Integrated approaches to health

A handbook for the evaluation of One Health

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Chapter 4

Evaluating the contributions of One Health initiatives to social sustainability

Photo: Chinwe Ifejika Speranza

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Abstract

One Health is an approach that integrates perspectives from human, animal and environmental health to address health challenges. As the idea of One Health is grounded in achieving sustainable outcomes, an important aspect is the contribution of One Health to social sustainability. In this chapter we ask, what social sustainability is, what the indicators of social sustainability related to One Health are, and, through what measures we can evaluate the contributions of One Health to social sustainability, in terms of its operations, its supporting infrastructures and outcomes. We adopt a wider conceptualization of social sustainability and propose an approach based on basic needs, capabilities and emancipation, environmental justice, solidarity and social cohesion. First, we identify indicators used in literature to capture social sustainability in human, animal and environmental health and propose ways to integrate them into a framework for the evaluation of One Health initiatives. Second, we formulate questions that can be used to evaluate the social sustainability of One Health initiatives. Third, we discuss the viability of operationalising the indicators, the trade-offs that might arise and identify how they can be minimised. We then discuss methodological issues and highlight the importance of transdisciplinary deliberative approaches for adapting the framework to specific contexts.

Keywords: One Health, social sustainability, capabilities, emancipation, environmental justice, solidarity, social cohesion

4.1 Introduction

Interacting agro-ecological, physical, economic, socio-cultural and political conditions (commonly understood as social-ecological systems) can contribute in various ways to human, animal and ecosystem health. For instance, human health benefits from contact with nature through improved mental and physical well-being, and human interactions with nature can improve pro-nature attitudes and behaviours (Frumkin *et al.*, 2017; Hofmann *et al.*, 2017; Richardson *et al.*, 2016).

Yet stressors on resources and the environment increase wider health risks, including and beyond disease. Human-induced environmental impacts such as greenhouse gas emissions, deforestation, and land degradation, or natural processes such as volcanic eruptions or pest infestations can drive environmental change and make environments unconducive for animal and human health. This includes the increase of climatic hazards such as floods and storms (Zinsstag *et al.*, 2018), respiratory diseases due to air pollution (Thurston *et al.*, 2017), bioaccumulation of pollutants and endocrine disrupters in the food chain (Frazzoli and Mantovani, 2010; Frazzoli *et al.*, 2009), water pollution by pharmaceuticals and plastics (cf. Caliman and Gavrilescu, 2009), and the development of antibiotic resistance and subsequent adverse impacts on human and animal health. Pollution also affects animal health and this can compromise the functioning of ecosystems, such as the reduction of crop pollination due to bee colonies affected by pesticides and herbicides (Henry *et al.*, 2012).

Impaired health often results from complex interactions between different components of a social-ecological system; hence, there is a need to address the interdependencies between humans, animals and the environment, and the social and environmental determinants of health. This requires a consideration of the distal and proximate drivers of disease and health, as well as disease detection, prevention and control (WHO *et al.*, 2015, p. 41; Zinsstag *et al.*, 2011). The One Health (OH) approach that integrates societal and scientific perspectives to address the sectoral interlinkages between human, animal and environmental health (Rüegg *et al.*, 2017) can meet this challenge. An integrative OH-approach promises to be more effective in reducing losses (e.g. economic loss from production and trade; human and animal mortality from disease, habitat loss) that would have occurred if single sector approaches were followed (Berthe *et al.*, 2018; Zinsstag *et al.*, 2015a). Moreover, it is also expected that OH leads to more sustainable outcomes for humans, animals and the environment.

So far, no frameworks or methods exist for evaluating *how* OH, through its operations and outcomes contributes to social sustainability. This chapter thus aims to develop a framework for defining what social sustainability is about and presents a methodological framework for evaluating the contributions of OH to social sustainability.

4.2 Understanding social sustainability, its dimensions and indicators

Contemporary ideas of social sustainability primarily build on the Brundtland Report that defines sustainable development as 'development which meets the needs of the present without compromising the ability for future generations to meet their own needs' (WCED, 1987, p. 43). Subsequently, various attempts highlight the social in sustainable development; addressing system characteristics and properties such as welfare in the present and future, and the interdependence between society and the environment (cf. Garcés *et al.*, 2003; Hodge and Hardi, 1997).

A first distinction in framing social sustainability is the focus on: (1) the capability of institutions to address societal concerns; and (2) the ability to maintain a dynamic balance between social agents and social structure.

In the social quality/capability perspective, social sustainability is understood as a 'quality of societies' that encompasses not only basic needs but also the ability to address societal concerns in the face of risks, such as coping with climate change (Eizenberg and Jabareen, 2017) or being resilient to health challenges (Obrist *et al.*, 2010). It thus focuses on whether institutional configurations are able to satisfy both human needs and preserve the social and ecological capabilities required to fulfil these needs by including criteria of social justice, human dignity and meaningful participation (Littig and Griessler, 2005).

Thus, the above-mentioned focus on capabilities and needs is part of a social structure-agent perspective. It focuses on and unpacks the relations between agents (individual(s)) and social structure (society). It builds on the assumption that agents and social structures are constitutive of each other, with individual and collective perceptions shaping historical and contemporary social developments (Giddens, 1984). In this sense, Empacher and Wehling (1999) argue that the social is innately bipolar, with tensions between the individual social

actor who strives for autonomy and achievement of own goals; and the society (social system) within which the individual actor is situated, which strives for conformity, cohesion and stability. Social sustainability thus entails securing individual and social stability and securing the capacity of society to develop and function (Empacher and Wehling, 1999). For the individual, this relates to physical and material well-being (income, employment), social recognition and social integrity, and opportunities for self-development and autonomy. Securing social stability concerns peaceful coexistence, distributive justice, and participation.

According to Empacher and Wehling (1999), such development and functional capacity can best be achieved through maintaining cultural diversity, diversity of social structures, social cohesion (inter-generational, solidarity principle) and availability of education and learning facilities. They thus identify five key elements of social sustainability: (1) livelihood security for all; (2) development capacity of social subsystems and structures; (3) maintenance and further development of social norms and values; (4) equal access to resources; and (5) participation in decision-making.

A second distinction can be made between analytical (what are the relations between society and nature?), normative ('what kind of social values are needed?') and political framings of social sustainability ('what practical strategies should be adopted to achieve social sustainability') (Littig and Griessler, 2005). Analytical, normative and political aspects of sustainability can also be interpreted as system-, target- and transformation knowledge (Pohl and Hirsch Hadorn, 2007). While social sustainability and its different theoretical, political and practical framings are inherently normative (Littig and Griessler, 2005; Pareja-Eastaway, 2012; Vallance *et al.*, 2011), different perspectives have primarily focused on either the analytical or normative aspects.

The analytical perspective departs from theories concerning the relationship between nature and society in terms of the social values to be attained through sustainable development (Littig and Griessler, 2005). This perspective is both descriptive and prescriptive, with a focus on describing the social processes that shape society's interrelations with nature, and inquiring about how processes and structures can be transformed to ensure development chances of future generations (Littig and Griessler, 2005).

In contrast, a normative perspective to social sustainability is concerned with what kind of social values are needed. It captures a set of social principles (Box 4.1) as reflected in the contents of the Brundtland report. This perspective seeks to set value standards such as participation, equal opportunities, justice, etc., which are considered inherently legitimate and define social development ideals for present and future generations (Becker *et al.*, 1999, p. 5; in Littig and Griessler, 2005, p. 70). In addressing the contributions of OH initiatives to social sustainability, various principles drawn from across United Nations charters may be assumed, and are made explicit in Box 4.1. Grounded in human rights principles, these tenets can help to guide transdisciplinary deliberations on the social sustainability of OH initiatives.

Box 4.1. Underlying principles for assessing social sustainability.

