



---

# Counties as hubs for stimulating investment in agrifood sectors in Kenya

A review of aquaculture, dairy and horticulture sectors in selected counties

Ingrid Coninx and Catherine Kilelu



---

# Counties as hubs for stimulating investment in agrifood sectors in Kenya

A review of aquaculture, dairy and horticulture sectors in selected counties

Ingrid Coninx<sup>1</sup> and Catherine Kilelu<sup>2</sup>  
With support of Ann Kingiri, Simon Kimenju and Ann Numi

1 Wageningen Environmental Research

2 ACTS

Wageningen Environmental Research  
Wageningen, March 2020

---

Reviewed by:  
Irene Koomen, Senior Expert (WCDI)

Approved for publication:  
Corine van As, teamleader of Regional Development and Spatial Use

3R Kenya Report 015  
Report 3008  
ISSN 1566-7197

---

Coninx I., and Kilelu C., 2020. *Counties as hubs for stimulating investment in agrifood sectors in Kenya; A review of aquaculture, dairy and horticulture sectors in selected counties*. Wageningen, Wageningen Environmental Research, Report 3008. 44 pp.; 1 fig.; 16 tab.; 15 ref.

Abstract (NL): Sinds de introductie van de decentralisering in Kenia zijn de regionale overheden aan zet om de socio-economische ontwikkeling in de regio te stimuleren. Veel van deze ontwikkeling wordt gedreven door de agrifood sectoren. Deze studie is erop gericht om te verkennen hoe deze regionale overheden zich positioneren ten opzichte van de agri-foodsectoren. Een analyse is uitgevoerd op de regionale ontwikkelingsplannen en ook zijn mensen van bedrijven en overheden geïnterviewd. De resultaten laten zien dat de regionale overheden vooral gericht zijn op het verbeteren van productiviteit, toegevoegde waardecreatie en marketing. Die doelen worden bereikt via beleidsinstrumenten zoals het financieren van infrastructuur, goedkoper voorzien van diverse inputs en het aanbieden van training- en adviesdiensten. Hoe meer volgroeid een sector is, hoe meer instrumenten te vinden zijn die gericht zijn op het versterken van institutionele governance en innovatie systemen, terwijl de private sector zelf de rol opneemt om de productie-investeringen te financieren. Dit is duidelijk te merken in de melksector en in de tuinbouwsector. Alle sectoren, aquacultuur, melk en tuinbouw hebben baat bij sterkere publiek-private sector samenwerking en overheden nemen best ook een sterkere rol op om ondersteunend beleid op te stellen omtrent prangende issues zoals duurzaamheid en voedselveiligheid.

Abstract (UK): Since the introduction of a devolved system of governance in Kenya in 2010, counties have been positioning themselves as hubs for catalysing socioeconomic development across the country, most of which is hinged on agrifood sectors. Based on analysis of the County Integrated Development Plans (CIDPs) and interviews with private sector and governmental officials, this study explored how county governments support investment in selected priority agrifood sectors: aquaculture, dairy and horticulture. The results show that county governments mainly aim to improve productivity, value addition and marketing. Financing infrastructure and providing inputs and extension and advisory services are the most common types of interventions. The more mature the sector, the more support county governments aim to provide to strengthen institutional governance and innovation systems, while the private sector is investing in integrated supply chain systems. This is observed in both the dairy and horticulture sectors. All three sectors would benefit from stronger public-private sector collaboration, but guided by governments that put in place supportive policies, laws and regulations to promote nutrition-sensitive, sustainable and safe agrifood systems.

Keywords: food system, policy intervention, county level, agrifood sector, support

The pdf file is free of charge and can be downloaded at <https://doi.org/10.18174/522332> or via the website [www.wur.nl/environmental-research](http://www.wur.nl/environmental-research) (scroll down to Publications – Wageningen Environmental Research reports). Wageningen Environmental Research does not deliver printed versions of the Wageningen Environmental Research reports.

© 2020 Wageningen Environmental Research (an institute under the auspices of the Stichting Wageningen Research), P.O. Box 47, 6700 AA Wageningen, The Netherlands, T +31 (0)317 48 07 00, [www.wur.nl/environmental-research](http://www.wur.nl/environmental-research). Wageningen Environmental Research is part of Wageningen University & Research.

- Acquisition, duplication and transmission of this publication is permitted with clear acknowledgement of the source.
- Acquisition, duplication and transmission is not permitted for commercial purposes and/or monetary gain.
- Acquisition, duplication and transmission is not permitted of any parts of this publication for which the copyrights clearly rest with other parties and/or are reserved.

Wageningen Environmental Research assumes no liability for any losses resulting from the use of the research results or recommendations in this report.



In 2003 Wageningen Environmental Research implemented the ISO 9001 certified quality management system. Since 2006 Wageningen Environmental Research has been working with the ISO 14001 certified environmental care system. By implementing the ISO 26000 guideline, Wageningen Environmental Research can manage and deliver its social responsibility.

---

# Contents

	<b>Verification</b>	<b>5</b>
	<b>Shortened forms</b>	<b>7</b>
	<b>Summary</b>	<b>9</b>
<b>1</b>	<b>Introduction</b>	<b>13</b>
	1.1 Devolution and agricultural sector development	13
	1.2 Methodology	14
	1.2.1 Sampled counties	14
	1.2.2 Data collection and analysis	15
	1.2.3 Analytical framework	16
	1.2.4 Limitations of the study	16
<b>2</b>	<b>Challenges in the sectors as outlined by the county governments</b>	<b>17</b>
	2.1 Main crops, livestock and fish in the counties	17
	2.2 Overview of challenges of the aquaculture, dairy and horticulture sectors noted in counties	19
	2.2.1 Aquaculture sector challenges in the selected counties, as described in the CIDPs	19
	2.2.2 Dairy sector challenges in the selected counties, as described in the CIDPs	20
	2.2.3 Horticulture sector challenges in the selected counties, as described in the CIDPs	21
<b>3</b>	<b>Policy objectives and interventions to support agrifood sector development</b>	<b>23</b>
	3.1 Counties' policy objectives and interventions for the aquaculture sector	23
	3.2 Counties' policy objectives and interventions for the dairy sector	26
	3.3 Counties' policy objectives and interventions for the horticulture sector	28
	3.4 Cross-sectoral objectives	31
	3.5 Implementation gap in CIDPs	32
<b>4</b>	<b>Catalysing private sector investment for agrifood sector development</b>	<b>33</b>
	4.1 The aquaculture sector	33
	4.2 The dairy sector	35
	4.3 The horticulture sector	37
<b>5</b>	<b>Conclusion and recommendations</b>	<b>39</b>
	<b>References</b>	<b>42</b>
	<b>Annex 1 Interviews</b>	<b>43</b>

---

---

# Verification

Report: 3008

Project number: 5241499

Wageningen Environmental Research (WENR) values the quality of our end products greatly. A review of the reports on scientific quality by a reviewer is a standard part of our quality policy.

Approved reviewer who stated the appraisal,

position: Senior Expert (WCDI)

name: Irene Koomen

date: maart 2020

Approved team leader responsible for the contents,

name: Corine van As

date: maart 2020





---

# Shortened forms

AI	artificial insemination
ASDSP	Agriculture Sector Development Support Programme
CIDP	County Integrated Development Plans
FFEPP	Fish Farming Enterprise Productivity Programme
FFV	fresh fruits and vegetables
FNS	food and nutrition security
GDP	gross domestic product
IT	information technology



---

# Summary

Since the introduction of devolution in Kenya in 2010 (Republic of Kenya, 2010), counties are becoming hubs for catalysing socioeconomic development across the country. Agriculture, arguably a key economic pillar of the country, is one of the important sectors whose functions have substantially been devolved to county governments. Building on previous efforts of the national government, counties have identified and prioritised specific agrifood chains and positioned these as strategic to their requisite agrifood sector development (ASDSP, 2019; Chipeta et al., 2015). This report presents findings of an exploratory study conducted under the 3R Kenya project that sought to understand how county governments have positioned themselves to foster agrifood sector development, with a focus on the aquaculture, dairy and horticulture sectors. The study was focused on a selection of 10 counties and sought to look at:

- how selected agrifood sector development challenges are framed by the 10 selected county governments
- what policy objectives are formulated to support the development of these sectors
- what policy interventions have been planned to support the sectors
- the types of investment being made by private sector actors and their perspectives on investment opportunities.

The analysis is based on a detailed review of the first cycle of the five-year County Integrated Development Plans (CIDPs) of 2013–2017, with a follow-up quick review of the 2018–2022 plans. The review was complemented by interviews with 17 private sector actors and 11 government officials. We also relied on the 3R Kenya sectoral quick scans that were made in the beginning of the 3R Kenya project in 2016.

The findings demonstrate that county governments have a good understanding of the many challenges that the three sectors experience in each context. The challenges related to integrated supply chain systems are fairly well understood, with all counties facing similar supply chain challenges – including high costs, unreliable and poor quality inputs, limited marketing, poor storage and resultant post-harvest losses – although there are some differences between the sectors. However, the challenges of institutional governance and innovation are barely mentioned, except that the lack of extension services is on the agenda of most counties.

All county governments aim to support the three sectors to improve production, and many also aim to support value addition and marketing. These objectives relate to the production and supply chain development systems. However, a key issue that is critical to enabling competitive and sustainable sector development is that of food quality and safety, and this is receiving only limited mention in the CIDPs.

The new CIDPs 2018–2022 reveal that most counties are adding new objectives to their policy agenda. Counties mainly support sectors by financing infrastructure at farm and county level and by providing cheaper inputs and extension and advisory services. The more mature the sector, the more that interventions take place in the innovation and institutional governance systems. However, the review sections in the CIDPs 2018–2022 show that county governments struggle to actually implement these interventions, particularly those in the institutional and governance systems, partly due to lack or delay of funds and lack of capacity. County governments would benefit from support in setting up public–private partnerships, research–practice collaboration and helping actors in the private sector to access credit and finance.

The aquaculture sector receives county support mainly to strengthen integrated supply chain systems. Common policy interventions are financing infrastructure at farm and county level, providing subsidies for input and providing extension and advisory services. In the new CIDPs 2018–2022, we observe that interventions to strengthen institutional governance are planned. The aquaculture sector is not

---

yet well supported on aspects related to the innovation system, apart from extension and advisory services. Private funds can be catalysed to finance farm-level infrastructure. Public-private collaboration would assist in the provision of cheaper inputs and extension and advisory services. We recommend that county governments continue to build road infrastructure and design strong policy frameworks to avoid overfishing and to secure fish quality and safety. Private sector actors advocate for county governments to support various types of collaborations, such as stronger farmer cooperatives; stimulate market demand through awareness campaigns; and help them access credit and finance.

The dairy sector is mature compared to the aquaculture and horticulture sectors. The descriptions in the CIDPs of the different challenges faced and support needed to strengthen the integrated supply chains reflect this difference in the sector's development, as do the institutional governance and innovation systems. However, the review sections of the CIDPs 2018–2022 have indicated some struggles in implementing the interventions to strengthen the institutional governance and innovation systems. The private sector invests in infrastructure at farm and county levels. Areas to catalyse further private investment are improving product quality and modernisation of the sector. We recommend, in line with the new CIDPs, that county governments further organise policy interventions to foster collaboration, encourage research-practice collaboration and strengthen the requisite policy and regulatory framework. Emerging issues like climate change are entering the policy agenda, but it is remarkable that issues of milk quality and food safety had only limited policy support at the county level, according to the CIDPs. Investment in quality and safety was also a clear request by the interviewed private actors, mainly by improving cooling systems, modernisation, value addition, new product development, packaging and training as well as integrating traceability systems.

