



Hygiene integration in  
agricultural value chains  
Strategic Framework

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### List of abbreviations

<b>AVC</b>	Agricultural value chain
<b>EEA</b>	European Environment Agency
<b>HACCP</b>	Hazard Analysis and Critical Control Point
<b>LMIC</b>	Low- and middle-income country
<b>PPE</b>	Personal protective equipment
<b>WASH</b>	Water, sanitation, and hygiene
<b>WHO</b>	World Health Organization

## Definitions

<b>Agricultural value chain</b>	The people, activities and places that bring an agricultural product, from production to the consumer, via processing, packaging, and distribution
<b>Behaviour change communication</b>	An approach that uses an in-depth understanding of people's behaviour to design persuasive communication.
<b>Blue water</b>	Rainwater that must be drained away from markets and workplaces to avoid flooding and creation of habitats for insect breeding.
<b>Environmental hygiene</b>	Practical prevention and control measures used to improve the basic environmental conditions affecting human health, for example clean water supply, human and animal waste disposal, protection of food from contamination, and provision of healthy housing, all of which are concerned with the quality of the human environment
<b>Formative research</b>	Research carried out to provide information to plan intervention programmes
<b>Grey water</b>	Untreated wastewater which does not include waste stream from the toilet

## Executive summary

The COVID-19 pandemic has highlighted the critical role of environmental hygiene in preventing the spread of infectious diseases. From the outset of the pandemic, markets were highlighted as potential hotspots for transmission. In addition to markets, food production and supply along agriculture value chains (AVCs) can lead to elevated risks of infectious disease transmission.

AVCs comprise a set of activities, spaces and people focused on bringing food products to consumers. With this vital purpose, AVCs must remain functional and operational during outbreaks. However, with their intensive interactions between regions and actors, often in poor and unregulated hygiene conditions, and low infrastructure endowments, AVCs are a focal point for emerging diseases and their spread. Therefore, investing in environmental hygiene-related infrastructure at AVC nodes such as processing and distribution centres and markets, is urgently needed and must be prioritised by health practitioners and policymakers.

There is a lack of international guidelines for governments and local authorities to develop programmes and regulations to improve environmental hygiene. In response to these challenges, SNV has embarked on a programme to improve environmental hygiene and consolidate its role in the viability and resilience of AVCs in Africa. This includes the development of a Strategic Framework to help guide programme development and investments, and pilot projects to improve environmental hygiene at key AVC nodes. SNV with support from the University of Bristol has developed pilot projects to improve environmental hygiene in Burundi; developed tools for hygiene risk assessments; and key prepared evidence reviews.

Improving environmental hygiene requires investments to provide a minimum package of services, including a reliable, continuous water supply, toilets, handwashing facilities, adequate drainage and wastewater management, solid and organic waste disposal, and appropriate personal protective equipment. This must be complemented by programmes to support individual and collective behaviour change across the AVC. Developing standards and regulations is important to drive change, but their effectiveness depends on their enforcement. Incentives for different stakeholders across AVCs are important to understand, which requires developing a comprehensive understanding of the different stakeholders.

This Strategic Framework is a first effort to unpack key elements, approaches, and principles of hygiene integration. It maps out steps to engage with AVC stakeholders, and plan interventions to strengthen environmental hygiene services, regulations, and behaviours through an incentives-based approach. This is a live document and will likely be updated as experience and lessons are gained.

## 1 The importance of hygiene across agriculture value chains

Agricultural value chains (AVC) are defined as the people, activities and places that bring an agricultural product from production to the consumer, via processing, packaging, and distribution. These are important systems with interactions between different groups of people. The interactions along an AVC provide risks of disease transmission throughout the chain, including the potential for nodes within the AVC to become loci of epidemics and infection outbreaks. The potential for disease transmission means that maintaining high standards of hygiene – both individual personal hygiene and wider environmental hygiene – is critical in protecting public health and for maintaining the integrity of the AVC. As AVCs play a central role in society by ensuring access to food products to households, providing livelihoods, and supporting local economies, they must provide a healthy and safe environment.

There are norms and guidance for what constitute good hygiene across AVCs in high-income countries, which are then applied to producers in lower-middle-income countries (LMICs) who provide goods for export. However, for domestic AVCs in LMICs, and specifically in sub-Saharan Africa, well-established norms and guidance do not currently exist. As a result, actions tend to be taken on an *ad hoc* basis in response to outbreaks; and there is a failure to develop proactive, preventive measures that will ensure AVCs are healthy and hygienic. Preventative measures include infrastructure, environmental, behavioural, and regulatory interventions.

It is important that measures are identified which, in totality, provide protection against a range of diseases. This is more cost-efficient and is required because of the wide range of disease threats that exist. Disease-specific measures may provide protection against immediate threats, but in the long-term leave AVCs and the people who use them remain exposed to other disease risks.

This framework responds to this need for a structured approach to integrating hygiene across AVCs in Africa, and to support the programmes of SNV. The framework is focused on domestic AVCs within African countries. It concentrates on reducing the risks of spreading disease among the population as they process, transport and access food. In addition to this strategic framework, SNV has supported pilot projects based on formative research on costs and incentives of improving hygiene in markets, milk cooperatives and small food production and distribution centres in Burundi with support from the University of Bristol in the design and monitoring. A set of tools for undertaking hygiene risk assessments were developed; and a study of costs and incentives for improved environmental hygiene undertaken in Kenya. In addition, the University of Bristol has completed a scoping review of environmental hygiene in markets in Africa<sup>1</sup> and undertook a rapid review of public health interventions focusing on a selected disease.

The COVID-19 pandemic has raised new challenges for AVCs in Africa, as markets and systems of production have been interrupted or subject to stringent public health measures. However, as evidence from SNV's programming in East Africa has shown, compliance with these measures has, for some settings, age groups, and actions, been low – resulting in ongoing disease transmission. Furthermore, previous infectious disease outbreaks have shown that maintaining hygiene measures once the active stage of an epidemic pass is difficult, and compliance declines markedly. Finally, while some measures to combat COVID-19 has supported wider public health protection, some areas

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<sup>1</sup> Nijhawan et al. Environmental hygiene in outdoor markets in Africa: A scoping review. *Journal of Water, Sanitation and Hygiene for Development* (manuscript under review).

(notably drainage, solid waste, provision of toilets) that are important to combatting other infectious diseases, have received little attention.

While COVID-19 has presented a challenge, it has also created a new opportunity to promote and build healthy AVCs within Africa. The pandemic has focused attention on disease prevention and there is an opportunity to use this to promote maintenance and resilience of good hygiene across AVCs. It is critical to promote healthy AVCs now, not only because the COVID-19 pandemic continues, but because other future pandemics are likely. Improving hygiene along AVCs will be a key element of pandemic preparedness.

