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A diagnostic framework for food system governance arrangements: the case of South Africa

1. Introduction

Food security in Africa is high on the policy agenda of governmental authorities, business actors, NGOs, and scientists throughout the world [1, 2]. Nowadays, food security is connected to an endless list of old and new challenges, such as the effects of environmental change including land degradation, loss of biodiversity, and changes in climate and weather patterns [3-5]; the expected growth of the world population and wealth together culminating in the growing demand for energy-dense foods, especially animal proteins [2, 4]; the variability and volatility of food prices [6]; the increasing speed of urbanisation and (young) people moving out of the agricultural sector [4] the unequal distribution of land rights among castes, classes, and gender [7]; the increasing vulnerability of production systems, especially among the poor who have no resource buffers [4]; the societal concerns regarding production technologies [8]; the juxtaposition of hunger and obesity [9]; the human rights to food [10]; the triple burden of malnutrition [11]; the pledge of food sovereignty [12], and the increasing importance of food for national security [7].

To enhance the necessary broader discussion on food security scholars have promoted the ‘food system concept’ [13-15]. It starts from the observation that much of the food security debate has traditionally centred on agricultural production and hunger alleviation, and that consequently interventions are narrowly linked to the work of specific NGOs and governmental institutions, usually those dealing with agriculture [15]. The food system concept aims to elucidate the interconnected relationships between various activities in the commodity chain (producing, distributing, trading, consuming of food); various issues linked to food security outcomes (access, availability, utilisation, nutrition); various interactions across scales (time, space, jurisdiction) and levels on them; and various socio-economic and environmental constraints and impacts [13-15]. More recently, policymakers and international organisations have been increasingly embracing this food system perspective [16]. As a consequence, the food system concept has evolved into a normative concept, instead of being analytic, helping decision makers to choose the right model for their specific institutional contexts [17].

To date, this food system concept is poorly reflected in institutional terms at local, national, and international level [4, 12, 18]. Approaching food from a system perspective reveals and in turn enhances important governance challenges and opportunities, because it requires more holistic forms of governance. By its nature, food governance institutions are fragmented and cut across the usual boundaries between sectors, administrative jurisdictions, public and private domains, temporal and spatial scales and diverse normative frameworks. The interdependencies of actors, activities, and problems within the food system challenge the efficacy of traditional modes and strategies of governance [19]. It is an attractive proposition for actors with a change agenda to emphasise that food cannot be dealt with appropriately by the current fragmented institutional architecture, and that therefore, “the governance system should be made more coherent and harmonized, better integrated and coordinated, and more inclusive” [1]. This may result in steering strategies such as top-down integration, new coordination structures, or mandatory mainstreaming. Hajer et al. [20] refer to this phenomenon as cockpit-ism: the illusion that top-down steering by governments and intergovernmental organisations alone can address
global problems. Others emphasise that improving food security requires a careful diagnosis of existing institutions and the tailoring of policy interventions to these varied institutional conditions [21]. Little is known, however, about more appropriate food system governance arrangements that reflect a realist and context specific perspective on governance [1].

Against this background, this article addresses the question as to what forms of governance are most appropriate to govern food systems in a more holistic way? This paper firstly presents a framework to diagnose these food governance arrangements. Therefore it synthesises various strands of literature into a multi theoretical model of five principles that are crucial for governance arrangement that embrace a food system approach. We refer to these arrangements as food system governance arrangements. Secondly, this framework is illustrated by an analysis of the strengths and weaknesses of three South African food governance arrangements, which are selected because they go beyond a single agricultural production frame, involve a broader spectrum of challenges and fit into a system perspective. Finally, the article discusses the results and proposes an agenda to further elaborate the framework and its practical usefulness.

2. The five principles framework

Although the number of articles on food governance is increasing (e.g. [1, 9, 10, 19, 22-27]), only a few have explicitly touched upon the topic of governance from a food system perspective. To fill this gap, we have developed a framework to analyse and diagnose food system governance arrangements. This framework departs from the outcomes of a systematic literature review of food system governance conducted by Hospes and Brons [18]. This review concludes, among others, that food system governance is an emerging field of study that requires further development. Therefore we have added governance insights from system-oriented approaches in other more or less related research fields, such as agricultural systems (e.g. [28, 29]); earth systems (e.g. [30, 31]), social ecological systems (e.g. [32-34]), and integrated water management systems (e.g. [35-38]). The resulting framework consists of five interrelated principles for appropriate food system governance arrangements: system-based problem framing; boundary-spanning structures; adaptability; inclusiveness and transformative capacity. The five principles framework is meant to diagnose food system governance and not the food system itself. It goes without saying that these principles are not exclusive for food system governance.