The horticulture sector is also mature. County governments mainly aim to improve the sector's competitiveness and innovativeness and already support the sector with the most extensive range of policy interventions, compared to the other sectors. The support is more or less the same in all counties, with interventions to strengthen the supply chain, institutional governance and innovation systems. The county governments struggle to set up the research-practice collaborations and some other interventions for the institutional governance system. Issues such as soil fertility, water availability and pests and diseases are entering the policy agendas, but the challenges of food safety and quality are still not high on these agendas. This sector has significant potential to catalyse private investment to address production challenges related to pests and diseases, water issues and seed quality. The private sector also plays a role in financing sector modernisation and value addition. Public-private collaboration is recommended to improve irrigation, hybrid extension and advisory services for better production and pest control. Stronger policies are requested on food quality and safety.

Based on the insights of the study, we developed a number of recommendations to guide in identifying areas for support and intervention:

- **Complementing CIDPs with agrifood sector plans**

The CIDPs provide broad development visions for the counties, covering the different sectors. While agrifood sectors' development objectives and interventions are articulated in the CIDPs, the plans do not describe in detail the potential opportunities and areas for investment in each sector. This indicates the need to develop specific strategic and investment plans for the agrifood sectors in each county that would build on the CIDPs and outline in greater detail how to drive investment for sustainable development. Such plans should borrow lessons from and align with the national agricultural investment plans that are promoted through the African Union's Comprehensive Africa Agriculture Development Programme process.

- **Investment mapping**

Using public-private partnerships to drive competitive, sustainable and inclusive agrifood sector development is a key policy instrument that is increasingly being promoted. While partnerships can mobilise and also rationalise investments in sectors, there is need to put more effort into making them work better. We see that public investment still remains key in driving sustainable sector growth, especially for bigger infrastructure, and cannot be wholly replaced by private sector

---

investment. Thus competitive, sustainable and inclusive agrifood sector development needs better, evidence-based guidance on how to make partnerships more effective and impactful.

- **Supporting county governments to implement policy interventions**

The new CIDPs 2018–2022 all evaluated the implementation of CIDPs 2013–2017. It was observed that many of the planned policy interventions described in the plans have not been implemented. This is because of a wide range of challenges in financing; funds disbursement; human resource capacity both in terms of skills and available personnel; infrastructure; meaningful stakeholder engagement; unpredictability of external factors, including those related to climate shocks; and limited adaptive capacity. Many of these challenges relate to institutional governance systems; given the importance of governance in strengthening both integrated supply chains and innovation systems, we recommend that development partners in the agrifood sector build the capacity of counties to implement policy intervention and regulatory frameworks, set up public–private partnerships and help sectors access credit and finance.

- **Support foresight in policy development and implementation**

Agrifood sectors in Kenya, as elsewhere, are operating in a context where emergent issues related to how sectors can be robust, resilient and reliable continually shape the development trajectory. For example, issues such as food quality and safety – which are increasingly noted to affect the competitiveness of the sector – are not yet on the policy agendas at county level. Impacts from climate change, and recently from pandemic, continue to affect agrifood sector development and investments. Current environmental, social (inclusive) and economic sustainability concerns and other future threats related to agrifood systems development require strategic foresight in policymaking, policy implementation and investment. This means there is need to build the requisite system capacities for innovation and adaptation. It is important that the counties' investment decisions are guided in a way that is forward in thinking. We therefore recommend that county governments and private sector actors are supported to develop policies and implementation frameworks and to make related investment decisions that are guided by strategic foresight.



---

# 1 Introduction

## 1.1 Devolution and agricultural sector development

Since the introduction of a devolved system of governance in Kenya in 2010 (Republic of Kenya, 2010), counties are being considered the drivers of sustainable and equitable development. The county governments are now the hubs for catalysing socioeconomic development across the country. This implies that counties need to position themselves well to attract the necessary investment to spur sustainable economic growth. They are doing this by providing business opportunities and by setting up public–private partnerships that will create employment and improve the livelihoods of their residents. The 47 county governments have taken over the responsibility of service delivery and oversee a range of sectoral development issues at the local level, in areas that include agriculture, health services, water, culture, transport, trade, planning and development (Republic of Kenya, 2010; World Bank, 2012).

Agriculture, arguably a key economic pillar of the country, is one of the important sectors whose functions have been substantially devolved to county governments. This places counties at the centre of driving sustainable agrifood sector development to enhance food and nutrition security, accelerating equitable socioeconomic progress and reducing poverty in the country. This is in line with Vision 2030 and the national government’s Big Four agenda for 2017–2022, where food and nutrition security is one of the four key pillars of national sustainable development. However, levels of agricultural productivity are low, and the vast potential for enhanced sustainable growth and commercialisation of agrifood sectors is not realised in most counties. Revitalising and transforming the agricultural sector as part of a sustainable, competitive food system is a key priority for all counties. The counties have taken on service delivery-oriented functions – such as providing extension services, promoting marketing, enforcing regulations and developing and implementing agricultural development programmes – to drive sustainable sector growth (Chipeta et al, 2015; Njagi et al., 2015; Republic of Kenya, 2010).

Building on previous efforts of the national government, counties have identified and prioritised specific agrifood value chains as strategic to their requisite agrifood sector development (ASDSP, 2019; Chipeta et al., 2015). Counties use favourable policy and legal frameworks – coupled in some cases with strategic sector plans – to attract investment to these agrifood value chains to make inclusive, innovative, commercially oriented and sustainable agrifood sectors. County governments are encouraged to use the national Agricultural Sector Transformation and Growth Strategy 2019–2029 to strengthen their policy interventions in the agricultural sector (GoK, 2019). Nevertheless, budget monitoring reports indicate that county governments allocate only about 6% of their annual budgets to the agriculture sector, which is not adequate given the sector’s importance. Furthermore, this is significantly below the 10% target budget allocation that was set for national governments through the Africa-wide Malabo Declaration (Njagi et al., 2015; OCOB, 2019). The limited public investment by counties in agriculture points to the need to catalyse investment opportunities for the private sector to inject additional resources to transform the sectors.

This report presents findings of an exploratory study conducted under the 3R Kenya project (see Box 1) that sought to understand how county governments have positioned themselves to foster agrifood sector development. The study contributes to understanding about the dynamics of county government planning in enabling sustainable growth in the agriculture sector and food systems transformation. It specifically examined how counties frame sector challenges (Chapter 2) and articulate their policy objectives and interventions to stimulate the necessary public and private investment for agricultural sector growth (Chapter 3). The study also explored what aspects of sector development can rely on catalysed private funds, opportunities for public–private partnerships and pending investment opportunities (Chapter 4). The study focused on three key high value sectors – aquaculture, dairy and horticulture – as these play an important role in food and nutrition security in

---

Kenya and are also the agricultural sectors that are supported by the Embassy of the Kingdom of the Netherlands, the funders of the 3R Kenya project. The study looked at the first cycle of County Integrated Development Plans (CIDPs) of 2013–2017 and has updated these findings by reflecting on the second cycle of CIDPs (2018–2022). These are important documents, which form the basis of policy articulation of county governments. Additional insights were sought through interviews with selected county government officials and private sector actors working in the counties where the study was conducted.

#### Box 1: The 3R Kenya project

The 3R Kenya project seeks to contribute to improved agrifood sector performance, with a focus on aquaculture, dairy and horticulture in Kenya. It is an applied research and learning initiative that generates insights and engages stakeholders in these insights with a main focus on how to support a sustainable, market-led and inclusive agrifood sector and therefore increase food security. 3R Kenya is funded by the Embassy of the Kingdom of the Netherlands (EKN) in Kenya within the scope of the food and nutrition security programme.

More information can be found at <http://www.3r-kenya.org/>.

## 1.2 Methodology

The study compares how county governments aim to support the development of the aquaculture, dairy and horticulture sectors in their areas. The focus on these sectors is particularly of interest to the 3R Kenya project because of the sectors' centrality in the food and nutrition security programme of the Dutch government in Kenya. The focus on FNS has been to enable the development of commercial and market-driven sustainable farming and food systems, for which the three agricultural sectors hold a lot of promise.

This exploratory study served several objectives:

- to compare counties' articulation of policy challenges, objectives and interventions and to understand how they support and catalyse investments in the sectors
- to provide an overview of the enabling policy environment at the county level to potential investors and development partners interested in supporting and investing in the three sectors
- to make recommendations about how county governments can further strengthen their interventions to support sector development and to catalyse private sector investments.

The key research questions in the explorative study were:

- How are selected agrifood sector development challenges framed in the 10 selected county governments? (Chapter 2)
- What policy objectives and interventions have the county governments outlined to support the development of these three sectors? (Chapter 3)
- What investment opportunities would help to catalyse private funds? What opportunities are there for stronger public–private partnerships, as defined by the private sector actors? (Chapter 4)
- What observations and recommendations can be identified in relation to counties' positioning in driving investments for agrifood sector development? (Chapter 5)

### 1.2.1 Sampled counties

To answer the research questions, 10 counties were selected for this study by using the following criteria:

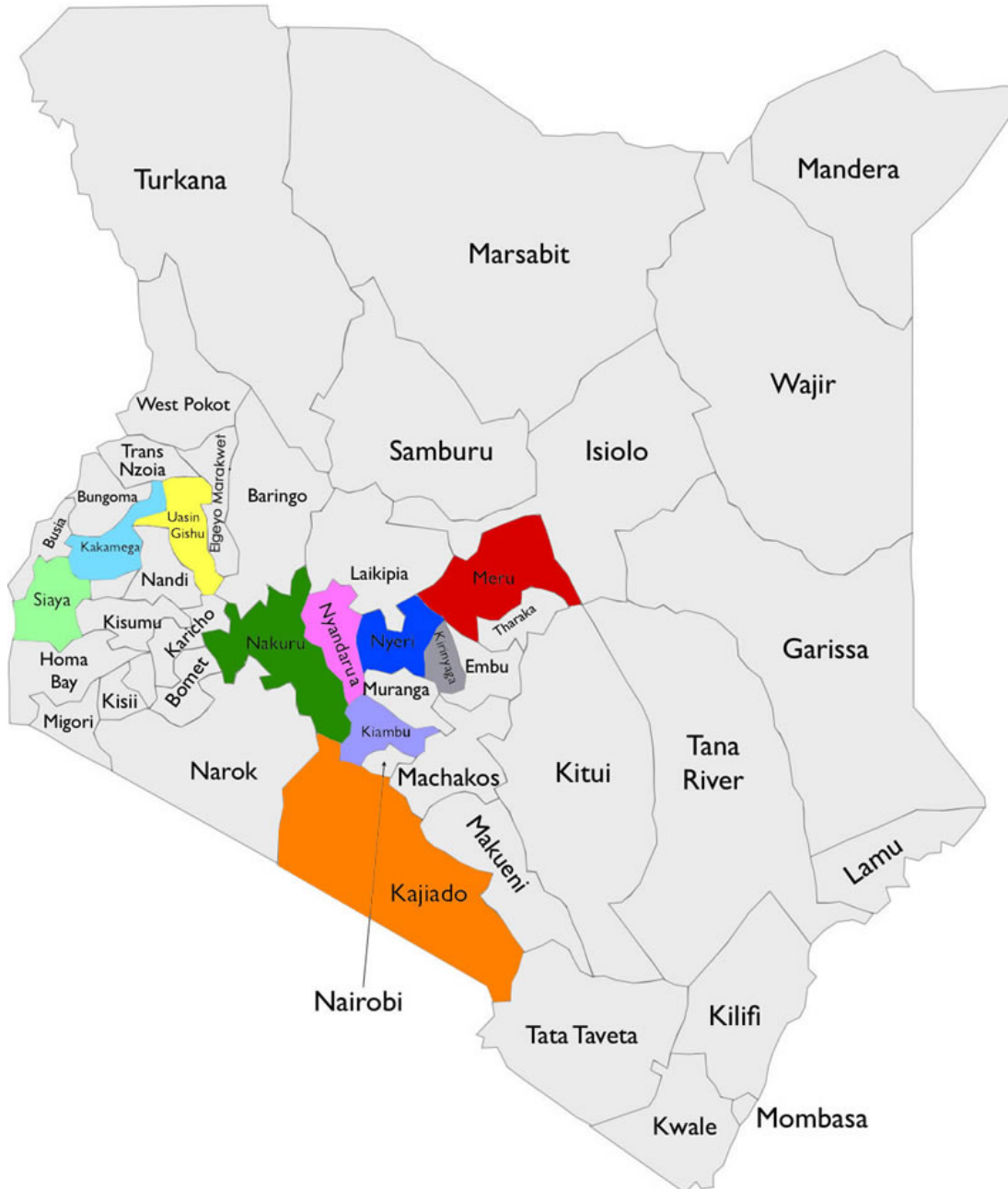
- that the sectors being examined are important in the county, as identified in the Agriculture Sector Development Support Programme (ASDSP)
- that the county is implementing the programmes supported under the FNS programme of the EKN
- that together the counties cover a range of different agroecological zones



- that the counties have proximity to major markets and are at a partial (subjective assumption) stage of policy development.