### 1.1 Aim and objectives of this framework

The aim of this framework is to set out how action can be promoted at both the country and international level to improve environmental hygiene across AVCs that helps reduce the transmission of disease, and improves the health, well-being, and productivity of the people in the value chain. In this strategic framework, the AVCs prioritised are those related to:

- Vegetables
- Cereals
- Plant oil crops
- Dairy

The specific objectives of the framework are to:

1. Set out the basis for integrating hygiene across AVCs, including establishing the minimum levels of service required
2. Identify ownership of the agenda at national and local levels, including within SNV
3. To identify opportunities for developing programming to address hygiene across AVCs, including both new programmes and modification of existing programmes
4. To set out key opportunities and objectives for national and international influencing

### 1.2 Key challenges addressed in this strategic framework

When people come into work in food processing and packaging workplaces, or are involved in the transport of food stuffs, they bring pathogens or other disease vectors into a new 'community' of work colleagues and contacts, who then take those pathogens and vectors back to their home communities. Markets are even more complex public health settings. The movement of large numbers of people in and out of markets make them prime nodes for disease transmission and can become a primary locus of disease and 'super-spreader' events. People at transport hubs interact with a much wider population, which increases their exposure to pathogens and disease vectors that they may introduce to their work or home communities. Transport hubs have the potential to create 'super spreaders' who go onto transmit disease to very large numbers of people.

These modes of transmission are important for protecting public health. For AVCs this highlights the importance of all those involved to be aware of and take measures to protect against disease transmission. Failing to do so may lead to interruption of the AVC because of public health action or loss of consumer confidence.

This framework is focused on the interaction between the AVC and the wider environment – that is, the social and physical environment beyond the AVC that may be the source of new disease vectors, or which may promote their transmission. In this context the AVC is understood to include producers, workers, managers, salespeople, vendors, buyers, and consumers. Therefore, the focus of the framework is to prevent infectious diseases being transmitted:

- Directly between people
- On agricultural products contaminated because of poor hand hygiene
- Via touching contaminated surfaces
- In the case of dairy, transmission of disease from touching animals, skin wounds or inhaling pathogens expelled by animals

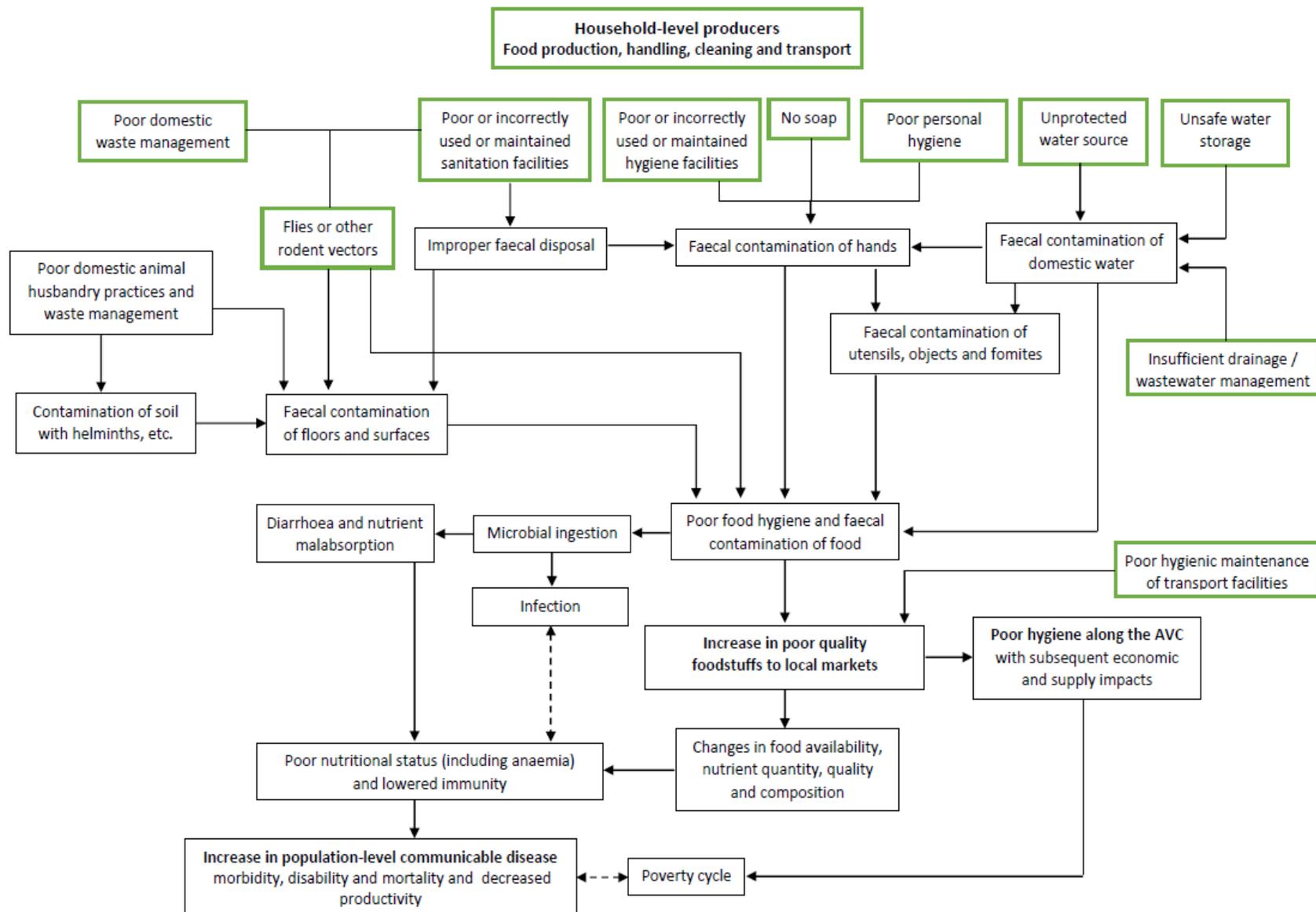
**Figure 1** below shows the basic components of an AVC starting at the producer-household level. **Figure 1.** A schematic representation of an AVC at the producer levelIt highlights at which points hygiene risks may be introduced, and how this then impacts the hygiene standards of food available to sell at markets and, ultimately, the impact on population health. In the same way, it indicates where actions are required.

It is important within programming to consider each specific AVC(s) and to map out risks along each stage of each AVC to identify where to intervene, what measures to consider, and how interventions may best be delivered.

### 1.3 Key stakeholders and ownership

The effective integration of environmental hygiene and its necessary components along an AVC will require a change in attitudes, norms and practice within both policy and practice – and at both national and local levels. This will require a clear strategy to influence different sectors and build commitment and action from different players: government (national and local); private sector; civil society and communities and actors within the AVC.

Section 3 describes in more detail relevant stakeholders and the question of ownership.



**Figure 1.** A schematic representation of an AVC at the producer level. The boxes highlighted in green indicate where infection risks are introduced and therefore also where interventions may improve hygiene

## 2 Integrating environmental hygiene

Improving hygiene across AVCs aims to reduce the risks of infectious disease transmission across a wide range of disease vectors and not simply for one individual disease. It therefore requires the consideration of multiple types of interventions which interrupt transmission in multiple ways. The concept of 'environmental hygiene' is useful when considering AVCs. This is defined by the European Environment Agency as the:

'Practical prevention and control measures used to improve the basic environmental conditions affecting human health, for example clean water supply, human and animal waste disposal, protection of food from contamination, and provision of healthy housing, all of which are concerned with the quality of the human environment' (EEA. n.d.).

This framework uses the EEA definition to describe the actions required to enable healthy environments and behaviours (both personal and collective) within AVCs. These activities and behaviours include:

- Provision of water supplies for drinking and cleaning
- Sanitation that hygienically removes human excreta and urine
- Individual and collective personal hygiene behaviours
- Drainage of rainwater and sullage generated in the AVC
- Solid waste management

Environmental hygiene interventions help prevent the transmission of different types of infectious diseases. These are summarised in **Table 1**.