- Human rights principles: Based on the United Nations, Universal Declaration on Human Rights in 1948, all humans have equal rights and freedoms, which are protected by law, irrespective of race, gender, nationality and other differences. In 30 articles, various indispensable rights for human dignity and free development of human personality are specified. Article 25 highlights the 'right to a standard of living adequate for the health and well-being..., including food, clothing, housing, medical care and necessary social services and the right to security...' (United Nations, 1948, p. 76). Article 29.2 highlights the limitations of individual rights for 'securing due recognition and respect for the rights and freedoms of others …, public order and the general welfare in a democratic society' (p. 77).
- The principle of intragenerational equity proposes that social impacts of interventions should not fall disproportionately on certain groups, in particular, children and women, the disabled and socially excluded, certain generations or certain regions (op. cit. Vanclay, 2006, p. 5). A critical aspect of intragenerational equity is gender equity.
- The principle of intergenerational equity proposes to manage interventions in ways that allow meeting the needs of the present generation without jeopardising the ability of future generations to meet their own needs (op. cit. Vanclay, 2006, p. 5). This relates to discounting in economic evaluation (see Chapter 6, Section 6.2.2.5).
- The uncertainty principle acknowledges that our knowledge of the natural and social world and of social processes is incomplete as the social environment and the processes affecting it are changing constantly and vary from place to place and over time (op. cit. Vanclay, 2006, p. 5).
- The precautionary principle states that strategies of precaution must be prioritized against strategies of reaction, especially when there are serious or irreversible threats to the health of humans or ecosystems, and even when there is acknowledged scientific uncertainty. In this sense, precaution should guide 'public health decisions under conditions of uncertainty with an appropriate consideration of power, ownership, equity and dignity' (cf. Martuzzi and Tickner, 2004, pp. 3; 7).
- The prevention principle states that it is generally preferable and cheaper in the long-term to prevent negative social impacts and ecological damage than having to restore or rectify damage after the event (op. cit. Vanclay, 2006, p. 6).
- The recognition and preservation of diversity states that planned interventions should not lead to the loss of social diversity (age, gender, value systems and different skills) in a community or diminish social capital (op. cit. Vanclay, 2006, p. 5). Social-ecological systems with diverse resources are likely to be more inclusive and more resilient to stress and shocks (Ifejika Speranza *et al*., 2014).
- The polluter pays principle proposes that the full costs of avoiding or compensating social impacts should be borne by the proponent of the planned intervention. (op. cit. Vanclay, 2006, p. 6). This includes the internalisation of costs, so that the full social and ecological costs of a planned intervention should be included into the cost of the intervention using economic and other instruments. Thus, no intervention can be cost-effective if they create hidden costs to current or future generations or to the environment (op. cit. Vanclay, 2006, p. 6). (For details, see Chapter 6).
- The protection and promotion of health and safety proposes that all interventions should be assessed for their health impacts and accident risks, paying particular attention to those groups that are more vulnerable and more likely to be harmed. This generally includes the economically deprived, indigenous groups, children and women, the elderly, and the disabled as well as the population most exposed to risks arising from the planned intervention (op. cit. Vanclay, 2006, p. 6)
- The principle of multi-sectoral integration argues that social development needs and social issues should be properly integrated into all interventions (op. cit. Vanclay, 2006, p. 6). >>>

Box 4.1. Continued.

- The principle of subsidiarity proposes that decision-making power should be decentralised, with accountable decision-making as close to an individual citizen as possible, with local people having an input into the approval and management process (op. cit. Vanclay, 2006, p. 6).
- The principle of emancipation means setting people free from the coercive control or constraint of more powerful or dominant other people or social groups, and from subjection to them. It emphasises altering the relationship between dominant and subordinate social groups, and lessening the opportunities for the one to harm the interests of the other (Williamson, 2010, p. 2).
- The principle of Common But Differentiated Responsibilities and Respective Capabilities acknowledges that in view of the different contributions of countries to global environmental degradation, countries have common but differentiated responsibilities and respective capabilities in view of their level of economic development to address this global environmental challenge, in particular, climate change (UNCED, 1992, p. 2 Principle 7; United Nations, 1992).

Considering social sustainability from a transformative perspective requires an additional conceptual step as made explicit by Opielka (2017, pp. 10-11), who identifies three inter-related discourses of social sustainability: (1) a narrow framing; (2) internal conceptualization (differentiated into conservative and liberal perspectives); and (3) a wider conception. The narrow framing captures social sustainability as one of the three pillars of sustainability, as 'conflict reduction and redistribution of resources' that allies with ecological sustainability but opposes the dominance of economic sustainability. For Opielka, a conservative perspective of the internal conceptualisation addresses 'social sustainability as the sustainability of the social', thereby maintaining the core values of a society while avoiding institutional transformation and social redistribution. The bridge between this internal conception and the human responsibility for nature and the environment is made through public debates on the commons: e.g. air, biodiversity, water, as they relate to local communities and the world society. A liberal perspective emphasises the sustainability of economic functioning as captured by 'intergenerational justice concerning the distribution of resources' such as old age allowances or financial debt. Opielka (2017) identifies the wider conception of social sustainability in cases, whereby social sustainability becomes a goal in societal transformation towards post-growth, green growth, de-growth or as captured by the sustainable development goals (Box 4.2), thus opening up the concept of social sustainability towards the type of economic system to which social sustainability should be related.

We argue that the above-mentioned 'wider conceptualization' of social sustainability is adequate for the OH-context, as it leads more concretely, to the consideration of a broader set of interests and actors than standard public health approaches.

First, it means integrating human, animal and ecological health (Hinchliffe, 2015; Rock *et al.*, 2014). Thus, even when public health interventions are humanist in orientation, efforts to sustain the health of our ecological communities might require the prioritisation of non-human interests (Capps and Lederman, 2015; Degeling *et al.*, 2016).

Box 4.2. Social sustainability in the sustainable development goals (adapted from United Nations, 2015).

The challenge of achieving social sustainability in health interventions is reflected in the global Sustainable Development Goals (SDGs). Maintaining a healthy world population remains a challenge that is being addressed through SDG 3 that aims to 'ensure healthy lives and promote well-being for all at all ages' (United Nations, 2015, p. 20ff.). Within this goal, health equity is reflected in the Target 3.8., which aims to 'achieve universal health coverage, including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all.' Target 3.9 foresees 'by 2030, [to] substantially reduce the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination.' Target 3b plans among others to 'provide access to medicines for all' and Target 3d aims to 'strengthen the capacity of all countries, in particular developing countries, for early warning, risk reduction and management of national and global health risks.'

Building on a pledge to leave no one behind – the SDGs strive to ensure the social foundations of society. SDG 1 aims to end poverty in all its forms (p. 19), targeting 'nationally appropriate social protection systems and measures for all, including floors,...(SDG 1.3)', ensuring that people 'have equal rights to economic resources, as well as access to basic services, ownership and control over land and other forms of property,... (SDG 1.4)', SDG 1.5 supports building the 'resilience of the poor and those in vulnerable situations...'. It also aims to secure 'significant mobilization of resources from a variety of sources...' (1.A), and 'create sound policy frameworks at the national, regional and international levels, based on pro-poor and gender-sensitive development strategies, to support accelerated investment in poverty eradication actions' (1.B).

Life in dignity and equality are important social conditions. Ensuring equality is a focus in various SDGs (e.g. SDG 1: no poverty; SDG 5: 'achieve gender equality and the empowerment of all women and girls' (p. 22); SDG 10: 'reduce inequality within and among countries', p. 25).

The SDGs also aim to foster social cohesion through a focus on peace – 'to foster peaceful, just and inclusive societies which are free from fear and violence. There can be no sustainable development without peace and no peace without sustainable development'. Further, the United Nations regards partnership (also in SDG 17) as a basis for Sustainable Development, 'based on a spirit of strengthened global solidarity, focussed in particular on the needs of the poorest and most vulnerable and with the participation of all countries, all stakeholders and all people' (p. 6).

Second, it means focussing also on the implications that social sustainability has for the currently dominant capitalist economic systems. Although there are varying forms of capitalist economic systems – they are commonly understood as the results of the specific interactions between marketization (driven by private or public interests) and socio-environmental protection (driven by protecting basic rights of people, other living entities and the environment) from the liabilities of marketization.

It was the merit of Polanyi (2001) to show that modern market-based economic systems result from, and are reproduced through, a progressive dis-embedding of the economic system from the related social systems. He also showed that this process was- and still is – only possible to

the degree that labour, nature and money (as a means of exchange) are stripped of their use value[1] and are turned through this into eventually factious commodities as the only way these human and natural elements can circulate in a predominantly market-based economy.

These considerations from a historical perspective of political economy are important for the discussion on social sustainability because they allow integrating a main root cause of social unsustainability (i.e. exclusive commodification of human, animal or ecosystem health) that affects the present and future generations. Hence, the definition of social sustainability must also consider to what degree it is able to contribute to the re-embedding of economic relations into the realm of wider society. This is of course not equal with reinstituting pre-capitalist societies. As Fraser (2011), based on feminist theories and practices shows, it is possible to broaden Polanyi's notion of a 'double' to a 'triple' movement, adding the notion of emancipation to the processes of marketization and state-based protection.[2]

Fraser (2013, p. 129) claims that the triple movement serves as an analytical lens that – unlike the double movement of Polanyi – '… delineates a three-sided conflict among proponents of marketization, adherents of social protection and partisans of emancipation. However, the aim here is not simply greater inclusiveness. It is rather to capture the shifting relations among those three sets of political forces, whose projects intersect and collide. The triple movement foregrounds the fact that each can ally, in principle, with either of the other two poles against the third.' The triple movement approach means therefore connecting the critique of commodification to the critique of domination, implying to understand social sustainability as also related to the transformation of the economic system. Such framing implies taking into account the opportunities and constraints offered by political collective action not only in view of a marketization vs state (regulation or protection), but in the

[1] According to economic theory and the political economy used by Polanyi (2001) and many others, all these items have use value i.e. they can be used for other purposes than engaging in market relations.

