, children who had become older than 24 months were included in Round 2. Some households were not traceable in the second round as they had relocated or the participants were not found for Round 2 of the survey.

Obtaining the child anthropometry data was no simple task. The researchers did not expect the number of children attending the Early Childhood Development (ECD) centres of the DSD (especially in Jozini) to be so high. The field staff struggled to gain access to these small children in order to take their anthropometric measurements, as they were not at home during the day.

5. Data treatment and analysis

The data from the survey was cleaned, checked and analysed for frequencies. Comparisons of the various elements under investigation were conducted using Microsoft Excel and SPSS Version 23 (IBM Corporation 2014).

Crop-producing households were considered to be those engaged in some form of crop production, such as vegetables, fruit or industrial crops. The scale of production was not taken into consideration, except where the data was disaggregated into large-scale farming, community gardens (smaller plots on a shared commonage), school gardens where groups farm smaller plots on a larger commonage, and home gardens. Livestock production was not considered.

Non-cropping households did not engage in cropping of any kind, but may have been involved in livestock production. Irrigating households were those engaged in cropping who used some form of irrigation (from buckets to irrigation scheme canals).

Numerous food security access indicators were evaluated and compared across the two seasons and compared to anthropometric measurements for children aged between 24 and 59 months and their female caregivers. Each indicator was estimated according to the following standard procedures set out in the literature.

The Household Dietary Diversity Score (HDDS) (Kennedy et al. 2011) is a measure of dietary quality. It uses a 24-hour recall period of 16 food groups, without asking about frequency of consumption. The HDDS is the sum of the first 14 scores classified as '1' for yes and '0' for no. As this is a continuous variable without international cut-offs, it was not classified into categories for this study. The description of the food groups is presented in Table 6. In this study, a non-quantitative 24-hour recall was used.

Table 3. Food groups

Cereals: maize, millet, sorghum, wheat and any other foods made from cereals such as porridges and bread
White roots and tubers: potatoes, sweet potatoes (excluding orange-fleshed sweet potatoes)
Orange-fleshed vegetables: butternut, carrots, orange-fleshed sweet potatoes and pumpkin
Dark green leafy vegetables: including *imifino* (green leafy vegetables), *morogo* (wild/Indigenous green leafy vegetables)
Other vegetables: eggplant, gem squash, green beans, onions and tomatoes
Orange-coloured fruit: apricot, dried peach, ripe mango, papaya and 100% fruit juice made from these fruit
Other fruit: banana, apple, orange and pear
Organ meat: heart, kidney, liver and other organ meats
Meat: beef, goat, poultry, pork and sheep

Eggs
Fish and seafood: fresh, tinned or dried fish and shellfish
Dried beans and pulses: lentils, nuts, peas, seeds or foods made from these (e.g. peanut butter)
Milk and milk products: cheese, milk, *amasi* and yoghurt
Oils and fats: butter, lard, margarine and sunflower oil
Sweets: honey, sugar, sweetened squashes and juices, carbonated sweetened drinks and sugary foods such as chocolates, cookies and cakes
Beverages and spices: condiments (e.g. tomato sauce), pepper and salt, non-alcoholic beverages (coffee and tea) and alcoholic beverages

Self-reported experience of hunger questions was used to estimate the incidence of experiences of hunger among adults and children in households during the preceding 12 months. The experience of hunger was based on questions typically included in the South African GHS (Stats SA 2014b). These questions ask whether any adult or child went hungry in the past 12 months because there was not enough food in the household during that time.

Months of inadequate household food provision is a simple sum of the number of months a household reports experiencing hunger in the previous 12 months (Bilinsky and Swindale 2010).

Anthropometry was used to assess children between 24 and 59 months and their female caregivers. Z-scores for child anthropometry were determined using Anthro for Personal Computers (version 3.2.2) (WHO 2011b) and international reference guidelines. Adult body mass index (BMI) was calculated as the weight of a caregiver divided by her height in centimetres squared.

6. Training of enumerators

Lima recruited enumerators from the communities in which the surveys were conducted. Eight enumerators from each community were selected and trained in survey data collection. The enumerator training was carried out in stages. Initial training on the use of the mobile device was carried out. The enumerators were taken through the paper-based survey questions. They were then trained on entering the data into the tablet. Experts from UP trained the enumerators in taking the anthropometric measurements. Roleplay was used to allow enumerators to practice engaging with households, introduce the survey, complete the informed consent form, ask questions, take anthropometric measurements and accurately record these, as well as entering and checking the data.

Anthropometry training sought to accomplish the following:

- Familiarise the enumerators with the anthropometric equipment
- Demonstrate techniques
- Give enumerators the opportunity to practice techniques under supervision
- Standardise height measurement

The training focused on three anthropometric measures:

- Weight (adult caregivers and two- to five-year-old children)
- Standing height (adult caregivers and two- to five-year-old children)
- Mid-upper arm circumference (MUAC) (two- to five-year-old children)

The training procedure included the following:

- Familiarisation with the equipment in terms of proper assembly, disassembly, operation, maintenance and storage; the equipment included the following:
- Leicester portable stadiometers (INVICTA PLASTICS Ltd, England) for height
- CAMRY digital scales (ISO 9001 (2008 certified by SGS) models EB9323 and EF906 and 118) for weight

- United Nations International Children's Emergency Fund (UNICEF) colour-coded insertion tapes for MUAC
- Step-by-step demonstration of the proper technique by the trainer
- Practice of the technique by the enumerators in a relaxed atmosphere, yet under supervision, to ensure that they were at ease, to explain how to deal with unusual/practical problems (e.g. the positioning of obese participants or correction for a non-compressible hairdo) and to address measurement errors
- Standardisation, whereby each enumerator performed duplicate measurements on eight other people in a blinded, private fashion. This was documented on pre-prepared forms to provide evidence of quality control and a degree of inter-rater reliability

For ethical reasons, the field staff and enumerators were told that should a child's MUAC be below 11 cm (i.e., in the red zone of the insertion tape), they should encourage caregivers to visit their primary health care clinic with their growth monitoring (Road to Health) booklet for a full assessment. Enumerators were reminded about the principles of the research, professional conduct and their role as data collectors (i.e., they should not counsel or interpret and judge the data during collection). The care and safety of equipment was emphasised.

Training in dietary assessment sought to achieve the following:

- Supplement previous training on the tablet
- Clarify food groupings though the provision and use of graphic images
- Practise the collection of non-quantitative 24-hour diet recalls

Eight A5-sized, laminated show cards with simple drawings of examples of foods in the eight food groups in the HDDS (as contained on the digital tablet) were discussed and explained to enumerators to highlight the distinguishing features of each group. An A3-sized composite of all eight groups was available for the learning facilitator. It was suggested that these be used during the interviews.

The principles of a non-quantitative 24-hour recall according to the HDDS (Kennedy et al. 2011) were explained.

7. Focus group discussions

Focus group discussions (FGDs) were held in each community to discuss food consumption and production practices and to explore precautionary behaviour adopted when faced with food shortages. The Lima officers at each site recruited participants for the FGDs. The FGDs were arranged by the Lima office staff in each community. Participation in the FGDs was determined by community member availability. The majority of participants were women.

Table 7 presents the FGDs and the number of participants in each focus group. The aim of the FGDs on food consumption and production was to explore food consumption patterns at each site and to get a broad overview of the food production and consumption patterns of the households in each study area. The current food consumption practices and food insecurity of the households were investigated by determining the availability and accessibility (including affordability) of food. Changes in food production were also explored, together with how these changes influenced food practices. The FGDs also included simple questions around access to farming resources, including land and water, to gain a general understanding of their experiences as subsistence farmers.

