ONEFOOD

SOCIAL SCIENCES ADVISORY REPORT

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Abbreviations and Acronyms

APHA	Animal and Plant Health Agency
BFAP	Bureau of Food and Agricultural Policy
Cefas	Centre for Environment, Fisheries and Aquaculture Science
CoE-FS	Centre of Excellence in Food Security
CSIR	Council for Scientific and Industrial Research
DALRRD	Department of Agriculture, Land Reform and Rural Development
DBE	Department of Basic Education
Defra	Department for Environment Food and Rural Affairs
DoH	Department of Health
DPME	Department of Planning, Monitoring and Evaluation
DSD	Department of Social Development
DSI	Department of Science and Innovation
ECD	Early Childhood Development
FAO	United Nations' Food and Agriculture Organization
GAP	Good Agricultural Practice
GBADS	Global Burden of Animals Diseases
GBCL	Global Burden of Crop Loss
GCBC	Global Centre on Biodiversity for Climate
GHS	General Household Survey
HSRC	Human Sciences Research Council
IFPRI	International Food Policy Research Institute
LCS	Living Conditions Survey
NDP	National Development Plan
NIDS	National Income Dynamics
NRF	National Research Foundation
NSNP	National School Nutrition Programme
PLAAS	Institute of Poverty, Land and Agrarian Studies
SDGs	Sustainable Development Goals
UK	United Kingdom
UK ODA	United Kingdom Official/Overseas Development Assistance
UWC	University of the Western Cape

Executive summary

Background

One Food is a unifying approach to conceptually frame and practically guide the transition of food systems to ensure food and nutrition security for all through safer, healthier and climate resilient food production, trade and consumption. It binds together the complex intersections between food systems, climate dynamics and livelihoods into a holistic perspective.

The *One Food* project launch workshop at Dinokeng in Gauteng (South Africa), held from 31 October to 2 November 2022, elevated the natural science elements of this approach and reinforced the need for including social and human science aspects into it. This Advisory Report (Road Map) shows how to incorporate social science issues into the *One Food* project, with specific emphasis on food systems hazard identification and control. Making social and human aspects of food systems explicit rather than implicit in the *One Food* project is thus the overarching purpose and message of this report.

Key Themes: Hazards, Controls and Social Sciences

Building an inclusive and resilient *One Food* community requires contributions from all spheres in society, particularly food and nutrition research from diverse scientific viewpoints. The human and social sciences can help this process through the following multiple channels. Social scientists can expand the size and composition of the *One Food* movement and help realise its transdisciplinary vision. Experts that research, document and monitor the social aspects of food and nutrition were underrepresented at the Dinokeng *One Food* workshop and so it is important to identify and forge links with prominent social science voices in South Africa's food system conversations, such as the Department of Social Development, the Centre of Excellence on Food Security and the Institute for Poverty, Land and Agrarian Studies (PLAAS). Expanding the participation of research and policy institutions that drive social aspects of ecologically responsive food and nutrition policy in the *One Food* community is crucial.

Social scientists are also ideally positioned to co-develop foundational concepts, principles and methodologies that underpin *One Food*, with specific reference to hazards and their control. Social sciences map the human activities and relationships within society, usually classified in *behavioural, relational, associational,* and *institutional governance* domains. Integrating social science aspects into the *One Food* Wheel[1] should include socio-economic difficulties faced in South Africa as well as a shared, rational definition of hazards that is meaningful in a social and human sciences viewpoint. These difficulties manifest in various forms of social exclusion and inequalities that also crisscross South Africa's food production-to-consumption chains. With deep roots in social structures, inequality and exclusion make society vulnerable to disruptive threats and often trigger adverse events that are socially destabilising. Social inequality and exclusion are 'social hazards' that call for appropriate 'social controls' such as inclusion and equity. Social inclusion and equity are realistic foundations on which to premise social controls. An inclusive and equitable food system, as this angle suggests, is about food supply, access and consumption that do not harm people's health and the environment.

Through such a social sciences lens, it is possible to characterise and capture traits of food systems hazards that are more nuanced, comprehensive and realistic. Besides the intrinsic differences of hazards embedded in socio-economic relations, practices and structures, such hazards are highly uneven in magnitude, interactive effects and how they transmit across society. Social conflict, food price inflation, trade wars and breakdowns in social protection are examples of social hazards that often result in hard-to-repair damages to the food systems. The socio-economic challenges faced in South Africa are significant in determining the extent of hazard transmission from food systems to society and vice versa. Every segment of food systems is prone to hazards that operate through intricate feedback loops with social hazards.

Concluding Thoughts and Summary

The ultimate goal of sustainable use of resources and preserving the planet is to ensure human wellbeing. Thus, *One Food* in the context of social sciences should address issues of socio-economic vulnerability in the analysis of hazard transmission and control. Such challenges that include poverty, unemployment, all forms of inequality, inadequate resources, poor education, power dynamics and injustice were either implied in the *One Food* workshop debates or excluded. However, they are entrenched, persistent, problems faced across the African continent, including in South Africa, and their incorporation in *One Food* is essential.

Grounding the *One Food* approach in local realities implies that this framework must be optimally responsive and adaptable to diverse social contexts. Towards this end, the social sciences have a crucial role to play in promoting awareness and sensitivity to society's food system priorities.

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[1]The *One Food Wheel* is a graphical anatomy of the *One Food* concept that shows interlinkages and overlap across sectors and depicts the economic burden of hazards and potential benefits of their control (see Figures 2 to 4, and surrounding commentary for more detail).

Social relevancy for food system stakeholders, particularly civil society formations and vulnerable people, is vital to maximise the meaningful use of *One Food* in practice. Moreover, societal and policy impacts hinge on those social factors that can be documented, monitored and assessed with the tools of the human and social sciences.

In summary, there is urgency in closing the social and human science gaps in the *One Food* approach, framework and movement. Actions to grow the *One Food* community, strengthen the conceptual and methodological fundamentals, and scaling-up policy and societal impacts merit prioritisation. Progress in constructing an information management architecture which is fit for purpose and agile is promising and should shift to the rapid exploration of social indicators that correspond with the One Food goals. Preliminary themes for metrics on the social aspects of the food system should be assembled, and information should be analysed on: vulnerability to social hazards (social controls, social inclusion); behaviour changes toward *One Food* goals (individual, relational and associational behaviour); quality of life, societal wellbeing and social justice.

1. Introduction

One Food is a concept that proffers a unified approach to how production, trade, distribution, and consumption of food by societies can be done without harming the environment. It is an approach that incorporates the rights to safe and nutritious food, health and a sustainable environment. Food safety and nutritious food are fundamental to the health of people and the environment. *One Food* is a project that applies a *One Health*[2] approach in taking a holistic view in identifying and controlling food systems hazards to ensure the supply of healthy, nutritious, and sustainable food.

The *One Food* project aims to develop a risk analysis tool that positions the identification and control of hazards at the core of socially, economically, and environmentally sustainable food system design. The Centre for Environment, Fisheries and Aquaculture Science (Cefas) is coordinating this UK ODA-funded research project. Cefas, the Animal and Plant Health Agency (APHA) and the Council for Scientific and Industrial Research (CSIR) co-led a workshop to launch the *One Food* project in South Africa. The workshop, which was attended by UK and South African experts, was held from 31 October to 2 November 2022 at Kwalata Game Lodge, Dinokeng Game Reserve, Gauteng. This report analysed insights from the *One Food* project launch workshop to identify social science aspects of *One Food.*

Insights from the workshop were obtained from recordings and inputs on the *One Food* platform[3]. Analysis of workshop views was complemented by a review of the project concept from documentation provided by Cefas.

The aim of this report was to analyse methods centred on food systems hazards and methods focusing on the assessment of environmental and climate change, which *One Food* seeks to bring together. In addition, it sought to propose social science questions this project could consider and integrate in the *One Food* concept. The report further provided advice on how the recommended social science questions could be addressed to ensure that *One Food* takes a holistic view to hazard identification and control in food systems. The social science issues proposed also highlight how important human and societal behaviours are for a transition to more sustainable food supply chains that are safer, healthier, climate resilient and ensure food and nutrition security.

This report is a Social Sciences Advisory or Road Map that, based on analysis of workshop discussions, identified gaps in debates on societal and human sides of the *One Food* project. The gaps identified inform a social sciences advisory on how social science aspects of hazards can be incorporated into the *One Food* project in the South African context. This report brings out how significant social and human aspects are vital to *One Food*, particularly to South Africa.