[2] In his seminal work, the 'great transformation' Karl Polanyi (2001) uncovers a double movement that acts as a major driver of economic processes in modern history. A first movement of 'marketization' refers to the establishment of hegemonic discourses and related institutions through which the economic elites are praising market utopia as the best way of organizing modern societies. Accordingly, the economic realms are progressively dis-embedded from the social and cultural ties used by society for gaining control over economic institutions and eventually determine the scope of the market. Polanyi argues that free-market utopians and related liberals are pushing towards a situation in which societies are increasingly subject to the rules of the market. This creates 'modern' capitalist economic systems that are powered by transforming nature, humans and means of exchange (money) into 'fictitious commodities' which are bought and sold in the market just like any other commodity.
The second movement is the reaction against the social, cultural, economic, health and environment related costs of the first movement. This reaction was not foreseen by the promoters of the first movement and was the result of the manifold protests against the ravages of the forces of free markets. Actors of the second movement are civil society organizations, trade unions, progressive and social-democratic political parties, social and liberation movements, organizations fighting for human, labour, ethnic, political, social, cultural – and more recently – also for environmental rights of people and ecosystems that were coming under pressure through the expansion of the forces of 'free markets'. The common ground of these movements was the establishment of sometimes powerful discourses and institutions (laws, rules and regulations) aiming at protecting social and environmental realms of societal life, from the negative influences of the 'free markets'. The actors of this second movement are mainly operating through governments and states that have the legitimacy to define, enforce and sanction the economic actors, based on socially and culturally defined rights that have to be respected, even if they contradict purely economic interests.

wider more complex and dynamic interplays between marketization, protection (state) and emancipation (social movements).

Considering the above discussions on the principles underlying social actions and relations (Box 4.1), the analytical and normative dimensions[3] of social sustainability and the need to emphasise the social, there is a need for a framework that integrates these dimensions. The suggestion by Littig and Grießler (2005) to track progress towards social sustainability, using the following three core indicators, namely: (1) the satisfaction of basic needs and quality of life; (2) social justice and equal opportunities; and (3) social coherence, follows such an integrative approach. While building on this approach, we propose to extend considerations on capabilities to emancipation processes, and extend notions of social justice to an approach based on environmental justice that encompasses both human and non-human dimensions (cf. Fraser, 2009).

We thus define social sustainability as a condition, process or outcome whereby the needs and capabilities of current generations are secured, environmental justice, solidarity, social cohesion, as well as emancipation and self-determination thrive in a context of ecological sustainability, while ensuring to the extent possible the capacity of future generations to meet their own capabilities (Figure 4.1). This definition builds on the capability approach as proposed by Sen and Nussbaum (Nussbaum, 2011, 2000; Nussbaum and Sen, 2002; Sen, 2009, 2000, 1993, 1992, 1985), while integrating the notion of basic human needs and emancipation. This wider approach also emphasises the non-human interests and needs central to the health and sustainability of our ecological basis (Figure 4.1).

Figure 4.1 illustrates the biophysical environment comprising soil, water, animals, plants, other biodiversity, physical and built resources as the context within which underlying values and principles (Box 4.1) are negotiated, socio-economic conditions thrive and institutional arrangements are deliberated. It shows that social sustainability builds on a biophysical context and can be realized in terms of conditions, processes and outcomes. The three dimensions of human well-being as captured by: (1) basic needs, capabilities and emancipation; (2) environmental justice; and (3) solidarity and social cohesion influence one another and are reflected in the sustainable development goals (Box 4.2). Well-being, which refers to quality of life, is thus likely to be high in the face of achieved functionings and capabilities and in a context of environmental justice, solidarity and social cohesion. Evaluating social sustainability thus means analysing the extent to which processes are socially sustainable and are likely to lead to socially and ecologically sustainable outcomes. In the following, we discuss the three overlapping dimensions.

4.2.1 Basic needs, capabilities and emancipation

In this section, we propose a 'basic needs, capabilities and emancipation' dimension of social sustainability. We consider capability as a broader conception of needs that goes beyond the basic needs ensuring the material basis of life, to providing people scope for action

[3] Dimension as used in this chapter refers to a component, an aspect, a feature, or a facet.

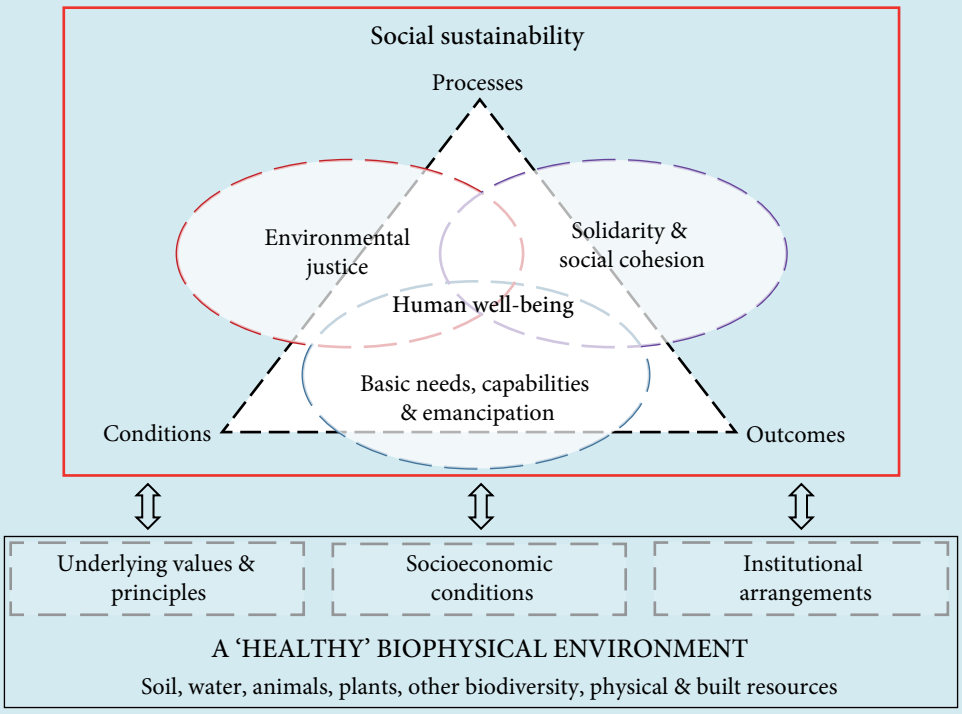

Figure 4.1. Conceptualising social sustainability.

and opportunity that allows choice, with emancipation playing a key role in creating the conditions to enable choice.

4.2.1.1 Basic needs

The concept of basic needs captures the universal need of humanity for food, shelter, clothing, bodily integrity, health, healthy environment, and access to clean drinking water and sanitation infrastructure, and security during illness, childhood and old age, and social crises (Empacher and Wehling, 1999; United Nations, 1948). The satisfaction of basic needs and quality of life can be extended to encompass education, employment, health security as well as subjective satisfaction with social processes and conditions (Littig and Griessler, 2005).

It can also be extended to non-material (psychological, spiritual, mental) and cultural needs that include integration in cultural and social networks, and free time and leisure (Empacher and Wehling, 1999). Such an extension means that action opportunities experienced by

individuals must be expanded to make agency[4] and enable them to cater for their basic needs (Empacher and Wehling, 1999).

According to Vallance *et al.* (2011), basic needs are also relevant to contexts of high economic development, because access to necessary goods and services are subject to change and are the foundations of the 'so-called 'higher-order' needs. We argue therefore that a capabilities lens to social sustainability that captures both basic- and higher-order needs is applicable to contexts with different (whether high or low) levels of economic development.

4.2.1.2 The capability approach

The capability approach is an evaluative normative and theoretical framework that asserts that the freedom to achieve well-being is critical for human development and justice. It frames this freedom in terms of capabilities, that is, people's opportunities 'to achieve outcomes that they value and have reason to value', that is, to do and be what they have reason to value (Sen, 1999, p. 291). It evaluates the extent to which a person is able to be (has capability) or to do something (function) with or without having chosen to be or do something in a particular way (Coast *et al.*, 2008; Sen, 1993). For example, starving and fasting are similar functionings but fasting is dependent on the person haven chosen to fast (Sen, 1993). Because it focuses on capacity and opportunity, applying the capability approach can help understand and address conditions, processes and well-being outcomes of people. The capability approach has been widely applied in the social sciences and has been conceptualised to comprise the following dimensions: resources, conversion factors, capabilities (opportunities to achieve beings and doings), choice and functionings (beings and doings) (Figure 4.2).

1. Resources (goods and services; Figure 4.2) can be categorised into human capital – e.g. knowledge and skills; ability to work/labour; physical and cognitive limitations (e.g. Stafford *et al.*, 2017), social capital – e.g. family and friends, financial capital – e.g. incomes and savings, natural capital – e.g. personal relationship with environment/animals (species), and physical capital – e.g. housing (cf. Ifejika Speranza *et al.*, 2014).
2. Conversion factors capture the extent to which a functioning (e.g. being healthy) can be derived out of resources. Conversion factors refer to the ability to convert resources (means) into opportunities (capabilities) or outcomes (functionings) (Sen, 1992). This ability is often an interplay of three types of conversion factors: (1) Internal/individual conversion factors refer to individual abilities, which are internal characteristics of an individual such as sociodemographic and socioeconomic characteristics. External conversion factors comprise: (2) social conversion factors, which capture the social context within which an individual lives – the formal and informal norms, policy landscape, levels of social cohesion, power dynamics, impacts of class, gender and other intersectionality such as race, ethnicity, and caste; and (3) environmental conversion factors that depict the biophysical environment of a person (Sen, 1992). In ideal cases, the combination of

[4] Agency refers to the possibility of people to shape actions and societal structures in which they are embedded in such a way that the members of a society have equal chances to bring their views to social, economic and material expressions.