Table 4. Focus group discussions held

Local municipality	Survey site	FGDs for discussing consumption and production patterns			FGDs for discussing seasonality and food security		
		Group	Composition	Number of participants	Group	Composition	Number of participants
Ingquza Hill	KwaThahle (Flagstaff)	Hlabathi	Nine women	9	KwaThahle	Nine women and two men	11

Local municipality	Survey site	FGDs for discussing consumption and production patterns			FGDs for discussing seasonatility and food security		
		Group	Composition	Num-ber of partici-pants	Group	Compo-sition	Number of partici-pants
	Mtontsana	-	-	-	Sophumelele	Eight women	8
	Mzenge	-	-	-	Mzenge Community Project	Six women	6
	Dubana	Lambase (first round)	13 women	13	Lambase	13 women	13
	Mpoza and Ludidi	Mazikhule Community Project	13 women and three men	16	Masikhule Community Project	12 women and two men	14
		Follow-up	10 women and two men	12	-	-	-
	Mdakani	-	-	-	Mdakani Chicken Project	Eight women and three men	11
Jozini	Sibongile	First round	10 women	14	Makhathini Block B	13 women	15

Local municipality	Survey site	FGDs for discussing consumption and production patterns			FGDs for discussing seasonatility and food security		
		Group	Composition	Num-ber of partici-pants	Group	Compo-sition	Number of partici-pants
	(Makhathini area)		and four men		Irrigation Scheme	and two men	
		(Second round) Follow-up	12 women	12	Maphaya Community Garden	Eight women and two men	10
	KwaJobe	Community garden	13 women and three men	16	GG Focus Group	Nine women and one man	10
		Community garden	13 women	13	Cezwana (Zamini Garden)	Nine women	9
		Community garden Follow-up	Five women	5	Bonelani	Eight women	8
					Mangweny a	Seven women	7
	Mzinyeni	-	-	-	Siyaphambili Community Garden	12 women and five men	17
	Ohlalwini	-	-	-	Ohlalwini Garden	11 women	11

Local municipality	Survey site	FGDs for discussing consumption and production patterns			FGDs for discussing seasonatility and food security		
		Group	Composition	Num-ber of partici-pants	Group	Compo-sition	Number of partici-pants
Marulleng	Madeira	Lefata Project Group	15 women	15	Lefata Project Group	16 women	16
	Sedawa	Community Hall	16 women and six men	22 (increased to 33 during meeting)	Enable Piggery Group	13 women and one man	14
		Community Hall Follow-up	14 women and two men	16			
	Bochabelo	Bochabelo drop-in centre	10 women and three men	13	Bochabelo drop-in centre	10 women and two men	12
Ratlou	Madibogo	Tribal Authority offices	Eight women and 15 men	23	Madibogo	Eight women and 15 men	23

Local municipality	Survey site	FGDs for discussing consumption and production patterns			FGDs for discussing seasonatility and food security		
		Group	Composition	Num-ber of partici-pants	Group	Compo-sition	Number of partici-pants
		Follow-up	Nine women	9			
	Phitshane	Gamosea ECD Makgobistad	12 women and three men	15	Gamosea ECD	12 women and three men	15
		Follow-up	11 women and one man	12			

A list of topics to explore the food practices was prepared with specific questions and probes to explore each of them. These included aspects relating to the following:

Food consumption patterns:

- Food supply (food sources – cultivated, collected, hunted, bought)
- Food for small children
- Food preparation facilities
- Changes in food consumption patterns
- Special occasions
- Food shortages

The questions about access to resources probed participants' understanding of decision-making and resource allocation by local authorities. The researchers also asked the women to describe changes over time in the way food was produced and consumed, using the surrounding features, for example the dam or terraced land, as reference points. The participants were asked questions about how and why farming had changed over the years and how this had influenced the availability of and preferences for different foods. Key informant interviews were also conducted.

8. Validation

Four validation workshops were held between 8 and 18 February 2016. Each workshop was attended by 30 to 40 participants. The participants included the community members and farmers who participated in the earlier surveys and FGDs, community garden organisers (schools and clinics), district agricultural extension workers and rural development workers.

APPENDIX II –COMMUNITY PRESENTATION BROCHURES

Maruleng

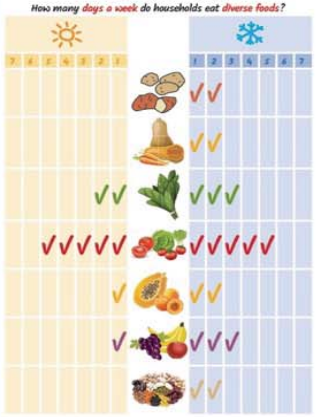
Maruleng

What we've found...

Our research shows that 8 out of 10 households in Maruleng grow crops on open plots or in household, community or school gardens, 3 of these were irrigated.

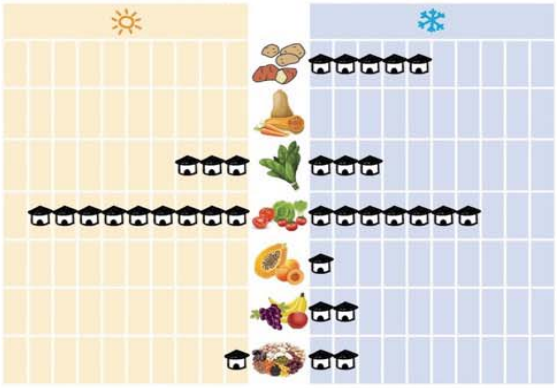
We found that all households ate purchased maize every day. Very few households eat diverse diets or eat foods from the following food groups every day.

How many days a week do households eat diverse foods?



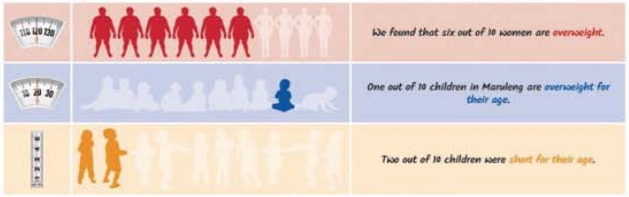
Most households in Maruleng ate foods from 5 food groups each week. It is recommended that people eat foods from as many groups as possible everyday to ensure good nutrition. The results show that diets in this community are not very diverse.

How many households eat diverse foods?



Key messages...

We weighed and measured female care-givers and children between 24 and 59 months of age at each household.



This shows these children have been under-nourished.

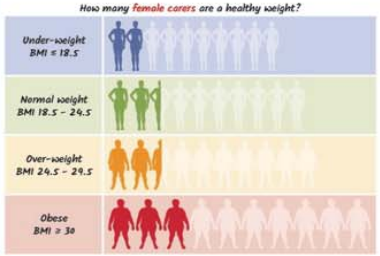
This shows that these children are not eating balanced and healthy diets.

We found that households that grow crops eat fresh vegetables and fruits more often than those who do not grow crops. They also eat more eggs and fish than households that do not grow crops.

We also found that households that irrigate enjoy a more diverse diet, eating fresh vegetables and fruits more often than those who do not irrigate their crops. They also eat more meat, eggs, fish and dairy products than households that do not grow crops or irrigate.

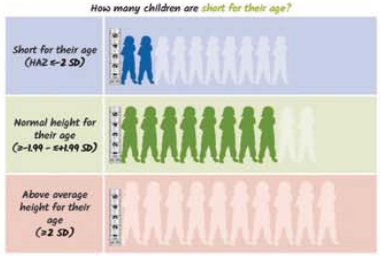
Improvements in the diets of all household members is necessary for improved nutrition, health and productivity.

How many female carers are a healthy weight?

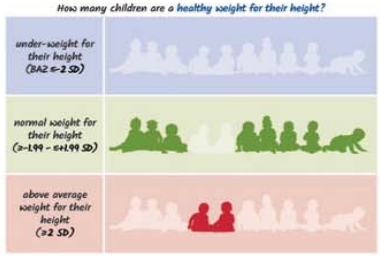


How many children are a healthy weight for their age?

How many children are short for their age?



How many children are a healthy weight for their height?



BMI = Body Mass Index (calculated as your height in metres squared, divided by your weight in kg), WAZ = weight-for-age z-score, HAZ = height-for-age z-score, BAZ = BMI-for-age z-score.

What we recommend...

Eating a variety of vegetables and fruits regularly ensures the intake of a variety of nutrients required for maintaining health bodies and minds. Diversified diets help children grow and develop optimally.

Diets can be improved by including the following foods or increasing the number of times in a week these foods are consumed. Growing these foods for home consumption will improve the diets of small children and adults.

The crops in the table below are able to grow in Maruleng.