The first principle of system-based problem framing addresses the challenge of moving beyond one-dimensional problem frames [36]. A frame is a selection of “some aspects of a perceived reality” in such a way as “to promote a particular problem definition, causal interpretation, moral evaluation, and/or treatment recommendation” [39]. Because the food system involves many interacting subsystems [29], it cannot be reduced to narrow problem frames – of, for example, undernutrition, vulnerable agricultural production, land reform conflicts, poor infrastructure, or biodiversity loss – that do not address system intricacies [9]. Thus far the conceptualization of food systems by Ericksen [40] is the most comprehensive [18]. It comprises of interconnected activities and outcomes embedded in a dynamic environment driven by social-ecological change, and leading to multiple feed-forward and feed-back
signals. A system-based problem framing thus rejects “quests for a single framing of the problem” [10] and requires food governance arrangements that enhance reflexivity “in which people engage to discuss tensions regarding group objectives, recognize contradictions, and deal with differences in a respectful way” [42]. However, the construction of too broad and too vague problem frames, may paralyse policymakers. Therefore we follow Gray [41] who emphasizes the importance of a connection of different issue frames in a jointly meaningful story that can generate guidance and commitment.

The second principle of **boundary-spanning structures** addresses the challenge of fragmented siloed organisational structures [22, 43]. Food systems inherently involve many subsystems. Decisions that may impact food activities and outcomes occur across a range of spatial, temporal, and jurisdictional scales, and involve a wide range of public and private actors [18, 44, 45]. These decisions are all embedded in different subsystems, like health, environment, agriculture and economics-, which have particular interests, ways of addressing problems, time pressures and historically grown networks [29, 46]. The boundaries between these subsystems are not only physical and organisational, but also cognitive and social [35]. Whereas some degree of institutional fragmentation may increase the innovativeness of the system, too much (conflicting) fragmentation can result in bad performances [30, 33]. The challenge lies in connecting different policy subsystems through spanning boundaries, such as integrated programmes, coordination schemes, public–private partnerships, multi-stakeholder platforms, integrated participatory analysis, or mutual gains processes [29, 31, 37, 38, 47].

The third principle of **adaptability** addresses the challenge of uncertainties and volatility [42, 48] in non-linear systems. Though the need for adaptive governance is emphasized in many publications, in particular those that conceptualize food system as a social-ecological system, it has hardly been empirically elaborated and tested [18]. It is crucial for food system governance arrangements to remain “feasible and optimal under a dynamic environment of changing social, economic, political and climatic conditions” [43]. This requires flexibility because “all the social and environmental ‘actors’ are in motion all the time — plans and strategies that aren’t … will not hit the mark” [42]. Much literature provides practical guidelines for modes of governance that can better adapt to uncertain pressures (e.g. [33, 34]) such as monitoring and back-up systems, room for self-governance and experiments, high levels of redundancy, flexible legislation that allows for tailor-made solutions, and decentralising decision-making authority [32, 33, 49]. Food governance scholars elaborate on these insights when they emphasise the need to: self-organise into more flexible networks [48]; enhance monitoring [23]; experiment by learning while doing [10]; encourage information sharing [50], and foster relational learning processes across scales and between communities [9].

The fourth principle of **inclusiveness** addresses the questions about whom to include and exclude, and thus reflects the inherent political character of food systems. Hospes and Brons [18] identified the limited involvement of civil society as a main weakness of food system governance. Although inclusiveness is important in general, it is very much emphasized in system governance literature. Within the notion of earth system governance Biermann [51] and Biermann et al. [52], argue that institutional frameworks for sustainable development must address legitimacy, accountability, justice, fairness, and equity. It is in
particular important to “give voice to marginalized people” [18] and ensure social differentiation amongst participants [29]. On top of this, involving existing local networks and communities could also contribute to a more holistic and system-based approach, since civil society actors do not think in silos and easily link “issues related to food, for example, food access, obesity, food supply, and nutrition” [19, 42, 50].

Because the food system perspective displays features of a paradigm shift, the fifth principle of transformative capacity addresses the challenge of transformative change. This principle is the least specific for food system governance. It fits into the suggestion of many authors who discuss the governance of complex problems, and point to the need for moving toward a totally different governance regime [18]. Transformative change includes “shifts in perception and meaning, changes in underlying norms and values, reconfiguration of social networks and patterns of interaction, changes in power structures, and the introduction of new institutional arrangements and regulatory frameworks” [53]. In general, governance institutions are highly resistant to transformative change because of all kinds of path dependencies, defined as the mechanisms whereby current decisions are determined or limited by decisions in the past, reflecting vested interests and historically grown power positions [54]. Documented examples of path dependencies in the food system are: the “historical tendency of domestic agricultural policy biases to favour the cultivation of import substitution high water-demanding food crops” [43]; “strategic interactions between private and public marketing actors [that] lead in some cases to heightened market instability and food crises” [25] or “import taxes on steel, but not on imported agricultural machinery, that disadvantage manufacturers in developing locally adapted agricultural equipment” [29].

