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ONE HEALTH IMPLEMENTATION IN THE GLOBAL SOUTH

A HOLISTIC APPROACH TO ADDRESS THE KEY CHALLENGES OF LIVESTOCK-DEPENDENT COMMUNITIES

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EXECUTIVE SUMMARY

One Health is defined as a "collaborative, multisectoral, and transdisciplinary approach – working at local, regional, national and global levels – to achieve optimal health and well-being outcomes recognizing the interconnections between people, animal, plants and their shared environment" (One Health Commission 2019). The concept has been on the rise in the past decades, and has been widely promoted by several intergovernmental organisations, research bodies and NGOs.

Nowadays that the One Health approach is getting more recognition, there are more opportunities to make this concept operational and that way properly address the complex risks found at the interfaces between humans, animals and the environment, especially in the Global South. This should be done by broadening the partnerships across more sectors, disciplines and types of stakeholders, including local communities and farmers organizations, and by adopting a One Health focus at every stage of planning, implementing and evaluating development and humanitarian strategies.

This paper aims to provide evidence on the added value of One Health as a framework to reach sustainable improvements for the well-being of humans, animals and the environment in the Global South through multisectoral and transdisciplinary collaborations between NGOs, local communities, research, international organisations, funding bodies and governments. It presents the principles that guide the VSF International network in One Health implementation, and it describes the strategic axes put in place by VSF International to address the interrelated health risks that affect livestock-dependent poor and vulnerable communities. Finally, it makes a global call for improved collaboration and partnerships inspired in the One Health principles to contribute towards achieving the Sustainable Development Goals.

1. ONE HEALTH AT THE INTERFACE OF HUMANS, ANIMALS AND THE ENVIRONMENT

THE EMERGENCE OF ONE HEALTH CONCEPT

One Health is an approach that aims to promote human, animal, and environmental health through multidisciplinary and multi-sectoral approaches. The notion that human health is connected to, or part of, our environment, has been around since civilization began (Evans and Leighton 2014), but the scientific and practitioner community started to use the term "One Health" only recently. Before reaching the term One Health, other concepts – such as veterinary public health, One Medicine or "ecosystem approaches to health" – have been explored in an effort to forge a multidisciplinary approach to health (Zinnstag et al. 2011).

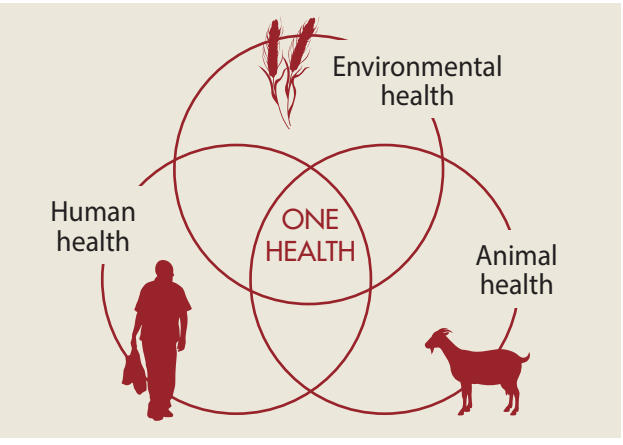
The term "One Health" first appeared in the early 2000s after some studies showed that 60% of known human infectious diseases and 75% of emerging human diseases actually originate from animals, domestic or wild (i.e. they are zoonotic) (Taylor et al. 2001). One Health was therefore used to recognize the **intrinsic linkages between animal diseases, public health and ecosystem transformation** which should be at the centre of disease control strategies. In the early 2010s, the global spread of highly infectious agents such as H5N1 highly pathogenic avian influenza, H1N1 influenza (swine flu), SARS, haemorrhagic fevers like Ebola, etc. caused important health crises and pandemics, and brought again One Health high on the agenda. It became clear that **addressing these health risks required a systemic approach** with inputs from many sectors and disciplines related to human, animal and environmental health and concrete plans to bring them together.

Various authors and institutions have suggested different definitions of One Health, and some complementary concepts such as Ecohealth have also been developed to help guide integrated research and practice and to put the focus on a broader understanding of the ecological context of health (Charron 2012). However, they all share a holistic understanding of health and a common approach of collaboration among multiple disciplines and stakeholders to ensure the health of humans, domestic animals, wildlife and the ecosystem.

THE WIDENING OF THE CONCEPT

Zoonotic diseases together with antimicrobial resistance (AMR), have been often put at the centre of the One Health focus, leading to collaborations involving mainly the medical and veterinary sectors. However, many topics that might not have been considered relevant to One Health a few years ago, are now slowly getting a place in the One Health discussions, as it becomes increasingly clear that the drivers behind health problems are multiple and complex. **Social drivers** (including poverty and inequality), **environmental drivers** (such as climate change, land degradation, reduced biodiversity, waste management, sanitation and hygiene) and **economic drivers** (for instance market deregulation and investments that don't consider social needs at the local level) are all seen as contributing to the emergence of health risks (Rüegg et al. 2017).

This consideration calls for expanding collaborations beyond the traditional involvement of the medical and veterinary sector by including other disciplines within the human, animal and especially environmental sciences (the latter often being left aside in One Health interventions). It also requires broadening the scope from the academic and research sector to a wide range of stakeholders, including public, private, international organizations and civil society, specialized in different sectors, in order to achieve practical outcomes for One Health implementation.



ACTORS INVOLVED IN ONE HEALTH

Working at the One Health interface requires adapting health governance mechanisms at global, national and local levels in a harmonized and coordinated way. At the international level, this harmonization is promoted by a **tripartite alliance** established in 2010 between the World Health Organization (WHO), the World Organisation for Animal Health (OIE) and the Food and Agriculture Organization of the United Nations (FAO).

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In parallel, several networks of **researchers, academics, professional organisations and NGOs** feed into the concept with their visions and expertise and contribute to its' advance. Through the organization of high-level conferences, the creation of global networks and platforms, and the publication of articles on the issue, they have put One Health topics at the highest level of the policy agenda and have contributed to the rise of a One Health "momentum", which is still ongoing (VSF Belgium 2015).

At national level, following the tripartite strategy and the conceptual frameworks elaborated by scientists and professionals, many countries (both in the North and in the South) started to implement the One Health approach by putting in place **national One Health platforms or technical committees** to foster coordination between different health systems at ministerial and decentralized levels, by preparing a national strategy and by developing action plans. One Health is also promoted to a certain extent through international cooperation, with efforts to support the creation of One Heath inter-ministerial platforms[1], or creating One Health reference centers[2].