Food group	Crop	Can provide food:	Supplemental irrigation needed
 White roots and tubers	Amadumbe	☀	
	Potato	☀ ❄	💧
	Sweet potato	☀	
 Orange-flesh vegetables	Beetroot	☀ ❄	💧
	Tomato	☀	
	Carrots	☀ ❄	💧
	Pumpkin/ Butternut	☀	
	Gem squash	☀	
	Orange-fleshed sweet potato	☀	
	Hubbard squash	☀	
	Pumpkin	☀	
 Dark green leafy vegetables	Broccoli	☀ ❄	💧
	African leafy vegetables	☀ ❄	
	Swiss Chard	☀ ❄	
	Beetroot leaves	☀ ❄	💧
	Pumpkin leaves	☀	
	Cowpea and legume leaves	☀	

☀ = Can provide food in summer

❄ = Can provide food in winter

💧 = Supplemental irrigation needed

Food group	Crop	Can provide food:	Supplemental irrigation needed
 Other vegetables	Cauliflower	☀ ❄	💧
	Cabbage	☀ ❄	💧
	Lettuce	☀ ❄	💧
	Cucumber	☀	
	Eggplant	☀	
	Green beans	☀	💧
	Green pepper	☀	
	Peas	☀ ❄	💧
	Zucchini	☀	
	Onion	☀ ❄	
 Orange-coloured fruit	Mango	☀	
	Papaya	☀	
	Spanspek	☀	
	Watermellon	☀	
 Other fruit	Avocado	☀	
	Banana	☀	
	Figs	☀	
	Loquat	☀	
	Pineapple	☀	
 Legumes	Bambara groundnut	☀ and when dried all year	
	Cow peas	☀ and when dried all year	
	Broadbeans	☀ and when dried all year	
	Harricot beans	☀ and when dried all year	
	Sugar Beans	☀ and when dried all year	
	Groundnut	☀ and when dried all year	

The research team thanks the the community for their participation in this project and the team of fieldworkers for their hard work in collecting the data.

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Design and layout by Marguerite Hartzenberg of Active Space Designs – marguerite.activespace@gmail.com.

LIMA RURAL DEVELOPMENT FOUNDATION

Ingquza Hill

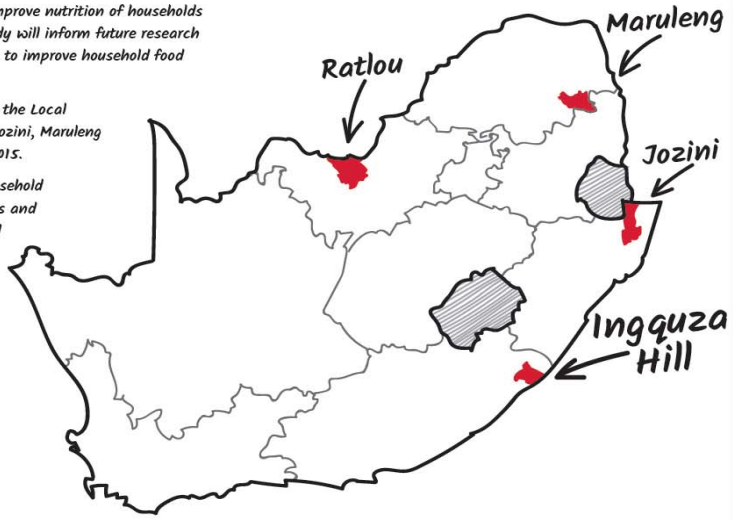
What should rural households grow and eat to improve their nutrition?

Over the past three years, the University of Pretoria has been conducting a research project commissioned by the Water Research Commission of South Africa.

The study set out to understand what people in rural households in South Africa grow and eat in order to make recommendations to WRC and the Department for Agriculture, Forestry and Fisheries to plan further research into how rain-fed and irrigated crop production can improve nutrition of households in these communities. This study will inform future research studies on water efficient crops to improve household food security and nutrition.

The research was carried out in the Local Municipalities of Ingquza Hill, Jozini, Maruleng and Ratlou between 2013 and 2015.

The survey team conducted household surveys, focus group discussions and interviews, in both summer and winter. The final stage of the project is to present the findings to members of the communities to get feedback on the accuracy of the findings and suitability of our recommendations.



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Institute for Food, Nutrition and Well-being

agriculture, forestry & fisheries
Department:
Agriculture, Forestry and Fisheries
REPUBLIC OF SOUTH AFRICA

This paper is based on research conducted by the University of Pretoria's Institute for Food, Nutrition and Well-being and was supported by the Water Research Commission (WRC No K5/2172/4) project entitled: *Current rain-fed and irrigated production of food crops and its potential to meet all year round nutritional requirements of rural poor people in North West, Limpopo, KwaZulu-Natal and Eastern Cape Provinces.*
For more information, please contact Prof Sheryl Hendriks at sheryl.hendriks@up.ac.za.

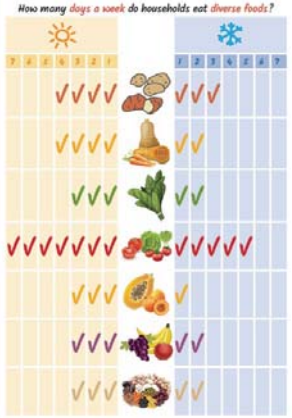
Ingquza Hill

What we've found...

Our research shows that 9 out of 10 households in Ingquza Hill grow crops on open plots or in household, community or school gardens. Half of these were irrigated.

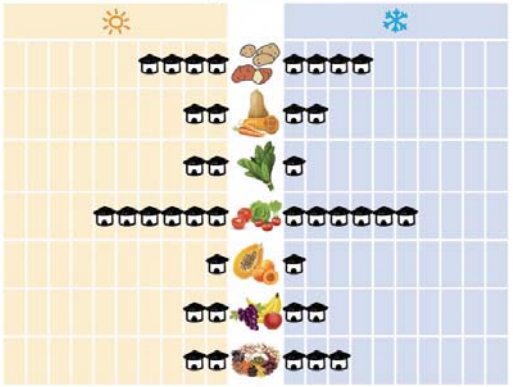
We found that all households ate purchased maize every day. Very few households eat diverse diets or eat foods from the following food groups every day.

How many days a week do households eat diverse foods?



Most households in Ingquza Hill ate foods from 5 food groups each week. It is recommended that people eat foods from as many groups as possible everyday to ensure good nutrition. The results show that diets in this community are not very diverse.

How many households eat diverse foods?



Key messages...

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This shows these children have been under-nourished.

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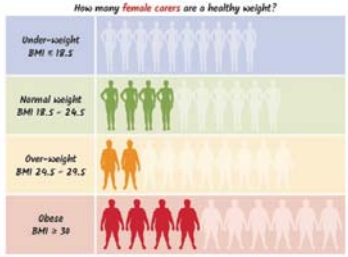
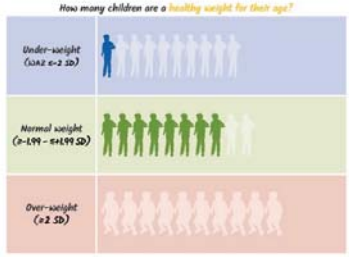
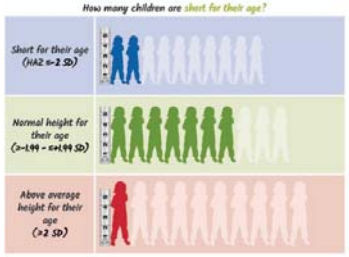


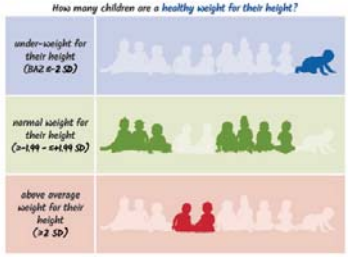
How many children are a healthy weight for their age?



How many children are short for their age?



How many children are a healthy weight for their height?



BMI = Body Mass Index (calculated as your height in metres squared, divided by your weight in kg), WAZ = weight-for-age z-score, HAZ = height-for-age z-score, BAZ = BMI-for-age z-score.

What we recommend...