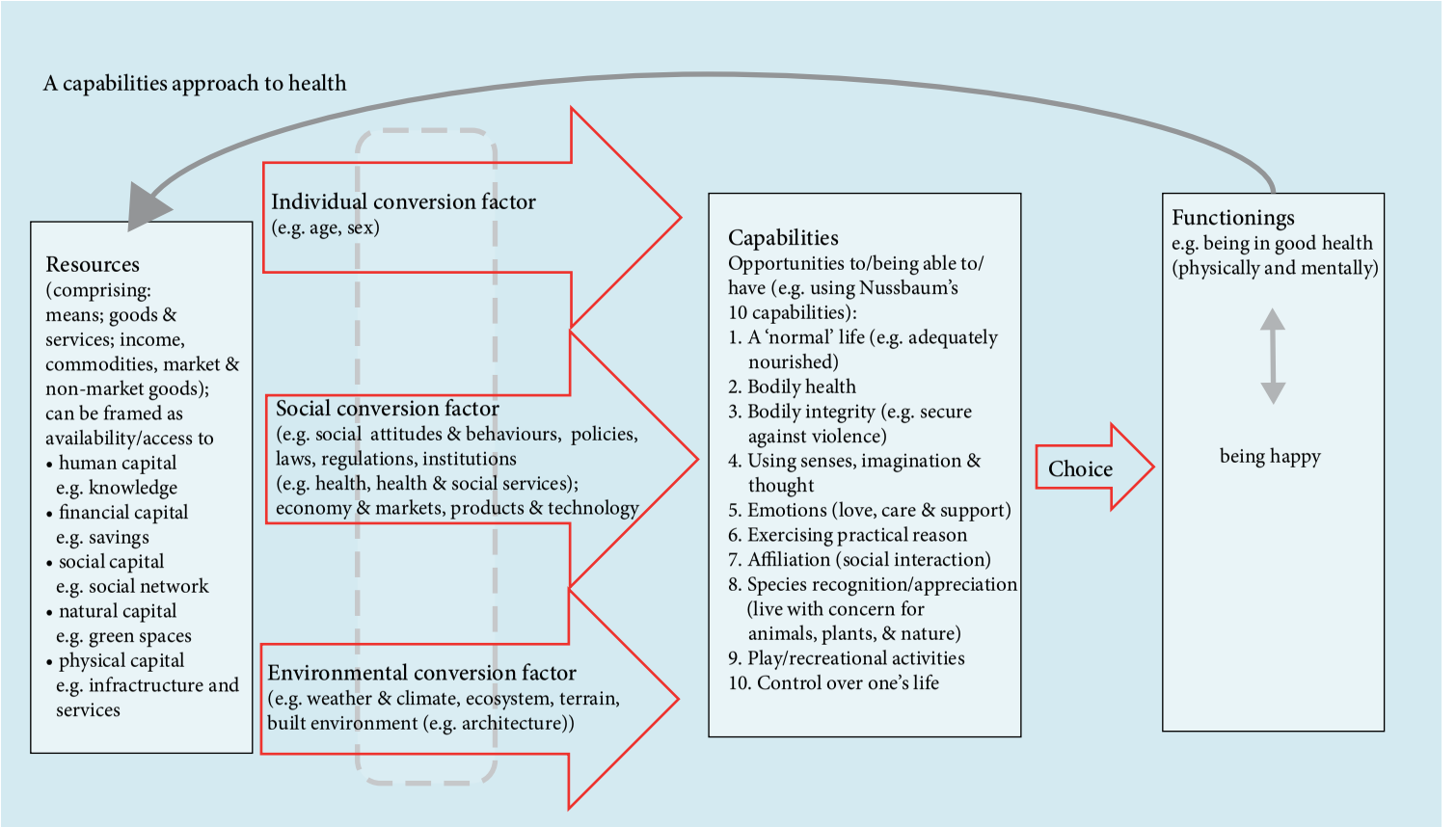

Figure 4.2. A schematic presentation of the capability approach (Authors' compilation from literature cited in this section, drawing in particular from Bussière *et al.*, 2016; Lorgelly *et al.*, 2015; Nussbaum, 2006; Sen, 1992, 1993, 1999; Simon *et al.*, 2013).

these conversion factors would foster the ability of individuals to use opportunities or combinations of opportunities available/accessible to them. Thus, human agency, that is, the ability to pursue valued objectives (e.g. aspirations to next generation's better health), to act and bring about change (Sen, 1992, p. 19) depends on individual and contextual factors.

3. Capabilities refer to (sets of) opportunities for achieving functionings and well-being (Figure 4.2). As levels of capabilities per individual are different, Sen (1992, p. 45 n. 19) captures this notion in *basic capabilities*, that is, 'the ability to satisfy certain elementary and crucially important functionings up to certain levels'. This can be related to poverty thresholds and issues related to human survival such as food and basic needs as discussed in the section on basic needs. Sen's conception of capabilities builds on the idea of social justice, which Nussbaum further concretised using the idea of a life in human dignity. Nussbaum (2006, pp. 76-78) (cf. Nussbaum, 2011) identified ten central capabilities as a minimum standard for a dignified and just life: life; bodily health; bodily integrity; senses, imagination and thought; emotions; practical reason; affiliation; other species; play; and control over one's environment (Figure 4.2). Nussbaum (2006) has also proposed a parallel set of species-specific capabilities to guide our treatment of non-human animals.
4. Functionings refer to 'beings and doings' (well-being outcomes) in the sense of what a person can be (e.g. being malnourished, unhealthy, wealthy, poor, excluded) or do (e.g. working, participating in a meeting) (Sen, 1992). Achieved functionings depends on the interactions of resources available to an individual, the individual, social and environmental conversion factors as well as the choice an individual makes out of the opportunities (capabilities) available/accessible (Figure 4.2).

4.2.1.3 Emancipation

Expanding the capability framing with emancipation (Figure 4.2) allows capturing broader processes of structural change that people can strive for in order to improve capabilities and functionings. According to Fraser (2013), emancipation implies being part of a society of autonomous subjectivities that have equal possibilities of taking part in the configuration of socio-cultural, political and economic structures defining the choices that a society offers to its members. Emancipation has thus the potential to transform the conversion factors that enable capabilities. Hence, emancipatory processes are more likely to be successful if they (1) open new spaces for communicative action, allowing for an intersubjective re-definition of the present situation, (2) contributed to rebalance the relationships between social capital and social, emotional and cognitive competencies within and between local and external actors (Rist *et al.*, 2006).

4.2.1.4 Evaluating the contributions of One Health to basic needs, capabilities and emancipation

To evaluate the impacts of OH initiatives on social sustainability, we propose to assess the four different dimensions – resources, conversion factors, capabilities (opportunities) and achieved functioning (achievements/outcomes) as these, while interacting, capture different dimensions of the capability approach. These dimensions are also active at different levels/scales: e.g. resources may be at the scale of an individual or a community (society). In line with

OH-principles, there is a need for a transdisciplinary and participatory process in defining what resources, conversion factors, capabilities and functionings are to be achieved.

A departure point would be to ask whether people have the resources (means; goods and services: e.g. health services) to make choices (e.g. use health services; select safe consumer products and foods) to achieve functioning (e.g. being healthy). A strength of the capabilities approach is that it can highlight how the impacts and outcomes of interventions – such as the provision of a good or service – varies across and between settings because people live under different conditions, and/or have different types and levels of capabilities.

The importance of resources that people value vary from person to person, so also the focus of OH initiatives. Applied to OH, the question then is what health resources are at the disposal of all people, how each individual has access to the resources and opportunities, how the social-ecological environment influences each individual's opportunities from which s/he can make choices of which actions to implement.

Considering that individuals differ in their abilities to convert resources into outcomes, the extent to which the social and environmental conditions empower people to achieve functionings (outcomes) becomes critical.

Individual conversion factors include physical body conditions, education, knowledge and skills, age, sex and health conditions, cognitive ability, coping styles, social background, profession, past and current experiences, attitude, behaviour, character, and other factors that influence individual experiences of health and well-being (United Nations, 2008, p. 24).

Socio-economic factors affect health operations and outcomes (Braveman and Gottlieb, 2014; CSDH, 2008; Marmot *et al.*, 2012; WHO, 2011), and policies and regulatory frameworks as well as community social capital can enhance health functionings. Socio-economic and political stability and relevant regulations are needed to sustain health programmes (Gruen *et al.*, 2008). Community involvement and participation can also improve the social sustainability of a OH-initiative (Pareja-Eastaway, 2012). Compensations, such as social support services (WHO, 2013), and social security payment systems can address gaps in social conversion factors for those unable to participate. Moreover, preventive and precautionary strategies such as taxes on unhealthy food (Roberto *et al.*, 2015) have potentials to reduce disease.

Emancipation can be captured by evaluating the degrees of self-determination in health-related aspects (access to different health traditions, treatments, institutional equity independently from class, gender or race categories). It thus reflects the intersection of individual and socio-economic conversion factors.