It found that critical factors for the integration of social science aspects of *One Food* into the *One Food* Wheel[4] should include incorporation of socio-economic difficulties faced in South Africa as well as a shared rational definition of hazards that is meaningful in a social and human sciences viewpoint. The socio-economic challenges faced in South Africa are significant in determining the extent to which hazards are transmitted to people, from food systems in general and agrofood[5] systems in particular. The report suggested that social science aspects can be made explicit by incorporating standard social science domains namely *behavioural, relational associational,* and *institutional governance* decisions and responses to food issues. It highlights the importance of a social sciences perspective on *One Food,* which appreciates that hazards, which happen in all phases of the food systems, frequently arise from human and social behaviours.

The structure of this report follows the 2022 *One Food* project launch workshop Agenda. The next section summarises the first session of the workshop, which introduced the *One Food* project and included presentations by key partners on the project. This is followed by a summary of presentations and discussions on what *One Food* is, in Section 3. The fourth section covers deliberations on the South African food systems during a panel discussion on the benefits of hazard identification and control. The discussion was on the benefits of hazard identification and control in multiple sectors of the economy, including non-food sectors. This is followed by a presentation on *One Food* methodologies in Section 5. Section 6 summarises a presentation on the challenges faced by smallholder farmers in South Africa, as they try to farm productively. The section highlights that most smallholder farmers operate in the informal sector and are unable to participate in the formal markets because of legislative requirements they cannot meet, which affects their profitability and pushes them further into poverty. Section 7 is on the *One Food Wheel*, the visual anatomy of the *One Food* idea. Section 8 is on breakaway sessions and covers discussions on key

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[2] According to the One Health High Level Expert Panel (2023), "One Health is an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals and eco-systems" as it acknowledges the close linkages and interdependence between the health of people, animals, plants and the environment.
[3] For more information on the One Food concept and the launch workshop visit: https://onefoodcommunity.org/ and https://app.swapcard.com/event/one-food-south-africa
[4] The *One Food Wheel* is a graphical anatomy of the *One Food* concept that shows interlinkages and overlap across sectors and depicts the economic burden of hazards and potential benefits of their control.

[5] These are food systems that include crops, forestry, livestock, fisheries, and aquaculture.

hazards for and of food systems, how climate change should be incorporated in the *One Food* concept, challenges of getting data for the *One Food* work as well as barriers to implementation of the project. Section 9 consolidates the gaps in societal and human sciences during workshop discussions along with the absence of some key social science experts and policy implementers at the workshop, as identified in Sections 2 to 8. It provides a discussion of why and how social sciences are important for the *One Food* project and should be included in the development of a tool for hazard identification and control in the food systems. Section 9 further suggests the focus areas that could be considered to close some of the social and human science gaps. Section 10 concludes the report.

2. Introductory and welcoming session

2.1 Overview of presentations

Presentations in the introduction and welcoming session of the workshop were given by CSIR and Cefas - which is part of the *One Food* project team - and stakeholders including the Department of Agriculture, Land Reform and Rural Development (DALRRD), Department of Science and Innovation (DSI), the United Nations' Food and Agriculture Organization (FAO) and the Department for Environment Food and Rural Affairs (Defra).

The CSIR presentation spoke about multiple challenges that hinder economic development and food security in Africa, including climate change vulnerability of food systems to multi-year droughts, floods, external conflicts, pests, and shocks. Subsequent presentations by other organisations largely focused on programs in the respective organisations linked to the *One Food* project and/or the natural science collaborations among South African institutions and between South Africa and the UK. DSI discussed the Decadal Plan[6] and its four societal grand problems, which are "climate change; future-proofing education and skills; re-industrialising the modern economy; and future of society" (DSI, 2022, p. 4). It also highlighted one of its initiatives, the National Biosecurity Hub - a collaboration with DALRRD and Innovation Africa at the University of Pretoria - created to maintain an effective national biosecurity system, protect the country from sanitary and phytosanitary (SPS) threats so that food security is achieved in the country.

The FAO highlighted the importance of transitioning to agrofood systems that have more resilience and efficiency while inclusive and sustainable to ensure realisation of the *four betters namely "better production, better nutrition,*

a *better environment*, and a *better life*, leaving no one behind" (FAO, 2021); particularly to directly contribute to SDG 1, SDG 2, and SDG 10[7]. The *four betters* indicate the interconnectedness of socio-economic and environmental facets of agrofood systems.

The Defra presentation probed the following questions were posed:

- Are our food and farming practices sustainable?
- How can we ensure our animals, plants and the environment are always healthy?
- Are we putting human health at greater risk?
- Can we provide safe, sustainable, and secure supplies of healthy and nutritious food for all?
- Can we develop fair, equitable, deliverable, and outcome-based standards and evidence?
- Will this support domestic production, livelihoods and enable trade to flourish, for the benefit of all?

Without addressing these questions, more challenges are expected to follow, given that people's demands grow with the growth in population. This puts pressure on finite resources which creates multiple threats and challenges on climate change and the use of land and natural resources; biodiversity; human health; animal and plant health, and ecosystem health; and safety of nutritious and secure food supplies.

DALRRD weighed in on the importance of collaboration, pointing out that there is a lack of collaboration among South African stakeholders involved in work related to *One Food* as they work in silos and have no knowledge of what other departments and agencies are working on, even though they do the same work. Working together with local stakeholders would help in advancing the agenda of *One Food*.

The Cefas presentation pointed out that Cefas works in partnership with Defra and across UK Government, with international governments, businesses, industry, non-governmental organisations, research institutions, universities, civil society, and schools to collate and share knowledge. Cefas recognises that sustainability is possible if farmed aquatic animals and plants are maintained in high health and welfare status, creating safe and nutritious foods for human consumption; and if the environment in which production occurs is both permissive of safe and sustainable production and not detrimentally affected by its presence. The challenges were placed in the context of the *One Health* approach and included:

- Achieving sustainability of food systems with a reduced land, water, and energy footprint.

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[6] The Decadal Plan is South Africa's roadmap to drive policy and programmes on science, technology and innovation over the ten-year period from 2022 to 2031 (See DSI (2022))
[7] SDG 1 (No Poverty), SDG 2 (Zero Hunger), SDG 10 (Reduced Inequalities).

- Minimising the loss and waste inherent within food supply chains.
- Minimising the impact of climate change associated with food systems by maximising efficiency per unit of production.
- Developing appropriate policies which align food production aspirations with permissive environments for long-term sustainable production.

The UK is leading in considering policies that recognise the need to focus on environmental protection and those which incentivise farmers to support nature protection and recovery.

2.2 Key partners on the One Food work

The key partners of the project in the UK and South Africa were mentioned. The *One Food* project is funded by the Global Centre on Biodiversity for Climate (GCBC), within the Defra, while Cefas and APHA lead in program delivery. Other UK partners include the University of Liverpool and the University of Cambridge. South African partners include the CSIR, the Human Sciences Research Council (HSRC) which supports the social science aspects, the DSI, the University of Pretoria, Prime Africa, and the Bureau of Food and Agricultural Policy (BFAP).

2.3 Gaps identified: Missing stakeholders and discussion of key policies

The first session of the workshop, during which presentations were given by key partners who attended the workshop, showed gaps as some policies related to the *One Food* idea, in the global and South African context, were not discussed. It also shows a gap in terms of the absence (at the workshop and in the discussions) of relevant key players in the *One Food* space in South Africa, as pointed out in Sections 2.3.1 and 2.3.2. Policies on food and nutrition in South Africa were not highlighted. Chapter 6 of the National Development Plan (NDP) which speaks about *One Food* related issues was not mentioned. The NDP chapter speaks to food security issues and agriculture, emphasising the need to stimulate agricultural productivity to create jobs in the sector and to improve nutrition. The National Policy on Food and Nutrition Security for South Africa (Department of Agriculture, Forestry and Fisheries, 2014) which aims to ensure that all dimensions of food security are addressed at national and household level was missing from the discussions. South Africa also has two nutrition programmes for learners run by the Department of Basic Education, the National School Nutrition Programme (NSNP) and the National Nutrition Week; however, these

were absent from the conversation.

The Department of Social Development has a mandate of social protection and does extensive work in the protection of vulnerable populations and ensuring they are protected from hunger.

The lack of focus on these policies was partly due to social sciences expertise and policy players being present in limited numbers or missing. This had the result that the workshop was biased towards biological sciences, neglecting the human aspect.