Eating a variety of vegetables and fruits regularly ensures the intake of a variety of nutrients required for maintaining health bodies and minds. Diversified diets help children grow and develop optimally.

Diets can be improved by including the following foods or increasing the number of times in a week these foods are consumed. Growing these foods for home consumption will improve the diets of small children and adults.

The crops in the table below are able to grow in Ingquza Hill.

Food group	Crop	Can provide food:	Supplemental irrigation needed
White roots and tubers	Amadumbe	☀	
	Potato	☀ ❄	💧
	Sweet potato	☀	
Orange-flesh vegetables	Beetroot	☀ ❄	💧
	Tomato	☀	
	Carrots	☀ ❄	
	Pumpkin/ Butternut	☀	
	Gem squash	☀	
	Orange-fleshed sweet potato	☀	
	Hubbard squash	☀	
	Pumpkin	☀	
Dark green leafy vegetables	Broccoli	☀ ❄	💧
	African leafy vegetables	☀ ❄	
	Swiss Chard	☀ ❄	
	Beetroot leaves	☀ ❄	💧
	Pumpkin leaves	☀	
	Cowpea and legume leaves	☀	
Other vegetables	Cauliflower	☀ ❄	
	Cabbage	☀ ❄	
	Lettuce	☀ ❄	💧
	Cucumber	☀	
	Eggplant	☀	
	Green beans	☀	
	Green pepper	☀	
	Peas	☀ ❄	💧
	Zucchini	☀	
	Onion	☀ ❄	
Orange-coloured fruit	Mango	☀	
	Papaya	☀	
	Spanspek	☀	
	Watermellon	☀	
Other fruit	Avocado	☀	
	Banana	☀	
	Figs	☀	
	Loquat	☀	
	Pineapple	☀	
Legumes	Bambara groundnut	☀ and when dried all year	
	Cow peas	☀ and when dried all year	
	Broadbeans	☀ and when dried all year	
	Harricot beans	☀ and when dried all year	
	Sugar Beans	☀ and when dried all year	
	Groundnut	☀ and when dried all year	

☀ = Can provide food in summer

❄ = Can provide food in winter

💧 = Supplemental irrigation needed

The research team thanks the the community for their participation in this project and the team of fieldworkers for their hard work in collecting the data.

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LIMA RURAL DEVELOPMENT FOUNDATION

Jozini


What should rural households grow and eat to improve their nutrition?
Jozini
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The study set out to understand what people in rural households in South Africa grow and eat in order to make recommendations to WRC and the Department for Agriculture, Forestry and Fisheries to plan further research into how rain-fed and irrigated crop production can improve nutrition of households in these communities. This study will inform future research studies on water efficient crops to improve household food security and nutrition.
The research was carried out in the Local Municipalities of Ingquza Hill, Jozini, Maruleng and Ratlou between 2013 and 2015.
The survey team conducted household surveys, focus group discussions and interviews, in both summer and winter. The final stage of the project is to present the findings to members of the communities to get feedback on the accuracy of the findings and suitability of our recommendations.
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WATER RESEARCH COMMISSION
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For more information, please contact Prof Sheryl Hendriks at sheryl.hendriks@up.ac.za.

What we recommend...

Eating a variety of vegetables and fruits regularly ensures the intake of a variety of nutrients required for maintaining health bodies and minds. Diversified diets help children grow and develop optimally.

Diets can be improved by including the following foods or increasing the number of times in a week these foods are consumed. Growing these foods for home consumption will improve the diets of small children and adults.

The crops in the table below are able to grow in Jozini.

Food group	Crop	Can provide food:	Supplemental irrigation needed
White roots and tubers	Amadumbe	☀	
	Potato	☀ ❄	💧
	Sweet potato	☀	
Orange-flesh vegetables	Beetroot	☀ ❄	💧
	Tomato	☀	
	Carrots	☀ ❄	
	Pumpkin/ Butternut	☀	
	Gem squash	☀	
	Orange-fleshed sweet potato	☀	
	Hubbard squash	☀	
	Pumpkin	☀	
Dark green leafy vegetables	Broccoli	☀ ❄	💧
	African leafy vegetables	☀ ❄	
	Swiss Chard	☀ ❄	
	Beetroot leaves	☀ ❄	💧
	Pumpkin leaves	☀	
	Cowpea and legume leaves	☀	

Food group	Crop	Can provide food:	Supplemental irrigation needed
Other vegetables	Cauliflower	☀ ❄	💧
	Cabbage	☀ ❄	
	Lettuce	☀ ❄	💧
	Cucumber	☀	
	Eggplant	☀	
	Green beans	☀	
	Green pepper	☀	
	Peas	☀ ❄	💧
	Zucchini	☀	
	Onion	☀ ❄	
Orange-coloured fruit	Mango	☀	
	Papaya	☀	
	Spanspek	☀	
	Watermellon	☀	
Other fruit	Avocado	☀	
	Banana	☀	
	Figs	☀	
	Loquat	☀	
	Pineapple	☀	
Legumes	Bambara groundnut	☀ and when dried all year	
	Cow peas	☀ and when dried all year	
	Broadbeans	☀ and when dried all year	
	Harricot beans	☀ and when dried all year	
	Sugar Beans	☀ and when dried all year	
	Groundnut	☀ and when dried all year	

☀ = Can provide food in summer

❄ = Can provide food in winter

💧 = Supplemental irrigation needed

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LIMA RURAL DEVELOPMENT FOUNDATION

Ratlou


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For more information, please contact Prof Sheryl Hendriks at sheryl.hendriks@up.ac.za.

Ratlou

What we've found...

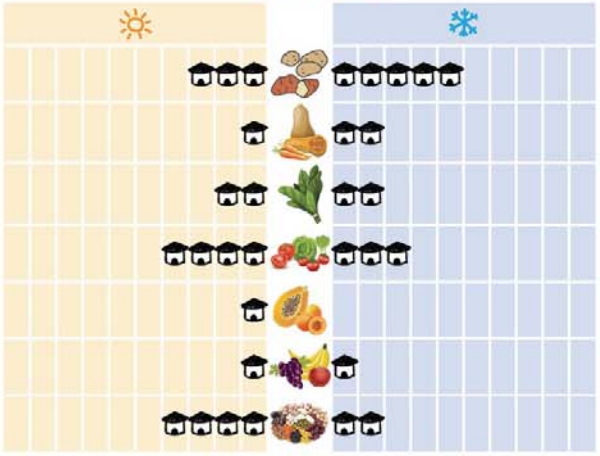
Our research shows that very few households in Ratlou grow crops on open plots or in household, community or school gardens. Those who do grow, irrigate.

We found that all households ate purchased maize every day. Very few households eat diverse diets or eat foods from the following food groups every day.

How many days a week do households eat diverse foods?

Most households in Ratlou ate foods from 5 food groups each week. It is recommended that people eat foods from as many groups as possible everyday to ensure good nutrition. The results show that diets in this community are not very diverse.

How many households eat diverse foods?



Key messages...

We weighed and measured female care-givers and children between 24 and 59 months of age at each household.

We found that six out of 10 women are overweight.

One out of 10 children in Ratlou are under-weight for their age.

Three out of 10 children were short for their age.

This shows these children have been under-nourished.

Two out of 10 children are overweight for their age.

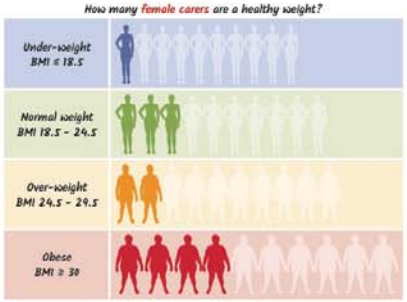
This shows that these children are not eating balanced and healthy diets.

We found that households that grow crops eat fresh vegetables and fruits more often than those who do not grow crops. They also eat more eggs and fish than households that do not grow crops.

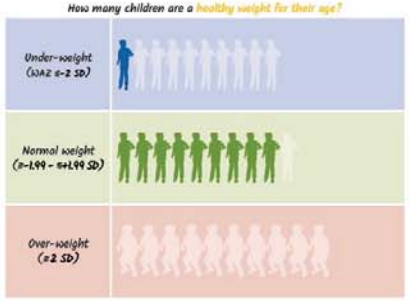
We also found that households that irrigate enjoy a more diverse diet, eating fresh vegetables and fruits more often than those who do not irrigate their crops. They also eat more meat, eggs, fish and dairy products than households that do not grow crops or irrigate.