Bussière *et al.* (2016) categorise environmental factors into barriers and facilitators. Facilitators include assistive technology and access to built-environment, such as curb ramps or to transportation, or provisions in law or social policy, family and community support. Barriers are unaccommodating physical or built environments, as well as stereotypical and stigmatizing attitudes. Favourable social and/or economic environment can compensate for the negative effects of cognitive and physical limitations (Bussière *et al.*, 2016). Urban

planning can be relevant to prevention, hence involving different user groups in the planning and decision process is important (Kabisch and Haase, 2014). Spaces for green infrastructure and physical activity have been found to reduce cardiovascular risks, obesity and diabetes and reduce health costs in developed countries (Carter and Horwitz, 2014; Grabow *et al.*, 2012; Jarrett *et al.*, 2012; Pucher *et al.*, 2010). Green spaces also provide habitat for wild animals.

Capabilities and functionings have been assessed through different methods and measures. Ruger (2012a, p. 79) proposes examining health functionings (achievements – e.g. being healthy) and a person's health agency (e.g. the capability of an individual to pursue healthy behaviour) as indicators of health capabilities since health capabilities are not directly observable. In operationalising these measures, a focus should be on assessing whether each individual has the same opportunity (capability) as outcomes (functionings) may vary depending on the choices people make[5].

Health capabilities represent 'the ability of individuals to achieve certain health functionings and the freedom to achieve those functionings' (Ruger, 2012b, p. 81). Socioeconomic capabilities can be in the form of health insurance, education level, and income. In basic terms, the question here is whether people have the freedom (choice) to undertake the relevant basic actions for them to avoid exposure to mortalities or fatalities arising from diseases. Mitchell *et al.*, (2017) conducted a review of the applications of the capability approach and the measurement of capability in the health field. The authors found that most studies focussed on the 'sufficiency of capabilities' whereby health status is one out of the many indicators evaluated. However, as health is an outcome of One Health (cf. Rüegg *et al.*, 2017), health status can be omitted as an indicator of social sustainability (another outcome of One Health) in order to avoid double counting[6]. Various authors have applied the capability approach in health (Al-Janabi *et al.*, 2012; Callander *et al.*, 2013a,b; Mitra *et al.*, 2013; Netten *et al.*, 2012; Simon *et al.*, 2013). Gender aspects have also been considered (Mabsout, 2011; Nikiema *et al.*, 2012). Lorgelly *et al.* (2015) operationalised the capability approach for public health (Box 4.1) using Nussbaum's 10 capabilities.

The WHO (2001, 2010, 2013) proposed the International Classification of Functioning, Disability and Health (ICF) framework for measuring health and disability, whereby functioning is conceptualised as a 'dynamic interaction between a person's health condition, environmental factors and personal factors' (WHO, 2013, p. 5).

Capabilities and well-being can be evaluated in terms of identifying the resources people value in terms of 'agency goals' (being able to do/capability) (Coast *et al.*, 2008) that enables them to achieve the functioning of being healthy and having well-being. Thus, the aim of an evaluation of the contribution of OH-initiatives to capabilities is to measure the capability set of people to be healthy and to achieve well-being. A first step in this analysis would be to identify from people the aspects of health and well-being capabilities they value and in a

[5] This means measuring an intermediate outcome or output that – according to a theory of change – may lead to a final outcome or impact.

[6] In analyses outside a one health context, health can be incorporated as an indicator of social sustainability.

next step to assess the extent to which they have options to achieve these values, the enabling factors and whether they succeed in achieving them (see for example Figure 4.2).

To operationalise such a framework, health and well-being values can be identified through literature review, surveys and expert assessments. These can then be developed into a questionnaire to collect data that is differentiated according to social categories (age, gender, class, ethnicity, etc.) as well as self-rated health condition (scale 1-5: poor, fair, good, very good, excellent). By not pre-defining values or resources important to people to achieve their capability well-being, context specific values can be captured and adapted for analysis (See for example Bussière *et al.*, 2016; Lorgelly *et al.*, 2015; Ruger, 2012b; Stafford *et al.*, 2017; Üstün *et al.*, 2010).

Table 4.1 illustrates the different ways the capability approach has been applied to analyse health issues. It shows that not all the 10 capabilities identified by Nussbaum are applicable to all cases and that authors have adapted them to fit their purpose.

Following Abma *et al.* (2016), questions can be asked about: (1) the aspects of health and well-being that are important/valuable (captures resources) to a person; (2) Whether the person has sufficient opportunities to realise the aspects of health important/valuable to him/her (captures capabilities); and (3) whether the person realises/achieves such identified aspects

Table 4.1. Illustration of the uses of the capability approach in health.

Illustration 1	**Illustration 2**	**Illustration 3**
Lorgelly *et al.*'s (2015, p. 80) operationalisation of the capability approach (using Nussbaum's 10 Central Human Capabilities) for public health.	Bussière *et al.*'s (2016, p. 72) operationalisation of health capabilities (disabilities) based on the International Classification of Functioning, Disability and Health (ICF) framework, using 5 latent constructs.	Üstün *et al.*'s (2010, p. 816) WHO Disability Assessment Schedule 2.0 based on the ICF (using 6 constructs).
1. LIFE: 'Given my family history, dietary habits, lifestyle and health status', I expect to live up to… 2. BODILY HEALTH: My health limits my daily activities, compared to most people my age.	HEALTH CONDITION CAPABILITIES: Number and presence of diseases: diseases, impairments, perceived health status and symptoms (e.g. sleep disorders, tiredness, stress, palpitations, discomfort) PHYSICAL CAPABILITIES: (Scoring scale): 'physical activity limitations (e.g. walking, raising arms, seeing, hearing) and resulting activity restrictions, primarily in terms of activities of daily living (e.g. washing, using the toilet, dressing)'.	SELF-CARE: Ability to attend to personal hygiene, dressing and eating, and to live/stay alone
3. BODILY INTEGRITY: I feel safe walking alone in the area near my home.		MOBILITY: Ability to move and get around
		>>>

Table 4.1. Continued.

Illustration 1	Illustration 2	Illustration 3
4. SENSES, IMAGINATION AND THOUGHT: 'I am able to express my views, including political and religious views.'	COGNITIVE CAPABILITIES: (Scoring scale): 'Cognitive activity limitations (e.g. understanding what people say, concentrating, remembering, being aggressive) and the resulting activity restrictions (e.g. establishing relationships, being disturbed in daily life because of a psychological problem)'.	COGNITION: Understanding and communicating
5. EMOTIONS: At present, I enjoy the love, care and support of my family and friends; In the past 4 weeks, I have lost sleep over worry. 6. PRACTICAL REASON: 'I am free to decide for myself how to live my life.'	SOCIETAL CAPABILITIES: (Scoring scale): 'participation restrictions of an individual in society (e.g. instrumental activities of daily living, leisure, employment, living as a couple), including environmental barriers (e.g. negative attitudes, inaccessible transportation and public buildings, limited social support, and the need for human/technical assistance)'.	
7. AFFILIATION: I am able to 'meet socially with friends, relatives or work colleagues'. 8. SPECIES: 'I am able to appreciate and value plants, animals and the world of nature' 9. PLAY: In the past 4 weeks, I have been able to enjoy recreational activities. 10. CONTROL OVER ONE'S LIFE: 'I am able to influence decisions affecting' my health and well-being; In the past 4 weeks I have experienced discrimination.	SOCIOECONOMIC CAPABILITIES: (Scoring scale): 'personal factors, specifically socioeconomic factors (educational level, insurance, income, home ownership, savings)'.	GETTING ALONG: Ability to interact with other people PARTICIPATION: Ability to engage in community, civil and recreational activities LIFE ACTIVITIES: Ability to carry out domestic responsibilities, leisure, work and school

of health and well-being. To capture the influence of the conversion factors, questions can be asked on what and to what extent self-reported individual (4), social environmental (5) and natural environmental (6) factors enable the person to achieve the aspects of health and well-being he/she values. Following Abma *et al.* (2016, p. 36), all selected items can be ordered from (1) to (5) and scored: 1='not at all'; 2='not', 3='neutral', 4='yes', and 5='very much'.

Box 4.3. An example of questions for capturing health and well-being capabilities.

Assuming for example that 'capability to be healthy and to achieve well-being' is being evaluated, the following questions can be asked to capture this capability:

1. Resources: To what extent does the initiative foster/facilitate/has positive influence on the resource you have at your disposal?
2. Capabilities: Depending on focus, questions can be chosen/adapted from Table 4.1.
3. Functioning: Depending on focus, questions can be chosen/adapted from Table 4.1.
4. Personal conversion factors:
   a. Under the circumstances, what is the most important personal (individual) factor that influences your ability to be healthy/achieve well-being?
   b. To what extent does the initiative foster/facilitate/has positive influence on this personal factor?
5. Social-political environments:
   a. How much does your social environment (family and friends, community, society) support you in your activities to be healthy/achieve well-being?
   b. How much do health policies, regulations and procedures support you in your activities to be healthy/achieve well-being?
6. Natural and built environments:
   a. How much does your natural environment support you in your activities to be healthy/achieve well-being?
   b. How much does your built environment support you in your activities to be healthy/achieve well-being?

To add depth to the collected information, 'explanations' (e.g. please explain why you assigned this score) can be requested from the respondents for the scores they assign to (1) to (6).

In the foregoing, the needs and capability dimensions of social sustainability have been elaborated. In the next section, the environmental justice dimension of social sustainability is discussed.