Policy gaps also include key SDG 2 indicators on food and nutrition and the fact that South Africa has no data to measure these. The presentations also failed to feature impacts of climate change and disease outbreaks on human health and livelihoods.

A key recommendation is to invite the following organisations and stakeholders who have expertise and experience in areas of social science and policy related to the *One Food* project and would add value if they became part of the conversation.

2.3.1 Government departments

Department of Planning, Monitoring, and Evaluation (DPME)
DPME is responsible for food and nutrition security plan implementation but was absent from the workshop. It is tasked with coordinating government planning, monitoring, and evaluation to address poverty, unemployment, and inequality. Government has enacted various policies that focus on food and nutrition of humans[8]. The role of DPME is to ensure coordination and coherence in the implementation of policies and programmes in different spheres of government. DPME is relevant in highlighting government progress in its targets and priorities of the NDP, gaps within policies and lessons in coordination and implementation.

Department of Social Development (DSD)
DSD provides protection, social development, and social welfare to the vulnerable to help reduce poverty, hunger, and vulnerability and improve malnutrition. DSD is a key partner on social protection policies put in place to protect the vulnerable against hunger as food and nutrition security are a top priority of government.

Department of Health (DoH)
DoH needs to bring the human health aspect into the conversation. The department is responsible for reducing

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[8] The Strategic Plan for the Prevention and Control of Non-communicable Diseases, 2013–17, and the National Policy on Food and Nutrition Security, 2014, focus on and prioritise food and nutrition security. The Integrated Growth and Development Plan, 2012, and the Agricultural Policy Action Plan are agricultural policies that support food/nutrition security and biosecurity/climate-smart agriculture focus, respectively.

the burden of diseases like cardiovascular diseases, diabetes, cancer, obesity, and chronic respiratory diseases, which are all mainly related to lifestyle and diets. The department also has a food control unit that ensures food safety by educating businesses, consumers, media, government agencies, relevant stakeholders, and interested parties regarding food safety.

Department of Basic Education (DBE)
The Department of Basic Education is responsible for school feeding schemes, providing learners from the foundation phase to secondary school with food. The early childhood development (ECD) programme is tasked with improving early nutrition for children from the age of 0-6 years. The National School Nutrition Programme provides primary and secondary school learners with nutritious meals daily to enhance learning. This program caters for over 9 million learners. Parents, learners, and teachers are also taught about healthy diets and skills to grow their own food to sustain food security in the household. The department's inputs can be invaluable with their policies, gaps, impact, and lesions from these programmes.

2.3.2 Research institutes and international development partners

Institute of Poverty, Land and Agrarian Studies (PLAAS)
PLAAS is an autonomous policy research institute based at the University of the Western Cape (UWC) in the Faculty for Economic and Management Sciences. Its work focuses on farming and biodiversity in the economies of underprivileged and economically disadvantaged individuals. In addition, PLAAS conducts extensive research on fisheries and marine policies that focuses on social science aspects of small-scale fisheries management and rights, coastal livelihoods, and ecosystems management.

Centre of Excellence in Food Security (CoE-FS)
The Centre of Excellence in Food Security is a DSI-NRF (National Research Foundation) Centre of Excellence centre, hosted by UWC and co-hosted by the University of Pretoria, that conducts research that addresses the challenge of food security and nutrition in Southern Africa and sustainable food systems. The research focuses on the scale, origin, and consequences of food insecurity on vulnerable populations in Africa. The centre's experience, scope of work, and expertise align with *One Food* issues.

International Food Policy Research Institute (IFPRI)
IFPRI conducts research that informs policy solutions that are based on evidence to sustainably eradicate malnutrition, ameliorate poverty and end hunger in less developed countries.

Its research focus includes climate resilience, the transformation of agricultural and rural economies, promoting nutrition and healthy diets for all people, building trade systems that are inclusive, and strengthening institutions and governance. This expertise is relevant to *One Food* and their input and experience in the field is vital for this work.

3. What is One Food?

3.1 Background of One Food concept

The *One Food* idea was initiated from a 2019 *One Health* Science event, with debates around **food security in a One Health approach** that span from aquatic through to terrestrial foods to **support a safe and sustainable food supply**. The *One Food* project was launched in 2022, as explained in the Introduction section. From the beginning, it was recognised that partnership with another country would be needed to co-design the *One Food* project. South Africa was seen as a strong partner based on previous collaboration with the South African government and academic partners and on the strength of the scientific capability in the country.

3.2 One Food project tasks

There are multiple tasks to be completed under the *One Food* project. These include building some blocks to try and find data for *One Food* project for the development of the hazard identification and control tool; and understand the data. The aim of the project is also to look at gaps and start addressing some of the research questions coming out of the workshop, to gather ideas on how best to develop a community of practice / shared thinking for *One Food* and on best approaches to run a fellowship programme for postgraduate students that will conduct their research on *One Food* topics in South Africa.

The workshop aimed to initiate thinking along the *One Food* concept that overcomes silos of food sectors and hazards to view benefits to biodiversity and climate change mitigation. The *One Food* project will be extended to other countries (still to be identified), with South Africa partnering, now, as a co-designing country. Once there is a proof of concept of the *One Food* project, it will then be extended to other nations on or outside the African continent, with different questions being asked in different countries as it is not going to be a one-size-fits-all.

The inclusion of social sciences as part of the initiative was commended, with one participant probing how the sciences and the social sciences will build the work together through the fellowships and the community of practice.

3.3 The Grand Challenge of the One Food concept

3.3.1 One Food in the One Health concept

One Health is an approach centred on the strong interlinkages food systems have with human populations and societies. Plant and animal health are critical for human health and existence. Plant and animal diseases kill, and pose problems for humans, as affected plants and animals cannot be consumed and give hazards back to humans in water bodies and soil. Up to 40% of food crops are estimated to be destroyed by pests and diseases. Various hazards (viruses, biotoxins, chemicals) thus impact the efficiency of food systems, which in turn affects food safety and trade. This is the space *One Health* focuses on – the loss space which has the potential to improve efficiency if adequately addressed. **Food systems are therefore regarded as the pivot around which *One Health* policies can be operationalised**. As such, ***One Food* is not different from *One Health*** but is within the *One Health* umbrella concept.

One Food fits into the *One Health* concept. *One Health* is a simple construct that entails that there is one globe, with things it is joined up with. *One Health* was originally defined as a "*collaborative effort of multiple disciplines-working locally, nationally, and globally – to attain optimal health for people, animals, and our environment*" (American Veterinary Medical Association, 2008, p. 13).

It was noted during the workshop that there is a big debate on whether the world needs more food or rather if the existing food system needs to be made more efficient to reduce food loss and waste. Conversations in *One Food* are expected to be mostly in that latter space – working on current food systems by reducing loss and waste and making food safe to ensure that it reaches the end of its production cycle and gets to be consumed.

3.3.2 Initial work: One Health Aquaculture

The *One Health* approach was applied in the aquaculture sector in the UK. It was highlighted during the workshop that when *One Health* principles are applied to any sector, policy aspects and research evidence on what is needed to build the principles into the particular sector requires the expertise of people in the sector and other key disciplines including social sciences to contribute to issues that include gender equality and environmental protection. The aquaculture work was taken further by considering all potential hazards that may interact with an aquatic food system. This serves as a checklist of the things that can go wrong and it should include all interventions - from policy-level interventions right to human beings' interventions - that would address the problem.

The scenario below is an example of *One Health* in practice being applied to a given sector.

Scenario example: To grow a product, say for export purposes, requires looking at the hazards that may interact with the scenario of what industry or government wants to do. The next step is then to work out what would happen if there was no control of any of the hazards in the sector. Different rounds of possible alternative scenarios (e.g., not processing the product and selling it raw in a certain market because we can't solve hazard X) are then taken until a solution is found or a decision is made to move out of that sector or until the hazard is dealt with.

3.3.3 Towards One Food

Figure 1 highlights hazard mapping and mitigation. It shows how hazards in a single sector can be interlinked with other sectors in any country and how the hazards in the environment may be shared across multiple sectors. This understanding and systemic approach is the foundation of the *One Food* project.