It is important to note that we refer not only to formal but also to informal institutions, for example patron–client relationships, which often play a larger role in the developing world [27]. To overcome path dependencies, governance arrangements are required that enhance transformative capacity, understood as “the ability to bring about substantial sustainable system changes” [55]. These capacities may include advanced forms of leadership, resources, and skills; target agenda setting, policy planning, implementation and enforcement, and long-term embodiment [55]; and require the identification of entry-points for innovation [29].

Although these five principles are not the only way to synthesize insights from literature, taken together they allow for a much more comprehensive diagnosis of food system governance arrangements than an analysis based on just one theoretical concept or model. An additional reason for developing five principles is that each principle contains its own trade-offs. Too much focus on system-based problem framing can lead to paralysis. Too many boundary spanning arrangements can blur responsibilities and modes of democratic accountability. Focussing on adaptiveness alone may undermine effectiveness and efficiency. A single focus on inclusiveness could ignore the role of other actors who have important resources at their disposal. Transformative capacity is crucial, but may neglect the importance of stability and predictability and might also lead to an even more undesirable governance state.

3. Methods
We chose South Africa as study area, because of its multiple food problems. Furthermore, the involvement of South African scholars provided us with access to relevant documents and actors. For our illustrative empirical study, we aimed to analyse South African governance arrangements that embrace a food system perspective. However, most existing governance arrangements in South Africa do not qualify as food system arrangements, because they aim to alleviate food insecurity with a focus on a single issue or are narrowly linked to the work of one specific department. As examples, these include agricultural credit and production programmes of the Department of Agriculture, Forestry, and Fisheries (DAFF), the Primary School Nutrition Programme of the Department of Basic Education, and the ‘food for all’ programme of the Department of Social Development. We have selected three long-term public governance arrangements that – at least on paper – aim for a more holistic system-based approach. The first is the Integrated Food Security Strategy (IFSS) because it aims “to streamline, harmonize and integrate diverse food security sub-programmes … and a comprehensive and multi-sectoral approach of all spheres of government, and the active participation of the private sector and civil society” [56]. The second is the South Africa Integrated Nutrition Programme (INP) because it introduced “a comprehensive approach to address the underlying causes of malnutrition through direct and indirect nutrition interventions” [57]. The third is the LandCare programme, because it aims to “embed integrated sustainable natural resource management into a broader holistic policy framework of food security, poverty alleviation and capacity building” [58]. The long-term characteristic of the programmes provided us the opportunity to analyse all phases in the policy cycle, from agenda setting up to implementation and evaluation.

Table 1: Framework: five principles for food system governance arrangements

<table>
<thead>
<tr>
<th>Principles</th>
<th>Challenges</th>
<th>Indicators</th>
</tr>
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<tbody>
<tr>
<td>System-based problem framing</td>
<td>To deal with interlinked issues, drivers, and feedback loops</td>
<td>- beyond one dimensional problem definition - feed-back mechanisms - integrative narrative - room for reflexivity</td>
</tr>
<tr>
<td>Boundary-spanning structures</td>
<td>To organise connectivity across boundaries of sub-systems involved</td>
<td>- interactions across levels and sectors - spanning siloed governance structures - public-private partnerships</td>
</tr>
<tr>
<td>Adaptability</td>
<td>To respond flexibly to inherent uncertainties and volatility in non-linear systems</td>
<td>- monitoring systems - decentralisation and self-organisation - flexibility - learning while doing</td>
</tr>
<tr>
<td>Inclusiveness</td>
<td>To involve actors who are affected by the problem and the proposed policies</td>
<td>- involvement of marginalized voices - social differentiation amongst participants</td>
</tr>
</tbody>
</table>
### The five principles framework

<table>
<thead>
<tr>
<th>Transformative capacity</th>
<th>To overcome path dependencies and create adequate conditions to foster structural change</th>
<th>- involvement of local communities and networks</th>
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<tbody>
<tr>
<td>-</td>
<td>- addressing path dependencies and lock-ins</td>
<td>- leadership</td>
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<td>-</td>
<td></td>
<td>- resources</td>
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<td>- political will</td>
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The five principles framework is used to diagnose these three different food system governance arrangements. For this purpose the principles are translated in sets of indicators (see table 1). The analysis is based on various data collecting methods: published papers, previous research of the authors, policy documents and websites. To contextualise, actualise, and deepen the insights, we organised two workshops with policymakers (DAFF mainly), NGOs (e.g. Oxfam), private companies (e.g. AgriSA, Maize and wheat steering committee) and research organisations in South Africa (e.g. FANRPAN, Medical Research Council) (2 October 2014/24 people; 6 February 2015/26 people). We discussed various topics during these workshops, such as the food system perspective (does it make sense?), the relevant network, future scenario’s, and obstacles towards more integrated food governance arrangements. Finally, a research team of scientists from South Africa and abroad interpreted the data, using the indicators from the framework.