**Table 1.** Types of communicable disease linked to deficits in environmental hygiene

Disease class	Environmental hygiene issues	Actions
<b>Diarrhoeal disease</b>	<ul style="list-style-type: none"> <li>Contaminated water (drinking, freshening of vegetables at market)</li> <li>Poor hand hygiene (contamination of food at markets / eating places)</li> <li>Poor hygiene in the handling, production, and sale of food products</li> <li>Poor sanitation (fresh excreta in the environment)</li> <li>Flies (transfer of faeces to food)</li> </ul>	Investments in: <ul style="list-style-type: none"> <li>Safely managed water supply</li> <li>Safely managed sanitation</li> <li>Provide soap for handwashing</li> <li>Behaviour change communication interventions covering hand hygiene food handling and food processing</li> </ul>
<b>Respiratory disease</b>	<ul style="list-style-type: none"> <li>Poor hand hygiene (lack of handwashing stations)</li> <li>Insufficient water supply)</li> <li>Lack of physical distancing</li> <li>Lack of face masks</li> </ul>	Investments in: <ul style="list-style-type: none"> <li>Safely managed water supply</li> <li>Provision of soap and handwashing stations</li> <li>Behaviour change communication regarding PPE, handwashing, cough, and sneeze practice</li> <li>Provision of face masks and other personal protective equipment</li> <li>Rules on social distancing and wearing of face masks</li> </ul>
<b>Insect vector diseases</b> (e.g., malaria, dengue, zika)	<ul style="list-style-type: none"> <li>Standing water (poor drainage and disposal)</li> </ul>	Investments in: <ul style="list-style-type: none"> <li>Grey and blue water drainage linked to soakaways or surface water drains</li> </ul>
<b>Rodent vectors</b> (e.g., leptospirosis)	<ul style="list-style-type: none"> <li>Poor solid waste management, particularly organic waste disposal</li> </ul>	Investments in: <ul style="list-style-type: none"> <li>Regular garbage collection,</li> <li>Separation of organic and non-organic waste</li> </ul>

As **Table 1** shows, some interventions are important for more than one type of disease. Thus, investments in safely managed water supply and the provision of soap help prevent both diarrhoeal and respiratory disease. Some interventions are also closely linked. For instance, the provision of water supply also requires investments in drainage to avoid the creation of risks related to insect vectors. Most, if not all, interventions will also require behaviour change communication. In planning interventions, it is therefore critical to take a systems view of the AVC to avoid unintended adverse consequences.

There are other areas where environmental quality may impact on AVCs:

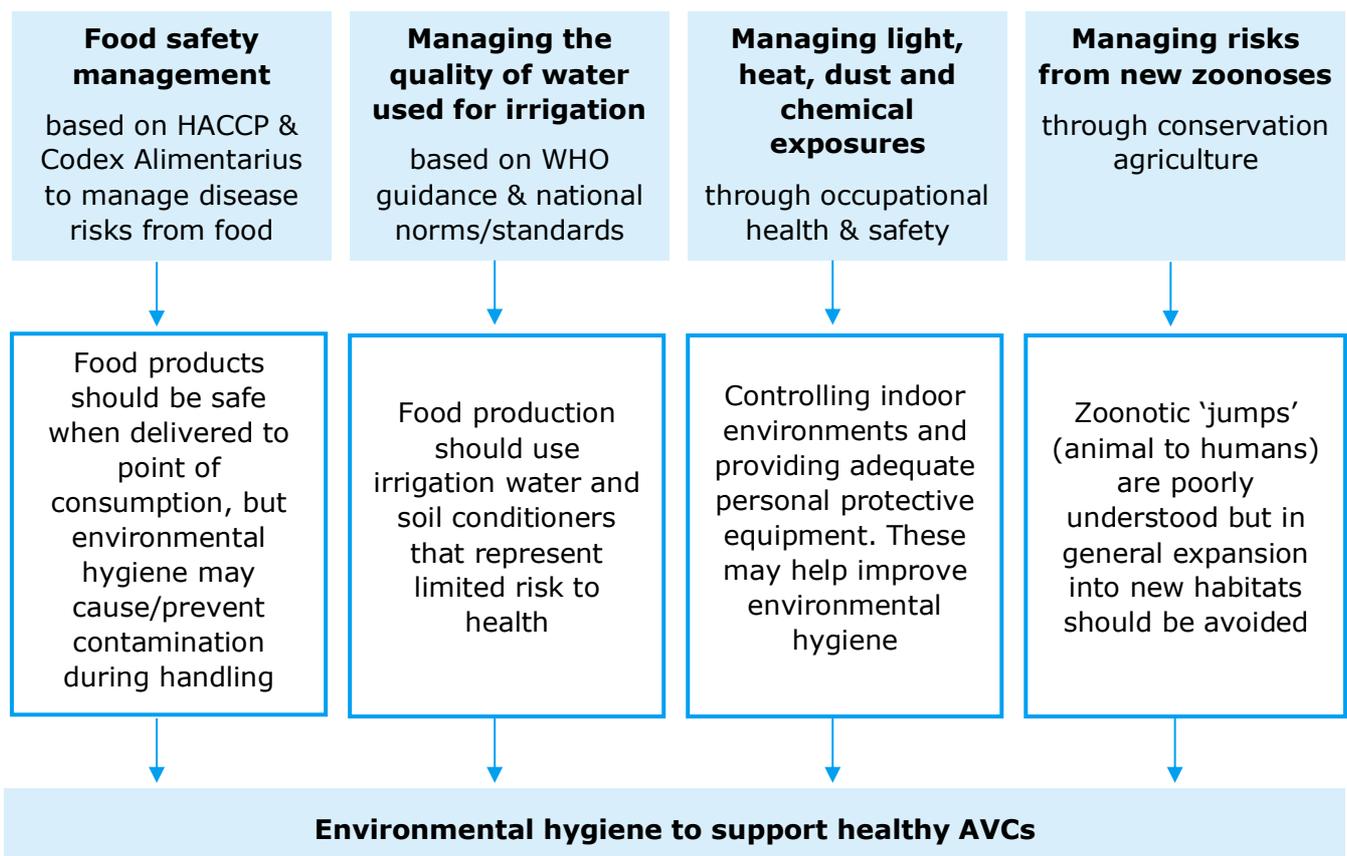
- Use of wastewater and faecal sludge in food production
- Land clearance and increased exposure to new zoonoses
- Slaughterhouses and the meat trade
- Chemical exposures from use of chemicals in production (pesticides) or in processing and packaging; noise and heat

These are issues that are either:

1. Subject to existing guidelines norms or regulations that should be followed
  - This includes use of wastewater and faecal sludge in food production (covered by WHO guidelines), use of chemicals, noise, and heat (usually covered by occupational health regulations), and slaughterhouses and the meat trade (usually covered by specific national regulations)
2. Were considered by SNV to out of scope in their primary work in AVCs (for instance slaughterhouses and the meat trade)
3. Where evidence is limited, disease pathways are complex and uncertain and subject to separate areas of research (e.g., land clearance and increased exposure to new zoonoses)

The framework also does not directly food safety, which is covered by application of the Hazard Analysis and Critical Control Points (HACCP) process that is standard within the food industry. The framework does, however, cover the prevention of contamination of raw foodstuffs in retail and wholesale markets caused by poor hygiene (for instance contamination of vegetables from dirty 'freshening' water, or poor hand hygiene of sellers and buyers). This framework therefore has interfaces with other guidelines, regulations, and norms, and should be seen as part of an integrated approach to managing disease risks illustrated in

below.