Improvements in the diets of all household members is necessary for improved nutrition, health and productivity.

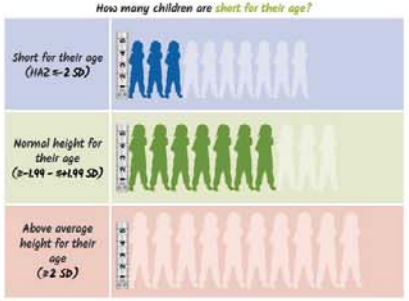
How many female carers are a healthy weight?



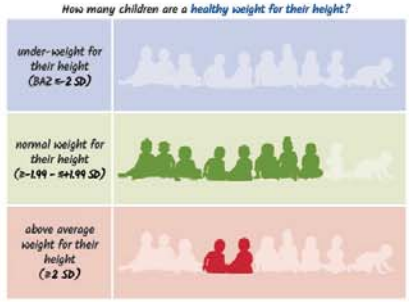
How many children are a healthy weight for their age?



How many children are short for their age?



How many children are a healthy weight for their height?



BMI = Body Mass Index (calculated as your height in metres squared, divided by your weight in kg), WAZ = weight-for-age z-score, HAZ = height-for-age z-score, BAZ = BMI-for-age z-score.

What we recommend...

Eating a variety of vegetables and fruits regularly ensures the intake of a variety of nutrients required for maintaining health bodies and minds. Diversified diets help children grow and develop optimally.

Diets can be improved by including the following foods or increasing the number of times in a week these foods are consumed. Growing these foods for home consumption will improve the diets of small children and adults.

The crops in the table below are able to grow in Ratlou.

Food group	Crop	Can provide food:	Supplemental irrigation needed
White roots and tubers	Amadumbe	☀	
	Potato	☀ ❄	💧
	Sweet potato	☀	
Orange-flesh vegetables	Beetroot	☀ ❄	💧
	Tomato	☀	
	Carrots	☀ ❄	
	Pumpkin/ Butternut	☀	
	Gem squash	☀	
	Orange-fleshed sweet potato	☀	
	Hubbard squash	☀	
	Pumpkin	☀	
Dark green leafy vegetables	Broccoli	☀ ❄	💧
	African leafy vegetables	☀ ❄	
	Swiss Chard	☀ ❄	
	Beetroot leaves	☀ ❄	💧
	Pumpkin leaves	☀	
	Cowpea and legume leaves	☀	
Other vegetables	Cauliflower	☀ ❄	💧
	Cabbage	☀ ❄	💧
	Lettuce	☀ ❄	💧
	Cucumber	☀	
	Eggplant	☀	
	Green beans	☀	💧
	Green pepper	☀	
	Peas	☀ ❄	💧
	Zucchini	☀	
	Onion	☀ ❄	
Orange-coloured fruit	Mango	☀	
	Spanspek	☀	
	Watermellon	☀	
	Orange/citrus	❄	
Other fruit	Avocado	☀	
	Figs	☀	
	Loquat	☀	
Legumes	Bambara groundnut	☀ and when dried all year	
	Cow peas	☀ and when dried all year	
	Broadbeans	☀ and when dried all year	
	Harricot beans	☀ and when dried all year	
	Sugar Beans	☀ and when dried all year	
	Groundnut	☀ and when dried all year	

☀ = Can provide food in summer

❄ = Can provide food in winter

💧 = Supplemental irrigation needed

The research team thanks the the community for their participation in this project and the team of fieldworkers for their hard work in collecting the data.

LIMA Rural Development Foundation and staff are thanked for facilitation of the fieldwork and most appreciated.

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Design and layout by Marguerite Hartzenberg of Active Space Designs – marguerite.activespace@gmail.com.

LIMA RURAL DEVELOPMENT FOUNDATION

APPENDIX III – IMAGES FROM THE FIELD

In the Eastern Cape, households grow home gardens but terrace farming has been abandoned

Focus group discussion in Lambase, Eastern Cape

Community-managed irrigation in Maruleng

An ox-drawn sledge in Lusikisiki

Home-grown maize from saved seed

Horse-drawn plough in the Eastern Cape

APPENDIX IV - NARRATIVE ANALYSIS

Definition: "Access to and control over the physical, social and economic means to ensure sufficient, safe and nutritious food at all times, for all South Africans, in order to meet the dietary requirements for a healthy life".		
Narrative type	National Household Food and Nutrition Strategy (excerpts by section, document is not paginated)	SA Food and Nutrition Policy
Neoliberal Productivity and purchasing power contribute to economic growth while eliminating hunger and poverty; open markets ensure food availability accessibility most efficiently; malnutrition is the result of lack of knowledge and poor lifestyle choices; charity is for the deserving poor.	2.6 […] among the poorest 10% of South African households, the share of total expenditure devoted to food was a very low 35%. One possible explanation for this apparent contradiction is that under-nutrition in South Africa is only partly a function of poverty or food affordability; also important are **poor dietary choices** and/or nutritious foods being unavailable. (p5) *Are healthy choices available and accessible? If not this is an unreasonable assignment of personal responsibility that ignores structural causes of malnutrition; considered a 'corporate' stance in the west.* 3.5 FoodBank South Africa (FBSA) is illustrative of the value of this approach. FoodBank South Africa has assisted both the Departments to	1.3 There are inadequate safety nets and food emergency management systems to provide for all those who are unable to meet their immediate food needs or to mitigate the impact of natural and non-natural disasters on food security; Citizens have inadequate access to knowledge and resources to make optimal choices for nutritious and safe diets…(p.4) Food security challenges: In cases where productive land is available, it is not always optimally utilised for food production, often for want of inputs (including finance, equipment and water), or skills; at the same time, there is a need to ensure that over-production does not drive down prices to the point that farming becomes unprofitable.

	improve Household Nutrition through the supply of food to a network of NGOs around the country, through it's food rescue programme, the strengthening of Community Nutrition Development Centres and support for family level production through its abilities to provide a market for such produce. (p.8) *There is a major role, according to the strategy, to be played by corporations in food security, mainly through food rescue programmes, which channel potentially 'wasted' but ostensibly safe food from being discarded and rather chanelling into charitable food distribution programs run either by the State or NGOs. As a long term measure it amounts to institutionalized charity. One is that rescued food is already paid for by consumers, accruing corporate social responsibility credential to big food retailers as well as being tax incentives (Hendriks & McIntyre, 2014).* *NGOs are relegated to the role of service providers for the State, rather than empowering / mobilising of communities around the social justice issues underlying food insecurity.*	There is limited access to processing facilities or markets for small-scale primary producers, including farmers, fishers and foresters (p.4) *Depending how this is interpreted or implemented, it may also be a food justice narrative. The aim might be to curb the excesses of the market, but it could also imply that greater market efficiency is a fix-all.* 3. Efforts to increase food production and distribution, including increased access to production inputs for the emerging agricultural sector; Leveraging Government food procurement to support community-based food production initiatives and smallholders; and The strategic use of market interventions and trade measures which will promote food security. (p.6) *Are these implemented by top-down, 'productivist' measures, or are local stakeholders engaged? If so, it could belong under justice/sovereignty.* 4. […] availability of improved nutritional safety nets, including government run and supported nutrition and feeding programmes, emergency food relief, as well as private sector, CBO and NGO interventions. (p.7)