### 4. Results

#### General analysis of the South African food system

This section very briefly describes the state of food security in South Africa in terms of the food system perspective, including the various processes in the commodity chain (producing, distributing, trading, consuming of food); and its food security and environmental outcomes (see introduction).

**The food system.** The South African food system can be described as dichotomous. On the one side, there is an established formal, commercial sector that is connected with international agribusiness and international finance that enables access to different, convenient foods at a cheaper price. On the other side, there are a larger number of poorer, small-scale black farmers and informal traders that operate at the margins of the formal system. Despite various political promises, the old agrarian and land systems remain in place. As of 2012, 87% of arable land in the country was still owned by white, commercial farmers who produce almost all of the country’s marketed output [59]. There are high barriers to entry for small farmers, manufacturers, and retail outlets to be a part of the increasingly competitive and commercial formal food system in South Africa [60]. Deregulation, that was largely welcomed by South African agribusiness, began in the 1980s in order to comply with the WTO regulations and to achieve competitiveness required to survive in the new competitive environment [61]. Because of the resulting openness of South Africa’s market, international food price shocks are almost fully transmitted down to local wholesale and retail prices, making poor households extremely vulnerable to food price increases [62]. The 2002/03 and 2007/08 food price crises did not result in structural policy changes, but have
reinforced the country’s reliance on short-term policy interventions that deal directly with relieving the burden of food price inflation for poor households, such as welfare payments, school feeding schemes, and food packages [62]. Nowadays, the issue of land reform is high on the political agenda. It fits into a larger debate around the need for agrarian reform in the country that will include marginalised farmers and communities in the country’s food system. The lack of progress has become an issue of great concern for many local communities and civil society movements, but the uncertainties of land reform policies also disquiet the private sector.

_Food security outcomes._ Although South Africa is food secure at national level, meaning that in case of equitable distribution there is enough food for all, at household level there is worrying evidence of a high prevalence of hunger and micronutrient deficiencies in both urban and rural areas that is related to socio-economic factors [63]. The rights of all South Africans to adequate food, grounded in the South African Constitution, have not been met in reality [24]. South Africa is also facing the so-called double burden of malnutrition: stunting, wasting, and undernutrition in young children is occurring alongside increasing levels of obesity and overweight in older children and adults [63]. The rapid urbanisation underway in South Africa is having serious repercussions on the food system’s ability to provide food to urban dwellers [64]. More than 60% of South Africa’s population now live in urban areas and rely on purchasing their food. Supermarkets have expanded into lower income areas by out-competing local wholesalers and small retailers on cost and quality in most of their product offerings [65]. These developments undermine the ability of households to invest in household food production, reinforce de-agrarianisation trends, and reinforce consumers’ choice of affordable, but nutritionally poor, foods in low income areas [66]. The government’s response to the 2008 food price crisis showed a rural bias, emphasising that poor people should grow their own food, neglecting urban dwellers and foreign migrants without access to land [67].

_Environmental outcomes._ The South African food system is very vulnerable to environmental change and in particular to changing water availability as a result of climate change. Natural water resources are unevenly distributed across the country, with more than 60% of the surface flows arising from only 20% of the land area [68]. Since the agricultural sector currently consumes 60% of the total water resource in the country, any increase in irrigation for growing food would thus impact the water and energy systems [69]. Other projected impacts include an increase in extreme events and high temperatures exceeding the natural tolerance levels of crops. In response to climate variability, many farmers have started deploying various adaptation methods, which can be seen at multiple levels and mostly comprise adjustments in farming operations [68]. Loss of natural habitats is regarded as a key driver of the loss of ecological integrity worldwide. The intensification of agricultural production is widely known to reduce biodiversity [70], and the range of ecosystem services that are provided by those species (e.g. [71]). Within the South African context, rich biodiversity has been linked to food security mainly through direct consumption and via income generated from tourism or commercialisation [72]. Although much further work is needed to accurately quantify the impact of the loss of wildlife on food security (e.g. the extent of reductions in pollination services, pest control, and so forth, due to wildlife loss), it is clear that the relationship is a negative one [73].
Analysis of the Integrated Food Security Strategy (IFSS)

In 2002, after years of drafting, the South African Cabinet issued the Integrated Food Security Strategy (IFSS). It aimed “to attain universal physical, social and economic access to sufficient, safe and nutritious food by all South Africans at all times to meet their dietary and food preferences for an active and healthy life” [56]. This plan was motivated by: the rapid rise in food prices; reports pointing to the increasing number of people vulnerable to hunger; the global attention on food security; and the “unsatisfactory situation that was occasioned by the implementation of many food security programmes by different government departments in all spheres” [24]. It consisted of a number of ambitious objectives, accompanied by measures and arrangements to meet them, such as: an increase in household food production, job creation opportunities, nutrition security, food safety and trading; and the development of food emergency management systems, capacity building, and stakeholder dialogues [56].