**Figure 2.** Other factors not addressed by the strategic framework which interact with environmental hygiene within AVCs and contribute an integrated approach to managing disease risk

## 2.1 Defining a minimum package of services for environmental hygiene

AVCs have clear 'nodes' within them – physical places where the provision and management of environmental hygiene services, including infrastructure, is essential. Without these services, behaviours contributing to improved environmental hygiene are difficult or impossible. Within AVCs the places where services and infrastructure are required are: food processing and packaging centres, transportation hubs, and markets.

### 2.1.1 Services and infrastructure

In each setting it is recommended that a minimum package of services is defined to guide plans and investment. **Table 2** provides recommendations for a minimum package of services derived from both design principles in service provision and on a limited review of available norms and guidance.

It will be important in each country to have conversations with stakeholders to define what in each local context is deemed sufficient and feasible in terms of a minimum package of services. Exploring what incentives and barriers exist for the provision of services are key stages in developing a minimum package of services. Actions should be planned that take these incentives into account.

The definition of levels of service uses, as its basis, the numbers of people who will be served and the critical locations for services – for instance the location of handwashing stations. It is important to note the difference between workplaces and markets in relation to user populations and therefore service provision:

1. Workplaces have relatively stable and predictable populations and the levels of service can therefore be defined based on expected numbers of users over reasonably well-defined time periods. It is important to consider the impact of shift work patterns on the workforce population, noting times when large numbers of people may require services, and to base designs for services to take this into account
2. Markets have a mix of a stable population of traders and their staff and a highly transitory population of customers. This may make planning of services more difficult as there will be some uncertainty in estimating the numbers of users over time periods
3. Transport hubs are very different as most of the population is transitory with only a small number of people at the hub for extended periods on a daily basis. This may make planning levels of service complicated given uncertainty over numbers of users

Setting	Water supply	Sanitation	Handwashing stations	Solid waste disposal	Drainage (grey and blue water)
<b>Markets</b>	<p>1 tap for every 20 traders, plus sufficient to provide one tap per 200 customers</p> <p>Taps located throughout the market area</p> <p>Water should be continuously available at least throughout the hours of operation of the market (including loading, packing up and cleaning)</p>	<p>1 toilet for every 20 traders with sufficient stances to ensure one toilet per 200 customers</p> <p>Toilets should be gender separated</p> <p>Women's toilets to have provision or menstrual hygiene management</p>	<p>1 handwashing station for every 15 traders plus provision for one handwashing station for every 25 customers. Handwashing stations outside each toilet</p> <p>Every handwashing station should have soap and/or hand sanitiser available and this should be regularly checked (at least daily) and re-stocked</p>	<p>Separated organic and non-organic waste in covered bins (minimum)</p> <p>One bin per 20 traders</p> <p>Bins located outside market and in a secure area that is cleaned at least weekly</p> <p>Organic waste collected daily</p>	<p>All roofs with gutters linked to surface drainage; surface drains in market cleaned daily</p> <p>Internal drains within markets sullage collection from trader stall linked to covered internal drainage system linked to soakaway or sewerage</p>
<b>Transport hubs</b>	<p>1 tap for every 100 travellers</p> <p>Taps located throughout the hub</p>	<p>1 toilet per every 50 travellers</p> <p>Gender segregated</p> <p>Women's toilets to have provision or menstrual hygiene management</p>	<p>Handwashing stations outside each toilet cubicle with sufficient for 1 handwashing station for every 100 people using the hub</p>	<p>Separated organic and non-organic waste in covered bins (minimum)</p> <p>Waste storage areas cleaned at least weekly</p> <p>Organic waste collected daily</p>	<p>All roofs with gutters linked to surface drainage; surface drains in market cleaned daily</p> <p>Internal drains within markets sullage collection from trader stall linked to covered internal drainage system linked to soakaway or sewerage</p>
<b>Food processing centres</b>	<p>1 tap for every 20 staff</p> <p>Taps available throughout the workplace</p>	<p>5 staff or less: 1 toilet (gender shared).</p> <p>6-45 staff: at least 2 toilets (gender segregated)</p> <p>46-100: at least 4 toilets (gender segregated)</p> <p>Over 100: detailed plans required by floor/zone</p>	<p>5 staff or less: 1 station</p> <p>6-25 staff: at least 2</p> <p>26-50: at least 3</p> <p>51-75: at least 4</p> <p>76-100 at least 5</p> <p>Over 100: detailed plans required by floor/zone</p> <p>All toilets have handwashing station</p>	<p>Separated organic and non-organic waste in covered bins (minimum)</p> <p>Waste storage areas cleaned at least weekly</p> <p>Organic waste collected at least twice per week</p>	<p>All roofs with gutters linked to surface drainage; surface drains in market cleaned daily</p> <p>Internal drains within markets sullage collection from trader stall linked to covered internal drainage system linked to soakaway or sewerage</p>

<b>Food packaging centres</b>	1 tap for every 20 staff	5 staff or less: 1 toilet (gender shared).	5 staff or less: 1 station	Separated organic and non-organic waste in covered bins (minimum)	All roofs with gutters linked to surface drainage; surface drains in market cleaned daily
	Taps available throughout the workplace	6-45 staff: at least 2 toilets (gender segregated)	6-25 staff: at least 2 26-50: at least 3 51-75: at least 4		
		46-100: at least 4 toilets (gender segregated)	76-100 at least 5	Waste storage areas cleaned at least weekly	Internal drains within markets sullage collection from trader stall linked to covered internal drainage system linked to soakaway or sewerage
		Over 100: detailed plans required by floor/zone	Over 100: detailed plans required by floor/zone All toilets have handwashing station	Organic waste collected at least twice per week	

**Table 2.** Example of a minimum package of environmental hygiene services to guide planning and investment

## 2.2 Behaviour change, regulations, and governance

In addition to the provision of services and infrastructure, interventions focused on behaviours and behavioural change are required. These should be designed keeping in mind incentives for behaviour change among the different AVC actors. This ensures that services are used effectively and that both the individuals and the broader group of players and the public follow behaviours that protect health.

Further, AVCs represent an integrated set of economic, commercial, social, and infrastructure-related factors. Actions within AVCs must tackle a range of issues which includes regulations, and policies. Before implementing any new regulations and policy, programmes aiming to improve environmental hygiene will need to review those which are current to assess their adequacy and levels of enforcement.

Details on providing and assessing behaviour change campaigns, regulations and governance are considered in detail in Section 4: Planning Interventions (sections 4.2 and 4.3, respectively).

## 3 Understanding and engaging with stakeholders

To integrate environmental hygiene effectively requires changing attitudes, norms and practice within policy and practice at national and local levels. This requires a strategy to influence different sectors to build commitment and action from different players: government (national and local); private sector; civil society and communities. There are several key steps in this process.