Figure 1: Towards 'One Food'
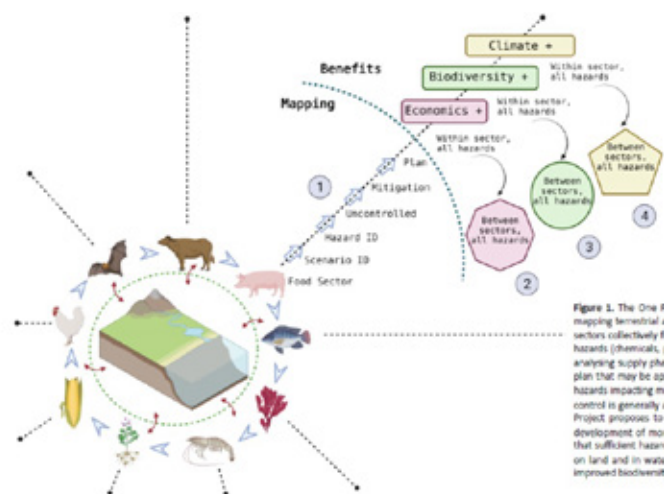
Moving along the dotted line in Figure 1 shows three major blocks namely:

- Economics: Seeks to understand the economics of hazard impact and control (there are colleagues from the Global Burden of Animals Diseases (GBADS) world and Global Burden of Crop Loss (GBCL) world who work on that).
- Biodiversity: When how much can be saved from having those hazard control elements put into a system is understood, next is to understand as an example, what saving 25% of your crop from not dying from pathogen X means for biodiversity. Does that mean we can do farming in less space? If so, what does it mean for biodiversity protection in the space we would have used in the system? This means extending beyond the comfort zone of economics and trade and burden to the environment.

- Climate: Similarly, if biodiversity is taken into consideration, then what about climate change? If up to 40% of a crop is lost to disease, that 40% inefficiency of greenhouse gasses, natural and fossil fuels, and water is built into the failure to make the food product. Thus, climate efficiency must become a metric for working out how to measure when these controls are put in place for the food sector.

Figure 2: One Food Wheel
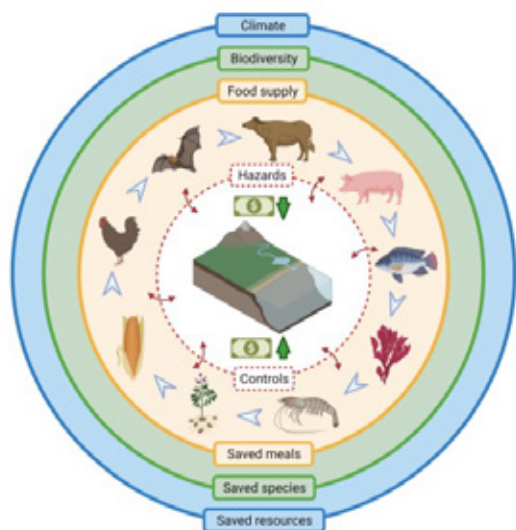
The *One Food Wheel*, presented in Figure 2, captures all the discussions on what *One Food* summarised in Section 3. Workshop participants were requested to look at the Figure, during the course of the workshop, to see whether it adequately covers what was discussed.

- Environment and hazards that need to be dealt with where the food system exists are in the middle of the picture.
- Food sectors, as presented in *One Food Wheel*, are all interlinked and there is overlap across sectors, that currently are not built in.
- The yellow ring gives the economic burden of hazards and their potential control, and it's intended to give policy makers an idea of what it is worth to control the hazards.
- The magnitude of what is saved is compared with what food production means for biodiversity and climate, in the green and blue rings, respectively.
- The three rings, which should all be linked together, depict the benefits of: how many meals would be saved, how many species would be saved, and how many resources would be saved by applying *One Health* principles to the food system.

Figure 2 thus provides the *One Food Wheel* or *One Food* anatomy; it is the basis of the discussion on these elements to get into the details of what those rings mean.

While working in silos was acknowledged as a common problem and a reality everywhere, it was pointed out that there should be **agreement on the shared outcomes** on:

- an open approach to hazards
- more and safer food, with fewer resources
- reduce losses and waste
- enhance biodiversity
- reduce climate impact
- food as a pivot for *One Health* policy
- engaging youth.

If agreement on the outcomes is reached, debate on the pathway to that point can then follow, which includes: **how to map systems**, **how to map hazards**, and **gaps in data** – what needs to be done, how to articulate costs/benefits, how to design appropriate policy, how to educate, and how to spread the word?

4. The South African food system: Insights from a panel discussion on benefits of hazard identification and control - beyond food and $$

A multidisciplinary panel of experts from different institutions discussed and reflected on the benefits of hazard identification and control in multiple sectors beyond food. The panel reflected on plenary discussions and presentations made during the workshop. During this discussion, the workshop participants were given a chance to either ask questions or submit their contributions on the live chat/comment platform. In addition, the facilitator of this session started by asking a multidisciplinary panel about the lessons learned from the plenary discussion as well as what was missing from the conversation.

The panellists expressed their worry about inclusivity and fragmentation in the *One Food* project. Of particular concern was the degree to which the project would be inclusive in the co-designing of the concept. In addition, questions were raised about what the government could do to provide a conducive environment for the success of the *One Food* initiative in South Africa. It was further acknowledged that the issue is complicated because of food politics both locally and globally. Success would therefore depend on technical expertise in relevant fields and political will from all stakeholders.

During the panel discussion, participants raised the issue of the increase in non-communicable diseases like obesity and diabetes arising as food habits change, especially in relation to the increase in food security. It was pointed out that in South Africa the problem of 'unethical foods' is a reality and is causing a rise in diabetes particularly among children, and obesity. However, the *One Food* Wheel does

not bring out this clearly. It was suggested that it might be necessary to split the picture into the ideal food (the food we should be eating) and food that is available. There was also debate on the most appropriate production systems, and the need for a balance between large-scale agriculture production systems and small-scale agriculture production systems, to ensure consumption of healthy agrofood, taking into consideration food losses, food safety, and people's capability to produce their own food.

Suggestions from panellists about the development of the tool included:

- Food should be at the centre of the *One Food* Wheel and users should be able to unzip the different foods.
- Risk mitigation should be examined through hazard identification, but this should be focussed on food (plant or animal).
- As a starting point, an information-gathering tool to support decision making with inherent ability to grow as new information becomes available so that it can identify new areas of risk or weaknesses in terms of entire food systems.
- Requires a centralised mechanism that serves as an axle point where information can be accessed for data analysis, risk profiling, or to response to a fundraising event - because without information all that would not be possible.
- Require a bigger dashboard to help avoid having data in isolation, ensuring coordination.

4.1 Hazard awareness and education

Education and awareness about the advantages of hazard identification and control are critical for promoting food safety in production, processing, distribution, and consumption. This aspect was not explored further during the panel discussion, which is a critical social science gap in hazard identification and control. Education is another important avenue for increasing awareness to promote food safety along the value chain.

The understanding of hazard identification and control practices requires cooperation among all relevant parties, including industry experts, healthcare providers, and public health officials. It is important to highlight that food safety cannot be overlooked at any level, from production, and processing within factories, through its transportation to the home (or restaurant/hotel) where it is prepared for consumption.

4.2 Importance of involvement of all key stakeholders in One Food discussions

The preceding sections revealed a growing concern about the exclusion of certain stakeholders from *One Food* discussions. All key stakeholders including consumers, farmers, other government entities, relevant research/ academic institutions, and international development partners should be involved in the food systems conversation to advance the idea of *One Food*. It is critical to involve all relevant stakeholders to achieve equitable and well-informed *One Food* outcomes. Furthermore, the involvement of various stakeholders will be critical to understanding the hazards and how they can be avoided.

5. Methodology

5.1 Hazards to people and to the environment

The session discussed hazards in production of food, how the hazards can be controlled, and the methods used to measure the impact of hazards and of their control. A preference to consume raw or lightly cooked Bivalve mollusks without subjecting them to intensive processing, was given as an example of a potential source of hazards from food. This is because when the mollusks are consumed lightly cooked or raw, they transmit contamination to people, causing human deaths. This example highlighted the intrinsic link between nature and food production – nature is a hazard for food production and food production is a hazard for nature. Physical hazards that are not commonly spoken about were also mentioned, for example, fishing using bottom trawling which digs up sand and disturbs the seabed.

Pests were highlighted as food production hazards, with a cited example being the 2019 to 2021 locust outbreak across East Africa. Locusts at that time were eating the same amount of food as the entire population would eat daily. As they decimated the region's crops, not only did the locusts decrease the availability of food for local communities, the nutritional and financial value of livestock that is important to people for survival increased while the availability of feed supply for animal health in the short and medium term decreased. Pesticides were sprayed across East Africa in 2020 to try and stop the destroy the locusts. Use of pesticides led to the death of bees and birds while a significant reduction in honey production was recorded in Ethiopia in 2020 (Mullié, et al., 2023). In addition, any of the starving communities had to turn to gatherings and eating locusts and in the process, consumed the poisons sprayed to contain them. It is still unknown what the consequences of the pesticides use were on human health.