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Although the grass-roots organizations in developing countries are not always easy to mobilize on topics that are apparently "too technical", they have a fundamental role to play in the One Health implementation. **Local civil society, farmers' and livestock keepers' organizations and local communities** have all a pivotal role to play at the interface of the three pillars of health. Rather than being considered solely as the "beneficiaries" of One Health interventions, they should have a more central role in the co-identification of the problems (or health threats) and in finding locally-adapted solutions. Especially in those countries where public service delivery is fragile or absent in many regions, civil society should be involved in the government-led One Health action plans and committees.

[1] For instance through the Global Health Security Agenda programme by USAID.

[2] For instance, the 'One Health Research, Education and Outreach Centre for Africa' (OHRECA) established by the German Federal Ministry for Economic Cooperation and Development (BMZ) and the International Livestock Research Institute (ILRI) in November 2019.

2. CHALLENGES REQUIRING A ONE HEALTH APPROACH IN LIVESTOCK-DEPENDENT COMMUNITIES OF THE GLOBAL SOUTH

Globally, livestock supports the livelihoods and food security of 1.3 billion people, of whom 600 million are resource-poor farmers (HLPE 2016). Many of them are found in low- and middle-income countries from Africa, Asia and Latin America, which we will refer to as the "Global South". Even though from a One Health perspective each local context should be analysed in relation to its' unique specificities, some common features can be found across these countries, and more specifically in the most vulnerable rural and pastoral areas where the VSF International network works:

- The **gaps and weaknesses in veterinary and human health services** (both public and private) are numerous, especially in rural areas far from the main urban centres. The inadequate services, coupled with lack of infrastructure, represent a major risk for Public Health, jeopardising the implementation of preventative measures, disease diagnosis, effective treatment and epidemiological surveillance both in humans and in livestock.

- Smallholder farmers, livestock keepers and pastoralists face increasing competition over water, arable land, pastures and forests due to **land encroachment by industrial farming, mining, commercial forestry operations and other major investments** that occupy large regions in rural areas. These conflicting land uses often impact negatively on the ecosystems and lead to pollution and overexploitation of natural resources.

- The trends in **population growth and rapid urbanization** contribute, on one hand, to increased pressure on natural resources for food production, and on the other hand, constitute a risk to the spread of disease through inadequate water, hygiene and sanitation facilities. Populatin growth put pressure on the ecosysems and wildlife through habitat-destruction, fragmentation and degradation, hunting activities targeting wildlife for commercial reasons or bush meat consuption. Closer distance between humans and wildlife can favour the outbreak of zoononotic diseases transmitted by wildlife such as Ebola.

- As large parts of the urban population become wealthier, the growing demand for livestock-derived food pushes the **intensification of livestock production**, with increased pressure on ecosystems, increased risk of contamination and the emergence of new pathogens, as it was the case of avian influenza.

- As in many other countries, the Global South has seen an **increase in international trade and in the movement of goods and people**, which accelerates the possible flow of pathogens (a local crisis can easily become a global crisis).

- Lastly, but of primary importance, the effects of **climate change** severely affect low- and middle-income countries and especially those communities directly dependent on the available natural resources for crop and livestock production. Besides the devastating consequences of prolonged droughts or sudden storms and flooding, the modification of the ecosystems is also a major contributing factor for the increased risk of vector-borne diseases (European Commission 2013).

In such complex contexts, the challenges related to One Health are numerous. The following chapters present some key challenges that impact on or are influenced by at least two of the three One Health pillars (human, animal and environmental helath), focusing on the areas where VSF International works. These challenges have to be considered especially in light of the context presented above (see Figure 1).

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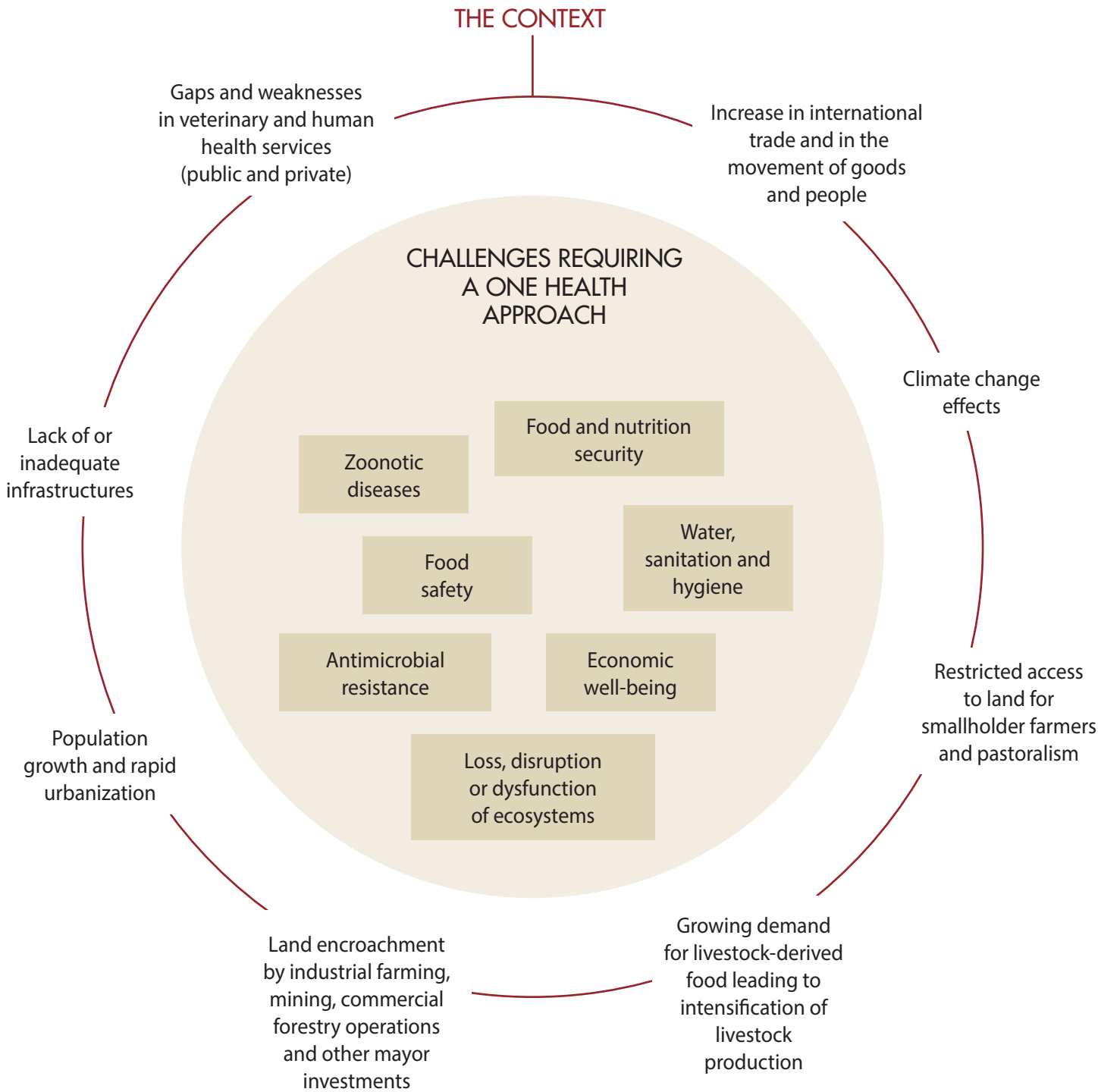
Figure 1