### 3.1 Map and engage with key actors

Mapping of key players is critical in each context to identify who they are, what incentives are likely to drive their decision-making, and how they may be influenced to change. As above, this builds a strategy which forms commitment, action, ownership, and accountability from different actors.

### 3.2 Identify and establish who owns which parts of this agenda at local and national level

Influencing sector norms requires clarity over who should 'own' the agenda. Ownership is not the same as action. Ownership is who ultimately takes responsibility for action being taken, even where those actions may be implemented by someone else.

The overarching 'owner' of environmental hygiene promotion lies with public health bodies at a country level (both national and local government). Ultimately, the norms, regulations and guidance that govern environmental hygiene are driven by the need to protect public health and promote healthy places, products, and services. In reality, because of the environmental element, many public health authorities delegate all or partial responsibility to WASH professionals, or environmental health officials. These professionals are likely to sit within local government who play a critical role in determining the location, nature, and quality of public places, such as markets and transport hubs, as part of their spatial and economic planning systems. Agriculture policy and bodies are also key owners of the agenda because it is they who will help determine whether and how improvements in environmental hygiene are made on the ground in key parts of the AVC. Agriculture will lead the definition, promotion, and support to interventions to improve environmental hygiene in food workplaces and settings.

Reflecting this somewhat complicated set of 'owners', this framework recognises that there are likely to be two areas of ownership of action on environmental hygiene in each country: food processing and packaging workplaces, and market and transport hubs.

#### 3.2.1 Food processing and packaging workplaces

Ownership lies with the agriculture sector; this may involve national Ministries of Agriculture, their delegated agencies (e.g., extension departments) and local Government departments (particularly in rural areas). In this setting, the agriculture sector should work with producers (private sector and civil society) and national government to drive change on improving environmental hygiene and draw on WASH technical expertise to help define and design interventions.

#### 3.2.2 Markets and transport hubs

Ownership lies with local governments and will involve economic development departments, local infrastructure and planning departments, and the WASH department. Where this exists, the WASH sector (on behalf of public health agencies) will need to engage with local and national governments, service providers and traders to develop and design programmes. Agriculture teams may assist in some aspects of this, for instance through links to market managers, traders' associations, and food producers.

### 3.3 Changing practices around environmental hygiene

#### 3.3.1 Food processing and packaging workplaces

Ultimately, changing practice around hygiene in food processing and packaging workplaces requires investment from the business or (social) enterprises that run these centres. There is a wide range of food processing and packaging enterprises that may be found from small to medium scale private businesses, and cooperatives or other forms of social enterprise. They may include very small numbers of people or relatively large workforces. They be outdoor or indoor premises. Different types and size of enterprise will need different types of intervention, but all will need incentives to invest in environmental hygiene. Such incentives may be regulatory requirements, commercial benefits, reputational risks, or demands from employees.

In general, regulatory requirements as incentives are likely to be strongest for larger and commercial enterprises, whereas meeting the demands of employees may be strongest for social enterprises. Reputational risk may apply across all types of enterprise but are likely to be strongest for those enterprises where this may be directly linked to loss of income. In thinking about which type of incentives to focus on, it is important to research and analyse a few factors:

- **Is there an industry body?**
  - Where associations exist the potential for action may be increased as the umbrella body can be engaged with and can be used to canvass and lobby their community to respond positively.
- **Are they already subject to regulation?**
  - Where enterprises are already subject to regulation, there will be greater scope to introduce environmental hygiene improvements (albeit possibly with some resistance) than trying to introduce regulations to previously largely unregulated enterprise.
  - Regulation may be determined by enterprise size but may also be determined by type. Smaller enterprises and often social enterprises may well be less regulated than their larger, commercial counterparts.
- **Is there a demand for regulation from enterprises?**
  - There may be a demand for regulation, for instance, to differentiate enterprises producing high quality food products from those with lower standards and poorer products. This has been found in Burundi where milk-cooperatives have requested a push for the government to develop mandatory training for their staff, and similar demands have come from milk producers and vendors for regulation.
- **How large and engaged are their customer base?**
  - Larger customer bases and more engaged consumers tend to create larger reputational risks around failure to adopt best practices and may create commercial opportunities for early adopters.
- **What levels of competition do they face?**
  - Highly competitive markets increase the value of reputation, creating incentives to demonstrate best practice. They may also create early adopter commercial benefits.

Many countries have occupational health and safety requirements, but these may not extend to all businesses (number of workers is often a criterion) or they may be poorly enforced. Influencing should focus on the enforcement of existing regulations, after understanding the underlying causes and drivers for non-enforcement, rather than drafting of new regulations. While regulation alone is unlikely to resolve issues with hygiene, and in particular its ongoing enforcement outside of disease outbreaks, it nonetheless is a critical underpinning of improvements and creates incentives for action.

Local authorities may need to be engaged to put in place licensing and certification for businesses that comply with regulations.

For businesses to adopt new practices, a business case for investment in hygiene across the AVC will need to be developed showing how this investment will yield commercial or other benefits (e.g., social, reputational) that are valued by the enterprise. Benefits may arise, for instance, through opportunities for marketing, or by improving productivity in workers through avoided lost days of work because of illness. To do this properly, SNV will need to undertake assessments at a local level to build the case. Generalised statements based on modelling have proven to be largely ineffective more widely in WASH and there is no reason to believe this would be different for food processing and packaging. One element of assessment will be to explore how consumers of products value hygiene when buying the product: are they willing to pay more for products considered healthier and more hygienic and by how much?

Making a case for action and engaging with businesses should consider how greatest influence and impact across the national sector may be achieved. It would be beneficial to focus on those businesses that, because of their size, are able to influence actions across similar businesses. Starting with larger businesses that serve local (national) markets, some of whom may be multi-nationals, may be useful given their potential to drive change. Securing buy-in from larger companies will have three positive effects:

1. Their actions will be important as they serve a large portion of the market.
2. They can cascade requirements through their supply chain to extend their impact across the AVC.
3. Their actions can put pressure on other producers to match their actions to ensure that they gain similar benefits.

Achieving this will require investing in analysis that shows likely benefits of improving hygiene and a realistic assessment of the costs to allow businesses to assess the value for money. Studies on consumer perceptions of the importance of hygiene in purchasing products may be needed as well as studies of productivity gains. The first stage of this should be a critical review of evidence that exists globally (including high income countries and a range of sectors) before deciding to embark on further studies.

Improving environmental hygiene may also represent a new business opportunity and this may create added incentives for businesses. The potential for development of markets for the supply of hygiene products should be explored – for example linking to major soap suppliers who may be willing to develop strategies to market their goods to food producers.

Reputational risk can be a strong incentive particularly for larger players and those linked to companies with an international profile, as basic failures in hygiene or protection of workers health can have negative impacts on consumer perceptions. Understanding reputational risks is best integrated with considering commercial advantage, as it is best viewed as a positive driver (i.e., companies wish to protect a good reputation) as opposed to a negative (i.e., threat to expose poor behaviour). Where reputational risk is an incentive, providing branding on food products can be one way to track their safety down the supply chain and ensure compliance among food processors.

### **3.3.2 Markets and transportation hubs**

Markets and transport hubs are public spaces and therefore while private traders commonly use them and may contribute towards their management, they are 'owned' by local authorities. There is therefore an expectation that local (or national) governments will ensure services are provided, although market managers or traders associations may play an important role in demanding services, contribute to financing, or be involved in

the organising the provision of services. This may be stronger for markets with a consistent body of people involved in the sale of goods and who have vested interests in ensuring that their environment is hygienic and attractive to customers to encourage footfall.