5.2 Measuring hazards and hazard control: GBADS

It was pointed out that the use of GBADS, a programme to quantify the positive and negative impacts of animal and aquaculture production systems on society and the environment, is essential for measuring baseline burdens of hazards and interventions to control hazards.

5.3 Understanding people's behaviour

During the methodology session, it was not mentioned what having pelagic and demersal fish as the top two foods that are consumed domestically or imported mean for people residing along the coast as they are likely to make a living from fishing. The following questions would be important to understand what influences people make to make certain decisions.

Does it provide jobs to the people? Does it improve the economic welfare of people residing by the coast? More research needs to be done to examine the economic impact of having pelagic and demersal fish as the top two types of fish that are consumed or imported. Also, since pelagic and demersal fish are the most consumed and imported food, it means that their demand is high, which would bring about unsustainable use of these foods. There is thus a need to determine what measures can be put in place to ensure the sustainability of the fish and ecosystem (society needs to adopt sustainable practices).

There is a need to study the reasons behind people eating raw or lightly cooked bivalve mollusks. Since bivalve mollusks produce hazards, does it mean that people should stop eating them altogether or start consuming them in a more sustainable way or are there any other methods that can be used to prevent contamination during the primary stage of production? And are the consumers aware or informed about the risks of consuming raw or lightly cooked mollusk? All stakeholders involved in this food value chain need to be aware of the risks they are exposed to. How can bivalve mollusks be promoted as a sustainable foodstuff? What would that mean for the community?

It would also be important to understand why people continue using hazardous means like bottom trawling when there are plenty of other fishing systems that are less harmful, such as bait fishing and fly fishing. Important questions to ask would include, is society aware of the dangers posed by bottom trawling? Are there resources put in place for people to use the systems that are less harmful? An examination of the wealth distribution in communities would shed light and provide understanding of how vulnerable people are economically and socially.

6. Motivating a One Food movement

This session focused on the work of smallholder farmers in South Africa, particularly on assistance provided to small/emerging scale farmers to help them become food safety compliant to mitigate risk and ensure consumer safety. It also discussed the help small/emerging farmers require to gain access to the markets. South Africa has an abundance of smallholder or household farmers,

it has approximately two million smallholder farmers compared to 32 000 commercial farmers. Most of these smallholder farmers rely mostly on their land to feed their families with hopes of having more to sell or trade. The session presenter pointed out that the domination of the production of agricultural food by commercial farmers in South Africa is one reason why smallholder farmers end up operating in the informal market because very little room is left for them to compete.

Failure by smallholder farmers to participate in the formal market negatively affects their profitability and further pushes them into poverty.

It was acknowledged during the presentation that South Africa has very sophisticated legislation when it comes to food production for consumption by humans that farmers need to adhere to. An example of this is the Good Agricultural Practice (GAP) certification that farmers need to acquire before their produce can be sold in the retail market. Not only is the certificate expensive for smallholder farmers, but often the information on how to obtain it can be difficult to access. The inability to obtain the GAP certificate was highlighted during the session another reason why many smallholder farmers operate in the informal sector. This poses a threat regarding the issue of traceability - the ability to track the history, use, or location of a product by means of recorded identification. However, the presentation did not discuss how traceability for smallholder farmers could be improved, and what measures would be needed to ensure food safety along the whole agrofood value chain, without perpetuating poverty.

6.1 Social science gaps

In addition to the policy framework that does not cater for smallholder farmers as was mentioned by the presenter, it is important to note that South Africa is a highly unequal country especially with regards to educational attainment and land ownership. A large part of the land in this country has historically and predominantly been owned by white people and it is only recently that people of colour have been granted access to land ownership. Therefore, policies have always been centered around farmers who own large pieces of land and subsequently contribute more to the South African economy. The historical disenfranchisement of people of colour was also enacted through separate and unequal education systems which privileged white people and disadvantaged black people. This historical legacy is still present in the education system and educational attainment is still skewed on racial lines. Both factors have an inhibiting impact on the development of smallholder farming and agriculture more broadly. An exploration of the existing policies needs to be examined and possibly amended to make sure smallholder farmers benefit from them as much as commercial

farmers do. Critical questions that need to be addressed include: How can information on these policies be made more accessible for smallholder farmers to duly benefit from them? What are the exact difficulties smallholder farmers face when trying to comply with regulations like GAP certification?

The speaker also mentioned an apparent lack of organisations that invest in providing smallholder farmers with training to equip them with skills on how to mitigate and counter the effects of climate change, which causes extreme weather conditions like droughts, floods, heatwaves, and excessive winds. Such skills would help them to preserve their land for sustainable farming. However, there was no mention of the current farming measures that smallholder farmers are undertaking and the impact that they have on the environment or how sustainable they are. Black people in South Africa have a long history of farming and to this day some may still be using traditional methods of farming that may or may not damage their land. It is therefore important to consider Indigenous Knowledge Systems (IKS) in mitigating the effects of climate change and possibly complement them with modern sustainable farming methods. Important questions that need to be investigated include: What are the different farming practices used by smallholder farmers currently? How can production be made safer and how can safety be ensured in the conditions of production? How can the safe use of pesticides be ensured?

7. One Food Wheel

The session discussed how a *One Health* economic lens can be applied to hazard identification and control, focusing on the value chains using the "farm to fork" analogy and how SDGs fit into it. Approaches to hazard mitigation were also discussed.

7.1 Social science gaps

Speakers addressed the direct impacts of hazards, diseases and accidents on animals and crops. However, the economic impact was the focus, and the impacts on people were under-emphasised. One speaker asked the following questions: To what extent does this affect people? Who in society will be affected by this? In addition, it is important to understand what it means to a farmer if their crops/livestock are affected by diseases, not only in monetary value but the social effects as well. Given that this tool will be developed in the South African context, it is vital to understand what a farmer's loss due to disease, burden, hazards and pests mean in a South African context, drawing from global lessons.

Furthermore, there is need to measure the social effects, in addition to monetary yield loss, of control measures put in place by farmers (or any actors of the value chain) to mitigate hazards.

7.2 One Food Wheel with explicit human and social aspects

The discussions on *One Food Wheel* (and the entire *One Food* concept, as indicated in previous sections) tend to exclude the human and social aspects. References to social sciences are implied but not embedded in the wheel. Social science issues can be made explicit in the *One Food* debates by making them explicit in the One Wheel.

In South Africa, social exclusion is a big hazard that creates huge problems. However, if controlled, through social inclusion, it would address multiple *One Food* related challenges in the country. Social exclusion, commonly referred to as **inequality**, causes inequality of hazard transmission because *the socially excluded are more negatively affected by any form of hazard*. An important question then is: *What are the conditions that will propel hazard transmission?*

7.3 Curtailment of hazard transmission

The original *One Food Wheel* (Figure 2) illustrates a linear/unidirectional idea of counteracting the transmission of hazards. However, in reality, hazard transmission and control are multifaceted. The question is: *How can non-linear hazard transmission and control be traced?* The impact of hazards and their control are affected by the magnitude of social inclusion and social exclusion in any society.

Figure 3: One Food Wheel – Impact of social inclusion/social exclusion
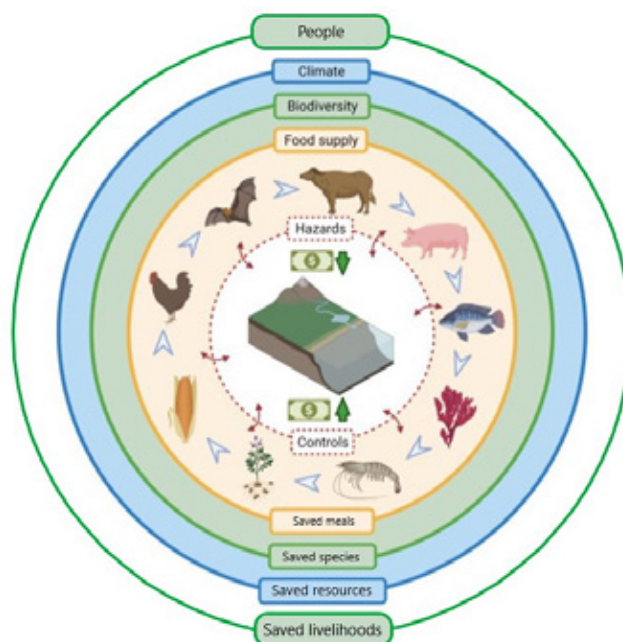
The *One Food Wheel* could be modified as shown in Figure 3, to understand the impact of hazards where social exclusion exists compared to where there is social inclusion. Similarly, benefits of hazard control could be compared in a social exclusion scenario versus a social inclusion scenario, to understand the extent to which inequality worsens the impacts of hazards on people and the environment. Human behaviour and social contributions to the creation of hazards as well as to hazard control can also be illustrated by adding an outer layer to the *One Food Wheel*, as in Figure 4, showing that people contribute to hazards and their control.