Based on the outlined criteria, the following counties were selected for each sector:

- **Aquaculture:** Kakamega, Kiambu, Kirinyaga, Nakuru, Nyeri and Siaya
- **Dairy:** Kiambu, Kakamega, Kiambu, Meru, Nakuru, Nyandarua and Uasin Gishu
- **Horticulture:** Kajiado, Kiambu, Kirinyaga, Meru, Nakuru, Nyandarua, Nyeri, Uasin Gishu



**Figure 1** Map showing the 10 selected counties

### 1.2.2 Data collection and analysis

Data were collected between May and October 2017. The data comprised:

- Document review of CIDPs 2013–2017; these are the main documents in which the counties describe their vision and strategy. We updated the findings by reflecting on the new CIDPs (2018–2022) of the selected counties.

- 
- Key informant interviews with 10 county officers in charge of agriculture and livestock in each of the counties and one respondent from the national government.
  - Interviews with 17 private sector respondents that were selected through a snowballing approach. During the interviews with public officers, we asked for contacts with private sector actors that have invested significantly in the sectors during the past years.

The data was analysed in a structured and comparative manner through content analysis, categorisation and comparative methods.

### 1.2.3 Analytical framework

To understand sector development, 3R Kenya has relied on the approach guiding the 3R Kenya project that focuses on three subsystems: the integrated supply chain system, the institutional governance system and the innovation system.

- Integrated supply chain system: the interactions and exchanges between different supply chain actors, including input (seed) and finance providers, production and processing agents and retail and trade enterprises
- Institutional governance system: the policies, standards and markets for supply chain actors that create and enable the business setting
- Innovation system: the critical players that support innovation (research, extension, dedicated projects).

This analytical framework of systems is used to cluster policy objectives and policy interventions, as well as opportunities for further investment.

Policy interventions are categorised according to common methods used in policy analysis, which groups them as instruments of the following types: financial, information, collaboration/network, knowledge and regulatory. But to avoid loss of detail, more than five categories are constructed to better understand the type of support for sector development.

### 1.2.4 Limitations of the study

The findings of this explorative study have to be interpreted with the following limitations in mind:

- We relied mainly on CIDPs developed in 2013 for the period 2013–2017, and we have added any new relevant findings based on our quick review of CIDPs 2018–2022. While the CIDPs are important development planning documents, they do not provide detailed agricultural sector strategies for their counties. Such sector-specific strategy documents were not available in most counties.
- Some information appeared to be very difficult to get, such as data on agriculture sector budget allocation and the level of investment in the sectors through private sector ventures in the county.
- Our data collection and analysis took place in the period right before the elections, making it difficult to access some key informants in the government agencies.
- The private sector actors were identified through snowballing approach that relied on the guidance of the government officers; this means we may have overlooked some relevant actors.
- The study did not examine regional economic blocks that have emerged to bring together a number of counties with the goal of leveraging joint investment beyond an individual county. The six regional economic blocks that have now been established are a new coordination structure that aim to guide counties in attracting investment opportunities. However, future analysis should pay attention to these regional economic blocs that are touted as the new engines of transformation that will accelerate development. How these units pool resources and present investment opportunities that drive the sustainable and robust agrifood sector development would be interesting to study.

Nonetheless, we have been able to develop a good understanding of the diversity of policy approaches to the sectors among the counties and have identified some recommendations for EKN, county officers and development partners.

---

## 2 Challenges in the sectors as outlined by the county governments

### 2.1 Main crops, livestock and fish in the counties

All the selected counties have diverse mixed farming systems. Most farmers grow a variety of crops and keep different livestock. The production of the different crops and livestock is not equally distributed across the counties, but depends on the various agroecological zones as determined by rainfall patterns and soils. Nonetheless, some crops and livestock are key in each of the counties in terms of their potential for commercialisation and contribution to socioeconomic development of the counties (see Table 1). The characterisation of which crops, livestock and fish are key is based on various parameters such as the acreage dedicated to the crop, the number of households growing or keeping the livestock and fish and the economic value in terms of what are considered cash crops.

Notably, the county governments inherited several national government initiatives such as the ASDSP after taking over most of the agricultural sector development functions, although there remains overlap in some functions. Through stakeholder consultation as part of these earlier efforts, the priority agricultural sectors were identified in the specific counties. The county governments continue to support and stimulate development and investment in these identified sectors even as they determine new priority areas. In some counties, different crops or livestock are emerging in sectors that are gaining prominence, for example fish farming in Kirinyaga or horticulture in Uasin Gishu.

The analysis in this chapter zooms in specifically on the positioning of the three key agricultural sectors which are of interest for the 3R Kenya project – aquaculture, dairy and horticulture – within the selected counties. We provide an overview of these sectors, which is followed by a rapid analysis of their notable challenges at county level, as noted in the CIDPs 2013–2017. These challenges have generally remained the same in the second cycle of CIDPs. This provides the entry point for understanding how counties catalyse investment in these sectors to leverage sustainable commercialisation and contribute to socioeconomic development.

**Table 1** Summary of main crops, livestock and fish in the selected counties as mentioned in the recent CIDPs (2018-2022) In bold are the crops and livestock of focus in this study, which have been indicated as high potential value chains.

	Coffee	Maize	Beans	Bananas	Pigeon and cow peas	Potatoes (Irish or sweet)	Tea	Rice	Finger millet and sorghum	Cassava	Wheat	Sugarcane	Cut flowers	Groundnuts	Cotton	Horticultural crops	Dairy cattle	Sheep	Pigs	Poultry	Goats	Fish
<b>Kajiado</b>		x	x	x	x	<b>x</b>										<b>Tomatoes and various vegetables</b>	x	x	x	x	x	x
<b>Kakamega</b>		x	x	x	x	x	x	x	x	x		x				Tomatoes, arrowroot	<b>x</b>	x	x	x	x	<b>x</b>
<b>Kiambu</b>	x	x	x	x		x	x									<b>Various vegetables, fruits, e.g. pineapples</b>	<b>x</b>	x	x	x	x	x
<b>Kirinyaga</b>	x	x	x	x		x	x	x								<b>Horticulture (tomatoes, mangoes)</b>	<b>x</b>	x	x	x	x	<b>x</b>
<b>Meru</b>	x	x	x	x	x	x	x	x	x		x					<b>Various vegetables, mangoes, citrus</b>	x	x	x	x	x	x
<b>Nakuru</b>	x	x	x	x		x	x				x		x			<b>Various vegetables, tomatoes, peas, carrots, onions, French beans</b>	x	x	x	x	x	<b>x</b>
<b>Nyandarua</b>		x	x	x	x	x				x	x		x			<b>Horticulture (peas, cabbage, carrots)</b>	<b>x</b>	x	x	x	x	x
<b>Nyeri</b>	x	x	x			x	x						x			<b>Various vegetables</b>	x	x	x	x	x	<b>x</b>
<b>Siaya</b>		x	x	x	x	x		x		x		x		x		Vegetables and fruits	x	x	x	x	x	<b>x</b>
<b>Uasin Gishu</b>		x				x					x					<b>Horticulture</b>	<b>x</b>	x				x

## 2.2 Overview of challenges of the aquaculture, dairy and horticulture sectors noted in counties

### 2.2.1 Aquaculture sector challenges in the selected counties, as described in the CIDPs

Aquaculture is a viable option for contributing to the country's food and nutrition security ambition, particularly in providing affordable, high-quality protein. Aquaculture is especially important because of the declining fish volumes in capture fisheries. Additionally, Kenya's climate is suitable for aquaculture of warm freshwater fish species such as tilapia (*Oreochromis niloticus*), catfish (*Clarias gariepinus*) and cold freshwater fish like rainbow trout (*Oncorhynchus mykiss*) (Munguti et al., 2014).

According to the ASDSP value chain prioritisation process, 11 of the 47 counties listed fish, including aquaculture and captured fisheries, as among their top three value chains to be strategically supported for sustainable commercial development. As aquaculture is a fairly nascent sector, most challenges outlined in the CIDPs of the selected counties relate to enhancing production. To revitalise aquaculture in the country, the national government supported a fish farming enterprise productivity programme (FFEPP) across many counties as part of the economic stimulus program of 2009/10. The expectation was that the programme would translate into a vibrant aquaculture sector with positive economic returns. However, its performance was below expectations due to various challenges that counties continue to contend with and seek to address (Obwanga and Lewo, 2017).

**Table 2** Overview of aquaculture sector challenges noted in the CIDPs of the selected counties

Identified challenges		Kakamega	Kiambu	Kirinyaga	Nakuru	Nyeri	Siaya
<b>Production</b>	Low-quality fish seed/fingerlings	■		■	■	■	■
	High cost of feed	■		■	■	■	■
	Limited skills of farmers / limited technology adoption	■	■	■	■	■	■
	Low uptake of aquaculture		■			■	■
	Poor breeding programmes/practices			■			
	High equipment and investment costs			■	■		
	Porous soils that cannot hold water				■		
<b>Supply chain</b>	Limited value addition				■		
	Limited well-established markets (linkages)	■		■			
	Limited market information	■					
	Lack of cold storage infrastructure	■			■		
<b>Institutional governance</b>	Poaching and overexploitation of capture fisheries	■			■		■
	Lack of cooperation in managing common natural resource						■
	Lack of other legal/regulatory frameworks, including quality surveillance					■	■
	Political interference and poor design of sector development programmes			■			
<b>Innovation system</b>	Insufficient extension service delivery (technical staff) who are underresourced; lack of extension delivery guidelines	■	■		■	■	■
	Limited aquaculture research support	■					
	Lack of accurate data on the sector	■					

Coloured cells in Table 2 indicate that the specific challenge is mentioned in the respective CIDP. As Table 2 shows, low-quality fish seed and feed coupled with limited skills of fish farmers are the key challenges across the counties. The timely availability of high-quality inputs is a challenge recognised by the county governments. This is confirmed in a recent study (Obwanga and Lewo, 2017) that points to similar issues that limit the growth of the sector. Counties such as Siaya, with high potential, are characterised by low uptake of aquaculture. There are also challenges related to market development and access. Some of the institutional governance challenges are poaching and

overfishing, as well as challenges on lack on regulations related to food quality. Additionally, poor surveillance and enforcement of feed and fingerling quality negatively impact the sector. On innovation issues, insufficient extension service delivery is a concern in most of the selected counties. These observations were also noted by Obwanga and Lewo (2017) who further pointed out the problem of overlapping responsibilities between the key institutes related to research, training and extension at county and national levels.