In developing approaches to improving services in these places, it will be important to work with local governments to develop and provide initial services (informed by the minimum levels of service, as outlined for example in **Table 2**). This may well start locally to demonstrate the feasibility of the models of service provision, with subsequent work with local and national governments to update standards, byelaws, and enforcement. It is recommended that this is carried out through two related activities.

*1. Develop a set of pilots*

A set of interventions can be piloted in markets to improve environmental hygiene services, behaviours, and awareness. These will require investment in services that meet minimum standards, supported by brokering agreements regarding payment of costs towards operation and maintenance and negotiation on tariffs with suppliers. These pilots should be co-created with local government and enterprises (or market associations) in areas where there is already established interest and formative research has been done to identify incentives. These projects should be subject to rigorous evaluation to assess how effectively they can be implemented and what impact they have on revenue collection, food sales, hygiene practices of market traders and user in the market.

*2. Dialogue with national government policy leads, local governments, and service providers*

Dialogue must be undertaken on getting support for the development of a national framework for minimum standards in public places. This could be delivered through a set of structured workshops aimed at getting endorsement of the approach and to agree and define national minimum levels of service.

Transportation hubs represent a somewhat greater challenge in that in most cases users of the hubs will expect local government to provide services, maintain hygiene, and enforce hygiene regulations on food sellers. Opportunities for working with transport providers or transport user groups may be limited, particularly for hubs where more informal minibus services operate typically outside of a regulatory framework. There is a strong logic for government to take the lead in service provision and to maintain this because of the importance of transport networks in disease transmission, particularly for respiratory infections such as COVID-19. However, there may be scope for charging for user of toilets, for instance, to help off-set some government costs.

To achieve this, it is recommended to:

1. Identify one or more country programmes where it is feasible to work with the national and local governments, and service providers to develop an agreed national framework for minimum package of services that is agreed by all stakeholders.
2. Work with local governments and service providers to develop pilots to provide the minimum package of services, with tariffs agreed with service providers and systems of payment by market traders of fees for operation and maintenance.
3. Rigorously evaluate the pilot(s) to assess the effectiveness of implementation and their impact in terms of market trader and user confidence, using key performance indicators.
4. Develop projects to support a local enterprise to manage services under contract from traders' associations in markets and potentially manage sanitation systems in transport hubs

## 4 Planning interventions

### 4.1 Minimum package of services

#### 4.1.1 Planning and delivery of infrastructure

The planning and delivery of the minimum package of services should address the infrastructure to support the services, how these services will be operated and maintained, and who will pay for these services. The minimum levels of service shown in **Table 2** gives an indication of what kind of infrastructure will be needed. The starting point for the provision of services is to identify how much of the infrastructure required currently exists, whether this is adequate to meet expected demands, what rehabilitation and/or extension is required, current levels of hygiene compliance and how much upgrades or provision of new infrastructure will cost. Services may need to be improved incrementally, with priority for services that are most likely to be used by employees and traders. This has been evidenced in Burundi where market vendors expressed greater enthusiasm for toilets and facilities for washing produce, rather than facilities for handwashing.

Where existing infrastructure is limited or non-existent, improvements must be based on a detailed engineering assessment and design. For instance, the drilling of boreholes may be required where piped water is not available or highly unreliable. This will need to be complemented by engineering design of a within-market piped distribution network where there are no, or inadequate, internal piped systems.

The capital costs for provision of infrastructure for services in markets and transportation hubs is most likely to be provided solely by government, or their donors, although in some cases contributions may be required from traders as part of pitch fees. Capital costs will include:

- The construction of the internal piped systems within markets
- Construction of toilets and handwashing stations
- Construction of gutters and drains linked to surface water drainage systems
- Construction of garbage collection points

For food processing and packaging companies a similar assessment and subsequent design will be needed. However, in such cases this may be led by the companies themselves with support offered to facilitate engagement of suitable engineering expertise.

An additional element of the capital investment may well be connection charges to utility providers, particularly in large urban areas or small towns. In planning programmes, it is therefore important to understand what these fees are and how these will be paid. In some cases, the government or donor/SNV can pay these charges, but it may be worth considering a contribution from traders to pay part, if not all, of the connection fee. This may be feasible through a market association or traders association where these exist.

#### 4.1.2 Operation and maintenance of services

The operation and maintenance of services, including payment to service providers, is critical for improved environmental hygiene. SNV projects themselves have flagged operation and maintenance of water, sanitation, and hygiene (WASH) in markets as an issue. In developing programmes, it will be critical to work with market trader associations or similar bodies to determine the feasibility/acceptance of raising funds through trader fees or taxes. It is crucial to identify whether traders can be incentivised to pay fees or higher taxes by the possibility of increased food sales. Formative research in Burundi found that vendors were amenable to an increase in taxes if improved services can be provided in the market and can result in better profit margins from sales.

Local authorities should be supported in developing systems for collecting and payment of fees for environmental hygiene services. This is likely to require a dedicated bank account, a well-defined system of individual contributions and a clear financial management system.

Consideration could be given to the development of local enterprises (one or more traders) to take responsibility for the management of environmental hygiene services, including fee collection and internal plumbing repairs, in a market(s) or transport hub(s). Such an approach could then be easily extended to cover costs of maintaining toilets and drains, both of which may struggle to secure other funding. Such an approach would allow a small business to develop, contributing to employment, and may also offer opportunities for securing bulk discounts from soap and other hygiene product providers. This could be further developed by investing in the establishment of service organisations able to manage hygiene maintenance across multiple markets, paid for by traders' associations in each market. This would offer economies of scale and create a more viable business opportunity.

Transportation hubs represent a somewhat greater challenge in that in most cases users of the hubs will expect local government to provide services, maintain hygiene, and enforce hygiene regulations on food sellers. Opportunities for working with transport providers or transport user groups may be limited, particularly for hubs where more informal minibus services operate typically outside of a regulatory framework. There is a strong logic for government to take the lead in service provision and to maintain this because of the importance of transport networks in disease transmission, particularly for respiratory infections such as COVID. However, there may be scope for charging for user of toilets, for instance, to help off-set some government costs.

#### **4.1.3 Summary**

If programmes are being developed for markets and transport hubs, therefore, a design will need to consider and follow these steps:

- 1.** Establish which environmental hygiene services (piped water, faecal sludge management, solid waste management, drain maintenance) currently exist within each AVC node
- 2.** Prioritise areas for hygiene improvement and integration
- 3.** Assess whether existing services could be extended or whether new services will need to be designed and developed.
- 4.** Prepare engineering designs for both services that can be extended and where new services are required.
- 5.** Identify capital costs for new infrastructure and agree how this will be financed (e.g., a grant or loan from government or donor, and /or what level of trader contribution is required)
- 6.** Work with market associations to develop a financial management plan for maintaining services, including:
  - a.** Setting charges to traders, collection methods and frequency
  - b.** Establishing an oversight committee
  - c.** Ensuring a bank is account opened
  - d.** Registration of market association with service providers
- 7.** Establish a within-market service provider and develop clear contract between the association and service providers

## 4.2 Behaviour change

In addition to the provision of services and infrastructure, interventions focused on behaviours and behavioural change for all AVC actors, including consumers may be required. This will ensure that services are used effectively and that personal and collective behaviours that protect health are followed. Insights into the causes of low hygiene compliance and incentives for improving behaviour should be generated through formative research and used in the design of the behaviour change campaign. The different groups (traders, customers, staff, etc.) may have slightly different needs and as with all behaviour change initiatives, ensuring that these individual needs are addressed is important. Key messages in the behaviour change campaign in Burundi were developed based on the motivations identified for customers and actors in each AVC node, linking good practices to incentives.