	Corporations feature more prominently in the 'solutions' than in the 'problems' narratives. *Rent-seeking by middlemen is identified as a problem but this is a predictable result of a system of incentives that rewards the 'tenderpreneur.' There is no suggestion that issues such as corporate concentration and monopolies might be part of the problem.* *Finally, the 'personal responsibilty' narrative around obesity needs to be contested when healthy and diverse diets are simply unaffordable to most South Africans, both rural and urban.*	*Is this institutionalized charity? Does it promote as well as protect the right to food?* 8.1 Availability /Production challenges: land use, distribution and storage, market reform (p.13) *Are improvements in these informed through localized, consultative processes or top-down, blueprint solutions? How does this incorporate specific local challenges and assets?* 8.2 Accessibility: poverty and unemployment *This indicates that understanding is limited to recognizing a broad pattern of deprivation; what are other structural factors/local constraints and capabilities?* 8.3.1 The neglect of indigenous foods also exacerbates micro nutrient deficiencies. Indigenous crops like "Amaranth" (amaranthus hypochondriacus) and "Spider plant" (cleome gynandra)' contain more micro nutrients than exotic vegetables such as cabbage and lettuce. The promotion of indigenous crops such as bambara ground nuts (vigna subterranae), amadumbe (colocasia esculenta) and cowpeas (vigna inguiculata) is integral to ensuring that households consume more diverse diets. Increased consumption will also induce their production and assist in

		the creation of markets for these commodities, which will in turn enhance rural economies. (p.15) *Who is involved in this very complex set of extension/production/marketing and consumption decisions involved in promoting indigenous crops? Are indigenous crops eaten/grown everywhere?* 12. Pillars (p.18) Food assistance networks/safety nets/school nutrition/fortification (p.18) *Are these rights or charity-based? What are the procurement procedures? Is it corporate-sponsored institutionalised charity? What models of food banks are employed?*

Reformist (food security) Household food security improves with purchasing power and productivity; open markets ensure accessibility most efficiently but consumers and producers sometimes need support to access these; modernisation and incorporation of small producers; nutrition outcomes are the result of lifestyle choices but people need guidance on how to make healthier ones; philanthropy through corporate incentives supports the neediest.	2.7 the General Household Survey (GHS), which reveal that between 2002 and 2007, the proportion of households experiencing hunger 'sometimes', 'often' or 'always', declined from 24% to 11%. (Similarly, those experiencing hunger 'often' or 'always' declined from 7% to 2%.) This improvement appears to owe to a combination of increased social grant coverage and higher employment levels.(p5) 2.8 A larger share of the population is at risk of experiencing temporary under-nutrition owing to shocks such as food price spikes, job loss, death of pensioners, etc. (p.6) *These shocks are inherent features of the food system and people will continue to be exposed to them unless there are major structural changes. 'Buffers' like social grants do not uplift, they merely keep people afloat.*	2.1 Steps to improve access to markets for smallholder farmers, and An emphasis on agro-ecological approaches to farming (p.5) 3. Increased and better targeted public spending in social programmes which impact on food security (p.6) 8.3.1 The neglect of indigenous foods also exacerbates micro nutrient deficiencies. Indigenous crops like "Amaranth" (amaranthus hypochondriacus) and "Spider plant" (cleome gynandra)' contain more micro nutrients than exotic vegetables such as cabbage and lettuce. The promotion of indigenous crops such as bambara ground nuts (vigna subterranae), amadumbe (colocasia esculenta) and cowpeas (vigna inguiculata) is integral to ensuring that households consume more diverse diets. Increased consumption will also induce their production and assist in the creation of markets for these commodities, which will in turn enhance rural economies. (p.15) *Who is involved in this very complex set of production/marketing and consumption decisions involved*

	3.1 […] social grants, which raise the disposable income of vulnerable households; the direct provision of food through feeding schemes and through the distribution of food parcels; and the fortification of staples, in particular to improve access to micro-nutrients; and measures to increase subsistence production. […]In the absence of these interventions, there is no doubt that the scourge of food and nutrition insecurity would be far worse than it is […].these measures are not adequate: they must be expanded, enhanced or better focused, used in more effective combinations, and complemented by additional interventions. (p.6) *Again – these are buffers that reinforce the status quo*. 3.5 The distribution of food parcels may need to be revised so that it is linked to initiatives such as the Community Nutrition Development Centres, a system of food vouchers that would facilitate the purchase of food from local community producers and community markets. (p7) *Long-term, institutionalised food assistance is anticipated, supported by local food systems. A*	*in promoting indigenous crops? Are indigenous crops eaten/grown everywhere?* 8.4.2 A food production and marketing strategy that clearly outlines state support to farmers and the agricultural industry is a prerequisite for food security. International comparisons show massive state support to farmers by developed and developing, mostly in the form of subsidies and tariffs, and South Africa needs to consider such measures in order to protect and promote agricultural production. (p.17) *Which farmers? See De Schutter's different worlds of farming. Does empowering small producers and creating advantages and protections for local food systems count as subsidies? What are the processes involved?* 12. Pillars: Nutrition education; district-level nutrition services *If centres address only nutrition and not food security, they could be missing opportunities to mobilise and build capacity* Consumer literacy

	high level of community / stakeholder engagement would be needed for this to be sustainable and not have adverse effects on. Local markets.. A top-down blueprint for this arrangement would be highly problematic. 3.2 The government intervention that has most significantly mitigated household-level food insecurity over the past 10 years is almost certainly social grants. (p.7) 3.3 Probably the second most significant intervention – and the most significant of those designed specifically to address food insecurity – is the National School Nutrition Programme (NSNP) (p.7) *More buffers, no systemic change.* 3.5 From the perspective of government, the advantage of food parcels is that they can be targeted at those in acute need and those who may not be eligible for other forms of support such as social grants. (p.7)	*If only unhealthy food is available/accessible this will make little difference. Is it complemented with food industry regulations, e.g. for accurate labeling, not marketing to children?* Alignment of investments towards local economic development, infrastructure, irrigation schemes *Are these made on the basis of local economic/ecological assessments and consultations with local stakeholders?* Improved market participation, government purchasing program, agri-BEE, broaden supply bases *Many, many assumptions about local economies need to be explored if this is to avoid being a remotely-inflicted economic blueprints that could be irrelevant or even detrimental to existing livelihoods.* Risk management *Mitigation measures need to be designed with local consultation. How are conflicts with non-agricultural stakeholders managed? How are livelihoods affected overall by protecting agricultural land?*

	4.2 there are three conceptually distinct types of households that must be catered to: those who are chronically under-nourished due to abject poverty; those who are transiently under-nourished because of shocks; and those who have the resources to be properly nourished, but who are malnourished either because of their poor choices or because they are poorly served by consumer markets. (p.8) *The language here seems to accept the entrenched structural inequality: we just need to get our "catering" right.* 4.3 Moreover, the fortification programme must be linked to the NSNP as a means of ensuring that the food on offer through the NSNP becomes more nutritious. One manner of doing this would be to introduce 'micronutrient sprinkles' which can be added to food that is already prepared, rather than focusing only on fortifying ingredients, which are not always easy to control or trace. (p.9) 4.4 the state taking a more active funding, organising and partnership role in conjunction with existing social service agencies which are	

	typically faith-based or community-based organisations, such as the FoodBank SA, which over the years has developed an effective logistics system for the distribution of food to poor communities. (p.10) 4.4 Early Childhood Development (ECD) centres and service providers should be capacitated to offer nutritious menus to children 0 to 4 years in a similar manner to primary and secondary schools through the NSDP […] i) offering an institutional grant to ECD centres and service providers to provide for kitchen equipment and food acquisition; ii) co-opting beneficiaries of the Community Works Programme to serve as food preparers; and/or iii) bringing in other service providers or agencies to organise food distribution and feeding on behalf of ECD centres and service providers, such as those that operate the food distribution centres mentioned above. (p.10) 6.1 […] the private sector also features prominently as service providers, for example by means of tendering to become food suppliers to the NSNP. Caution is in order: while this can be used as a means of creating opportunities for promoting entrepreneurial development, the	

	reality is that it has also sometimes resulted in rent-seeking and overly expensive services, which society can ill-afford. While this requires further reflection and discussion, there is a growing inclination to work with CBOs and FBOs, and where necessary to capacitate them to perform their functions more effectively. (p.11) 6.3 […]correct to worry about worsening the proliferation of committees and forums, the reality is that seeking household food and nutrition security is a large and vital task which requires some amount of institutionalisation, including at a very high level. The establishment of a number of committees and working groups at different levels is recommended, to ensure both high-level and geographically distributed accountability and coordination, as well as to ensure that learning and programme development are taken as ongoing responsibilities. (p.12) 6.5 Meeting immediate nutritional needs of the most vulnerable and food insecure social grants, food grants, food banks, and community food distribution programmes Food fortification – This group will review the approach to food	