Challenges faced by livestock-keepers communities in the Global South requiring a One Health approach ↓

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Zoonotic diseases

Zoonotic diseases are infectious diseases that are naturally transmitted from vertebrate animals to humans and vice versa, whether through vectors, direct contact or consumption of animal products. At least 60% of existing human infectious diseases are zoonotic, and 75% of emerging infectious diseases in humans (including Ebola, HIV and Influenza) have an animal origin (Taylor et al. 2001). According to the International Livestock Research Institute (ILRI), 2.2 million deaths are caused by 13 zoonotic diseases each year (Grace et al. 2012).

Humans, domestic animals and wildlife live in close contact in many parts of the world, and contacts and exchanges of pathogens are regular. Some examples include the propagation of avian flu between wild birds, poultry and people, or the transmission of brucellosis from animals to humans through ingestion of raw animal products (mainly milk) or direct contact. Bushmeat consumption is also a frequent source of disease spread from wildlife to humans, as was the case for Ebola outbreaks in West Africa. These frequent interactions constitute a potential risk for the three pillars of One Health: domestic animals, humans and wild animals, with a consequent impact on the ecosystem and biodiversity.

Due to the intrinsic nature of zoonoses – at the crossroads between humans, animals and the environment –, their control requires a One Health approach. Controlling zoonoses effectively requires in particular early detection of the source of the disease and the factors facilitating its propagation. If serious efforts are put into monitoring the health of wildlife, farm and domestic animals and if this is linked up with human health, chances of large zoonotic epidemics decrease. According to calculations from the World Bank, the cost of zoonoses prevention between 1997 and 2009 was far below the annual economic losses due to zoonotic disease outbreaks (World Bank 2012). However, in many countries in Africa, Latin America and Asia, structural investments in animal and human health and environmental services are still limited.

Food safety

Food safety hazards are increasingly being recognized as a major public health problem worldwide. According to estimates from the World Health Organization, foodborne diseases (FBD) made 600 million people sick and caused 420,000 premature deaths in 2010 (Jaffee et al. 2019). The global burden of FBD is unequally distributed and affects to a greater extent low- and middle-income countries (LMICs), especially Sub-Saharan Africa and South East Asia. Children under the age of five are the most vulnerable group, with an estimated 30% of premature deaths caused by FBD (Jaffee et al. 2019). Other vulnerable groups include the young, old, malnourished, poor, pregnant, and those who are immuno-compromised.

Food safety hazards include microbial pathogens (bacteria such as salmonella or brucella, or virus such as rotavirus), parasites (e.g. cysticercosis), chemical compounds such as adulterants (e.g. melamine), naturally occurring toxins (e.g. aflatoxin), antibiotic drug residues, pesticide residues, and heavy metals. Unsafe food containing those hazards can cause acute or chronic illness, and reduce the bioavailability of nutrients, particularly to vulnerable people, and is therefore associated with malnutrition. Furthermore, the presence of food safety hazards can lead to food losses and reduce availability for food-insecure populations. For these reasons, food safety is seen as an integral part of food and nutritional security (FAO 2019a).

Most food borne diseases in the Global South are associated with informal markets, which are the predominant source of food for the poor (Grace 2015). Particularly when it comes to animal products (e.g. meat, milk, eggs) that are highly perishable, incorrect food hygiene practices at every step of the value chain and deficiencies in infrastructure increase the risk of getting a contaminated end product, with potential consecuences for public health. This risk has to be addressed by following a "farm-to-fork" approach. However, in many of these countries, food safety still receives minimal policy attention and investment. Many countries have weak food safety systems in terms of infrastructure, trained human resources, food safety culture and enforceable regulations (Grace 2015).

Applying a One Health model where potential solutions are viewed and delivered more holistically and with an emphasis on prevention would increase global food safety substantially.

Antimicrobial Resistance (AMR)

The rapid emergence of AMR is a major global health risk with potentially huge medical, economic, and social consequences. The gradual loss of effective antibiotics will undermine our ability to fight infectious bacterial diseases in humans, animals and the environment. Today, 700,000 people die of resistant bacterial infections every year, and it is estimated that the number will increase steadily, reaching 10 million people annually by 2050 if the emergence and spread of AMR is not curbed (O'Neill 2016).

Beyond the risk to human mortality, AMR threatens the health of animals and their productivity – and hence the livelihoods of millions of producers who rely on livestock, poultry and fish – with effects on food security, food safety and the environment.

Low- and middle-income countries (LMICs), where the majority of the world's population lives, face a disproportionate burden, with a fragile health system that does not reach the rural areas and poor infrastructure. These factors contribute to a lack of proper disease diagnostics, therapy provision and effective antimicrobial treatment. Because of the scattered presence of veterinary services, livestock keepers often practise self-treatment for their animals, using drugs sold in informal markets without clear indications about their quality, proper use, effective treatment and withdrawal period before consumption of animal products. In many LMICs, the incorrect use of antibiotics is coupled with the high proportion of low-quality or counterfeited drugs that are sold informally in the market. In Africa, the market for sub-standard non-registered veterinary medicines is estimated to be 400 million USD, equal to that of the quality, officially-registered veterinary drugs (Clifford et al. 2018). Similar trends exist with medicines for human use.