### 2.2.2 Dairy sector challenges in the selected counties, as described in the CIDPs

Kenya has a vibrant dairy industry. The sector contributes 14% of the agricultural gross domestic product (GDP), 40% of the livestock sector GDP and 4% of the national GDP. The industry is currently growing at an average rate of 5–7% per year. It provides employment to over 1.2 million citizens (KDB, 2015). There are over 1.8 million smallholder milk-producing households that own one to three cows, which aggregate to over 80% of the national dairy herd (estimated at 4.2–6.7 million cattle). Milk yields of small-scale producers in Kenya are about 5–8 litres per cow per day, while large-scale farmers typically reach yields of 17–19 litres per cow per day (KDB, 2015). The dairy sector contributes immensely to food security and nutrition and has the potential to reduce poverty, particularly in the rural areas. Annual per capita milk consumption in Kenya is estimated at 145 litres – more than five times the milk consumption in other East African countries – and is expected to reach 210 litres by 2030. The growth of the sector can be sustained by the growing demand for milk and milk products in Kenya, and by a private sector that is willing to invest. The private sector has been a key driver of the sector’s development. For counties that consider dairy as a major sector, their potential to benefit from this projected growth depends on how they address the key limiting factors impeding sector development.

In the ASDSP prioritisation assessment, 27 of the 47 counties identified dairy as one of the top three value chains they sought to sustainably develop (ASDSP list provided by project). Our analysis focused on six counties located in the Central and Rift Valley regions, which are high dairy potential areas in the country.

**Table 3** Overview of dairy sector challenges noted in the CIDPs of the selected counties

Identified challenges		Kakamega	Kiambu	Meru	Nakuru	Nyandarua	Uasin Gishu
<b>Production</b>	Low productivity and production of milk	■					■
	Production system not optimally (sustainably) intensified						■
	Predominantly low-quality breed of cattle	■					■
	Limited technology transfer and adoption (e.g. artificial insemination)		■			■	
	Inadequate genetics services	■	■	■		■	■
	High cost of and poor access to fodder and pasture			■	■	■	■
	High cost of inputs			■	■	■	■
	Pest and disease management challenges	■	■	■	■	■	■
<b>Supply chain</b>	Poorly developed milk marketing supply chain (fluctuations, pricing, licensing)	■	■	■	■		■
	Inadequate milk storage (cold chain) facilities		■	■	■		
	Limited value addition				■		■
	Milk quality challenges				■	■	■
	Milk payment not quality-based				■		
	High interest rates of finance		■		■		
	High energy costs		■	■	■		
	High cost of labour			■			
<b>Institutional governance</b>	Suboptimal land sizes (complicated land tenure system)		■				
	Lack of strong cooperatives		■		■	■	
	Limited capacity for quality feed testing			■			
	Limited regulatory capacity to enforce standards				■		
<b>Innovation system</b>	Weak linkage between research, extension and producers; limited extension support	■					■

---

The coloured cells in Table 3 indicate that the specific challenge is mentioned in the respective CIDP. At the production level, the issues of poor access to and high cost of quality fodder are common across all counties. This is a key challenge in dairy farming in Kenya, since feed makes up about 60% of milk production costs and most dairy farmers struggle to access affordable and quality fodder year-round. Equally important in five of the six counties is the challenge to access quality genetics services, which is a foundation to improved dairying. This must be accompanied by good dairy farming practices, including disease management. In relation to the supply chain, poorly coordinated and structured milk marketing systems are noted in most counties. Some issues are more specifically located, such as the high cost of finance in Kiambu and the high cost of labour in Meru. Lack of strong cooperatives is noted as a challenge in the dairy sector in three counties, although this is also true in most dairy-producing regions. Compared to the sector issues analysed in the 3R Kenya quick scan (Bebe et al., 2016), the counties appear to underestimate the problems related to milk quality and safety. Also, the highly fragmented market is not described as a challenge, and the issues of the formal vs. informal market are not mentioned at all.

### 2.2.3 Horticulture sector challenges in the selected counties, as described in the CIDPs

The horticultural sector has grown significantly over the past 20 years, providing employment to many Kenyans. The sector comprises a huge range of crops, making it particularly difficult to characterise. Since the early 2000s, Kenya's fresh fruits and vegetables (FFV) sector has received a great deal of attention due to the rapid and sustained growth of its exports to Europe (Muendo et al., 2004). Yet despite this growth, exports remain a small fraction of Kenya's overall horticultural sector. In 2016, the total value of FFV generated in the country amounted to US \$1.46 billion, of which the export revenue was US \$310 million (21%), while the domestic market generated US \$1.15 billion (79%) of the total value (HCD Validated Report, 2016-2017). While the export market remains important for sector growth, a more active focus on the potential and constraints of domestic horticulture in Kenya offers huge opportunities for investment and sustainable growth of the sector.

According to the ASDSP value chain prioritisation analysis, 17 of the 47 counties identified at least one horticulture commodity as one of their top three value chains to be supported through the programme interventions. The analysis focuses on eight of the counties that indicated some horticultural crops as a key value chain.

**Table 4** Overview of horticulture sector challenges noted in the CIDPs of the selected counties

	Identified challenges								
		Kajiado	Kiambu	Kirinyaga	Meru	Nakuru	Nyandarua	Nyeri	Uasin Gishu
<b>Production</b>	High cost of inputs (seeds, fertilisers, pesticides)								
	Poor quality of the inputs (e.g. certified seeds)								
	Soil infertility (degradation) challenges								
	Low adoption of and access to technologies (including for climate change adaptation) and low yields								
	Unpredictable and inadequate rainfall and climate change effects								
	Low mechanisation								
	Pests and diseases								
	Limited irrigation (overreliance of rainfall)								
<b>Supply chain</b>	Poor marketing (access, infrastructure, intermediaries, information)								
	Poor storage and high post-harvest losses; farmers selling at lower prices; price volatility								
	Inefficient market chains (lack of information)								
	High cost of labour								
	Limited value addition								
	Limited access to affordable credit (banks averse to financing farming enterprises)								
<b>Institutional governance</b>	Lack of strong horticultural crops cooperatives/ farmers organisations								
	Shrinking agricultural land sizes; inadequate spatial planning								
	Regulatory implementation gaps (e.g. packaging)								
	Lack of systems for quality assurance, especially related to pesticide use								
	Poor/limited infrastructure to support export/domestic marketing								
<b>Innovation system</b>	Limited innovation (with research/extension link)								
	Limited extension services to enhance farmers' (innovation) skills								

The coloured cells in Table 4 indicate that the specific challenge is mentioned in the respective CIDP. As noted in Table 4, the counties consider comparable production challenges in the horticulture sector. These challenges include high cost and poor quality of inputs (seeds, fertiliser, etc.), which contributes to the low adoption of technology. This compounds further the challenge of controlling pests and diseases that heavily affect horticultural crops, which was mentioned to be a challenge in four of the eight counties. Additionally, the counties face some similar supply chain issues, such as poor marketing, poor storage and resultant post-harvest losses, which cut across all counties. All the other supply chain issues mentioned affect at least half the counties, except that Kiambu is the only one affected by access to affordable credit. Some institutional challenges affect half of the counties, such as lack of strong farmers' cooperatives, while others are specific to counties, such as Nyandarua mentioning the issue of produce packaging regulation. Another innovation system challenge is the limited extension services to help farmers, affecting more than half the selected counties. Compared to the sectoral challenges that were assessed in the 3R Kenya horticulture quick scan (Matui et al., 2016), we observe that food safety issues are gaining only limited attention from the county governments.



### 3 Policy objectives and interventions to support agrifood sector development

This section presents the analysis of county policy objectives and interventions as outlined in CIDPs (2013–2017) aimed at supporting specific agrifood sectors. The objectives were analysed to understand how the county governments aim to catalyse investment to develop these sectors and value chains. The objectives were categorised into three broad systems: integrated supply chain, institutional governance and the innovation system. Further, the analysis looked at the different types of policy interventions that counties have crafted to enable them to attain their objectives. These interventions are organised using a policy intervention framework that categorises interventions into financial, information, organisational, knowledge and regulatory interventions (Hood and Margetts, 2007). Applying this policy intervention framework to the CIDPs has resulted in subcategories of interventions that fall within these five mentioned categories.

#### 3.1 Counties’ policy objectives and interventions for the aquaculture sector

Six of the counties analysed in this study focus on aquaculture value chain development and have identified the following policy objectives shown in Table 5.

**Table 5** Summary of policy objectives for aquaculture value chain (CIDPs 2013–2017)

	Policy objective	Kakamega	Kiambu	Kirinyaga	Nakuru	Siaya	Nyeri
<b>Production (as part of integrated supply chain)</b>	Enhance fish production	■	■	■	■	■	■
	Promote sustainable fish stock for both capture inland fisheries and aquaculture				■	■	
	Reduce fish disease		■				
<b>Integrated supply chain</b>	Enhance value addition, including processing			■	■	■	■
	Improve fish marketing	■			■	■	■
	Enhance fish safety and quality assurance				■		
<b>Institutional governance</b>	Promote economically viable and strong cooperative societies				■		

All six counties want to enhance fish production. Two counties clearly express that production should be sustainable. Kiambu wants to address fish diseases. Some counties focus on aquaculture production, and others emphasise their capture fisheries. Related to the supply chain, value addition and improved marketing are key for most counties. Nakuru is the only county that had objectives related to institutional aspects of promoting cooperative societies formation.

In the second generation of CIDPs (2018–2022), Kirinyaga has added the objectives of improving fish marketing and enhancing institutional efficiency. Kirinyaga also refers to the “Blue Economy”, which is the sustainable use of marine and freshwater resources to create economic value. Siaya still pays significant attention to promoting sustainable fisheries resources and enhancing fish production but has also explicitly mentioned the objective to enhance fish safety and quality. Nakuru intends to focus on fewer objectives compared to the 2013–2017 plan, mainly on revival of fish farming, sustainable fishing and enhancing value addition. Kakamega also aims to reduce fish disease and improve quality of inputs; however, no specific interventions have been found that support these objectives. Nyeri has

---

added the objective of enhancing fish safety and quality assurance via a fish-processing facility. Kiambu plans to invest in improving access to the market and marketing support to the sector.

To achieve these objectives listed in Table 5, the counties have defined various policy interventions to support the aquaculture sector and catalyse investment (see Table 6).

The information in Table 6 illustrates that most counties support the aquaculture value chain by providing inputs or subsidies for inputs, by providing extension services and by financing infrastructure, mainly at the county level. This approach fits well with sector needs, since the sector would benefit from mainly long-term investments to get to the next stage of development (Obwanga et al., 2017). All counties consider the need for extension and advice to support the aquaculture sector in its growth and development. This is very much needed given the limited production, management and entrepreneurial skills of many beginning farmers (Obwanga et al., 2017). The review sections in the CIDPs 2018–2022 illustrate that county governments have largely succeeded in organising this type of policy intervention. Most county governments seem to promote collaboration, such as public–private partnerships, and provide some details of how this will be done. However, the review sections rarely mention achievements in terms of collaboration. We also observe that several counties had aimed to improve access to credit and finance, but none have mentioned successes in the CIDPs 2018–2022; this intervention has probably been more difficult to organise. These two types of interventions, collaboration and access to finance, are related to the institutional governance system and will need further strengthening in the coming years. Less common interventions are strengthening legal and regulatory frameworks in order to support sector development. Regulatory interventions are clearly limited but are needed, especially for the nascent aquaculture subsector. With regard to the innovation system, we observe that hardly any intervention has been planned. To conclude, the county governments are mainly positioning themselves by supporting the production and supply chain systems. They intend to support the institutional governance system as well but have not yet succeeded in achieving these interventions.