Behaviours that may need to be promoted will cover hand hygiene, physical distancing, wearing face masks, discouraging spitting, and discarding rubbish. Behaviour change programmes, or elements of programmes, require:

1. To be tailored to the specific setting of interest (e.g., market, transport hubs, food processing and packaging)
2. To be targeted towards the relevant audience (e.g., staff, traders, suppliers, public)
3. To decide at the outset which behaviours will be targeted in communication programmes
4. The number of behaviours targeted, and messages delivered at one time

For point 3, for all settings and audiences this will include handwashing with soap and safe food handling, but messaging may need to be changed depending on whether the interest is diarrhoeal disease, respiratory disease, or a combination of diseases. Other behaviours will include aspects such as personal protective equipment (face masks etc.) and physical distancing, which are important in relation to the current COVID-19 pandemic and may be considered for influenza and other respiratory diseases. Other aspects such as garbage disposal (important in terms of rodent vector control) will also require behaviour change. Garbage disposal will be particularly important in relation to markets and transport hubs where indiscriminate disposal of food waste is common and hard to control.

An important consideration is how many behaviours and messages will be delivered at one time. Evidence shows that it is better to focus on a smaller number of target behaviours and messages at any one time to maximise adherence. Too many messages or too many behaviours tend to lead to confusion in the audience and lower adherence. The communication should ideally be visual and kept as simple as possible. Finally, care should be taken to avoid stereotypes and make communication material as inclusive as possible.

### 4.2.1 Staff at food packaging and processing workplaces; vendors at markets and transport hubs

It is generally relatively small, well-defined groups of people who are present in these settings. Therefore, behaviour change programmes should focus on a range of interactive participatory tools that allow repeated engagement with individuals or small groups. It is important when designing programmes to have clearly established outcomes in terms of desired behaviours (e.g., washing of hands with soap, wearing of face masks), clear communication on the importance of the behaviours (not always solely in terms of health), and an understanding of motivations or barriers.

This requires investment in formative research to build up a picture of current awareness and practices, what drivers and triggers help adoption of behaviours, and to understand what factors may incentivise and hinder the sustained adoption of the behaviour. This opens the range of tools that can be used. It is also important to understand structural barriers to behaviour change. For instance, people may not wash their hands as often as desired because of insufficient supplies of water or soap. In addition to interpersonal mechanisms for behaviour change, more passive approaches to messaging through posters and regular communication to workforces may help to reinforce the need for behaviours be practiced. The content and delivery of passive messaging must be based on formative research. There is evidence that groups often have a strong preference between positive and negative messaging i.e., messaging that highlights the benefits of a good behaviour rather than one that warns against an undesired behaviour. Therefore, the intended audience of the campaign should be engaged early in the design process.

For visual messaging, the choice between illustrations and context-specific depictions of real people should also be considered. Market traders may be concerned about their consumers being put-off by photographs of contaminated food or animal slaughtering. Therefore, informational material should be designed and displayed to make AVC actors most likely to respond positively.

Adherence to behaviours may slip over time, so programming needs to develop processes of regular assessment of adherence and to repeat behaviour change programmes on a regular basis. This may require modification from original messaging to tackle inertia or resistance to behaviour change. It is therefore desirable to design interventions that allow repeat engagement and follow-up.

#### **4.2.2 Suppliers visiting AVC nodes**

For this group, behaviour change may be somewhat more complex. Where possible it is advisable to include them within some or all the interpersonal approaches used for workforces and traders – however, this may be difficult. One approach will be to develop programming that makes it clear which behaviours must be adhered to, to be allowed to continue to supply their products or services and remain competitive in the AVC. This can then be supported by short, focused sessions to explain these 'rules' and how they can be followed.

#### **4.2.3 For the general public visiting markets and transport hubs**

This group is a large, diverse population with individuals spending limited time in the setting at any one time and many with irregular attendance. As such, for this group interpersonal approaches are not feasible (although may occur through other, community-focused programming). One approach, like suppliers, is to establish clear rules for people accessing these places which should be prominently displayed. However, enforcement will be difficult, and many traders and their associations may be reluctant to bar people due to a lack of adherence to required behaviours, as this would result in a potential loss of earnings.

For these audiences, a greater emphasis on mass communication campaign approaches may be required. Such approaches preferably deploy a variety of approaches including posters, radio messages and use of social networks. Such approaches are generally overall less effective in securing behaviour change, although not necessarily knowledge, than more interactive and engaged approaches. Nonetheless, given the nature of the customer population and how they engage with the AVC, this may be the only realistic solution.

Mass media campaigns can have some impact if designed well and if they are engaging. It is critical that mass communication campaigns are based on formative research to understand what may motivate individuals to adopt desired behaviours and what barriers

prevent them from adopting behaviours. Such research should be led by local agencies with knowledge of how people generally access mass communication. It will need to differentiate between different populations (based on age, gender, etc.). Further, programming will also need to consider how messaging will change over time to remain engaging, including cost implications or potential benefits from interventions.

Examples of behaviour change programme planning, design and delivery can be found at on SNV's website.

#### **4.2.4 Summary**

Programming on behaviour change will need to be developed considering:

- 1.** Different target audiences (and sub-groups) of interest and how they may be best reached
- 2.** Clarity on behaviours to focus on and the outcomes desired in relation to behaviour change
- 3.** Formative research with different groups to understand incentives and barriers to change
- 4.** Development of messaging tailored to the different audiences and behaviours, both for interpersonal communication among staff/traders and general public mass media
- 5.** A programme to monitor adherence to desired behaviours, to identify any drop-off over time and to use this data to refresh and renew behaviour change messaging

### **4.3 Regulations and governance**

AVCs are not simply physical spaces but are an integrated set of economic, commercial, social, and infrastructure-related factors that result in agricultural products reaching consumers. Actions within AVCs will therefore have to tackle a range of issues – including commercial incentives, costs, regulations, and policies – as well as infrastructure and the provision and financing of services.

Regulatory interventions are based on the enforcement of regulations or byelaws by local authorities. Their effectiveness therefore very much depends on the applicability of regulations, their enforceability, the willingness of local authority staff to enforce compliance, and the potential for corruption and rent-seeking behaviour. Regulations are typically set by local or national bodies and are then enforced by local authorities. Most countries have some form of regulations, on either statute books, or developed as local byelaws that govern environmental hygiene. Regulatory interventions may be effective when aimed at workplace owners and managers, and for market traders and vendors, where there is a recognised right to trade. Programmes aiming to improve environmental hygiene will need to review current regulations and byelaws to assess their adequacy and review their enforcement. If programmes are developing new investments in environmental hygiene measures, this may provide a basis to engage local and national authorities to review regulations and enforcement practices.