The level of awareness of AMR is generally low among livestock keepers, drug sellers and veterinarians in many countries in the Global South which is also due to a lack of local data on the level, spread and patterns of resistance in human, animal and agricultural contexts (Chokshi et al. 2019). A proper evaluation of the problem in those areas is needed in order to design effective evidence-based interventions, which need to be pursued with a One Health lens. The close relationship between animals, humans and the environment that characterizes low-input small-scale livestock farming and pastoralism, requires multidimensional and multi-stakeholder approaches to tackle AMR based on One Health.

Food and Nutrition Security (FNS)

Food and nutrition insecurity – defined as lack of access to sufficient, affordable and nutritious food –affects hundreds of millions of people worldwide. Food insecurity and malnutrition take several forms, ranging from insufficient intake of calories, protein, vitamins, minerals and micronutrients, to different manifestations of obesity, which can also be caused by the intake of inexpensive, high-calorie, low-nutrition foods, or even by metabolic adaptations to food deprivation.

The number of undernourished people (i.e. those facing chronic food deprivation) in the world has been on the rise since 2014, reaching an estimated 821 million people in 2017 (FAO, IFAD, WFP 2018). Africa remains the continent with the highest prevalence of undernourishment, with almost 21% of the population (more than 256 million people) affected. Furthermore, it is calculated that more than 1.5 billion people worldwide suffer from the so called "hidden hunger" due to a lack of micronutrients (vitamins and minerals) (FAO, IFAD, WFP 2018). Again, much of sub-Saharan Africa and the South Asian subcontinent are hotspots where the prevalence of hidden hunger is high. Factors that contribute to micronutrient deficiencies include poor diet, increased micronutrient needs during certain life stages, such as pregnancy and lactation, and health problems such as diseases, infections, or parasites.

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Animal products have a huge impact on nutrition and health, as they provide high-quality protein and a variety of essential micronutrients (some of which, such as vitamin A, vitamin B12, riboflavin, calcium, iron, zinc and various essential fatty acids, are difficult to obtain in adequate amounts from plant-based foods alone). Poor people depend heavily on animal-sourced foods (including meat, milk, eggs, fish but also blood and offal) to ensure that their diets deliver the nutrients necessary for cognitive and physical development (Dasi et al. 2019). In East Africa, for example, livestock provide on average 11% of energy and 26% of the protein in poor people's diets (Herrero et al. 2012).


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For this reason, animal diseases (including non-zoonotic diseases as for instance peste de petits ruminants and zoonotic diseases like anthrax) that affect livestock productivity, mortality and reproduction have serious consequences for food and nutrition security and the overall resilience of livestock-dependent communities, translating into clear One Health risks.

Together with conflicts, climate change is increasingly recognized as one of the leading causes of long-term food crises (FAO, IFAD, WFP 2018). Climate variability, which affects rainfall patterns and agricultural seasons (e.g. late onset of the rainy season or erratic rainfall), and climate extremes such as droughts, floods or storms are among the key drivers behind agricultural failure, livestock losses or morbidity and the rise in hunger. Increasing the resilience of the vulnerable population, including through livestock-based interventions, is therefore key to promoting food and nutrition security by improving access to food, food availability, food stability and food utilization.

Water, sanitation and hygiene

According to a report by UNICEF and the World Health Organization, in 2017, 5.3 billion people used safely managed drinking-water services coming from improved water sources located on-premises, available when needed, and free from contamination. However, 785 million people still lacked a basic drinking-water service, of which 144 million people were dependent on surface water. At least 2 billion people use a drinking water source contaminated with faeces, representing a risk for the spread of diseases such as cholera, dysentery, typhoid, and polio (UNICEF, WHO 2019).

Likewise, in 2017, 2 billion people still did not have basic sanitation facilities such as toilets or latrines, and at least 10% of the world's population is thought to consume food irrigated by wastewater. Inadequate sanitation is estimated to cause 432 000 diarrhoeal deaths annually and contributes to malnutrition and the spread of some neglected tropical diseases (NTDs) such as intestinal worms, schistosomiasis, and trachoma (UNICEF, WHO 2019).

It is estimated that around 10% of the total human disease burden worldwide could be prevented by adequate sanitation and drinking water (Prüss-Üstün et al. 2011). Neglected tropical diseases (NTDs), a diverse group of communicable diseases, affect more than one billion people and cost developing economies billions of dollars every year. Populations living in poverty, without adequate sanitation and in close contact with infectious vectors and domestic animals and livestock are those most affected. Improving water and sanitation is a fundamental part of One Health as well for a successful fight against NTDs It results in a decrease in vector-borne diseases, reduced risk of malnutrition, reduced environmental contamination and increased food safety. Availability of contaminant-free drinking water is important for humans, for livestock and for the environment.

Economic well-being

The linkages between economic wellbeing and health are numerous and interrelated. On the one hand, good health status is a necessary precondition to conduct a healthy and productive life and to contribute to the family well-being; on the other hand, a sufficient level of income allows to access nutritious food and services, including health and education, which in turn improve maintenance of good health. For this reason, economic well-being should be seen as a key component of One Health, especially when the livelihood of the family

directly depends on livestock and crop production that is based on the natural resources locally available and the specific environmental conditions. If any of the components of the fragile equilibrium that sustains rural livelihood and income generation is broken, the consequences on the different components of the system could be devastating.

In many countries in the Global South, smallholder farmers, livestock keepers and pastoralists are politically and economically marginalized. This marginalization translates into restricted access to land, natural resources, services, inputs, markets and income-generating opportunities. As a result, in some cases rural communities might be pushed to adopt destructive survival strategies based on intensified extraction or use of natural resources (timber, water, cropland…), contributing in that way to their depletion or degradation, or start sourcing their food from wildlife, with increased risk of the resurgence of zoonotic diseases (e.g. Ebola). Marginalised producers are likely to enter in a a cycle of poverty, where they become more vulnerable for istance in terms of food security, health, hygiene and education.

Economic factors should also be considered when analysing the costs of diseases. If on the one hand, prevention costs are generally lower than the economic costs of disease control or eradication, on the other hand the latter are still lower compared to the overall economic losses caused by the disease (World Bank 2012). For instance, it is calculated that Peste des Petits Ruminants (PPR) causes annual economic losses of up to USD 2.1 billion (OIE 2019). Looking beyond this monetary figure, 330 million families are at risk of losing their livelihoods, food security, and employment opportunities due to this disease.