System-based problem framing. On paper, the guiding problem definition certainly moved beyond a one-dimensional problem frame. The IFSS adopted a broadly developmental rather than strictly agricultural approach to food security [74]. It presented a broad spectrum of issues, varying from food availability and access to empowerment and mitigating the impacts of natural disasters. It also addressed more politically sensitive issues such as, for example, the lack of institutional capacity in poor areas. Various multi-sectoral fora were installed to encourage reflexive debates. However, an integrative story that linked these issues and initiatives was lacking. Whereas the official document showed a certain level of system-based problem framing and reflexivity, the implementation phase reverted to a one-dimensional agricultural production frame with a single focus on national food security. DAFF, the national department appointed to coordinate and facilitate the integrated strategy, was biased by an agricultural production frame and thus failed to start from the initial comprehensive frame [24].

Boundary-spanning structures. The IFSS deliberately aimed to streamline, harmonise, and integrate the diverse food security programmes across government departments [75]. It comprised ambitious objectives to improve coordination among governmental levels, enhance relations between the several national departments, and foster cooperation among public and private organisations. Various multi-sectoral platforms were planned to stimulate creative interventions, such as the Integrated Food Security and Nutrition Task team and the National Food Security Forum. However, inadequate structures hindered the effectiveness of these boundary-spanning structures [24]. The IFSS did not have its own programme with actions, but had to bring together various programmes of different ministries [74]. This coordination was tasked to a directorate within the agricultural department that had neither much administrative capacity nor authority to coordinate a complex policy. Its emphasis on agricultural production did not fit into the problem frames of other departments and thus discouraged these departments from actively participating. Permissiveness and lack of authority further reduced the commitment to join. The blurring of budgets, that were allocated by sectors and labelled for specific activities, was not allowed, which prevented the emergence of joint projects and programmes. Despite the good intentions, the silo approach dominated, and linkages with other sectors remained vague [24].
Adaptability. The IFSS was motivated by the rapid change in food prices. It shows some understanding of the volatility of the issues and the need to establish arrangements that could facilitate adaptability. It aimed to coordinate activities for monitoring vulnerability to hunger and malnutrition and for predicting food shortages. It also presented some activities to anticipate food emergencies. Further, the strategy endorsed the strengthening of a decentralised planning system by highlighting the need for additional resources and technical support, which, if realised, would increase adaptability. However, in practice less was realised. Despite significant investments, the IFSS has not established an appropriate information system. Various institutional constraints, such as for example the formalised disjuncture between national and provincial government [76], hindered opportunities to flexibly align activities across levels and sectors, as is required for rapid and flexible responses to emergencies [48].

Inclusiveness. The strategy recognised the importance of equity in its remit, but it did not meet the expectations in practice. The promised multi stakeholder platforms were not installed and stakeholder dialogues with civil society actors and communities were minimal [24]. Because the leading department was not able to move from its focus on a prosperous agricultural by the predominately white commercial sector, there was less involvement from the black majority, who suffered most from the food insecurity problems.

Transformative capacity. The IFSS belonged to the post-apartheid policies, all aimed to address the adverse impact of apartheid and move the country forward as a unity [74]. It included an innovative blend of mechanisms to stimulate and support programmes that would engage creatively with food insecurity [74]. Whilst the IFSS was good on paper and came at an opportune time in the South African political context, it has not achieved many of its goals [74]. Existing institutional structures, reflecting existing power constellations, hindered the implementation of the proposed food system governance arrangement. There were no dedicated funds for government to spend on food security that could have changed the path dependency whereby the current siloed budget system encourages continual non-collaboration and implementation of relevant programmes in a disjointed manner [24]. Leadership also failed to open up lock-ins in the traditional and closed agricultural policy community.

Analysis of the South Africa Integrated Nutrition Programme (INP)

After the first democratic elections in 1994, several nutrition intervention programmes were implemented under a comprehensive national strategy to combat malnutrition. The major response to malnutrition in the country has been the Integrated Nutrition Programme (INP) [77]. The programme has been based on internationally accepted best practice, has a comprehensive set of interventions, and emphasises the social determinants of nutritional health. The INP, which is frequently updated, has three main components: health facility-based nutrition programmes and strategies; community-based nutrition programmes and strategies; and nutrition and HIV and AIDS support programmes and strategies [78, 79]. The INP is intended to replace previously fragmented nutrition programmes with a more integrated approach. It aims to address broader political and economic forces that impact the health and nutritional status of the population. In so doing its intention is to work cooperatively with other sectors and the communities involved; and to raise awareness of local and global issues affecting food production and supply. A
review of the INP as well as a Landscape Analysis resulted in the repositioning of nutrition and nutrition-related issues and actions [79].

System-based problem definition. The INP adopted the United Nations Children Fund’s (UNICEF’s) conceptual framework on undernutrition, which outlines the multiple causes of undernutrition operating at various levels in society. This framework provides a broad system-based analysis of malnutrition in general, but requires contextual analysis to make it locally applicable. It is not clear how the framework was translated into a comprehensive meaningful story for the specific situation in South Africa.