	fortification, including that done through industry regulation *Reform within the status quo is the default narrative of the Strategy. The basic structure and function of the food system not only remains intact but is reinforced as people's purchasing power is increased by social grants. As the number of grant recipients grows, so does the imperative to assess whether they are having a trasnformative effect. The same can be said for various forms of food charity. Interventions such as supplementation, fortification and 'micronutrient sprinkles,' while having tangible nutritional outcomes, evade distributional issues and circumvent the underlying casuses of poor dietary diversity and accessibility of food, if not of nutrients.* *Shocks and stresses are mentioned but there is no link drawn between these and the vulnerability of the whole system to these, or to the ways in which entrepreneurs could be benefiting through monopolies and inflation. The challenges facing the NSNP are acknowledged but the fact that these are largely linked to state governance, trasnparency and accountability bears no mention. Again, there is mention of NGOs and CBO in the capacity of service providers,*	

	potentially raising the same sustainability and accountability questions that were raised during the HIV crisis around the creation of parallel administrative and logistical structures to carry out what is essentially government work. No political role for civil society is acknowledged. Instead, new structures are being created (while warning of the proliferation of committees) at central and provincial levels. "Geographically distributed accountability" says very little about the vertical nature of accountability. Mechanisms of downward transparency to constituents could easily be accommodated in this highly developmentalist Strategy, but they are conspicuouly ommitted, which creates limitations on the transformative potential of the Strategy.	
Transformative		
Progressive (Food Justice) Underserved communities need investments in sustainable local food systems (production, processing and retail) and new business models; better wages for agricultural workers, access to land and inputs and guaranteed access to adequate nutritious food; nutrition is a social justice issue.	2.6 […] among the poorest 10% of South African households, the share of total expenditure devoted to food was a very low 35%. One possible explanation for this apparent contradiction is that under-nutrition in South Africa is only partly a function of poverty or food affordability; also important are poor dietary choices and/or nutritious foods being unavailable. (p.5)	1.3 In cases where productive land is available, it is not always optimally utilised for food production, often for want of inputs (including finance, equipment and water), or skills; at the same time, there is a need to ensure that over- production does not drive down prices to the point that farming becomes unprofitable (p.4)

	Another possible explanation is that they have huge transport, housing and health care expenditures. 2.6 […] there is a growing incidence of obesity and other so-called 'diseases of affluence', such that even within poor communities, there is evidence of the 'double burden' comprising under-nutrition on the one hand, and over-consumption of some foods on the other hand. (p6) *Is overconsumption an accurate term? It seems to imply choices and alternatives that don't exist.* […] the strengthening of Community Nutrition Development Centres and support for family level production through its abilities to provide a market for such produce. (p.8) *The assumption is that household production is enough to make a difference to food security: there is mixed evidence and many co-determinants at work in local contexts.* 4.3 The enormous reach of the NSNP must be built upon. This should include the introduction of	There is limited access to processing facilities or markets for small-scale primary producers, including farmers, fishers and foresters (p.4) *Depending how this is interpreted or implemented, it may also be a food justice or a neoliberal narrative. The aim might be to curb the excesses of the market, but it could also imply that greater market efficiency is a fix-all.* 4. Food and nutrition security requires well-managed inter-sectoral co-ordination, and the genuine integration of existing policies and programmes in health, education, and environmental protection, as well as in agrarian reform and agricultural development. (p.6) *Food insecurity is driven by wider social injustices and can only be corrected by addressing these.*

	a breakfast meal before the beginning of the school day, starting with primary schools in the poorest quintiles. (p.9) *School nutrition is a rights-based, food justice intervention that 'levels the playing field' and meets an inalienable right, and has long-term positive impacts. Can it be more transformative by linking to local suppliers?* 4.2 Households that are malnourished due to poor choices or because of limited availability of nutritious foods, may not experience the same misery as those in the other two categories, however they may well experience less well-being than they would otherwise, and they collectively impose a growing burden on the country's public health system. Here the interventions are less urgent and less targeted at specific households, and more to do with enhancing the public's awareness of the importance of good nutrition, while encouraging an agro-food system that is more in sync with local communities' needs. (p.9) *Agrofood systems should/can be shaped to meet the food security and nutrition needs of communities.*	

	6.5 Improving access and affordability of food – This group will review approaches to ensuring stable and affordable food prices. This will include a consideration of production, market and trade policy issues affecting food access and prices, as well as logistical and infrastructural inhibitors across the food production and manufacturing value chain that may be negatively impacting food prices. Support for Small Scale Producers, including Family Production […]. (p.9) *Assumption: Political will exists to affect these widespread, sweeping reforms and they will be informed and driven by public/community engagement.* *Where the Strategy crosses the 'transformation line' is in its diagnosis of the food security problem, which carries some essential food justice*	

	narratives. One of these explains the contradiction of coexisting over- and undernutrition as one of food accessibility and availability, rather than simply attributing obesity levels to poor lifestyle choices. This hints at the issue of food environments that are the product of a system not necessarily serving the ends of food security. The personal choice narrative appears in several locations, however, suggesting that the food availability and affordabilty problems, especially of the rural poor are not well-understood and thate strategy simply does not grasp the basic fact that adequately diverse diets are not affordable to the majority of South Africans. The vulnerability of the developmental, charity-based system to corrpution is acknowledged, suggesting there are governance problems. But this is another truncated branch of an incomplete governance narrative, which tells that that local markets and small-scale production can promote food security, but without suggesting any governance mechanisms – participatory, inclusive, community-focussed – that would necessarily accompany these development initiatives. An agri-food system "in sync with community needs" implies a form of accountability that is not provided for anywhere	

	in the strategy. Thereafter the strategy leaps back into the comfort zone of central government, suggesting that there are production, market and trade policies that might affecting food security, although the pathways netwen this and obesity and stunting remain vague.	
Radical (Food Sovereignty) Corporate agri-foods monopoly power must be dismantled and land redistributed, communities need guaranteed rights to water and seed, guaranteed sustainable livelihoods, protection from food dumping / overproduction, agro-ecological management is needed to mitigate climate change, markets and food supplies should be regulated; nutrition and health have holistic determinants linked diverse, ecologically and culturally appropriate local food systems.	6.5 This [food sovereignty] working group will lead a substantial and important component of the overall strategy and will be led by the Department of Agriculture, Forestries and Fisheries. Key outputs for this working group will be the development of a Food Security Policy, and a Food Production Strategy. The Food Security Policy will provide policy guidelines around South Africa's food supply and food sovereignty while the Food Production strategy will enable support for food production by a range of stakeholders. This will include support for family and household production and production by smallholdings . Consideration will be given to alternative production and distribution platforms to integrate the production and consumption of food. This will include the following home and community-based food production systems, the establishment of decentralised popular/local food	1.3 Steps to improve access to markets for smallholder farmers, and An emphasis on agro-ecological approaches to farming (p.5) *Is this an empowerment narrative, i.e. citizens gain control over local food systems and markets, or is it a top-down intervention, remotely tinkering with agricultural policy? It depends on consultative processes in implementation.* 3. Efforts to increase food production and distribution, including increased access to production inputs for the emerging agricultural sector; Leveraging Government food procurement to support community-based food production initiatives and smallholders; and The strategic use of market interventions and trade measures which will promote food security. (p.6)

	markets with increased production coming from smallholder producers. This working group will also explore policy mechanisms that would provide for the purchasing of food by public institutions and programmes from small producers. *This is an appropriate place for the appearance of food sovereignty given its narrative of radical structural change, grassroots empowerment and redistributive emphasis. But "alternative production and distribution platforms" and decentralised popular / local food markets with increased production coming from smallholder producers" and procurement from these by public institutions, within the broader, highly centralized governance context is an incomplete narrative.* *The suggestion here is that there could be a parallel food system, with no clarification of the targeting, geographical dimensions or commercial implications of such a system. Is it community-owned and operated, or a government-led parallel food system?*	*Are these implemented by top-down, 'productivist' measures, or are local stakeholders engaged? If so, it could belong under justice/sovereignty.* 8.3.1 The neglect of indigenous foods also exacerbates micro nutrient deficiencies. Indigenous crops like "Amaranth" (amaranthus hypochondriacus) and "Spider plant" (cleome gynandra)' contain more micro nutrients than exotic vegetables such as cabbage and lettuce. The promotion of indigenous crops such as bambara ground nuts (vigna subterranae), amadumbe (colocasia esculenta) and cowpeas (vigna inguiculata) is integral to ensuring that households consume more diverse diets. Increased consumption will also induce their production and assist in the creation of markets for these commodities, which will in turn enhance rural economies. (p.15) *Who is involved in this very complex set of production/marketing and consumption decisions involved in promoting indigenous crops? Are indigenous crops eaten/grown everywhere? Is this an expression of the right to cultural preference, enabled by empowering people to choose their food and farming systems?*