4.2.2 Environmental justice

Considering human, animal and environmental interconnections, justice needs to be expanded to encompass human species and ecosystems. Environmental justice focuses on the right of all humans to a healthy environment irrespective of their social positions and wealth status (Griffiths, 2006; Schlosberg, 2007), thus extending the concept of social justice to account for human and non-human dimensions of justice. Environmental justice refers to three interrelated dimensions of justice that include recognition (mutual respect), procedural justice including participation and self-determination in decision-making, and distributional justice in terms of equitable access to resources, benefits and burdens (Fraser, 2009; Schlosberg, 2007).

Furthermore, it has been proposed to extend subjects of justice beyond the human individual to include human communities, non-human animals and environmental elements (Schlosberg, 2013; Sikor *et al.*, 2014). Applied to non-human animals, environmental justice can be interpreted in terms of animal welfare (Carrel *et al.*, 2016). Thus, evaluating the contributions of OH to social sustainability in the dimension of environmental justice entails examining the extent to which human individuals and communities are recognised, can participate and equitably share in resources and burdens, and the extent to which animal welfare and environmental health are concerns. In the following, we discuss these dimensions and their relations to OH initiatives.

4.2.2.1 Recognition

Recognition is about respecting identities and cultural differences (Fraser and Honneth, 2003). It is about the 'extent to which different agents, ideas and cultures are respected and valued in interpersonal encounters and in public discourse and practice' (Martin *et al.*, 2016, p. 255). Recognition means 'acknowledging that individuals in groups construct different cases about what is right and wrong based on a complex assemblage of ideas and circumstances, which shape the way they experience a particular problem or issue' (Martin, 2017, p. 14).

Since contexts are different and people's reactions to circumstances are often mediated by their ideas, beliefs and interpretations that are locally and historically situated and less homogenous, rational and predictable (Parsons, 2007), social justice is understood/perceived differently. Recognition means therefore opening up equity concerns to the plurality of contextual and cultural framings of justice. Thus, Fraser (2000) proposes to address cultural inequalities in addition to economic and political inequality, with a focus on the complementarities between redistribution and social recognition.

Recognition therefore entails that all actors (privileged, disadvantaged or vulnerable), are recognized in terms of having an appropriate share of burdens, benefits and opportunities, voice, and their identities respected (Eizenberg and Jabareen, 2017). Through accounting for social categories such as gender, race, age, class and their intersections, recognition and guaranteeing diversity can ensure that the different needs of members of society are not addressed in a one-size fits all approach but in diverse ways relevant to the social context (Borgonovi and Compagni, 2013). Recognition thus provides some clues to navigate through the delicate terrain of universally accepted capabilities and the plurality of framings, aspiration and values. In other words, it means to acknowledge and account for plurality of justice values without abandoning the attachment to a general basic normative principle (Martin, 2017). Recognition also refers to Fraser's (2013) notion of emancipation pointing to the right of self-determination of societal actors in a context of equality to reduce asymmetric power relations.

4.2.2.2 Procedural justice and participation

In social justice theory, distributive justice is intimately tied to procedural justice (Rawls, 1971), which focuses on whether procedures of decision-making ensure equity (e.g. who was involved in the decision-making process? How were the persons involved? Was due diligence followed? Was the process transparent?). Procedural justice has been conceptualized as meaningful participation. Fraser (1996, pp. 30-31), proposes the concept of parity of participation, which focuses on the extent to which social arrangements allow all '(adult)

members of society to interact with one another as peers'. Parity of participation thus depends on legal and political factors but also on the equal distribution of material resources and economic independence, that allows a person's independent participation and voice.

Participation as a measure of procedural justice assumes that people are likely to perceive a decision as just if they participated in making that decision, and is thus often associated with democratic decision-making (Barnes and Coelho, 2009; Iroz-Elardo, 2015). Arnstein (1969) proposed a hierarchical ladder of participation reflecting different levels of engagement with the higher levels reflecting the highest levels of participation and expected effectiveness. Participation is expected to improve ownership and the tailoring of interventions so they are appropriate and relevant for people (cf. Gruen *et al.*, 2008). However, Hurlbert and Gupta (2015) have highlighted shortcomings of participation, especially when it is deemed as inherently good without examining whether it is implemented with appropriate mechanisms or addressed in a technocratic manner. Participation is the most fundamental element that links the dialectic relationship between agency and social structure. This means that participation must allow creating governance conditions that aim at social learning processes that involve all relevant actors. Such social learning processes also aim at creating spaces for transforming strategic action (oriented towards optimizing ego-centric individual or collective interests) into communicative action, oriented in collective efforts, based on a common understanding about what problems, conflicts and solutions are (Rist *et al.*, 2007).

Colquitt and Rodell (2015, p. 189), propose to evaluate procedures based on: (1) 'Process control: procedures provide opportunities' for influencing/controlling a process – voice; (2) 'Decision control: influence over outcomes'; (3) 'Consistency: procedures are consistent across person and time'; (4) 'Bias suppression: procedures are neutral and unbiased'; (5) 'Accuracy: procedure is based on accurate information'; (6) 'Correctability: procedures offer opportunities to correct an outcome'; (7) 'Representativeness: procedures take into account concerns of subgroups'; and (8) 'Ethicality: procedures uphold standards of morality'.

4.2.2.3 Distributive justice

In establishing processes to pursue health equity[7], Litman (2015, p. 3) considers equity as closely related to the social distributive justice, whereas equity is 'also called justice and fairness and refers to the distribution of impacts (benefits and costs) and whether that distribution is considered fair and appropriate'. The notion of distributive justice goes back to Rawls (1971), who considers the greatest benefits of the least advantaged as an outcome to attain through rational impartiality in procedures. Social distributive justice thus ensures that people have (equal) rights (Eizenberg and Jabareen, 2017), and comprises two dimensions: intergenerational (between present and future generations) and intra-generational (between

[7] 'Health inequality is the generic term used to designate differences, variations, and disparities in the health achievements of individuals and groups' (Kawachi *et al.*, 2002, p. 647). 'Health inequity refers to those inequalities in health that are deemed to be unfair or stemming from some form of injustice' (Kawachi *et al.*, 2002, pp. 647-648). The crux of distinguishing 'between equality and equity is that the identification of health inequities entails normative judgment premised upon (1) one's theories of justice; (2) one's theories of society; and (3) one's reasoning underlying the genesis of health inequalities. Because identifying health inequities involves normative judgment, science alone cannot determine which inequalities are also inequitable, nor what proportion of an observed inequality is unjust or unfair' (Kawachi *et al.*, 2002, p. 648).

different societal categories using an intersectional lens (e.g. race, ethnic groups, gender, age, class, etc.) in allocating resources, burdens, benefits and opportunities.

Distributive justice can be evaluated based on (1) 'Equity: outcomes are allocated according to contributions'; (2) 'Equality: outcomes are allocated equally'; (3) 'Need: outcomes are allocated according to need' (Colquitt and Rodell, 2015, p. 189).

4.2.2.4 Justice for animals and other non-human entities

Incorporating environmental justice into health concerns makes the link between humans, animals and ecosystems, and is thus particularly relevant to the OH approach. Griffiths (2006, p. 582) proposes promoting environmental justice as a way towards reducing health inequalities as the concept includes the right of all to a healthy environment. Through an environmental justice approach, health inequalities associated with environmental inequalities can be reduced. Applying the concept of 'environmental justice' helps identify whether exposure to health risks is 'socially patterned' and/or due to the impact of reduced or uneven availability of health facilities, and reduced access or 'access deprivation' (op. cit. Smith, 2016).

Because OH explicitly prioritises the health of non-human animals and ecological systems, there are emerging questions as to whether non-human entities (organisms and ecologies) should also be subjects of distributive justice, rather than this social good being the strict preserve of human interests and human benefits (Capps and Lederman, 2014; Rock and Degeling, 2015). A capability based approach to justice – with its commitment to flourishing – also seeks to promote conditions for health and a good life and could be meaningfully extended to more-than-human concerns (Haraway, 2008; Nussbaum, 2006). Broadening the scope of environmental health justice to include non-humans will require us to share the risks, burdens and goods of OH interventions across species boundaries. Such a move would be both politically and ethically controversial because traditional public health approaches to disease risks are steadfastly humanist in orientation and distribute the costs of control (where possible) onto the environment and other species (Verweij and Bovenkerk, 2016). Nevertheless, consistent with the social sustainability agenda, OH could be a vehicle to prioritise approaches that seek to share both risks and benefits of interventions, where humans and non-humans are considered to be prone to much of the same environmental risks, and have a converging set of interests to their integrity (Capps and Lederman, 2015; Degeling *et al.*, 2016).

Dealing with human and animal health as OH inevitably sheds light on the human-animal relationship and bond. Animals such as dogs contribute to human health, biologically (e.g. reduce cardiovascular health risks), psychologically (e.g. reduce depression and loneliness), socially (e.g. more positive perception of people and the environment), and have educational effects on children (Hediger and Beetz, 2015). Domestication of wild animals has been one of the fundamental cultural achievements of humans and the use of animals for hunting and as livestock was critical for human development and culture.