**Table 6** Summary of planned and implemented policy interventions to support the aquaculture value chain during 2013–2017

Type of interventions		Examples of proposed interventions						
<b>Integrated supply chain system</b>	Finance infrastructure	<b>Farm level:</b> Construct ponds, install water tanks and introduce modern aquaculture technology (cages)			*			
		<b>County level:</b> Fish breeding/multiplication station; fish landing stations; storage, processing and cooling facilities; construct modern fish produce markets; set up an aqua park; fridge van; fish factory; fish auction centre; recirculatory system; fish feed mill	*	*				*
	Provide subsidies for inputs	Stock ponds and supply feed and fingerlings; provide quality and affordable farm inputs and fish gear	*	*				*
<b>Institutional governance system</b>	Foster collaboration	Public-private partnerships in seeds and feed production, co-manage fisheries resources, trade promotion committee, community participation, stakeholder partnerships, international aquaculture stakeholders symposium		*				
	Promote farmer organisations (cooperatives, producer groups)	Form farmer groups, promote farmer-based marketing organisations, elect beach management units and training/mentoring officials			*			*
	Legal frameworks and regulation	Regulatory framework to remove destructive gear, collect fish production fees, fish safety and quality standard spot checks, control fishing effort via patrols			*			*
	Improve access to credit and finance	Establish a trust levy fund, low interest loans, credit schemes						
<b>Innovation system</b>	Provide extension and advisory services	Training in fish production, post-harvest handling, value addition and breeding technologies; feed formulation; field demonstrations and demo farms; establish training centres; train the trainers; promote good practices;		*				*
	Organise information collection and improve access to information	Information technology (IT) systems for marketing, monitoring tools for water quality, collect timely and accurate data, suitability surveys, farm surveys						*
	Promote research-practice partnerships	Strengthen liaison with researchers at the University of Eldoret, Dominion Fish Farm and Sagana Aquaculture Centre to develop high-quality fish breeds						
	Other interventions	Two "Eat more fish" campaigns, promote fisheries, awareness campaigns				*		*

Grey fill: County intends to support, according to CIDP 2013–2017

\* : County's actual support during 2013–2017 as mentioned in CIDP 2018–2022

## 3.2 Counties' policy objectives and interventions for the dairy sector

The six counties in the study that seek to promote dairy have outlined various policy objectives to stimulate the sector's development. These broadly relate to enhancing production, increasing marketing and value addition and strengthening institutional governance of the sector via stronger cooperative societies. There are some small differences between the counties in terms of the selected objectives as summarised in Table 7.

**Table 7** Summary of policy objectives of counties for spurring dairy sector development

	Policy objectives	Kakamega	Kiambu	Meru	Nakuru	Nyandarua	Uasin Gishu
<b>Production (as part of integrated supply chain)</b>	Increase livestock/dairy productivity by technology adoption and use of improved inputs	■	■	■	■	■	■
	Reduce livestock diseases	■	■	■	■	■	■
<b>Integrated supply chain</b>	Increase value addition of dairy products	■	■	■	■	■	■
	Improve marketing/access to market	■	■	■	■	■	■
<b>Institutional governance</b>	Promote economically viable and stronger cooperative societies	■	■	■	■	■	■

All counties seek to increase productivity of the dairy sector, mainly by adopting technology and using improved inputs. Most counties also aim to reduce livestock diseases, which affect production. To enhance the supply chain, some counties aim to improve marketing and increase value addition of dairy products. Most counties aim to develop stronger institutional governance through promoting economically viable and stronger cooperative societies. The second generation of CIDPs (2018–2022) show that most counties have expanded their objectives. Meru is now also focusing on value addition of dairy products. Nyandarua now also focuses on improving the quality and safety of food products. Kiambu has added the objectives of value addition and market access to its plan. Nakuru has the same objectives as for the past CIDP but has chosen a more focused set of policy interventions. Kakamega has added the objectives of stronger cooperatives, reducing pests and diseases and improving access to the market. Uasin Gishu maintained the same set of objectives.

The objectives are to be achieved through the following set of policy interventions (Table 8).

**Table 8** Summary of policy interventions to support the dairy value chain

	Type of interventions	Examples of proposed interventions	Kakamega	Kiambu	Meru	Nakuru	Nyandarua	Uasin Gishu
<b>Integrated supply chain system</b>	Finance infrastructure	Provide milk coolers, milk processing plants, storage facilities, tannery, farm livestock feed processing plant, labs for diagnosis of disease, markets, vaccine cold storage, agricultural mechanisation station, animal multiplication centres, genetic resource centre, pasteurisers, resource centre, feed mixers, pulverisers, milk vending machines, biogas units, cattle dips, slaughter houses	*	*	*	*	*	*
	Provide subsidies for inputs	Purchase cattle and dairy goat breeds, finance employment of artificial insemination (AI) providers, provide quality and affordable farm inputs, fodder, livestock breeding programmes, vaccines, fodder store	*	*	*	*	*	*
<b>Institutional governance system</b>	Foster collaboration	Set up and strengthen public-private partnerships, trade promotion committee, form intercounty trade development forum, revive collapsed cooperatives, mobilise community, collaborate with nationally and internationally funded programmes		*				
	Promote farmer organisations (cooperatives, producer groups)	Promote the formation of dairy cooperatives and farmer-based marketing organisations, capacity-building of cooperative societies, amalgamate weak societies to enjoy economies of scale, form fodder producer groups			*			
	Legal frameworks and regulation	Control livestock movement, feed quality control, livestock breeding policy, create disease-free zone, license AI providers, regulate animal movements by controlling issue of permits, taxes		*		*		
<b>Innovation system</b>	Improve access to credit and finance	Funding to livestock, tax incentives, low interest rate loans, credit schemes, vouchers, subsidies to encourage farmers to stay in production, smart cow investment, establish farmers saving and credit cooperative societies, revolving fund, community-based lending organisations, tax reduction						
	Provide extension and advisory services	Livestock model farms, field days; training in feed management, breeding and housing; training in production systems and value addition; learning centres; demo sites for dairy goat development; business planning; vaccination; training in tick control; establish training centres; support demonstration sites; train the trainers; promote AI services; farmer field schools; feed formulation value addition; disease sampling, treatment and advice programme; husbandry practices; train stakeholders in disease control						*
	Organise information collection and improve accesses to information	Census of all classes of livestock, fill in forms to gather information about highly pathogenic avian influenza collect disease information for early warning and response, value chain analysis, develop global information networks, livestock identification and traceability, register animals with Kenya Stud Book, register dairy cattle and goats					*	
	Promote research-practice partnerships	Establish agricultural research and resource centres, industrial research and development agency, expand research capacity at Kenya Agricultural & Livestock Research Organization						

Grey fill: County intends to support, according to CIDP 2013-2017

\*: County's actual support during 2013-2017 as mentioned in CIDP 2018-2022

To a large extent, the counties have similar policy interventions to achieve their objectives. Many of these interventions are focused on the integrated supply chain systems, since all counties did intend to support the dairy sector by financing infrastructure at county level, financing inputs and providing extension and advisory services. All counties also aimed to improve the institutional governance system by promoting farmer organisations and easing access to finance. The review sections of the new CIDPs have illustrated that the counties largely succeeded in financing infrastructure and inputs and providing extension and advisory services. But only little evidence was found of actual success in promoting farmer organisations, and no evidence was found that access to credit and finance had been improved. Based on these review sections, it can be concluded that counties have some difficulties implementing interventions in the institutional governance and innovation systems, despite their intentions to improve these systems. The main conclusion is that counties have positioned themselves to support the dairy sector by supporting the integrated supply chain system. Strengthening the institutional governance and innovation systems is also at the core of the counties' strategies but appears to be more difficult to achieve. The new CIDPs 2018–2022 show that counties are starting to position themselves with regards to some emerging issues such as climate change. However, despite the current challenges of milk quality and food safety for the dairy sector, we see little evidence that counties intend to implement policy interventions to address these issues. We also observe that the policy interventions remain silent about the large existing informal milk sector. The new policy interventions in the current CIDPs (2018–2022) show that more county governments – Nyandarua, Kiambu and Kakamega – intend to develop policy and legal framework to support the dairy sector. Kakamega also plan to make use of traceability programmes and information to support sector growth and want to promote agricultural research to support innovation, mainly with regard to climate change.

### 3.3 Counties' policy objectives and interventions for the horticulture sector

Eight of the sampled counties have the horticulture sector as a priority. Their objectives are described in Table 9.

**Table 9** Summary of policy objectives for horticulture sector

	Policy objectives	Kajiado	Kiambu	Kirinyaga	Meru	Nakuru	Nyandarua	Nyeri	Uasin Gishu
<b>Production (as part of integrated supply chain)</b>	Increase horticulture productivity by technology adoption, improved inputs, increased crop diversification and improved soil fertility	■	■	■	■	■	■	■	■
	Improve produce handling and reduce post-harvest losses	■	■	■	■	■	■	■	■
	Improve irrigation/water harvesting for horticulture	■	■	■	■	■	■	■	■
	Reduce plant diseases	■	■	■	■	■	■	■	■
<b>Integrated supply chain</b>	Increase value addition of crops	■	■	■	■	■	■	■	■
	Improve horticultural access to market/marketing issues	■	■	■	■	■	■	■	■
<b>Institutional governance</b>	Promote economically viable and stronger cooperative societies	■	■	■	■	■	■	■	■

All sampled counties that have the horticulture sector as a priority seek to increase productivity, mainly through improving inputs, enhancing technology adoption, increasing crop diversification and improving soil fertility. Improving value addition is another common policy objective. Four counties aim to improve access to market and marketing. Three counties have opted to focus on improving water availability, which also relates to improving productivity. Three counties have outlined objectives related to improved produce handling and reduction of post-harvest losses, as well as reduced plant diseases. Promoting strong and viable farmer cooperatives is an objective in half the counties. In the new CIDPs, we observe a clear ambition among counties to improve the competitiveness and

---

innovation capacity of the horticulture sector as well as an increase in the number of objectives. Kajiado has added the objectives of improving access to the market and dealing with pests and diseases. Kirinyaga now also intends to revitalise the cooperative societies. Meru is now also planning to improve marketing of horticulture objectives as well as improve soil and water conservation to enhance water retention. Nyandarua is working to reduce post-harvest losses. Kiambu also intends to improve marketing and access to market.

To attain these broad objectives, the counties propose a number of interventions as summarised in Table 10.

The results clearly show that the counties apply similar interventions to support development of the horticulture sector. The policy interventions focus on the integrated supply chain system, as well as the institutional governance and innovation systems. The review sections in the CIDPs (2018–2022) show that counties have succeeded in implementing support such as financing infrastructure, mainly at county level, as well as financing inputs. Interventions such as extension and advisory services are implemented largely to strengthen the innovation system. While six of the eight counties intended to strengthen research–practice collaboration for more innovation, we have observed that only one county, Uasin Gishu, actually reported achievement in this area. In the new CIDPs, most counties still have this objective. Kirinyaga has now added this policy intervention to improve research–practice collaboration to the new CIDP. The counties also acknowledge the importance of an enabling environment and they have indicated efforts to strengthen the institutional governance system by promoting collaboration and farmer groups, establishing legal and policy frameworks and fostering access to credit and finance. However, the review sections have indicated only little evidence of such interventions. The objective to implement such policy interventions remains in the new CIDPs. In the new CIDPs, we observe that issues such as soil fertility and water availability are becoming more prominent in the policy strategies. The willingness to further support the sector to deal with pests and diseases remains. Surprisingly, the challenges of food safety and quality are rarely mentioned in the CIDPs.