APPENDIX V – ETHICAL APPROVAL

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

ETHICS COMMITTEE
Faculty of Natural and Agricultural Sciences

01 August 2013
Prof S Hendriks
Department of IFNuW
University of Pretoria
Pretoria
0002

Dear Prof Hendriks

EC130628-066: Current rain-fed and irrigated production of food crops and its potential to meet all year round nutritional requirements of rural poor people in North-West, Limpopo, KwaZulu-Natal and Eastern Cape Provinces

This protocol conforms to the requirements of the NAS Ethics Committee.

Kind regards

Prof NH Casey
Chairman: Ethics Committee

Agriculture Building 10-20
University of Pretoria
Private bag X20, Hatfield 0028
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Tel: 012 420 4107
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APPENDIX VI – INFORMED CONSENT FORM FOR FOCUS GROUPS AND WORKSHOPS

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
Faculty of Natural and Agricultural Sciences

INFORMATION LEAFLET AND INFORMED CONSENT

Current rain-fed and irrigated production of food crops and its potential to meet all year round nutritional requirements of rural poor people in North-West, Limpopo, KwaZulu-Natal and Eastern Cape Provinces

Dear Participant

1) INTRODUCTION

We invite you to participate in a research study. This information leaflet will help you to decide if you want to participate. Before you agree to take part you should fully understand what is involved. If you have any questions that this leaflet does not fully explain, please do not hesitate to ask the interviewer/ enumerator;

2) THE NATURE AND PURPOSE OF THIS STUDY

This survey is part of a project funded by the WATER RESEARCH COMMISSION (Project K5/2172/4).The purpose of the current study is to assess current rain-fed and irrigated production of food crops and its potential in relation to food and nutrition requirements of rural poor people to determine crop water use in a future project.

The project is managed by the University of Pretoria's Institute for Food, Nutrition and Well-being and facilitated by the LIMA Rural Development Foundation. We would like to interview the caregivers of children between 2 and 5 years of age and take the weight, height, arm circumference and waist measurements of children between 2 and 5 years of age. You as a participant are a very important source of information in the study.

3) EXPLANATION OF PROCEDURES TO BE FOLLOWED

This study involves four components:

- Focus group discussions facilitated by the researchers from the University of Pretoria and LIMA with community leaders that will identify the most food insecure households in the community, profile these, describe their coping strategies for food security and provide the information for the Coping Strategies.

- An initial survey of households who are willing to participate in the study. We will ask participants about household demographics, livelihood characteristics and income and income profiles for each member of the household, expenditure and consumption information, sources of

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food, coping behaviours, experience and severity of hunger, sale of assets (including livestock) to mitigate risk and manage food shortages and for nutrition we will ask to measure the household head and the child/children under the age of 5 years in the house for their weight and height. We will ask about your agricultural activities (crop and animal) data on food production, consumption of own production and marketing of the produce.

- A year-long engagement with ten households who participated in the survey and are willing to continue engaging with the researchers over a year to report on food consumption, dietary diversity, food purchases and harvested produce from your gardens or farms

- A second survey with the same households participating in the first survey, covering the same information as in the previous survey but six months later.

4) RISK AND DISCOMFORT INVOLVED

There are only minimal risks involved in participating in the study, namely, some of the processes may cause minimal / some discomfort or take some of your time. You need to take off your shoes when we weigh you and that may provide some discomfort. Some of the questions we are going to ask you may make you feel uncomfortable, but you need not answer them if you don't want to. The interview / measuring session will take about 3 hours of your time.

5) POSSIBLE BENEFITS OF THIS STUDY

Although you will not benefit directly from the study, the results of the study will enable the WRC to identify what crops the South African Department of Agriculture, Forestry and Fisheries should be promoting to ensure food security in communities like yours and to help WRC prioritise their research to address the potential of these crops to help communities like yours.

We will present the findings of our study to your community at the end of the study for your input and discussion. The results will be made available to community members and leaders on request.

For households participating in eth year-long part of the study, the cell phone we will use to interact with you will be given to you at the end of the study.

6) WHAT ARE YOUR RIGHTS AS A PARTICIPANT?

Your participation in this study is entirely voluntary. You can refuse to participate or stop at any time during the study without giving any reason. Your withdrawal will not affect you or your treatment in any way. Respondents do not have to answer all the questions – answers are voluntary.

7) HAS THE STUDY RECEIVED ETHICAL APPROVAL?

This study has received written approval from the Research Ethics Committee of the Faculty of Natural and Agricultural Sciences at the University of Pretoria and

Water Research commissions. A copy of the approval letter is available if you wish to have one.

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8) INFORMATION AND CONTACT PERSON

The contact person for the study is Prof. Sheryl Hendriks from the Institute for Food, Nutrition and Well-being, University of Pretoria. If you have any questions about the study please contact her at tel: 012 4203811

9) COMPENSATION

Your participation is voluntary. No compensation towards your expenses will be given for your participation.

10) CONFIDENTIALITY

The information captured in this questionnaire is strictly confidential and will be used for research purposes by staff and students at the University of Pretoria to inform a study for the Water Research Commission investigating agricultural production and food consumption. Research reports and articles in scientific journals will not include any information that may identify you or your household members.

I confirm that the person asking my consent to take part in this study has told me about nature, process, risks, discomforts and benefits of the study. I have also received, read and understood the above written information (Information Leaflet and Informed Consent) regarding the study. I am aware that the results of the study, including personal details, will be anonymously processed into research reports. I am participating willingly. I have had time to ask questions and have no objection to participate in the study. I understand that there is no penalty should I wish to discontinue with the study and my withdrawal will not affect any treatment in any way.

I have received a signed copy of this informed consent agreement.

Participant's name ……..... (Please print)

Participant's signature: .....……Date.....

Investigator's name .....…….... (Please print)

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Investigator's signature .....…….Date….....

Witness's Name .....……..... (Please print)

Witness's signature .....…….....Date….....

CONSENT FORM FOR THE PARTICIPATION OF CHILDREN BETWEEN 2 AND 5 YEARS OF AGE

I (name of parent /guardian) _____

hereby grant permission that (name of child) _____

may participate in the study on the Current rain-fed and irrigated production of food crops and its potential to meet all year round nutritional requirements of rural poor people in North-West, Limpopo, KwaZulu-Natal and Eastern Cape Provinces. This will involve weighing and measuring the height, mid-upper arm circumference and waist of this child for the purpose of the study outlined above.

_____ _____

Signature parent / guardian Date

If there is more than one child between 2 and 5 years in the household, please complete a form for each child.

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_____ _____

Signature parent / guardian Date

VERBAL INFORMED CONSENT (If the respondent cannot read)

I, the undersigned, have read and have fully explained the participant information leaflet, which explains the nature, process, risks, discomforts and benefits of the study to the participant whom I have asked to participate in the study. The participant indicates that s/he understands that the results of the study, including personal details regarding the interview will be anonymously processed into a research report. The participant indicates that s/he has had time to ask questions and has no objection to participate in the interview. S/he understands that there is no penalty should s/he wish to discontinue with the study and his/her withdrawal will not affect any treatment in any way. I hereby certify that the client has agreed to participate in this study.

Participant's Name ..... (Please print)

Person seeking consent ..... (Please print)

Signature .....Date.....

Witness's name ..... (Please print)

Signature .....Date.....

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