Figure 4: One Food Wheel – Impact of social exclusion/ social inclusion
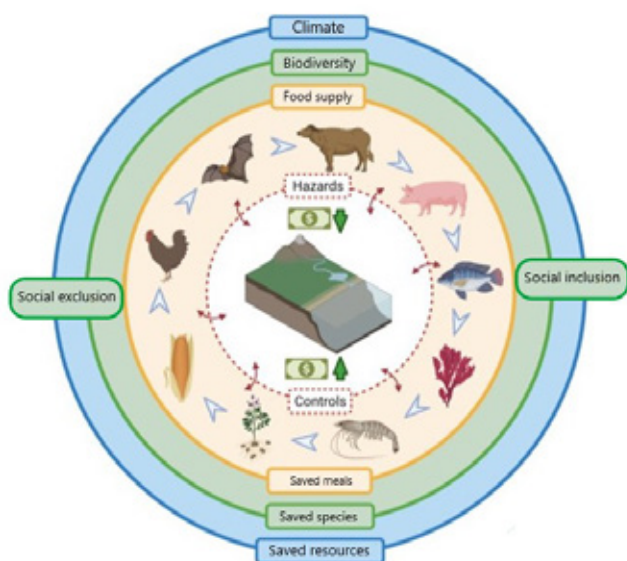
8. Breakout Sessions Discussions

The purpose of the breakout sessions during the workshop was to provide a platform that allows all participants to contribute on how to take the *One Food* concept and movement forward. The discussions were centred on i) hazards as the cornerstone of food systems design, ii) data requirements and availability for the *One Food* work, iii) barriers to implementation of the *One* Food concept, and iv) attaining the benefits of healthier, safer foods for a more sustainable planetary future.

8.1 One Food approach – Hazards and endpoints as the cornerstones of food system design

8.1.1 What are the key hazards for and of food systems?

Natural hazards overshadowed workshop conversations. Food systems depend on water availability and access. The provision of adequate water for food production is subject to multiple disruptive threats. Drought, for instance, is a natural hazard, but water pollution or contamination flows from the behaviours of water users, policies governing use and the efficiency of regulators. Many natural hazards have social and institutional aspects.

The overuse of pesticides and fertilizers damage soils and the productive base of primary agriculture. This can jeopardise productivity, yields and the availability of healthy foods.

Cases of water and soil contamination show that hazards may originate anywhere along food systems, but its ripple effects can spread beyond the point of origin.

Conflict is a social hazard. Widespread conflict exists between nature and human activities, examples include deforestation or human settlements in wildlife or fragile ecosystems (which pose a threat to biodiversity). Another aspect is the impact of human-to-human conflict, and social and human sciences can shed light on conflicts such as food riots or perhaps where trade wars are aspects of social hazards Food is often central to export-import and tariff wars, but conflicts propelled by and located in other socio-political tensions can also hinder global food supplies and trade.

South African consumers buy their food mainly from formal and informal food traders, including supermarkets, street food sellers and fast-food outlets. Consumers that rely on purchased foods are more vulnerable to food price inflation than people who produce their own food. ***Food price inflation is a socioeconomic hazard*** in South African food systems where high poverty and inequality result in reduced access to enough food, cuts in consumption of nutritionally balanced meals or combinations of these unsustainable food consumption patterns.

8.1.2 How should climate change be represented in the One Food concept?

As a composite construct, climate change refers to causes of greenhouse gas emissions, more frequent extreme weather occurrences, warming oceans, rising sea levels and societal responses to these hazards. Higher sea levels pose disruptive threats to the livelihoods of island states and coastal communities that make a living from marine ecosystems and species. Coastal communities in South Africa depend on oceanic resources for food, work, and income.

While the primary concern is how global warming or extreme weather events impact the food sector, mapping and measuring the carbon footprint of food value chains have advanced. The contributions of food subsectors to greenhouse gas emissions vary and depend upon production and transportation ('food miles concept') methods. Sustainable models of how societies produce, distribute and consume food, range from mixes of climate smart agriculture to agroecological farming.

Understanding of and responding to **climate change anxiety** is an aspect of the social dimensions of the *One Food* approach.

8.2 One Food approach – Data: what, where, when, how

8.2.1 Critical challenges for gathering data – hazards, economics, biodiversity, climate

Food system actors collect and preserve thematic data (whether on climate, food or economic variables) in different formats and portals. Data formats can be qualitative, quantitative or both. Owners store their data on open access portals and in secured sites regulated through proprietary rules, some more flexible than others. All datasets vary in their content, timeframes and how often agencies collect the data (or waves of longitudinal datasets every 2 or 3 years). It is rare for data owners to release and disseminate data for wider use in real time due to technical and regulatory compliance issues.

The social aspects of food systems are often covered in administrative records but more commonly through large national surveys (official statistics) or customised surveys on a problem or hypothesis with a narrower definition. **Compatibility** with the *One Food* approach is a key test when looking at data access options or gathering new data. Questions to rapidly test for data availability, access and quality are: *What are the options to access high quality data on the social aspects of producing food as well as trading, distributing and consuming it? How can datasets be combined? What is the scope for collecting new data (One Food variables/items or new datasets)?* A unified *One Food* data dashboard with items and variables derived from the human and social sciences can assist with using and promoting data more effectively. Some laws that govern what type of data can be collected and shared prohibit access to relevant socioeconomic data (example: Agricultural Census). Costs to collect and process new data or mandatory payments to use privately held data are **obstacles to accessing data**. Improved relations with data owners (stakeholders) and institutional arrangements that govern data access should lower the barriers to data gathering and access. Knowing the holders of different types of data has to do with existing data rather than whether the **substantive social dimensions of food system** receive the needed coverage.

Observational studies point to shifts in the ways in which people access food and what they consume. Farming to feed the family has declined as the dominant way of making a living in South Africa. When people engage in this livelihood mode, it is often as a fallback to cope with hunger emergencies but there is no comprehensive knowledge of how the social aspects of this change interacts with food system and climate dynamics.

In South Africa, people increasingly consume food (food utilisation – saved meals and the environment) bought from supermarkets and other eating away from home options.

The overlap between these **patterns of food buying and consumption and the social status of consumers** deserves closer investigation, especially at a subnational level (district municipalities) to construct nuanced bottom-up databases.

8.2.2 Jumping over the gaps – how can we work in data poor sectors or settings?

South Africa is a data rich environment on the social aspects of the food system. However, limitations of data quality and coverage vary. One-time and irregular data collection, for instance, means that documenting the rapidly **evolving nexus between society, climate and the food system** lags far behind changing realities. Consequently, there has been an **accumulation of 'aging' data** rarely used for deeper reflections on food system transformation. Social science data on the food system is ultimately about the optimal and purposeful use of the data for the *One Food* goals.

Useful data must capture meaningful social aspects of the food system in a timely manner. *One Food* must explore **innovations in real-time data collection** through 'citizen science' as mentioned at the workshop. *Overcoming data gaps with citizen science must be grounded in principles of agency and transformative participation*. Furthermore, intensive data usage for policy change and to address sustainability endpoints - quality of life and societal wellbeing endpoints - require resilient data use networks. National surveys (such as the General Household Survey (GHS), Living Conditions Survey (LCS) and National Income Dynamics Study (NIDS)) are high-level snapshots that do not allow for consistent **district-level analyses** of how food systems work. In addition to the need for larger samples **for in-depth subnational analyses** of "food utilisation" (household food preparation, consumption and nutritional health outcomes), the surveys ignore food access through institutional safety nets, like the school nutrition scheme. Dominant food traders, especially supermarkets and takeaway food outlets, prioritise limited data on aggregate revenues and incomes from trading food items over the social distribution of food costs and benefits for categories of consumers. Among the **priority data gaps** to be closed is the gap between, on the one hand, *subjective agency and relational factors that determine what people eat and, on the other hand, food industry performance data*.