Furthermore, the problem frame is based in a primary healthcare within the INP, with less attention on issues of agricultural production or environmental outcomes [78]. Despite its broad problem frame, the main pillar (in terms of budget) of the programme became the National School Nutrition Programme [74].

Boundary-spanning structures. The INP is situated within the Nutrition Directorate of the Department of Health. The plan aimed to organise several linkages with other departments such as Education (i.e. school feeding programme), Finance (i.e. taxation and subsidies), Agriculture (i.e. food gardens), Environmental Affairs (i.e. fortified foods), and Social Development (i.e. child grants). However, the actual integration between these departments has been suboptimal due to weak coordination structures that impede cooperation across scales [78]. A multi-sectoral nutrition working group, which was intended to include various departments and partners including actors in industry, academia, and development partners, was poorly activated. This working group was necessary to play a key role in advocating for greater attention to nutrition focusing on priority interventions, and to promote better coordination among the different actors [80].

Adaptability. The Nutrition Directorate was expected to develop a comprehensive information plan that would underpin an effective monitoring and evaluation system to guide implementation. This would ensure the adaptation of interventions to the local situation. Despite these objectives, a systematic, coordinated effort and proper monitoring system have not emerged. The collection and utilisation of available information at provincial and district level should be a priority to ensure appropriate targeting and resource allocation towards the most needy [78].

Inclusiveness. Officially, the targeted population consisted of nutritionally vulnerable communities and groups [74]. The idea was to implement the INP at the level of population, community sites, households, health facilities, and schools. However, these ambitions got stranded. The Landscape Analysis, designed to assess the country’s readiness to accelerate action in nutrition, among others revealed that nutrition actors held different views on the major causes and priorities of nutritional problems facing South Africa [79]. The dominant perception was that nutrition action consisted of the provision of food parcels and food gardens revealing a very narrow response to malnutrition [79]. This revealed a lack of multi-actor involvement and response across society, which was heralded as a key tenant of the INP. Further limitations have occurred at community level, with an inability to facilitate a comprehensive approach at this level [78].
Transformative capacity. From inception, the INP advocated for transformative policy changes in relation to these issues. The idea was to develop strategic capacity at national and provincial level to identify and open up path dependencies and lock-ins. This strategic capacity was intended to foster political will, negotiate agreements, respond to challenges and opportunities, build relationships between nutrition actors, and undertake strategic communication with varied audiences. However, inadequate human resources have been identified as the most significant contributors to the lack of progress [74]. Also, advice to modify the ambitious objectives defined in the INP based on analysis of the context and available resources has not been followed [78].

Analysis of the LandCare programme

In 1997, the Government of South Africa through DAFF introduced the LandCare programme to reduce degradation of natural agricultural resources by recognising and addressing its primary causes, in particular in the former Homelands, where black South Africans were relegated under Apartheid spatial planning [56]. The overall objective of LandCare has been to optimise productivity and the sustainable use of natural resources, leading to greater productivity, food security, job creation, and a better quality of life for all [58]. The concept of ‘care for the land and the land will care for you’ provides the underlying philosophy [81]. The programme is frequently updated. Nowadays, the programme is organised around four thematic areas: soil care, water care, veld care, and junior LandCare [58].

System-based problem definition. The programme was designed on a system-based analysis of the problem by recognising and addressing the vicious circle whereby degradation of natural resources has a direct and significant impact on those living in rural areas, who respond to increasing pressure with unsustainable agricultural practices, which in turn cause further degradation of natural resources [81]. Therefore, the programme deliberately aimed to link natural resource issues with agricultural production, food security, capacity building, and poverty alleviation. However, through the years, the focus has narrowed to enhancing sustainable farming systems, in particular conservation agriculture [58]. It is telling that a search of peer-reviewed literature yielded no studies that had assessed the natural resource management component of the LandCare Programme in South Africa.

Boundary-spanning structures. LandCare aims to span boundaries by building public–private partnerships. For example, DAFF, a Provincial Department of Agriculture, and private sector stakeholders can form a partnership with a local community in order to collectively prepare specific project plans and proposals and implement those that are selected and financially supported [81]. In doing so, it blends together national policies and bottom-up initiatives. Furthermore, in 2006, South Africa initiated the African LandCare network to develop synergies across countries [58]. However, at all governmental levels (regional, national, provincial), agricultural departments dominate the programme with very few linkages with other departments. This dominance is reflected in the funding structure. Previously, the LandCare programme was funded from the South African poverty relief fund, and since 2005 it has been funded from the budget allocated to DAFF [81].