Economic losses can be direct (linked to animal mortality and a drop in their food production potential) or indirect (linked to the lower value of surviving animals, reduced genetic heritage, restrictions on movements and sales, and veterinary expenditures incurred in fighting the disease). In many cases, indirect losses far exceed the direct ones. When a major epidemic or outbreak of animal disease is declared, contingency measures can include closure of borders (national or even regional), a ban on livestock movements not only across borders but also within the country, and extensive slaughtering-out policies. All these measures have enormous economic impacts at different levels: at the micro level, they cause a loss of income for livestock keepers; at the meso level, the whole livestock local economy – including all actors on the value chain – is negatively affected; finally, the impact at macro level can affect the national or even international economy, especially when export is prohibited (FAO 2016).

Being involved at the level of prevention, control or eradication plans, the One Health approach, by favouring collaborations and mutualisation of resources, allows making significant savings at all levels (micro, meso and macro), while producing longer-lasting results.

Loss, disruption or dysfunction of ecosystems

Human well-being and livelihood depend in many ways on the Earth's ecosystems and their biodiversity. For instance, soil fertility, natural occurring pest and disease control, the genetic diversity of crops species and livestock breeds, pollination, water supplies are all vital to food production, to health and to human well-being in the broadest sense (FAO 2019b). Well-managed small-scale mixed farming and pastoralism contribute to maintaining the agro-ecological equilibrium through sustainable and locally-adapted farming practices. However, this equilibrium is under threat in many parts of the world due to habitat modifications, resource depletion and pollution caused by other forms of land use.

In many parts of the world, biodiverse agricultural landscapes in which cultivated land coexist with forests, pastures and wetlands are being replaced by large areas of monoculture, farmed using high levels of external inputs such as pesticides, mineral fertilizers and fossil fuels. This form of commercial agriculture intensification is associated with a loss of diversity in terms of ecosystems, biodiversity and genetic resources, but also with soil erosion, loss of organic carbon, nutrient imbalances, salinization and contamination with pollutants.

Agro-chemicals, widely used in industrial and mono-crop farming, also pose important risks for the health of humans, animals and the environment. Annually, 25 million people suffer from unintentional pesticide poisoning (Carvalho 2017). Human exposure to pesticides occurs through air, contaminated water and residues in food, and is correlated with a higher risk for certain cancers (Horrigan et al. 2002). Although there is no reliable data on pesticide poisoning in livestock, it is reasonable to assume that the risk is high, especially in mixed-use areas, where animals graze at the margins of commercial crop plantations. In many countries in the Global South, dangerous pesticides that are no longer allowed in Europe are still permitted, causing huge health costs. It has been estimated that only 0,1% of the pesticides applied reach the pests they target, meaning that 99,9% enters the environment (Horrigan et al. 2002). Due to this widespread and over-use of pesticides, resistant pest strains are increasing from less than 20 to over 500 in less than 50 years (Horrigan et al. 2002). Furthermore, by disrupting the predator/prey balance, pesticides endanger the balance of biodiversity, because pests recover faster from pesticides than predators. This disruption in biodiversity has a huge impact on food security and nutrition: the disappearance of bees and other pollinators on the one hand and the loss of naturally-occurring biological pest control on the other hand, threatens food harvests globally.

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Finally, ecosystems have a central role in diseases transmitted by vectors (i.e. insects such as mosquitoes, ticks, flies, sand-flies, fleas, bugs and some aquatic snails). Vector-borne infections represent 17% of infectious diseases, causing more than 700 000 deaths annually (WHO 2019). By definition, they depend on and are influenced by the ecology and distribution area, the period of activity and the lifecycle of their vector. And vectors themselves are influenced by the evolution of their environment. The effects of climate change, but also major changes in land use or contamination, will affect the biology and ecology of vectors and therefore the risk of outbreaks of vector-borne diseases.

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3. HOW VSF INTERNATIONAL INCORPORATES A ONE HEALTH APPROACH IN THE FIELD

As described in the previous sections, health risks in the Global South are complex and multi-dimensional. The adoption of a One Health-based approach becomes therefore necessary in order to address different health interfaces simultaneously and achieve sustainable and lasting results. Although the theoretical framework for One health is widely recognised, the current challenge is to make it operational in the field, especially at community level.

The implementation of One Health is far from easy, as it necessitates dealing with multiple factors and sectors that interact with each other. It requires dealing with different institutions and types of stakeholders, each one driven by different missions and priorities, different funding sources and levels, different education, training and attitudes (Kahn 2012). The degree of success in One Health implementation therefore largely depends on the willingness of the different organizations to act collaboratively and share common goals in each specific local context.

COMMON GUIDING PRINCIPLES

The VSF International network has been inspired by One Health since its foundation, over 30 years ago. The common vision *"Healthy animals, healthy people, healthy environment"* guides its interventions in the Global South to support vulnerable populations in contexts characterized by a high degree of interdependence between humans, animals and the environment and poor access to services.

In order to address the challenges outlined above, VSF International is guided by a set of principles that combine our commitment to achieve sustainable impact through development and humanitarian actions and our efforts to making One Health operational in the field. Although these principles accompany the day-to-day work of the VSF International network, it is useful to stress their importance also in the framework of One Health operationalization in the field, where they become fundamental.

1. ADOPT A SYSTEMIC APPROACH INCLUDING DIFFERENT DISCIPLINES AND SECTORS THROUGH PARTNERSHIPS

A **holistic, integrated, systemic approach** recognizes the complexity and diversity of each context and in particular the close and interdependent links between human, animal and ecosystem health. Development and humanitarian interventions should favour a **transdisciplinary** approach and focus on **several sectors** at a time, integrating knowledge from different disciplines at every step of the project, from the inception to the evaluation. Interventions focusing on improving animal health for instance, should be designed with linkages to human health and ecosystem preservation. It is of primary importance to systematically **include the environmental pillar** in all health interventions, moving forward from the traditional collaborations between human and animal health sectors only.

One Health should be seen as a "good practice", a guiding approach that leads to questions and contributions from different perspectives when identifying and implementing projects, and a major driver to establishing **partnerships and collaborations** that complement the core expertise of each party to tackle problems in a holistic way.