8.2.3 Data collection and sharing across government, industry, society – technical and conceptual solutions

It is unusual to collect data without a defined purpose in view of the time, human and financial costs that such undertakings consume. Motivations for data collection may be driven by policy, social activism, academic and scientific ends. Usually, the reasons for collecting data arise from a combination of these ends as well as promoting the proper use of data. A key question pivots on the differences that data sharing and use make to the *One Food* sustainability endpoints. More specifically, *from the social sciences angle, what is the impact of the shared data on societal wellbeing? What are the social impact priorities of sharing data via One Food platforms?* In order to demonstrate the tangible benefits from a *One Food* data sharing platform, lessons from platforms that share food system data merit consideration.

Rules that govern data storage and sharing must distinguish analysed information (or the least sensitive type/format of data) from original data (like a unique survey). Sharing published literature in the public domain for social impact, for instance, is probably the least sensitive data category. Using easy to access 'secondary data' to initiate a **_One Food_ Data Hub** can be a pilot test for incremental adaptation within 6-9 months. *How can the One Food Data Hub help popularise the policy briefs, research reports and scientific publications that target specific food system actors?* Policy briefs, for instance, aim to influence practitioners responsible for the design and execution of food programmes. However, better food policies require an active citizenry to hold those in the policy space accountable. Translating the policy recommendations to empower **citizen activism**, with the aid of social media, calls for popularising policy briefs into layperson-friendly messages. This example shows that *enhancing the social impact of the One Food Data Hub requires investment in 'democratising data' sharing*.

8.3 One Food approach – Barriers to implementation and breaking policy silos

8.3.1 Who are the key stakeholders holding the levers (public, industry, government, all)?

The workshop identified social, economic and technical levers but stopped short of ranking them in terms of their importance. A useful but far from exhaustive example of **food system levers** focused on effective and efficient communication. Since communication is about the flow of information between distinct stakeholders, it has behavioural, relational and cultural aspects. It is inherently a social science issue.

Effective sharing of information, for example, means that stakeholders recognise the need for it, that the right platforms are being used, messages are ethically compliant and that language barriers are non-existent.

In essence, food systems incorporate diverse stakeholders who operate individually or as part of a collective, such as farmers, agro-processors, food retailers or farmer and commodity associations.

Mapping stakeholder groups across food value chains should deepen understanding of the nature, intensity and reasons for their internal and external relationships (networks). How members of a stakeholder group (or category) relate to each other is as important as how groups in different parts of food value chains relate to each other.

Stakeholder groups are the more likely holders of food system levers rather than isolated individuals, unless a single stakeholder dominates key food system activities. Matching stakeholder groups with food system levers presupposes a shared understanding of what the levers are and the mechanisms through which they influence food system operations.

Strategies to overcome the barriers to implementation should **define and comprehensively map food system levers upfront**. In characterising the levers, it is important to also identify the combinations of levers as well as their varied sizes, amplifying effects and changes over time. Examples of levers are economic, institutional governance, food assistance schemes, organisational capabilities and information systems and tools.

To reinforce the importance of food system levers in overcoming implementation barriers, it is instructive to focus on the **institutional governance lever**. This lever typically includes laws and policies but also intellectual property and regulations that govern food production, trade, distribution, storage and consumption. Larger food producers and traders are better positioned to influence food system regulations or policy reforms than civil society groups or consumers. This advantage draws from their economic strength and stronger associations where the barriers to entry for other stakeholders might be prohibitive. What this means is that levers to address implementation barriers must be well thought through to mitigate and avoid the reproduction of social exclusion (or inequalities).

8.3.2 How should 'food' (production, supply) be considered within the 'public/private goods' classification?

Food is a human right because it is vital for the sustenance of human life. However, whilst food as a human right has the backing of the country's law (and South Africa's Constitution), making this right real in practice is subject to design and implementation barriers.

One Food offers a unified approach to how societies produce, trade, distribute and consume food without environmental harm. Healthy and safe foods are central to human and environmental health. This approach integrates the rights to food, health and a sustainable environment. Given this *One Food* philosophy, *in what sense is the way in which societies classify food – as a private/public good- a barrier to implementation?* This is less about the properties of food than the characteristics of the system through which people meet their food needs. *What are the barriers to people buying food or receiving it through food relief schemes?* Since food relief depends on private sector donations or support, such as corporate social responsibility initiatives, the private/public good classification is not as clearcut as appearances suggest.

The amount of their income that people spend on food determines what kinds of foods they ultimately eat. Food affordability is more than just the number of food items purchased. Ultimately, it pivots on food quality, dietary balance and optimal nourishment. When consumers adjust their food budgets to cope with food price inflation, for instance, they often opt for less nutritious foods as seen in the growing consumption of ultra-processed food among poor consumers. The social sciences can reveal crucial insights into how the **workings of private food markets determine the composition of food baskets** where socioeconomic inequality is a major factor in food access.

Markets that determine food provision through assistance programmes range from direct food trade to banks that donate to **food relief programmes**. However, the intensity of this market dependency varies by, among other factors, the targeted area for food assistance. Food assistance spans all dimensions of food and nutrition security and agrofood value chains. Agricultural development assistance targeting resource-poor farmers, for instance, usually combines state assistance with private sector assistance to expand food production capabilities (availability of food). Farmer assistance is increasingly seen as an example of **social protection**. School feeding schemes, delivering food parcels and distributing cooked meals (soup kitchens) are direct food assistance schemes that often operate side-by-side with social cash transfers.

In tracking the benefits of all food assistance, it is important to know who has been reached or not as well as the **volume and variety of foods distributed** in this way.

8.4 One Food approach – Realising the benefits of healthier, safer foods for a more sustainable planetary future

Discussions centered on what should be the **definition of safer foods**, what is to be considered the benefits of better and safer foods for a sustainable planet, how to communicate the benefits, who the audience should be, and the quality of the message communicated. However, the discussions did not focus on how food production and consumption can be made more sustainable in order to save our planet.

8.4.1 Pesticide and fertilizer use in the production of food

Fertilizers, pesticides and preservatives are fundamental in the farming industry. These are used to increase yields, protect crops from pests and diseases and ensure that they remain fresh and healthy. However, fertilizers and pesticides can be both beneficial and detrimental to farmers, farmworkers, and consumers, it all depends on how the agrofood value chain actors use them. These chemicals can have negative impacts as they can not only destroy both the crop and the land but can be harmful to people. For example, there have been reports of cancer among farm workers due to the use of chemicals during farming.

8.4.2 Access to food as a social science issue

South Africa is a country with very high poverty statistics. In a country like this, often people who are very poor do not have the luxury of choosing what to eat, rather they consume what they can afford. This is usually food that is very cheap and does not have the sufficient nutrients that adults/children need in order to meet daily nutrient targets. In extreme poverty conditions, it is not uncommon to find individuals eating food that has been disposed of in either residential/mall bins or even landfill sites. As one can imagine this type of food is highly unsafe and unhealthy to consume.

8.4.3 Food labels as a social science issue

It is unrealistic to expect every individual to know what is in the food that they consume. Often this information is hidden in the fine print of the food item. This poses a problem for a country such as South Africa which has very high cases of illnesses such as diabetes, obesity and cholesterol which are mainly caused by unhealthy eating habits.

It is not uncommon to find a product that is advertised as being healthy but upon further investigation it is found that it is actually the opposite. An example would be fruit juice being advertised as being a healthy option to soda when in actual fact they both contain a high amount of sugar which is not entirely healthy.

9. Knowledge Gaps

The pressure put on biodiversity by food systems, which brings about unsustainable use of natural resources, pushes both governments and society to come up with policies and practices to shape a future that is sustainable for both people and nature. The solutions must be based on both natural and social sciences. While discussions during the *One Food* Workshop do mention social sciences, these are mentioned only in passing.

The workshop discussions focused mainly on diseases, hazards, animal and plant health, the environment as well as food safety issues in the natural sciences context. The societal or human context of impacts of the hazards discussed during the workshop are missing.

Social science issues are particularly vital in that they can enable measurement of progress towards normative goals of sustainability, particularly overall human wellbeing. In the social science context, the *One Food* concept should include social vulnerability aspects in the analysis of hazards. Such social challenges that include unemployment, lack of resources due to poverty, inequality in all its forms, inadequate education and training, power dynamics and justice are either not discussed in depth or not discussed at all in the *One Food* debates, yet they are deep-rooted and persistent challenges in South Africa and across the African continent.