OH, even in a more restricted definition, faces challenging questions regarding cultural differences in view of what animals are and how they are valued. According to Zinsstag *et*

al. (2015b, op. cit. p. 19), culture and religion determine the norms and values governing human-animal relationship. As intimate companions, animals have high emotional value for humans but also have financial and consumption values as many humans consume their meat. The authors argue that despite the general protective attitude in most cultures and religions, domestic animals are still massively handled and slaughtered in terrible conditions, hence the need for an urgent and much stronger engagement for animal protection and welfare. They explain that under given circumstances, humans are prey for animals and this is one of the reasons for deep-seated fears against wildlife, which have led to the extinction or threat of extinction of predators in large parts of the world and one of the reasons for the current ecological crisis. Culture, religion and economic considerations thus influence the human-animal relationship and by extension the potential of OH within the dilemma of aspirations of a globalized economy, social development and animal welfare (op.cit. Zinsstag *et al.*, 2015b).

Thus, OH initiatives need to account for the normative aspects (values) of the human-animal relationship with emphasis on improving animal protection and welfare. Acknowledging animals' rights implies considering their well-being such as through animal welfare regulations (Wettlaufer *et al.*, 2015). As OH outcomes should be socially sustainable from the perspective of the user (human and animals, plants, microbiota ecosystems) a non-speciesist, or a 'less speciesist' position with all its dilemmas, need to be taken. The consideration that non-human animals have direct entitlements to justice remains nevertheless a debated issue (Berkey, 2017; Liberto, 2017; Plunkett, 2016).

4.2.2.5 Evaluating the contributions of One Health to environmental justice

Equity and health equity

The emergence and perpetuation of health problems is often related to multiple causal pathways, which make it difficult to assess which health problems manifest in social injustices, and which constitute human rights deficits or violations (Pogge, 2015, 2016). Such factors include exclusive and discriminatory barriers to health system access, lack of enforcement of legal restrictions, and the agency and environment of people with avoidable health problems. Tanner (2005) and Zinsstag *et al.* (2011) have proposed to assess the effectiveness of health interventions and policies in terms of social equity, through an integrative analysis of social, economic and cultural, as well as biological and environmental determinants of health and well-being.

Ruger (2012b) links societal health strategies with the notion of equity through attainment equality, which focuses on absolute levels of achievement, and shortfall equality focusing on shortfalls of actual achievement from the optimal average (such as longevity or physical performance) for individuals. Attainment equality highlights social variables such as education, gender, social class and location, whereas a shortfall equality draws attention to the reasons for the deficit from the optimum (Ruger, 2012b).

Equity and right issues in health have often been restricted to the access to universal health care issues than for equal health or the equal right to health (Ruger, 2012b, p. 120). This is visible in the WHO definition of universal health coverage (UHC), whereby, 'all people can use the promotive, preventive, curative, rehabilitative and palliative health services they need, of sufficient quality to be effective, while also ensuring that the use of these services does not

expose the user to financial hardship' (WHO, 2016). However, Ruger proposes to rethink equal access as ensuring 'the social conditions in which all individuals have the capability to be healthy' […] thereby emphasising 'effective access so that all have the ability to achieve health functionings and health agency' (Ruger, 2012b, p. 134).

Equity and rights issues have also been expanded to intergenerational equity. In such framing, the question would be whether OH initiatives that aim to preserve current capabilities increase the burden for future generations (e.g. disease burden, tax burden) and constrain their capabilities (e.g. in terms of increasing expenditure on health, increasing pensioners purchasing power and creating imbalance with the working population; (cf. Garcés *et al.*, 2003)). This concern is also visible in the recent report from the Lancet Commission on planetary health (Whitmee *et al.*, 2015), which emphasizes the preservation of the health of future generations through maintaining the integrity of biophysical systems, while addressing health inequities in the present generation.

Health issues and the dimensions of environmental justice

In relation with health issues, recognition has two main implications. First, it means to acknowledge better the contribution of individuals and communities to health, such as for example, volunteer care of sick or geriatric family members that needs to be legally and economically recognised (Garcés *et al.*, 2003). This also implies to avoid presenting people in a negative light related with their health condition, such as dismissing the poor for poor sanitation behaviour. Second, it also implies recognizing how people manage to improve their subjective welfare and optimize their accessibility to services (Garcés *et al.*, 2003). This requires acknowledging the plurality of views on notions of health, disease and treatment, thus opening up to the recognition of culturally appropriate, complementary and alternative medical care options.

In health issues, participation is usually understood as the extent to which individual actors and communities engage with and are committed to health policies and activities through collaborative partnerships. The WHO (2018) acknowledges that community engagement is key to successfully controlling disease outbreaks. In relation with OH initiatives, the question then is whether OH initiatives have procedural ways to ensure the participation that is representative enough to capture existing diversity that creates ownership and belonging (Borgonovi and Compagni, 2013).

Participation is therefore about how democratic a health care system is, and to what extent citizens can be involved in defining priorities and criteria, and shape a health care system that responds to collective expectations (Borgonovi and Compagni, 2013, pp. 36-37). Collaborative partnerships, active health-system policy-making, incentive structures, and population-based performance measures are some forms (Plochg *et al.*, 2006; in Gruen *et al.*, 2008, p. 1583). Indicators of participation in vital spaces to empower individuals who suffer disabilities have also been formulated in the ICF framework (WHO, 2013, p. 114).

Social distributive justice has been broadly related to health through *the causes for the persistence of health* inequalities, such as limited resources for public health systems, larger burden of disease in poorer countries, limited means to purchase health insurance, inadequate

allocation of resources, unethical trade (e.g. dumping of banned products and waste), to legal entitlement to health services (Pogge, 2015, 2016). However, Ruger (2010) highlights that social distributive justice is often reduced to the right to health care services, thereby neglecting philosophical reflections on a right to health. Benatar *et al.* (2016, p. 323) make a more direct link to distribution, highlighting the 'inequalities in the global distribution of conditions necessary for human health and well-being'. Among them is the structure of the global economy that advantages the wealthy, hence is deemed unjust (Kochhar, 2015; Benatar, 2003; in Benatar *et al.*, 2016, p. 325; cf. Schrecker, 2017; Pew Research Center, 2018).

A focus on environmental justice (as a wider conception of social justice) highlights the processes that underpin the achievement of capabilities and functionings. This implies that capabilities can be regarded as a metric of environmental justice in that it specifies thresholds (foundations) of a set of capabilities that all persons need to achieve and which governments need to ensure for their citizens (Nussbaum, 2006, p. 71). Yet a focus on environmental justice exposes the interlinkages (including the tensions) between addressing individual needs and collective needs as well as individual responsibilities and collective responsibilities. For example, public health concerns in a context of the spread of infectious diseases: How can the health care needs of the individual be ensured and at the same time ensure that public health is secured? What roles must the individual play and what the collective and how can a just division of responsibilities (Robeyns, 2017, p. 157) be ensured? Justice is thus about rights and responsibilities (duties), which need to be negotiated in a political and social process. Box 4.4 displays possible question for evaluating the contributions of OH to environmental justice. To facilitate the move from theory to implementation/application, example questions and references to literature are provided in Box 4.4.

4.2.3 Solidarity and social cohesion

In this section, we discuss solidarity and social cohesion, why they are important, what their constituent parts are and in what ways a OH-initiative positively/negatively affects these dimensions.

4.2.3.1 Solidarity

Solidarity is closely related to recognition, in that recognition can occur without solidarity, but recognition is a precondition for solidarity. Solidarity is therefore 'a measure of relatedness toward the achievement of mutual interests and goals and emerges between people who share common interests and perceive the advantages of pursuing them collectively (Goffee and Jones, 1998; in Pinto *et al.*, 2011, p. 379).

Forst (2002 in; Juul, 2010) identifies four normative contexts in which people are situated as ethical persons, legal persons, political citizens and moral persons. 'Ethical norms' is about sharing values as a member of an ethnic group or a local community. 'Legal norms' captures situations in which individuals are equal bearers of rights, binding for all members of a legal community. 'Political-democratic norms' captures civic solidarity characterised by tolerance and respect for different ways of life, protection through a system of equal rights, recognition of people as equal participants in public life and the avoidance of exclusion for ethical, social or political reasons. 'Moral norms' protect people in situations where ethical, legal or political

Box 4.4. Potential points for evaluating the contributions of One Health to environmental justice.

Prior to an evaluation, an agreement has to be reached in a deliberative process among those involved about which social determinants will be considered (e.g. age, wealth and income, gender) in the local social-ecological context. The following examples serve to illustrate potential focus or questions and are not comprehensive. A yes/no data can be generated or 'a five point scale where 1 = To a Very Small Extent; 2 = To a Small Extent; 3 = To a Moderate Extent; 4 = To a Large Extent; 5 = To a Very Large Extent' adopted (Colquitt and Rodell, 2015, p. 191).