2. INCLUDE LOCAL COMMUNITIES, YOUTH AND WOMEN

Participation of **local communities and livestock keepers' organisations** are at the core of VSF International's development or humanitarian intervention at each stage of the project cycle. Especially in those areas where public service delivery is fragile or absent, they have a pivotal role in the co-identification of the problems and in the design and implementation of locally-adapted solutions. Rather than being considered solely as the "beneficiaries" of One Health interventions, they should have a more central and active role. As well, their **traditional knowledge** should be recognised and mobilized in tandem with scientific knowledge and research results.

All these elements are key to assuring the sustainability and local ownership of One Health interventions and to understand the complexity of issues that affect well-being in broader terms.

3. DEVELOP PILOT PROJECTS AND INNOVATIVE SOLUTIONS

Due to the way they are conceived/identified (i.e. through participatory, holistic and multi-sector approaches), many of the projects inspired by the One Health approach will actually be "pilot-actions", which express a certain **innovation capacity**. Innovation can be defined as the development of new and sustainable responses to needs that are new or poorly met in the current conditions of knowledge, market or public policies (GASL 2019). Adopting a One Health focus often allows to developing solutions that are clearly different from the solutions available locally, while being appropriate to the context.

Specific indicators and monitoring, evaluation and learning tools have to be developed to measure the interconnected achievements and impacts in terms of One Health benefits.

4. FOCUS ON SUSTAINABILITY

In conclusion, One Health should be seen as a tool to achieve sustainability, at the intersection between the environmental, economic and social pillars. The mission of VSF International is to build **resilient and sustainable livelihoods** at the interfaces of human, animal and environmental health, and to integrate livestock keepers' communities in sustainable value chains. Aiming for One Health and working according to that approach is contributing significantly to the Sustainable Development Goals (SDGs).

One Health and the SDGs

The Sustainable Development Goals (SDGs) were adopted by the UN General Assembly in September 2015 as a "universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030" (UNDP 2019). The SDGs reflect a wide range of environmental, economic and societal concerns. They are designed to be cross-cutting, as the inter-linkages and networks within goals are as important as the individual goals themselves, and they recognize that action in one area will affect outcomes in others (Queenan 2017). In this sense, they embody a One Health strategy, whereas health is recognized as a precondition, an outcome and an indicator of sustainable development.

Within the 17 SDGs there are a number of objectives relating to One Health, but they will not be achieved if human, animal, plant and ecosystem health remain compartmentalized and collaborations are not put in place. One Health is essentially promoting a paradigm shift for a de-sectoralized and more integrated approach to health. Therefore, it will be key to progress on the achievement of the SDGs.

STRATEGIC AXES FOR ONE HEALTH IMPLEMENTATION

VSF International identified some strategic axes of intervention that are key to address, through a One Health lens, the complex and multidimensional challenges faced by smallholder livestock keepers and pastoralists in the Global South. The six strategic axes are presented below.

Quality animal health services

The VSF International network has developed a solid experience in supporting animal health delivery and promoting livestock keepers' access to quality animal health services. VSF International supports Public Veterinary Services to improve their performance through capacity building, infrastructure and equipment. In parallel, VSF Internaitonal strengthens and develops the capacities of veterinarians, technicians and Community Animal Health Workers (CAHWs) to provide care, prophylaxis and epidemiology services. In remote areas, CAHWs play a crucial role in treating animals, implementing vaccination campaigns, collecting and sharing information for disease surveillance, but also in raising awareness and giving advice to livestock keepers on good practices related to animal health and livestock farming, including preventive and curative care that improve animal well-being and production. In their day-to-day activities, CAHWs are supervised by a certified veterinarian or veterinary paraprofessional, in order to ensure the quality and sustainability of the services (VSF International 2018b).

Better access to quality animal health services is key to achieving two important goals: firstly, securing livestock production and thus improving food and nutrition security, income generation and overall resilience of livestock keepers; secondly, reaching and promoting public health on a wider scale, including by addressing zoonosis, AMR and food safety.

FOOD AND NUTRITION SECURITY

Healthier animals are more productive and generate food products that can be used partly for self-consumption and partly (the surplus) for sale. The benefits arising from this increase in production will be used to buy other foodstuffs, but also for other household expenses such as health and education. Other food products will therefore become more accessible and people will become healthier thanks to a more diversified diet and better access to basic health care. Also, as animal products become more available in the markets, they contribute to diversifying the diets of rural and urban populations by introducing an important source of protein and micronutrients.

PUBLIC HEALTH

Besides contributing to human well-being through improved availability of high-quality animal proteins and income, the efforts to improve animal health services in remote rural areas contribute to the general goal of improving public health.

Firstly, better functioning veterinary services, working in collaboration with human health and wildlife specialists have a key role to play in controlling and preventing the spread of **zoonotic diseases** and contribute to better monitoring and understanding of the evolution/progression of vector-borne diseases and their factors of transmission.

Secondly, better-managed animal health services also contribute to the responsible use of veterinary drugs, including **antimicrobials**. This is key to preserving the efficacy and availability of antibiotics and to retain their capacity to cure infectious diseases. For instance, veterinarians and CAHWs are trained in the proper use of antibiotics, including diagnostic measures, adequate dosing and the correct administration of medicines, and they contribute to raising awareness among farmers and pastoralists of good practices. Their role in prevention, through better livestock management and vaccination campaigns, and in early detection of disease outbreaks, contributes to reducing livestock vulnerability and thus reduces the necessity to resort to the use of antimicrobial medicines. As well, ethnoveterinary practices have great potential to substitute some synthetic drugs with effective and scientifically-validated natural or herbal treatments.

Finally, veterinary services and well-trained animal health staff play an important role in guaranteeing the **safety of animal products** at all stages of the food chain and ensuring that they are not contaminated. At every step of the value chain, food safety issues are addressed through appropriate training and awareness-raising on hygiene, supply of equipment and infrastructure and monitoring of the quality standards through sample analysis. In dairy value chains, for instance, VSF International reinforces the capacities of dairy farmers', processors' and sellers' cooperatives in order to ensure that

correct hygiene practices are consistently adopted in all phases of the value chain (milking, collection, transportation, processing, packaging and sales) to maintain high standards in the final quality of the products and to minimize the risk of food-borne diseases.