**Table 10** Policy interventions to support the horticulture sector

Type of Intervention		Examples of proposed interventions	Kajiado	Kiambu	Kirinyaga	Meru	Nakuru	Nyandarua	Nyeri	Uasin Gishu
<b>Integrated supply chain system</b>	Finance technology and infrastructure	<b>Farm level:</b> Provide and promote greenhouses, drip irrigation kits, pumps tanks and piping, micro-irrigation <b>County level:</b> Seed multiplication centre, processing plants, cooling and storage facilities, demonstration sites, set up manufacturing plants, construct modern markets for improved trade, (cold) storage facilities, seed bulking sites, construct fresh produce market sheds, improve existing market facilities, stores, finance facilities for water supply/irrigation, nurseries, machinery hire scheme for farmers, grain drier, facilities to overcome post-harvest losses, processing equipment, soil-testing lab	*	*	*	*		*		*
	Provide subsidies for inputs	Subsidise fertilisers, provide quality and affordable farm inputs (fertiliser and seeds), pesticides, seedlings, equipment for plant clinics		*	*	*	*		*	*
	Foster collaboration	Set up public-private partnerships, facilitate networking and partnerships, trade promotion committee, community participation in environmental management and conservation, empower farmers to participate in policy formulation, tree planting with community, stakeholder partnerships, negotiate in bilateral and multilateral trade, economic cooperation, collaboration with national and international funded programmes		*	*					
<b>Institutional governance</b>	Promote farmer organisations (farmer groups, cooperatives)	Enhance farmer institutions' capacity to purchase fertiliser in bulk, promote farmer-based marketing organisations, capacity-building of cooperative societies, amalgamation of weak societies to enjoy economies of scale, farmer groups		*	*					
	Legal frameworks and regulation	Develop spatial planning laws, enhance enforcement of plans, speed up issuance of title deeds, reduce business licences to single business permit agricultural master plans, review and formulate policies and acts, environmental policies, climate adaptation plan, zone the county								
<b>Innovation system</b>	Improve access to credit and finance	Create revolving funds; link farmers to financial institutions; provide low interest loans; credit schemes; vouchers; attract investors to set up tools and equipment for production; supply firms dealing in inputs, tools and equipment; establish county development bank; provide credit facilities to groups; partner with financial institutions to provide affordable financial services; crop insurance		*			*			
	Provide extension and advisory services	Train farmer groups; train small- to medium-sized enterprises; field demonstrations; farm visits; field days; advise farmers to diversify crops; training centres; training in value addition; demonstration sites; train the trainers; promote good practices; plant clinics; farmer field schools; training in export market requirements, marketing and business skills; training in post-harvest handling; soil fertility management; training in safe and responsible use of pesticides; training in energy conservation	*	*	*	*	*	*	*	*
	Organise information collection and improve access to information	Conduct surveys, surveillance systems; monitor, identify and control pests and diseases; soil analysis kits; field soil sampling; soil analysis reporting systems; markets surveys; land record management; IT systems for marketing; weather data monitoring; study the produce market; study the effects of agriculture levies/taxes on trade; early warning systems					*			
Promote research-practice partnerships	Develop linkages between farmers and research institutions; collaborate between existing institutions, namely Kenya Agricultural Research Institute and Egerton University; increase research capacity; establish agricultural research and resource centres; set up an industrial research and development agency; establish on-farm trials; pathology laboratory									*

Grey fill: County intends to support, according to CIDP 2013–2017

\*: County's actual support during 2013–2017 as mentioned in CIDP 2018–2022



### 3.4 Cross-sectoral objectives

Some policy objectives outlined in the CIDPs are cross-sectoral, aimed broadly at all the sectors, including agriculture (Table 11). Examples are improving road infrastructure, access to water, land-use planning and environmental management with an emphasis on water and soil conservation. Most counties aim to improve road infrastructure, which will contribute to agricultural produce reaching markets. Half the counties want to improve land-use planning as a way to better manage agricultural development in the context of increasing pressure for land by other sectors. Improving environmental management, including water and soil management, was noted in four counties.

**Table 11** Policy objectives related to cross-sectoral issues

Policy objective	Kakamega	Kajiado	Kiambu	Kirinyaga	Meru	Nakuru	Nyandarua	Nyeri	Siaya	Uasin Gishu
Improve road infrastructure		■		■		■			■	■
Improve land-use planning	■	■			■	■				■
Improve water access				■						
Improve environmental management and protection, water and soil conservation			■	■		■				

To achieve these cross-sectoral objectives, many counties have structured their interventions around injecting finance, strengthening legal and regulatory frameworks and developing climate change adaptation plans (Table 12).

**Table 12** Policy interventions to support cross-sectoral issues

Type of support	Examples of interventions	Kajiado	Kakamega	Kiambu	Kirinyaga	Meru	Nakuru	Nyandarua	Nyeri	Siaya	Uasin Gishu
Finance water infrastructure	Facilities for water supply, construction of mega dams, excavation of dams, rehabilitation of irrigation schemes	■		■	■		■	■	■	■	■
Finance road infrastructure	Improving road networks	■			■	■		■	■		■
Legal frameworks and regulation	Land-use plans, planning laws, county environmental officers	■	■			■	■	■	■	■	■
Climate change adaptation and environmental protection	Flood mitigation, water and soil conservation		■			■				■	■

---

## 3.5 Implementation gap in CIDPs

The new CIDPs 2018–2022 reviewed the previous CIDPs and revealed an implementation gap, that is, a gap between the interventions that were planned and those that have actually taken place. Counties listed a number of explanations and lessons learned that relate to this gap:

- late disbursement of national funds, affecting the progress of projects
- limited staff and limited capacities
- high costs and late acquisition of inputs
- too many projects with lean capital sourcing, leading to inadequate funding with financial pressure
- poor road infrastructure and therefore county officers are not able to access farmers
- insufficient water for fish production
- unfavourable and unpredictable weather conditions, leading to yield failure, pests and diseases
- lack of stakeholder involvement in planning, prioritisation and implementation of projects, resulting in conflict and frustration
- failure of contractor to carry out work
- weak linkages between partners
- contradictory legislation
- political interference
- lack of spatial planning framework.

These challenges have to be considered in any further support of sector development.

---

## 4 Catalysing private sector investment for agrifood sector development

County governments recognise the role of the private sector in driving agrifood sector development and spurring sustainable economic growth in the sector. They are therefore positioning themselves as investment hubs to attract and mobilise private investors who can establish businesses and invest in the key agrifood sectors. However, to attract private sector interest, the county governments need to signal the specific opportunities available, as well as seek collaboration and partnership with the private sector to jointly spur sector development.

Based on interviews with a number of private sector actors (see Annex), this section describes the types of investment that the private sector has made in the selected agrifood sectors (aquaculture, dairy and horticulture). The actors also indicated the potential investment opportunities they perceive in these sectors. This provides a general understanding of where investments are being made in the sector and, in some respect, links with the sectoral challenges identified in the CIDPs. The section also outlines recommendations made by the private sector in terms of desired support from county governments regarding sector development in the upcoming CIDPs. Such information can be a starting point for county governments to know how to further promote areas of investment. This understanding is useful for:

- understanding investment opportunities to catalyse private investment for sector development
- determining opportunities for public-private collaborations to boost sector development.

### 4.1 The aquaculture sector

The aquaculture sector has been supported by plenty of public investment, including investment by the national and county governments as well as from multilateral organisations and bilateral government collaboration. The national government has boosted the sector through the Economic Stimulus Programme that supported the FFEPP. This support waned with devolution, although a number of counties have prioritised the sector as key to their socioeconomic development and have continued investment.

Private sector actors were interviewed about these government interventions (Table 13, column 2) and they made some recommendations for additional support (Table 13, column 3). They have indicated that they feel supported by the government with regard to financing infrastructure, subsidies for fingerlings, extension and advisory services for farmers, forming cooperatives and the "Eat more fish" campaigns. The private sector also invests in the sector (Table 13, column 4), in particular in infrastructure, inputs and extension services. Given the young development stage of this sector, it is important that investment continues; this is supported in the literature, with Obwanga and Lewo (2018) finding that lack of long-term continued investments is hampering the sector growth.

Based on these findings, we recommend that county governments catalyse private investment in infrastructure at the farm level. However, this might be difficult because not many aquaculture farms have sufficient available investment funds since they have not been operating for long. Public-private partnerships are recommended for extension and advisory services as well as providing inputs. Further, county governments can build road infrastructure and develop strong policy frameworks to avoid overfishing and to secure fish quality and safety. Private sector actors would appreciate county government support for collaborations, stronger farmer cooperatives, awareness campaigns that increase market demand and improved access to credit and finance.

**Table 13** Public and private investments in the aquaculture sector

Type of intervention	Experienced support from government intervention by the aquaculture sector	Investment opportunities for sector growth	Private sector investment
Finance infrastructure	<ul style="list-style-type: none"> <li>Construction of fishponds and fish farms (FEPP)</li> <li>Procurement of deep freezers for fish storage for farmer groups</li> <li>Processing factory and refrigerated truck for transportation</li> <li>Extruder for pelletising fish feed</li> </ul>	<ul style="list-style-type: none"> <li>Promote fish farming</li> <li>Finance fingerling hatcheries</li> <li>Finance the construction of cold storage facilities</li> <li>Finance local fabrication of aquaculture equipment and create a local market for these products, which will be cheaper</li> <li>Finance pond liners to lower the cost</li> </ul>	<ul style="list-style-type: none"> <li>Technologies and infrastructure for optimising production, such as intensive cage farming, local fabrication of hatcheries, liners for raised fishponds</li> <li>Production infrastructure such as water supply systems, hatcheries for fingerling production, pumping systems</li> <li>Value addition such as fish processing (fish fillets, sausages), ornamental fish</li> </ul>
Finance road and electricity infrastructure	<ul style="list-style-type: none"> <li>Construction of roads to make farms more accessible</li> <li>Introduction of electricity to ease pumping water and for cooling</li> </ul>	<ul style="list-style-type: none"> <li>Improve road infrastructure</li> </ul>	
Provide subsidies for inputs	<ul style="list-style-type: none"> <li>Subsidising of fingerling production</li> </ul>	<ul style="list-style-type: none"> <li>Facilitate access to good quality and affordable fish feed and other inputs to farmers at lower production cost</li> <li>Provide raw materials so farmers can manufacture their own feed</li> <li>Restock the river with fingerlings</li> </ul>	<ul style="list-style-type: none"> <li>Financing/providing inputs for fish feed production</li> </ul>
Provide extension and advisory services, including information collection and access	<ul style="list-style-type: none"> <li>Provision of extension officers to train fish farmers in fish handling and preservation techniques</li> <li>Provision of support staff and technical staff to work in the factory to assist cooperatives</li> <li>Training of cooperative members in issues such as management and regulations</li> </ul>	<ul style="list-style-type: none"> <li>Training in good farming practices and sustainable intensification</li> <li>Financial management training</li> <li>Organise exchange visits</li> <li>Capacity-building and sensitising fish farmers to water usage regulations</li> <li>Advise farmers on where to buy certified fish seed</li> </ul>	<ul style="list-style-type: none"> <li>Extension and advisory services such as training in fish production and feed formulation</li> </ul>
Foster collaboration		<ul style="list-style-type: none"> <li>Collaborate with institutions of higher learning to train farmers in improved practices</li> <li>Stimulate market linkages</li> </ul>	
Promote farmer organisations (farmer groups, cooperatives)	<ul style="list-style-type: none"> <li>Financing a cooperative and setting up a memorandum of understanding and action plan</li> </ul>	<ul style="list-style-type: none"> <li>Encourage fish farmers to form cooperative societies, enabling them to share information, easily communicate with county government and easily mobilise funds</li> </ul>	<ul style="list-style-type: none"> <li>Marketing</li> </ul>
Legislation and regulation		<ul style="list-style-type: none"> <li>Regulate and monitor who is selling what to avoid poor quality of fingerlings</li> <li>Legislate on fishing gear</li> </ul>	
Improve access to credit and finance	<ul style="list-style-type: none"> <li>Support in proposal writing to get funds from banks</li> </ul>	<ul style="list-style-type: none"> <li>Provide seed and investment (commercial) capital for farmers and other value chain actors</li> </ul>	
Awareness campaigns	<ul style="list-style-type: none"> <li>"Eat more fish" campaign</li> </ul>	<ul style="list-style-type: none"> <li>Encourage people to plant more trees to prevent rivers drying out and to conserve biodiversity</li> </ul>	