9.1 General: Social, human and behavioural (psychosocial issues?) aspects

Social and human aspects are intrinsic to *One Food*, but workshop participants did not always spell them out. One useful way in which the societal elements can be made more explicit is to incorporate it through typical spheres in social sciences. In broad terms, the spheres are *behavioural* (subjective decisions and responses to food issues), *relational* (interactions and relationships among people), *associational* (formal and informal organisations), and *institutional governance* (policies, laws and regulatory authorities).

The *One Food* approach is concerned with how societies produce, distribute and consume healthy food. Central to this approach is identifying the hazards that arise throughout the food system. Weaving a social sciences perspective into *One Food* implies a recognition that hazards often arise from human and social activities.

Social sciences map the human activities and relationships within society. Human activities and relationships have different dimensions that range from individual psychosocial dimensions to interactions among groups of people, such as a family or formal/informal associations. Each unit of a society interacts with the food system in a different way and these social interactions must form a central part of the *One Food* idea and approach. How can the social and human dimensions of *One Food* be incorporated into the *One Food* 'wheel'?

The socioeconomic difficulties confronting South Africa, coupled with policies to tackle these problems, must feature more prominently in the *One Food Wheel* model.

Society is grappling with poverty and inequality, with hunger and malnutrition forming dominant facets of the social agenda.

9.2 Social science meanings of hazards

Identifying hazards of and for food systems presupposes a common working definition of hazards that is meaningful from a social and human sciences perspective. The *One Food* approach needs a coherent and shared understanding of hazards.

Hazards are adverse events that are likely to materialise. They are disruptive threats to how food systems function, human wellbeing outcomes and sustainability endpoints. Measures to effectively counter hazards start from the sources of these disruptive threats and probable adverse events as well as the mechanisms through which these materialise or transmit and generate spillover effects.

9.3 Are all hazards equally important?

Workshop participants agreed on the inequality of hazards, the need for standardised risk tools and integrated platforms (tools) on hazard identification, measurement and control. It essentially concentrated on the criteria, dimensions and standards to differentiate one hazard from another. Given that hazards are unequal, what will a shared view mean when considering unequal hazards in terms of the human and social dimensions of food systems?

From the angle of natural sciences, the hazards that flow from the food system to environment or in the opposite direction differ in many ways. Separating and ranking these hazards in terms of their importance ought to begin with basic questions such as: *what are the sources from*

which the hazards originate? What is the size and scale of the hazard? What meanings, priority and valuations do different units in society (individual, community and associational structures) attach to the hazards? To answer these questions the assumed reference points must be made explicit to reduce blind spots and hidden risks intrinsic to hazards. Shared reference points form part of the necessary conditions for the **priority ranking of hazards**. A unified approach to **hazard heterogeneity**, implies incorporating societal indicators in hazard tools, models and platforms; without assuming that all hazards are the same. Similar to global warming or greenhouse gas pollution tipping points, unequal societal hazards can detonate hard to control social instabilities.

In human and social sciences, **capturing unequal hazards** must also map the intrinsic properties of hazards, their sources of origin and societal meanings. The societal dimension also brings into the spotlight ways in which hazards transmit and diffuse from their source to the rest of society. It is possible to think through the spread of food system hazards in society as a linear or multifaceted process. A **linear and unidirectional model** of hazard transmission from food systems to society (or a reverse flow) can result in missing social drivers of inequalities and might be an unrealistic model. Monitoring and controlling how food system hazards spread at a societal level, without ignoring spillover effects that are unintended or accidental, is complex.

The food system is part of society, but its interactions through food value chains, for instance, are manifold. Food price inflation and social conflict (food riots) are hazards that do not follow the logic of a linear and unidirectional transmission mechanism. The degrees of social inequality can transmit the burdens of these hazards disproportionately onto economically marginalised members of society. Similarly, food and nutrition safety nets for children or better working and living standards for people who work in parts of food value chains **transmit in multifaceted ways**, with feedback loops that can multiply hazard inequality outcomes.

9.4 What does the saved meals/saved species/saved resources future look like - what are the key endpoints?

One Food integrates multiple facets that constantly interact. The *One Food Wheel* makes this visible, but it is not easy to visualise the endpoints in a circular model. Thinking and acting from a *One Food* viewpoint makes it tricky to identify the start of endpoints.

Endpoint identification at the workshop overlayed all pillars of food and nutrition security (based on the definition) across food value chains. Whilst the workshop acknowledged the need to bring distribution, transportation, storage and markets into endpoints conversations, the dominant emphasis was on food availability and primary agriculture. However, adequate supply of safe and nutritious food without any environmental harm represents an intermediate endpoint without a **societal endpoint**.

One example to illustrate endpoints through a human and social science lens is the case of 'saved meals'. Saved meals is a sustainability endpoint which forms part of the *'food utilisation'* pillar in the definition of food and nutrition security. However, this pillar is not sufficiently nuanced as it takes for granted how users prepare food (meals) as well as consumption practices and the health outcomes of a meal. While a saved meal is part of 'sustainable food utilisation' endpoints, it has quality of life (subjective behaviour) and societal wellbeing (cultural, social inclusion, equity) consequences.

A social science view of the nexus between utilising food sustainably (save meals) and food waste is needed to **define intermediate and ultimate endpoints**. This includes effectively controlling societal hazards of food systems through policies that range from food markets to social protection policies.

9.5 Proposed work to address some of the social science gaps

To close some of the social and human science gaps discussed throughout this report and consolidated in this section, this subsection itemises the specific areas that could be considered as well as the questions to be addressed under each focus area.

9.5.1 Investigating data availability and identifying gaps

- Is available data compatible with the *One Food* approach?
- What are the options to access high quality data on the social aspects of food producing, trading, distributing and consuming food?
- How can the complementarities of data be optimised through combining datasets?
- What is the scope for collecting new data (*One Food* variables/items or new datasets)?

9.5.2 Mapping social/human dimensions of One Food to integrate into the One Food Wheel

- What hazards arise throughout the food system as societies produce, distribute and consume food in a *One Food* approach?
  - What hazards arise specifically from human and social activities?
- Which social and human dimensions of *One Food* should be incorporated into the *One Food Wheel*?

9.5.3 One Food hazards and impact of social exclusion on hazard transmission

- What meanings, priority and valuations do different units in society (individual, community and associational structures) attach to the hazards?
- How does higher social inequality impact on the spread of hazard burdens onto economically marginalised members of society?

10. Concluding remarks

The analysis of workshop and related documentation reveals that social and human aspects, which are considered fundamental to *One Food*, were not made explicit prior to and during the workshop. The report suggest that social science aspects can be made explicit by incorporating standard social science domains namely *behavioural, relational associational,* and *institutional governance* decisions and responses to food issues. It highlights the importance of a social sciences perspective into *One Food* which appreciates that hazards, which happen in all phases of the food system, frequently arise from human and social behaviours.

The report finds that critical factors for integration of social sciences aspects of *One Food* into the *One Food Wheel* should include incorporation of socio-economic difficulties faced in South Africa, and a shared rational definition of hazards that is meaningful in a social and human sciences viewpoint. The socio-economic challenges faced in South Africa are significant in determining the extent of hazard transmission from food systems to society. The report concludes by suggesting how the identified social science gaps can be incorporated into the *One Food* idea and proposing the necessary indicators to enable that. The indicators are in Table, in the Appendix.

11. References

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Appendix: Social science indicators

Table A1: Proposed Social Indicators

Metric	Indicator
Vulnerability to social hazards (social controls; social inclusion)	Access to resources
	Demographic characteristics: gender, education, age
	Cultural factors: beliefs and customs, race
	Household structure: number of dependents, household income
	Governance/political factors: hazard management policies, capabilities of government, access to political power and representation
	Social conflict, macroeconomic crises, food price inflation
Behaviour changes toward One Food goals (individual, relational & associational behaviour)	Adoption of sustainable practices (e.g., conservation, biodiversity)
	Comprehensive food and nutrition awareness (literacy)
	Farmers' trust in government, industry, academia, NGOs
	Civic engagement among farmers, government, industry, academia, communities, civil society (agency & collective action/citizen activism for One Food)
	Institutional governance of all One Food hazards and controls
(Quality of Life, Societal Wellbeing & Social Justice)	Increased income in food systems value chains
	Improved welfare of worker (e.g., remuneration, benefits, work hours)
	Food assistance as social protection across food value chains
	Increased income across age, sex, race, regional categories
	The share of food consumption expenditure in total household income (i.e., as a % of total household spending)/ Food Affordability

Source: Authors' compilation

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