Adaptability. One of the core tenets of the LandCare programme is that it contributes to reducing vulnerability to erosion and climate change. However, the ability of the programme to flexibly react to
Inclusiveness. Officially, equity is a core aspect of the LandCare programme. As a grass-roots programme, theoretically supported by both the public and private sector, LandCare stimulates partnerships at local level required to address locally relevant issues. However, land in South Africa is a very sensitive topic. Whilst the programme aims to address the inter-relatedness of ecosystem degradation with poverty, it struggles to tackle the broader structural and historical inequities embedded within the South African food system [59]. This limits the inclusivity of the programme.

Transformative capacity. Although promising on paper, the strategy of aligning natural resource management and poverty alleviation can only yield meaningful results if inequalities based on the historical, political, and social path dependencies are addressed [82]. If not and despite some short-term relief, long-term sustainability will not be achieved. Furthermore, evidence of policy effectiveness (or lack thereof) is, of course, important for future planning. Given the small size of the programme over the past 20 years, Greenberg [83] qualifies it as “a drop in the ocean”, that serves more as a poverty-alleviation exercise than as a real attempt to alter land management systems and methods in an ecologically sustainable way. Furthermore, he concludes that leadership is lacking, because the LandCare programme is not a serious component of DAFF’s work [83]. This is largely a result of an inadequate budget that arguably reveals a lack of political will to drive the processes required to address long-standing issues.

5. Discussion

Diagnosing the three arrangements

On paper the three programmes showed many strengths and some weaknesses with respect to the five principles. They were all motivated by a perceived lack of synergy between the various existing individual sector policy initiatives addressing food security. To overcome these shortcomings, all three programmes were based on a system-based problem framing, a high level of boundary-spanning ambitions and plans for advanced monitoring systems. They all linked food security with other issues that are important for the food system, but they also had their blind spots. Biodiversity issues, for example, were only mentioned in the LandCare programme, health issues only in the INP, and food prices and market issues only in the IFSS. They also all lacked a more integrative narrative that linked the various issues; this could have contributed to internalising the system-based problem framing and to making it more sustainable for the longer term. Whereas LandCare included a range of food system actors, IFSS and INP were -even on paper- predominantly government focused with less inclusion of private and civil society actors. A minor weakness of all three programmes was the limited attention to adaptability in terms of flexible rules and self-organisation.

Despite the attempts to develop more integrated food strategies, the results have been disappointing [80]. Although the programmes were promising on paper, the implementation has been sub-optimal. This was not caused by inappropriate policies or lack of knowledge about relevant solutions. Rather, the tensions
between the ambitious objectives of the policy programmes and the administrative constraints of implementing them are key to explaining the ultimate difficulties. Weak coordination structures, budget and funding rules that impede collaboration, inadequate human resources, and inflexible administrative procedures, were identified as the most significant contributors to the lack of progress. On a deeper level we revealed tensions between the promising policy documents and the stubborn implementation practices, or between ambitious objectives and institutional constraints. If DAFF is charged with coordinating the IFSS, reversion to a single agricultural problem frame is perhaps not surprising. If a relatively weak directorate in the Ministry of Health is mandated to implement the INP, it cannot be expected to foster strategic capacity and political will. And if sensitive land reform issues are not being addressed in a LandCare programme, the depoliticised programme will never become more than ‘a drop in the ocean’. Most importantly, if programmes provide only limited room for reflexive debates amongst a variety of stakeholders, even the most innovative plans will become paper tigers.

Reflection on the five principles framework

The five principles can mutually reinforce, balance or weaken one another. For example the lack of boundary spanning across departmental silos during the implementation resulted in a reversion to a single problem definition, which in turn further reinforced the exclusion of other state and non-state actors. The limited inclusion, in particular of those most affected by food insecurity, indirectly caused the reverse to a technical depoliticised problem frame, that could be seen as an important reason for the lack of political attention and the limited allocation of resources. Adaptability cannot be realised at a national level only, and thus became a weak element due the lack of boundary spanning across jurisdictional scales and the minimal involvement of local governments and communities. These findings confirm our theoretical assumption that the five principles together allow for a much more comprehensive diagnosis than an analysis based on just one principle.

We also revealed that the principle of transformative capacity underlies the other four principles. Transformative leadership in the agenda setting phase resulted in ambitious plans with attention for all principles. However, leadership failed to facilitate transformative change of the constraining institutions in the implementation and enforcement phase. A major reason why South Africa falls short of implementing food insecurity policies in a system-changing manner is that food insecurity is not simply a technical issue that can be addressed by programmes run by existing departments. Overcoming food insecurity requires a systematic approach and political will to challenge vested interests, dominant ideologies, bureaucratic traditions, political cultures, and distribution problems in the food system. However, a food system governance approach is impossible without institutional reforms within governmental departments, which in turn requires transformative capacity [85]. This aligns with the literature stating that change in governance institutions is required to enable new forms of governance that more appropriately deal with the wicked problem of food security [86].
Applying a system perspective inherently touches upon the question of system boundaries. In the introduction we departed from an ideal definition of a food system that includes all activities in the commodity chain (producing, distributing, trading, consuming of food); all interactions across scales (time, space, jurisdiction); all food security outcomes (access, availability, utilisation, nutrition) and all environmental outcomes. This definition results in a very broad and ambiguous system boundary. During the application of the framework we followed a pragmatic approach. While it is good to have a very broad problem definition that covers many elements, you cannot expect that all the related subsystems and actors are equally involved. Therefore we already qualified a principle as strong if more subsystems/actors were involved than usual and if they were not explicitly (for political reasons for example) excluded. This pragmatic boundary construction requires more conceptual elaboration.