Improved husbandry practices and animal welfare

Besides promoting and supporting good practices in animal health (see previous section), VSF International also provides technical support to improve animal welfare along with productivity, in order to ensure that livestock are in **excellent health conditions and that all their needs (biological, physical, behavioural, social, etc.) are satisfied**. These preventive practices focused on animal welfare ensure the achievement of the "Five Animal Freedoms": freedom from hunger or thirst by readily available access to fresh water and a diet to maintain full health and vigour; freedom from discomfort by providing an appropriate environment including shelter and a comfortable resting area; freedom from pain, injury or disease by prevention or rapid diagnosis and treatment; freedom to express normal behaviour by providing sufficient space, proper facilities and company of the animal's own kind; freedom from fear and distress by ensuring conditions and treatment which avoid mental suffering (Brambell 1965).

Livestock that are well managed, correctly fed, that have guaranteed access to water and shelter, also have a stronger immune system, which makes them less prone to diseases and more productive, with positive effects on farmers' well-being, food security and overall livelihood.

Technical support, mainly through training and capacity building of livestock keepers and their organisations, focuses on: the quality and availability of feed, fodder and forage; appropriate housing and management techniques; access to water sources; integration of livestock and crop production; and locally-adapted and controlled genetic improvements that don't undermine the maintenance of livestock genetic biodiversity. All these good husbandry practices are highly dependent on the local environment and on the available natural resources and require therefore sustainable integrated management of the environment and livestock in order to produce long-term benefits, on the basis of One Health.

Women's empowerment

It is estimated that about two-thirds of the world's one billion poor livestock keepers are rural women (Herrero et al. 2012). Although a common perception is that women are more likely to own small animals such as chickens, sheep and goats than larger animals, the species or breeds owned by women and their control over income generation varies by region and culture. For instance, in many cases, although cattle are under men's control, women are often responsible for milk, especially when it is used for household consumption, but sometimes also for market sales.

Especially in rural areas and pastoral communities, women play a **very important role in food security**. Women's access to and control of productive assets and their participation in the decision on whether to sell or consume the family's animal products could greatly determine the well-being of household members, especially children. A study from the International Livestock Research Institute (ILRI) showed that consumption of meat, milk and eggs by infants up to two years of age (the first 1,000 days) and by expectant and new mothers in developing countries improve a child's prospects of growth, cognition and development (Grace et al. 2018).

Despite the central role women play in livestock production, women generally have lower access to technology, land, inputs, information and training than men. Enhancing the role women play in livestock keeping, securing their access to resources, decision making and participation in income-generating activities can help to reduce childhood undernutrition. VSF International is working to foster women empowerment at all stages of the value chain, through **training, livestock distribution, and**

supporting the capacity building of women associations and credit groups. Women's participation in the economy is fundamental to promote their full participation in public life and in decision making at the family level.

Sustainable natural resources management and agroecology

The availability, access to and quality of natural resources directly impacts the capacity of humans to produce nutritious food (either crops or livestock products) to sustain healthy lives. Well-managed natural resources provide the basis for productive and sustainable farming and livestock keeping, resulting in long-term food security for local communities and improved health of humans, animals and the environment. When managed correctly, livestock grazing can increase land cover, plant productivity and biodiversity, and contribute to the sequestration of large amounts of carbon. Livestock grazing can be also vital in maintaining habitats for wild plants and animals. Furthermore, the integration of livestock and crop farming, under the agroecological approach, produces benefits for humans, animals and the environment.

VSF International helps farmers and pastoralists to establish or improve regulations and practices for **efficient and sustainable management of natural resources** to enable sustainable use of pasture, land and water, without degrading fragile ecosystems. When pastures are already degraded, attempts at their regeneration include better and collective management of grazing areas and re-seeding of grass and tree species.

In order to make optimal use of natural resources, maintain biodiversity, ecosystems balance and increase overall farm productivity, the VSF International network promotes farmers' adoption and scaling-up of **agroecology**, an integrated approach to farming based on local and traditional knowledge and adapted to the local environment and socio-cultural context. Agroecology provides a framework to link ecology, culture, economics and society to create healthy environments, food production and communities and is therefore closely linked with the One Health approach (VSF International 2014). For instance, agroecological systems optimize the interactions between plants, animals, humans and the environment: on one hand livestock contributes to increasing total farm and land productivity by providing draught power and fertilizer, reducing the need for external inputs, and by converting crop residues into valuable protein. On the other hand, the coexistence of different crop and forage species, shade trees, etc., improves animal welfare and overall health status (FAO 2018). All these interactions favour the maintenance of biodiversity and generate important ecosystem services, including the regulation of pests and diseases.

Nonetheless, **access to land and natural resources** remains a challenge for many smallholder farmers and pastoralists. On one hand, customary land tenure systems, which have governed community use of land for centuries, are often not recognised, and land without title becomes an easy target for land grabs and acquisitions. On the other hand, the intensification of droughts and other effects of climate change increases the risk of conflicts in relation to accessing water sources, grasslands and fertile lands. VSF International supports the establishment of **participatory land-use plans** by creating space for negotiation and co-management with all actors involved in the use of a specific territory. As well, by strengthening community-based organisations, VSF International supports their engagement in **policy dialogues** for the recognition and protection of customary land-tenure rights, traditional rules and rangeland management norms.

Inclusive value chains and access to markets

Many small-scale farmers are excluded from **marketing opportunities**, because of their size, non-homogeneous or limited production, weakness of their organization and reduced bargaining power. They may lack the infrastructure for stocking, transporting and processing their products. Support for inclusive value chains and well-functioning local markets is proven to be key to securing access to revenues for millions of vulnerable people.

VSF International supports smallholder producers to improve the quality of their products (animal-derived food or crops) through **improved production techniques based on agroecology and sustainable livestock practices**. Agroecology offers a wide range of opportunities to diversify on-farm production, which can generate further income, and off-farm activities related to the rural lifestyle, such as handicrafts and eco-tourism, which, besides generating income, contribute to keeping rural areas inhabited and well-managed.

Strengthening producers' groups or cooperatives is also key to developing appropriate marketing strategies and to ensure that the revenues stay at the farm level. When

possible, local processing of those quality products is promoted, allowing them to generate an increased income for the family. VSF International also supports the establishment of local markets where seasonal and local products are sold at a fair price.