---

## 4.2 The dairy sector

A notable feature of the Kenyan dairy sector is that its growth is largely driven by the private sector. This sector is mature compared to the aquaculture sector and, over the years, has dynamically grown to attract different types of investment at various scales of business. The private sector has an important investment role for sector growth. The private sector actors who were interviewed no longer receive government investment in production infrastructure; instead, this is mainly financed by the private sector (Table 14, column 4). They do still see government investment to improve feeder roads, AI kits and extension services to train dairy farmers (Table 14, column 2). The broad areas of potential investment where county governments can also catalyse these investments are improving dairy animal quality through better breeds, enhancing access to quality feeds, improving milk quality through cooling systems, value addition and new products, digital systems to track milk production, packaging, training and advisory and other input investments. The other broad area relates to modernisation of the sector. Table 14 summarises the insights that were generated from the interviews. The investors acknowledge that the dairy sector could benefit from policy support to foster collaboration, encourage research–practice collaboration and to strengthen the legal/policy framework. Investment opportunities (Table 14, column 3) include technologies to increase sustainable growth of the sector through increasing productivity and producing better quality products. The investment landscape for dairy is much larger than the interviews imply, as the sector attracts many domestic and international investors.

**Table 14** County government interventions to support the dairy sector: experiences and recommendations by the private sector

Type of intervention	Experienced intervention by the dairy sector	Investment opportunities for sector growth	Private sector investment
Finance infrastructure			<ul style="list-style-type: none"> <li>Technologies and infrastructure to optimise production at farm level, such as breeding technologies, machines to package silage, digital farming systems and forage and feed-mixing technology</li> <li>Finance infrastructure beyond the farm, such as feed manufacturing, packaging and processing machinery and coolers and laboratories</li> <li>ATMs</li> </ul>
Finance road and electricity infrastructure	<ul style="list-style-type: none"> <li>Challenges addressed and feeder roads improved</li> </ul>	<ul style="list-style-type: none"> <li>Improve road network</li> </ul>	
Provide subsidies for inputs	<ul style="list-style-type: none"> <li>Provision of artificial insemination kits</li> </ul>	<ul style="list-style-type: none"> <li>Ensure quality and availability of AI to improve breeds</li> </ul>	<ul style="list-style-type: none"> <li>Finance/provide inputs such as hay and raw materials for feed manufacturing</li> </ul>
Provide extension and advisory services, including information collection and access to information	<ul style="list-style-type: none"> <li>Provision of trainers to dairy farmers</li> </ul>	<ul style="list-style-type: none"> <li>Provide extension with practical experience</li> <li>Provide vaccination services</li> <li>Train farmers to improve milk quality</li> <li>Coordinate disease control</li> <li>Support farmer exchange visits</li> </ul>	<ul style="list-style-type: none"> <li>Extension and advisory services such as AI and veterinary services, training in milk quality</li> <li>Value addition and marketing</li> </ul>
Promote research-practice partnerships		<ul style="list-style-type: none"> <li>Support innovations in the dairy sector</li> <li>Fund research to support the sector</li> </ul>	
Foster collaboration		<ul style="list-style-type: none"> <li>Promote public-private partnerships for agriculture technology development</li> <li>Consult dairy sector stakeholders to guide programmes and policy</li> <li>Initiate development projects</li> <li>Support private sector in value addition</li> </ul>	
Legislation and regulation		<ul style="list-style-type: none"> <li>Implement and enforce regulations (e.g. on milk safety)</li> <li>Introduce viable quality-based milk payment systems</li> </ul>	
Improve access to credit and finance		<ul style="list-style-type: none"> <li>Provide investment funds</li> <li>Provide grants to support innovation development</li> </ul>	
Water management		<ul style="list-style-type: none"> <li>Support milk production in the dry areas by improving water provision: dams (renovate old ones or excavate new), boreholes</li> <li>Promote fodder irrigation</li> </ul>	
Raise awareness		<ul style="list-style-type: none"> <li>Encourage buying of milk based on quality instead of quantity</li> </ul>	

---

## 4.3 The horticulture sector

The horticulture sector is oriented to both the domestic and international markets and benefits from significant private investment. This sector is confronted with production challenges, but the private sector (Table 15, column 4) invests in increasing productivity by tackling the challenges related to pests and diseases (biological pesticides, agrochemicals), drought (irrigation schemes, drought-resistant seed varieties) and improving sustainable practices (zero-tillage, circular waste management). The private sector also invests in improving seed and modernising the sector through greenhouses and machines for harvesting, which helps solve problems with finding labour. Private investors also support value addition, by developing new products that meet consumer needs, and their activities support export to the international market and facilitate collaboration between farmers and buyers. The interviewed private actors from the horticulture sector appreciate the county government support (Table 15, column 2) in areas such as financing infrastructure, extension and advisory services and collaborations. County governments have provided land and financed a pack house. Public-private partnerships would help with irrigation infrastructure (column 3), given the challenges that the sector experiences with water shortages, and with extension and advisory services to increase productivity and pest control and other sector needs. The sector would also appreciate help from county governments with regards to transport and packaging policies. County governments can also help promote companies that have high standards of food quality and safety.

**Table 15** County government interventions to support the horticulture sector: experiences and recommendations by the private sector

Type of intervention	Experienced intervention by the horticulture sector	Investment opportunities for sector growth	Private sector investment
Finance infrastructure	<ul style="list-style-type: none"> <li>• Offer land to farmers for stores</li> <li>• Setting up a pack house</li> </ul>	<ul style="list-style-type: none"> <li>• Expand irrigation for more production</li> </ul>	<ul style="list-style-type: none"> <li>• Technologies and infrastructure to optimise production at farm level, such as greenhouses, biological inputs for pests and disease management, potato harvesting machinery (including small-scale) and irrigation equipment</li> <li>• Finance infrastructure beyond the farm, such as water infrastructure, potato processing and storage, cold pack house and pre-grading area</li> </ul>
Finance road and electricity infrastructure	<ul style="list-style-type: none"> <li>• Improved road network</li> </ul>		
Provide subsidies for inputs		<ul style="list-style-type: none"> <li>• Provide subsidised fertiliser and seeds to farmers</li> </ul>	<ul style="list-style-type: none"> <li>• Finance/provide inputs such as clean potato seeds multiplication and distribution, produce bio-pesticides, sell agro-inputs such as fertilisers and pesticides (including organic), develop seeds (improved, drought-resistant)</li> </ul>
Provide extension and advisory services	<ul style="list-style-type: none"> <li>• Provision of extension services</li> <li>• Training of farmers in techniques of tomato and melon pest eradication</li> </ul>	<ul style="list-style-type: none"> <li>• Promote measures to increase farm productivity</li> <li>• Train farmers to increase horticultural production through different measure e.g. soil mapping; improving fertility, input quality and accessibility</li> <li>• Train farmers to grow certified products/improve food standards</li> <li>• Proactive extension provision</li> </ul>	<ul style="list-style-type: none"> <li>• Extension and advisory training in different aspects of production and marketing, such as production of certified products, fertiliser use, soil mapping, etc.</li> <li>• Provide agronomic support</li> </ul>
Foster collaboration	<ul style="list-style-type: none"> <li>• Public-private partnerships</li> <li>• County governments helped programmes identify farmers groups to work with</li> </ul>	<ul style="list-style-type: none"> <li>• Support with reaching farmers in rural areas that investors may not reach</li> </ul>	
Legislation and regulation	<ul style="list-style-type: none"> <li>• National Environment Management Authority regulation</li> <li>• Introduction of levies</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce cess charges on transportation of produce</li> <li>• Enforce packaging policies and implement regulations on packaging</li> </ul>	
Promote marketing	<ul style="list-style-type: none"> <li>• Recommended the use of traps for <i>Tuta absoluta</i> infestations in their farms</li> </ul>	<ul style="list-style-type: none"> <li>• promote the company for people to access market for safe food</li> </ul>	<ul style="list-style-type: none"> <li>• Value addition such as potato chips, vegetable processing, canning factory</li> <li>• Improve marketing (pooled)</li> <li>• Export (French beans, bananas, snow peas)</li> <li>• Contract farmers</li> </ul>



---

## 5 Conclusion and recommendations

Agriculture is an important sector in Kenya, and since devolution in 2010 counties are at the centre of driving sustainable development in the agrifood sector. This explorative study has aimed to analyse how county governments are positioning themselves to support the aquaculture, dairy and horticulture sectors. Based on analysis of CIDPs 2013–2017 and 2018–2022 and interviews with government officials and private sector actors, we reach the following conclusions and follow them with a number of recommendations.

This study has illustrated that county governments are clearly positioning themselves to support the aquaculture, dairy and horticulture sectors.

***What are, according to the county government documents, the main development challenges that the three sectors face? How do they compare with the challenges that were indicated during the 3R Kenya sector quick scans?***

The findings demonstrate that county governments have a good understanding of the many challenges that the three sectors experience in each context. The challenges related to integrated supply chain systems are well understood, with all counties facing similar supply chain challenges – including high costs, unreliable and poor quality inputs, limited marketing, poor storage and resultant post-harvest losses – although there are some differences between the sectors. However, the challenges of institutional governance and innovation are barely mentioned, except that the lack of extension services is on the agenda of most counties.

***What policy objectives and interventions have the county governments outlined to support the development of these three sectors? What investment opportunities would help to catalyse private funds? What opportunities are there for stronger public–private partnerships, as defined by the private sector actors?***

All county governments aim to support the three sectors to improve production, and many also aim to support value addition and marketing. These objectives related to the production and the supply chain development systems. However, a key issue that is critical to enabling competitive and sustainable sector development is that of food quality and safety, and this is receiving only limited mention in the CIDPs.

The new CIDPs 2018–2022 reveal that most counties are adding new objectives to their policy agenda. Counties mainly support sectors by financing infrastructure at farm and county level and by providing cheaper inputs and extension and advisory services. The more mature the sector, the more that interventions take place in the innovation system and institutional governance systems. However, the review sections in the CIDPs 2018–2022 show that county governments struggle to actually implement these interventions, particularly those in the institutional and governance systems, partly due to lack or delay of funds and lack of capacity. County governments would benefit from support setting up public–private partnerships, research–practice collaboration and helping actors in the private sector to access credit and finance.