**Practical use and relevance of the framework**

Our five principles framework has helped to diagnose the strengths and weaknesses of South African food system governance arrangements, both on paper and in practice. An important but not very surprising lesson, is that the framework can only be applied in collaboration with scholars who have in-depth knowledge of the governance practices of a country and can distinguish between the formal and hidden transcripts [84]. If not, our analyses would have shown a much more positive picture. During the workshops we did not systematically check our framework but we experimented with some of its elements and got a first idea of its meaning for practitioners and policy makers. Based on our introduction of food system governance the workshop members identified many interesting hindrances. The civil servants, for example, mentioned that despite their ambitions they continue to work in their silos; that local, provincial and national agencies are developing programmes that are running concurrently; and that they lack skilled capacity and human resources to implement more holistic plans. Private actors, for example, mentioned their lack of understanding about governance; the unclear status of governmental interventions; and the difficulty of joint actions of business actors, farmers and civil servants. Interestingly, workshop members also identified opportunities for innovation and seeds for transformative change. Using elements of our framework thus helped to raise awareness of governance and its difficulties, go beyond blaming and disqualifications, and co-produce recommendations.

Finally, we want to show the policy relevance of our framework to diagnose new food governance developments. In 2014, the South African Cabinet endorsed the new Integrated Food and Nutrition Security Initiative [87]. This new policy replaced the IFSS and is based on a broad problem definition that links food security to nutrition security. It identifies four specific dimensions (adopted from [88]): adequate availability of food; accessibility; utilisation, quality, nutrition, and food safety; and stability of the food supply. Similar to the IFSS, this initiative recommends inter-sectorial coordination and a real integration of existing policies. In contrast to the IFSS, however, the policy suggests that DAFF is no longer the coordinating department and that the work is guided, motivated and led by the Presidency, with each element championed by a specific ministry, supported by various other ministries and departments. Based on our analysis we qualify this as a strength. Applying our five principles framework already helps
to diagnose some serious weaknesses. These include poor inter sectoral consultation (partial boundary
structures), a lack of stakeholder engagement (limited inclusiveness), direct control of government with
little space for private actors and local governments (limited adaptability), and unclear legal status
(limited authority to enforce transformative capacity) [80]. Again, this new programme runs the risk to
get stranded in a vicious cycle that is characteristic for many South Africa reform plans: “increased
regulation is followed by more noncompliance, leaving the citizens without effective governance
structures and deepening the rift between the aspirations of the developmental democratic state and its
actual achievements on the ground” [76].

6. Conclusions

This article aimed to diagnose what type of governance arrangements are good for sustainable food
security in Africa in view of a food system perspective. By their nature, food governance systems are
fragmented and most existing governance arrangements that address food-related issues are poorly
equipped to deal with food in a holistic and inclusive way. This article presented a framework of five
related principles underlying appropriate food system governance arrangements, and used it to diagnose
three food governance arrangements in South Africa. By applying the framework we could identify some
explanations for the disappointing outcomes: a reversion to a technical one-dimensional problem framing
during implementation and inherent depoliticising; the dominance of single departments; the limited
attention on flexible responses, which is crucial given the increased vulnerability due to climate change
and volatile world markets; and a lack of stakeholder involvement. A more general conclusion is that the
tensions between the ambitious objectives of the arrangements and the institutional constraints of
implementing them can persist because of inadequate resources to facilitate transformative change.

A limitation of this study is that we have analysed only governmental programmes, and further research
on private governance arrangements could add to our insights. In particular, it would be important to
analyse whether Glasbergen and Schouten’s [55] finding – that only a combination between public and
private governance arrangements will be able to realise paradigmatic change in environmental systems –
also applies to the governance of food systems in South Africa. Second, we suggest further elaborating
the five principles framework in other contexts, such as local communities, regions, and international
arenas, and parts of the world with different governance traditions. Third, we suggest using the
framework for large N studies to develop a database on food system governance arrangements and
generate quantitative results. Fourth, we suggest to analyse if these principles could also be used to design
or improve food system governance arrangements. Finally, we suggest translating the framework into an
attractive tool that can be used in reflective workshops with policymakers and other stakeholders to learn
about their food governance practices.

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Conflict of Interest statement

The authors declared that they have no conflict of interest.

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