Animal diseases may also constitute an obstacle for commercialisation and trade opportunities, either at the local, national or international scale. For instance, when a health crisis is declared (be it foot-and-mouth disease, bird flu, or others), movements of live animals or animal products are limited, borders are closed, and prices drop. Therefore, **strengthened animal health services contribute to preventing market disruption due to diseases.**

Support the livelihood of populations affected by crisis

Disasters, shocks or protracted crises such as droughts, floods, earthquakes, wars, etc. can affect livestock-based economies and livelihoods in several ways. Direct impacts relate to the loss of livestock and their multiple values, including loss of animal-sourced food, loss of manure and draft power (and increased demand for human labour), loss of savings and investments, loss of social capital. Indirect impacts are less visible but equally important, and refer to the loss of the other livestock functions in terms of reduced income to provide for food, reduced labour availability, reduced agricultural productivity, inability to cover sudden expenses such as medical bills and school fees, loss of pride and cultural/political power, migration or conflict.

In order to have a sustainable impact, effective crisis responses should offer a combination of short-term emergency relief and long-term resilience strengthening, tackling the multiple dimensions of livelihoods, including livestock. In this, VSF International is guided by the **Livestock Emergency Guidelines and Standards** (LEGS), a set of guiding principles to implement livestock-based interventions that strengthen the recovery capacity and the overall resilience of affected populations (VSF International 2018a).

LEGS' interventions include the provision of feed, provision of water, provision of veterinary services, destocking, restocking, and livestock shelter and settlement, and are usually accompanied by other emergency interventions to cover basic needs such as health, shelter, sanitation and hygiene, and education. Since the interaction between humans, livestock and the environment are at the centre of emergency interventions to rebuild the livelihood of affected communities, One Health is implemented through partnering with other specialised organisations who deliver complementary services.

Emergency preparedness is also a key component of VSF International's projects in vulnerable areas. Communities are involved in planning response strategies and in establishing early warning systems to be better prepared when disasters strike and to prevent catastrophes.

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Scope for partnerships

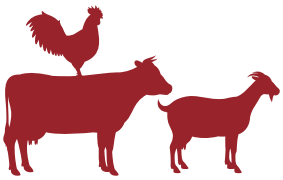
The scope for partnerships within the One Health approach is very broad. The figure below presents some possible starting points to build partnerships with other organizations working in development and humanitarian aid.

Figure 2

Examples of collaborations within One Health to contribute to the strategic axes of intervention ↓

SECTORS RELATED TO HUMAN WELLBEING

• **Joint disease diagnostic, laboratory analysis, prevention measures …**



SECTORS RELATED TO LIVESTOCK WELLBEING

• **Integrated service delivery**

• **Awareness raising on zoonosis; biosecurity; AMR…**

• **Training on sustainable farming practices, integration of livestock and crops, agroecology**

• **Nutrition-sensitive agriculture and livestock production**

• **WASH interventions**

• **Environmental conservation within participatory land use plans**

• **Early warning systems based on integration of environmental indicators**

• **Awareness raising on correct management of drug residues and waste, agrochemicals etc.**

SECTORS RELATED TO ENVIRONMENT AND WILDLIFE

4. CONCLUSION

In contexts characterized by a high degree of interdependence between humans, animals and the environment and poor access to services, the challenges related to health and well-being are numerous, and require adapted solutions. The VSF International network is committed to implementing the One Health approach in order to improve the livelihood of vulnerable communities in the Global South and increase their resilience based on healthy relationships between humans, animals and the environment. With the main expertise in livestock and animal health, VSF International has always aimed to adopt holistic approaches and implement multi-sectoral interventions in order to support vulnerable communities in a sustainable way. For this, **collaboration and partnerships are needed**, especially to complement different expertise from the human, animal and environmental-related sectors, and to involve different types of actors, including local civil society and farmers' and pastoralists' organizations.

Successful implementation in the field of the One Health approach requires a multi-dimensional understanding of the problems and solutions (responding to different expectations and needs), and input from every stakeholder under a transdisciplinary approach. It requires holistic, systemic approaches based on participatory methodologies to **involve local communities** and farmers organizations in the design, implementation and evaluation of the actions.

The strategic axes of intervention implemented by VSF International produce One Health benefits, as they either directly address more than one aspect of human, animal or environmental health, or because actions whose principal aim is to address one specific health risk also indirectly benefits the other two health pillars.

Making One Health operational requires an **enabling environment** to put in place practical collaborations and establish platforms where all actors, from grassroots organisations to research centres, government representatives and international organizations exchange knowledge and practice. Donors also have a big role to play to promote a One Health approach when defining the development priorities and policies and when they make decisions on resources and funds allocation.

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RECOMMENDATIONS

In order to build an enabling environment for One Health implementation in the Global South, international organizations, policymakers and donors should:

- **Recognize** the benefits of implementing the One Health approach, which allows for cost-effective interventions (as resources are shared/mutualized to achieve multiple objectives in the human, animal and environmental pillars and efficiency and effectiveness of interventions is increased) leading to long-lasting results by considering all the interconnected aspects of a health problem;
- Include One Health as a **key component of the development policies and health strategies**, in line with the achievement of the Sustainable Development Goals. In parallel, put in place mechanisms to assure **coherence among policies and programmes** to avoid interventions in one sector impacting negatively on either human, animal or environmental health;
- Put in place mechanisms to **foster multidisciplinary collaborations** between actors at global, national and especially local level. This could be done through the creation of ad-hoc institutions or platforms, or simply by facilitating multisectoral partnerships though appropriate policy frameworks. Collaborations for multi-sector interventions, involving different disciplines linked to human health, animal health and environmental health should be reinforced through adequate resources and funds;
- Include in One Health interventions a **broad range of stakeholders**, from academia to technicians and practitioners such as NGOs and local actors, with special attention to the inclusion of **local communities and farmers' organizations**, who are in the frontline of food production, at the interface between animal health and productivity, sustainable management of the environment and peoples' health, and who hold a valuable set of traditional knowledge;
- Strive to **systematically include the environmental "pillar"** in the implementation of the One Health approach by focusing also on human practices that impact the environment and, in turn, affect human health.

In order to support and enhance the adoption of One Health within field interventions, research institutions should:

- Engage more in the communication and dissemination of research outcomes to a wider audience, in order to facilitate the adoption and scaling-up of adapted solutions to One Health problems;
- Develop applied research projects to tackle One Health issues, based on collaborations between researchers, NGOs and other local stakeholders and institutions.

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VSF INTERNATIONAL
VÉTÉRINAIRES
SANS FRONTIÈRES

VSF International is a network of non-profit organizations working all over the world to support small-scale farmers and livestock keepers. In this publication, reference to "VSF International" is used to designate all members of the network, who are directly in charge of implementing projects in the field.

This technical paper is accompanied by a shorter Policy Brief. Both publications are available online at:
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