The aquaculture sector receives county support mainly to strengthen integrated supply chain systems. Common policy interventions are financing infrastructure at farm and county level, providing inputs for subsidies and providing extension and advisory services. In the new CIDPs 2018–2022, we observe that interventions to strengthen institutional governance are planned. The aquaculture sector is not yet well supported on aspects related to the innovation system, apart from extension and advisory services. Private funds can be catalysed to finance farm-level infrastructure. Public–private collaboration would assist in the provision of cheaper inputs and extension and advisory services. We recommend that county governments continue to build road infrastructure and design strong policy

---

frameworks to avoid overfishing and to secure fish quality and safety. Private sector actors advocate for county governments to support various types of collaborations, such as stronger farmer cooperatives; stimulate market demand through awareness campaigns; and help them access credit and finance.

The dairy sector is mature compared to the aquaculture and horticulture sectors. The descriptions in the CIDPs of the different challenges faced and support needed to strengthen the integrated supply chains reflect this difference in the sector's development, as do the institutional governance and innovation systems. However, the review sections of the CIDPs 2018–2022 have indicated some struggles in implementing the interventions to strengthen the institutional governance and innovation systems. The private sector invests in infrastructure at farm and county levels. Areas to catalyse further private investment are improving product quality and modernisation of the sector. We recommend, in line with the new CIDPs, that county governments further organise policy interventions to foster collaboration, encourage research–practice collaboration and strengthen the requisite policy and regulatory framework. Emerging issues like climate change are entering the policy agenda, but it is remarkable that issues of milk quality and food safety had only limited policy support at the county level, according to the CIDPs. Investment in quality and safety was also a clear request by the interviewed private actors, mainly by improving cooling systems, modernisation, value addition, new product development, packaging and training as well as integrating traceability systems.

The horticulture sector is also mature. County governments mainly aim to improve the sector's competitiveness and innovativeness and already support the sector with the most extensive range of policy interventions, compared to the other sectors. The support is more or less the same in all counties, with interventions to strengthen the supply chain, institutional governance and innovation systems. The county governments struggle to set up the research–practice collaborations and some other interventions for the institutional governance system. Issues such as soil fertility, water availability and pests and diseases are entering the policy agendas, but the challenges of food safety and quality are still not high on these agendas. This sector has significant potential to catalyse private investment to address production challenges related to pests and diseases, water issues and seed quality. The private sector also plays a role in financing sector modernisation and value addition. Public–private collaboration is recommended to improve irrigation, hybrid extension and advisory services for better production and pest control. Stronger policies are requested on food quality and safety.

The insights from the private sector perspective illuminate a number of issues. Private sector actors are already finding opportunities to invest in different ways in the counties. However, they are limited by lack of structured information to guide their decision-making about potential investment opportunities. Additionally, there is no clear articulation by the counties of incentive structures (fiscal and non-fiscal) that can help the private sector decide which specific counties and sectors to invest in.

### ***Recommendations to help counties drive investment in agrifood sector development***

#### ***Complementing CIDPs with agrifood sector plans***

The CIDPs provide broad development visions for the counties, covering the different sectors. While agrifood sectors' development objectives and interventions are articulated in the CIDPs, the plans do not describe in detail the potential opportunities and areas for investment in each sector. This indicates the need to develop specific strategic and investment plans for the agrifood sectors in each county that would build on the CIDPs and outline in greater detail how to drive investment for sustainable development. Such plans should borrow lessons from and align with the national agricultural investment plan that are promoted through the African Union's Comprehensive Africa Agriculture Development Programme process.

#### ***Investment mapping***

Using public–private partnerships to drive competitive, sustainable and inclusive agrifood sector development is a key policy instrument that is increasingly being promoted. While partnerships can mobilise and also rationalise investments in sectors, there is need to put more effort into making them work better. We see that public investment still remains key in driving sustainable sector growth,

---

especially for bigger infrastructure, and cannot be wholly replaced by private sector investment. Thus competitive, sustainable and inclusive agrifood sector development needs better, evidence-based guidance on how to make partnerships more effective and impactful.

***Supporting county governments to implement policy interventions***

The new CIDPs 2018–2022 all evaluated the implementation of CIDP 2013–2017. It was observed that many of the planned policy interventions described in the plans have not been implemented. This is because of a wide range of challenges in financing; funds disbursement; human resource capacity both in terms of skills and available personnel; infrastructure; meaningful stakeholder engagement; unpredictability of external factors, including those related to climate shocks; and limited adaptive capacity. Many of these challenges relate to institutional governance systems; given the importance of governance in strengthening both integrated supply chains and innovation systems, we recommend that development partners in the agrifood sector build the capacity of counties to implement policy intervention and regulatory frameworks, set up public–private partnerships and help sectors access credit and finance.

***Support foresight in policy development and implementation***

Agrifood sectors in Kenya, as elsewhere, are operating in a context where emergent issues related to how sectors can be robust, resilient and reliable continually shape the development trajectory. For example, issues such as food quality and safety –which are increasingly noted to affect the competitiveness of the sector – are not yet on the policy agendas at county level. Impacts from climate change, and recently from pandemic, continue to affect agrifood sector development and investments. Current environmental, social (inclusive) and economic sustainability concerns and other future threats related to agrifood systems development require strategic foresight in policymaking, policy implementation and investment. This means there is need to build the requisite system capacities for innovation and adaptation. It is important that the counties’ investments decisions are guided in a way that is forward in thinking. We therefore recommend that county governments and private sector actors are supported to develop policies and implementation frameworks and to make related investment decisions that are guided by strategic foresight.

---

# References

- ASDSP 2019, Agricultural Sector Development Support Programme (ASDSP) 2019 – 2022, Governments of Kenya and Sweden.
- Bebe, B.O., Rademaker, C., van der Lee, J., Kilelu, C., and Tonui, C. (2016). Sustainable growth of the Kenyan dairy sector – a quick scan of robustness, reliability and resilience. Executive summary. Wageningen UR. <https://edepot.wur.nl/413390>
- Chipeta, S., Henriksen, J., Wairimu, W., Muriuki, H., and Marani, M. (2015). Agricultural Sector Development Support Programme (ASDSP) Mid-Term Review. Stockholm: Swedish International Development Cooperation Agency.
- Government of Kenya. (2019). Agricultural transformation and growth strategy 2019–2029. <http://www.kilimo.go.ke/wp-content/uploads/2019/05/ASTGS-Long-version.pdf>
- Hood, C., and Margetts, H. Z. (2007). The tools of government in the digital age. New York, NY: Palgrave Macmillan.
- Horticultural Crop Directorate, 2016, Validated Report 2016-2017, <https://www.agricultureauthority.go.ke/wp-content/uploads/2016/06/HORTICULTURE-VALIDATED-DATA-2016-2017.pdf>. LRI (2008). Markets that work: Making a living from livestock. Annual Report 2007. Nairobi: International Livestock Research Institute.
- KDB. (2015). Kenya Dairy Board Annual Report and Financial Statements for the year ended 30 June 2014. Nairobi: Kenya Dairy Board.
- Matui, M. S., Saavedra Gonzalez, Y., Gema, J., and Koomen, I., (2016). From aid to sustainable trade – driving competitive horticulture sector development: A quick scan of the horticulture sector. Wageningen Centre for Development Innovation, Wageningen University & Research. Report 3RKenya-16-03/CDI-16-045. Wageningen.
- Muendo K.M., Tschirley D., (2004) Improving Kenya’s Domestic Horticultural Production and Marketing System: current competitiveness, forces of change and challenges for the future. Vol I: horticultural production. Working paper No. 08/2004, Tegemeo Institute of Agricultural Policy and Development Egerton University, Nairobi.
- Munguti, J. M., Kim, J-D., and Ogello, E. O. (2014). An overview of Kenyan aquaculture: Current status, challenges, and opportunities for future development. Fisheries and Aquatic Science 17(1), 2234–1749.
- Njagi, T., Kirimi, L., Onyango, K., and Kinyumu, N. (2015). The status of the agricultural sector after devolution to county governments. Working Paper 68. Nairobi: Tegemeo Institute of Agricultural Policy & Development.
- Obwanga, B., Lewo M.R. (Eds.) (2017). From aid to responsible trade: inable trade: driving competitive aquaculture sector development. A quick scan of the aquaculture sector in Kenya. Wageningen University & Research, Report 3R, Kenya.
- OCOB. (2019). County Governments Annual Budget Implementation Review Report. Office of the Controller of Budget. Nairobi: Government of Kenya. <https://cob.go.ke/reports/consolidated-county-budget-implementation-review-reports/#1554789685181-009bcca9-3e37> - OCOB
- Republic of Kenya. (2010). The Constitution of Kenya, 27 August 2010, available at: <https://www.refworld.org/docid/4c8508822.html>.
- World Bank. (2012). Devolution without disruption: Pathways to a successful new Kenya. Washington, DC: World Bank.

## Consulted CIDPs

- Siaya County CIDP 2013–2017; 2018–2022
- Kakamega County CIDP 2013–2017; 2018–2022
- Kirinyaga, County CIDP 2013–2017; 2018–2022
- Nakuru County CIDP 2013–2017; 2018–2022
- Nyeri County CIDP 2013–2017; 2018–2022
- Kiambu County CIDP 2013–2017; 2018–2022
- Meru County CIDP 2013–2017; 2018–2022
- Uasin Gishu County CIDP 2013–2017; 2018–2022
- Nyandarua County CIDP 2013–2017; 2018–2022
- Kajiado County CIDP 2013–2017; 2018–2022

---

# Annex 1 Interviews

**Table 16** Interviews with 16 private sector actors

Sector	Farmers	Processors	Other
Aquaculture sector	3 fish farms	1 fish-processing factory	1 university
Dairy sector	3 dairy farms 1 mixed fish/dairy farm		2 dairy cooperatives
Horticulture sector	1 horticulture company 1 flower company	1 trading company 1 bio-pesticides provision company 1 canning project	1 fertiliser project

---

Wageningen Environmental Research  
P.O. Box 47  
6700 AA Wageningen  
The Netherlands  
T +31 (0)317 48 07 00  
[www.wur.nl/environmental-research](http://www.wur.nl/environmental-research)

Wageningen Environmental Research  
Report 3008  
ISSN 1566-7197  
3R Kenya Report 015

---

The mission of Wageningen University & Research is "To explore the potential of nature to improve the quality of life". Under the banner Wageningen University & Research, Wageningen University and the specialised research institutes of the Wageningen Research Foundation have joined forces in contributing to finding solutions to important questions in the domain of healthy food and living environment. With its roughly 30 branches, 5,000 employees and 12,000 students, Wageningen University & Research is one of the leading organisations in its domain. The unique Wageningen approach lies in its integrated approach to issues and the collaboration between different disciplines.





To explore  
the potential  
of nature to  
improve the  
quality of life



---

Wageningen Environmental Research  
P.O. Box 47  
6700 AB Wageningen  
The Netherlands  
T +31 (0) 317 48 07 00  
[www.wur.eu/environmental-research](http://www.wur.eu/environmental-research)

Report 3008  
ISSN 1566-7197  
3R Kenya Report 015

---

The mission of Wageningen University & Research is "To explore the potential of nature to improve the quality of life". Under the banner Wageningen University & Research, Wageningen University and the specialised research institutes of the Wageningen Research Foundation have joined forces in contributing to finding solutions to important questions in the domain of healthy food and living environment. With its roughly 30 branches, 5,000 employees and 12,000 students, Wageningen University & Research is one of the leading organisations in its domain. The unique Wageningen approach lies in its integrated approach to issues and the collaboration between different disciplines.