#### **4.3.1 Outdated or insufficiently broad regulations or guidelines**

Existing guidelines or regulations may be outdated or insufficiently broad, and therefore require updating. Where public places such as markets are being upgraded, such a review may be a condition of the support offered, as failure to have adequate regulations in place may undermine sustained improvement in hygiene across the AVC.

#### **4.3.2 Enforcement of regulations or guidelines**

Enforcement may also be weak; this may arise from a lack of resources (human, financial, or technical) to support it, lack of political will, or limited legitimacy of enforcement among the target group. Where enforcement is lax or non-existent, it is important to engage local and national authorities to tackle this. Equally important is to understand what is driving non-existent enforcement and the underlying causes of failure in, and barriers to it. Programmes investing in improved hygiene in AVCs could legitimately demands action on enforcement as a means of ensuring that the investment delivers sustained impact.

Before trying to enforce regulations, broad stakeholder discussions are necessary to understand incentives and barriers to enforcing regulation and what changes would garner most support.

#### **4.3.3 Supporting existing programmes to strengthen regulations and guidelines**

In addition to regulations and byelaws, systems of governance within the AVC may also be strengthened through supporting current programmes investing in improved hygiene. This may mean strengthening existing traders or business associations and supporting them to develop codes of conduct and practice among members. Further, this may involve:

- Supporting governance to consider how such associations can build their legitimacy among members and potential members
- Providing training and support to associations to develop their capability to monitor how well codes of conduct are followed
- Develop penalties for those members who do not adhere to the code of conduct.
- Possibly extending support to associations achieving legal recognition, where this does not exist
  - Supporting associations to develop processes to bar non-members from particular areas (for instance barring non-members from trading in markets). This will require legal and governance support and expertise in supporting accountability and transparency in trade and community governance processes

#### **4.4 Creating incentives**

In addition to regulations, programmes can also look to develop commercial and economic incentives for uptake of improved environmental hygiene. These will involve demonstrating the potential commercial benefits for market traders in operating in a hygienic marketplace; or helping food producers and packaging companies use good environmental hygiene as a key marketing tool. However, it is essential that there is confidence that incentives identified are real and that improved hygiene genuinely has an impact on the attractiveness of a market or encourages greater purchase of a particular product. This requires proper market analysis to understand what consumers value and whether they express preferences for places and products based on their level of hygiene. For example, reputational damage and fear of losing customers were key incentives among business owners and market vendors in AVCs in Burundi. There were mixed reports from customers, with several of them prioritising the cost of food over safety and hygiene.

## 5 Strategic framework summary

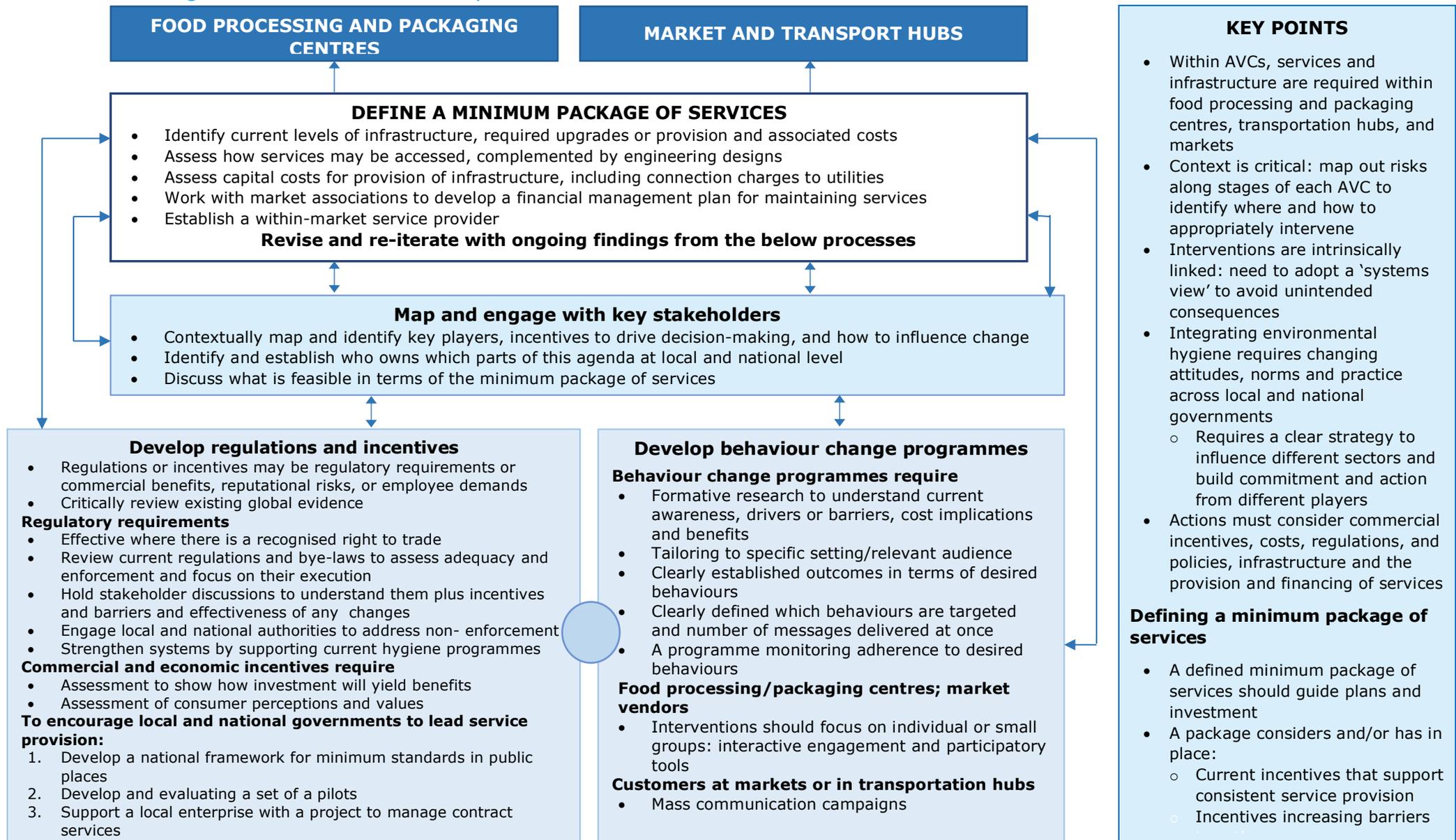


Figure 3. A summary of key processes of the strategic framework in developing a minimum package of services for environmental hygiene integration

# IMPACT THAT MATTERS



## About us

The COVID-19 Response and Resilience Initiative for Food Value Chains (CORE) ran from July 2020–December 2022. Initiated by the Netherlands Ministry of Foreign Affairs and led by SNV, it was set up by to strengthen responses to the COVID-19 pandemic across eight major SNV-implemented agriculture projects in Africa: BRIDGE, CRAFT, HortInvest, HortiLIFE, TIDE, MODHEM+, PADANE and STAMP+.

Based on field-level demand, CORE selected four themes that capture key structural challenges highlighted by the pandemic across agri-food systems: farmer inputs and services; consumer-oriented strategies; environmental hygiene integration; and digitalisation for agriculture (D4Ag). Each theme contributes to the structural resilience of food value chains and agri-food systems to shocks and stresses.

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