- Equity – The opportunities and outcomes are equitable for all involved.
  Does the OH-initiative 'describe how equity issues will be addressed' (period, mechanisms, outcome targets) (Association of Local Public Health Agencies/Ontario Public Health Association: ALPHA/OPHA, 2013, p. 10)?
- Recognition – The OH-initiative
  1. acknowledges diverse social categories; ensures right to information in a form and language that is accessible to all actors.
  2. does not discriminate against people.
  3. considers the diverse viewpoints/perspectives.
  4. communicates information in a language that all understand.
  5. incorporates the identification and planning for priority populations[1]
     5.1. 'Identification of priority populations': 'Standardized and explicit process (e.g. specified in a policy and procedure for operational planning)' (ALPHA/OPHA, 2013, p. 5)
     5.2. 'Identification of priority populations': 'Standardized and explicit template (e.g. separate column for priority population)' (ALPHA/OPHA, 2013, p. 5)
     5.3. 'Process for identification of priority populations': 'has a comprehensive list of possible priority populations (e.g. list of 10 subgroups) for consideration' (ALPHA/OPHA, 2013, p. 5)
- Procedural justice
  The questions can be applied to the procedures of a OH-initiative (*adapted from Colquitt and Rodell, (2015, p. 191)).
  1. Process control: '*Are you able to express your views during those procedures?' How satisfied are you with the procedure used to determine health insurance premiums? (Lind and Tyler, 1988, p. n.p.); How much opportunity did you have to participate in the decision-process to grant/not grant you health benefits? (Lind and Tyler, 1988, p. n.p.); Affected actors are involved in decisions relating to their own welfare.
  2. Decision control: '*Can you influence the decisions arrived at by those procedures?'; 'How much control did you have over decisions that were made in your case' (Lind and Tyler, 1988, p. n.p.)
  3. Consistency: '*Are those procedures applied consistently?'
  4. Bias suppression: '*Are those procedures free of bias?*
  5. Accuracy: '*Are those procedures based on accurate information?'
  6. Correctability: '*Are you able to appeal the decisions arrived at by those procedures?'
  7. Representativeness: 'Were the concerns of other groups considered in the procedures?' The initiative has procedures/mechanisms that ensure the participation that is representative enough to capture existing diversity, respecting equality, autonomy and self-determination as the maximum expression of emancipation.
  8. Ethicality: 'Do those procedures uphold ethical and moral standards?'

>>>

Box 4.4. Continued.

- Distributive justice
  The questions below could refer to the outcomes of a OH-initiative such as health benefits/subsidies, insurance premiums, etc. (*adapted from Colquitt and Rodell (2015, p. 191))
  The initiative:
  1. Equity: ensures that resources and the various costs (financial, social and cultural e.g. eroding cultural identity) to address health issues are allocated in an equitable manner; prioritises actions that promote benefits across species boundaries; maintains intergenerational solidarity – by not impairing the decision-making capacity of future generations; '*Do those outcomes reflect the effort you have [e.g. made to keep healthy]?'
  2. Fairness: assigns obligations according to the dispositions (resources) of the actors. '*Are those outcomes appropriate [e.g. for the efforts you have made to keep healthy]?'
  3. Equality: '*Do those outcomes reflect what you have contributed [e.g. in terms of health insurance paid; efforts to keep healthy]?'
  4. Needs: '*Are those outcomes justified, [e.g. given your health needs]?'
  5. Maintains or at least does not worsen the rights of various actor categories (intra/inter-generational) – youths, adults, the aged, and vulnerable (chronically ill; disabled), gender (men/women), ethnic groups.
  6. Ensures patients right to access second expert opinions
- Animal welfare
  The OH-initiative
  1. Ensures that non-human beings including animals are not adversely affected.

[1] Priority populations refer to 'those populations that are at risk [whether due to socially-produced factors, e.g. low income, or due to biological or physiological reasons [e.g. age], and for which public health interventions may be reasonably considered to have a substantial impact at the population level' (ALPHA/OPHA, 2013, p. 6).

norms are not sufficient, focusing on how one ought to treat all people as fellow human beings (Forst, 2002, p. 268).

Based on these considerations, Juul (2010, p. 266) formulates a concept of solidarity in inter-human relations as the recognition of a person as an equal and worthy partner of interaction and a just distribution of possibilities for recognition. Contemporary solidarity is thus about recognition and a fair distribution of chances for recognition (Juul, 2010, p. 235). In a pluralistic and individualised society, a multidimensional concept of solidarity is required that captures its affective (based on emotions), conventional (interests), and reflective (based on individual moral choice) dimensions (Juul, 2010). Yet as a frame of reference for ethical considerations, solidarity needs to be interpreted in context.

In practice, solidarity can also be extended to non-human others (Rock *et al.*, 2014). Given that caring relationships are foundational to health, people's diverse connections with places and non-human forms of life can also be relevant to social cohesion and to public health (Burgess

et al., 2005; Johnston *et al.*, 2007; Rock *et al.*, 2007). Amiot and Bastian (2017) developed constructs to assess solidarity with animals, moral concern toward animals, solidarity with humans, and identification with nature. In terms of solidarity with animals questions can be asked about strength of bonds, concern, closeness, connection to other animals/humans and commitment towards animals/humans. Bréchon (2014) applied identity altruism (compassion for family, neighbourhood, region, country) and social altruism (compassion for underprivileged other persons) to capture solidarity. Bonnie *et al.* (2010) assessed the degree of solidarity by asking respondent opinions whether persons that can cause high health costs should pay higher, equal or lower health insurance premiums, assessing expectations of 'lower, equal and higher costs' as high to low solidarity respectively.

4.2.3.2 Social cohesion

Solidarity is often seen as a prerequisite for social cohesion (Juul, 2010). Social cohesion refers to the process of development of shared values, shared challenges and equal opportunity within a community, which relies on trust, hope and reciprocity, and which fosters a sense of belonging and recognition among all its members (adapted from Jenson (1998, p. 4)). Carron and Hausenblas (1998) define social cohesion as 'a dynamic process that reflects a group's tendency to stick together and remain united in satisfying member needs' (in Bruhn, 2009, p. 34).

Having harmonious relations between people is likely to produce conducive conditions for societal development and sustaining beneficial social life than without. Social cohesion is thus critical for creating and maintaining social order, that is, the norms, rules and laws that define 'living together' as a group, community or society (Staerklé, 2013, p. 49). In other words, 'the structuring and structured processes of social reality' that is 'constantly generated by the interplay of worldviews and institutions' (Mielke *et al.*, 2011, p. 1). As the persistence of social life (social order) depends on different factors and perspectives, 'various social orders may exist at the same time' with the dominant social order being the preferred order of society by its constituent (and often powerful) members (Mielke *et al.*, 2011, p. 3).

However, the understanding of social cohesion on the basis of shared values (Jenson, 1998, p. v) has been critiqued to overlook conflicts and political action (Jenson, 1998). These different ways to conceptualise social cohesion raises a question about cohesion of what and for whom and whether social cohesion enhances or hinders social equity (Jenson, 1998). Hence, integrating institutions into the definition of social cohesion can address this equity question.

Building on previous studies (e.g. Chan *et al.*, 2006; Jenson, 1998) Bottoni (2018) highlights social cohesion can be studied in three domains – individual, groups and institutions (captured as state government and its constituents e.g. regions). The author identified at least six levels of social cohesion – (1) relationships between individuals; (2) between individuals and groups; (3) individuals and institutions; (4) between (within) groups as a whole; (5) between groups and institutions; and (6) between and within institutions (understood as state, regions). The author highlights the 'within dimensions' (e.g. within a group, connections of different parts of an institution) as well as the horizontal (e.g. peers) or vertical relations (e.g. European Union and member states) can also be analysed.

Yet, what constitutes social cohesion may differ from context to context. In traditional societies, social cohesion may be through similarity between people through sharing values, having a sense of belonging and feeling a part of the community (collective identity) (Jenson, 2002). However, in multicultural societies, which many societies are increasingly likely to become, tolerance and openness to diversity are critical for maintaining social order (Bottoni, 2018; Jenson, 2002). We find that sharing values (Table 4.2) still remains critical for social cohesion and does not negate tolerance and openness to diversity or sharing interests as in bonding and bridging networks, and have thus included it in the constituents of social cohesion. Jenson (2002, p. 5) highlights the need for mechanisms and institutions to balance social justice and social cohesion by simultaneously valuing and promoting 'equality of opportunity and fairness across all dimensions of diversity', while 'fostering the capacity to act together, collectively and democratically'.

Table 4.2. Constituents of social cohesion from a perspective of outcomes for individuals (adapted from Bottoni, 2018; Chan *et al.*, 2006; Jenson, 1998; Littig and Griessler, 2005).

To what extent does the initiative contribute to…		
Levels	**Subjective perspective (attitudinal)**	**Objective perspective (behavioural)**
Micro level – relationships among individuals (informal connections: interpersonal relations, family, primary groups)	1. Interpersonal trust 2. Social support (giving and receiving help and support)	3. Density of social relations (number and frequency of social relations, and compared to age-peers)
Meso level – relationships among individuals and groups (formal connections: neighbourhood, secondary groups, working groups)	4. Belonging: sharing values – (e.g. incorporating/respecting the norms/unwritten rules of the community in OH activities), collective identity 5. Openness: 'acceptance and openness toward diversity' (recognition/respect of differences and equality in possibilities of self-determined participation in the definition of agency and structures of a society)	6. Participation and emancipation: social and political participation. 7. Bridging (inter-group) and bonding (intra-group) ties 8. Inclusion: equality of opportunity
Macro level – relationships among individuals and society (institutions)	9. Institutional trust – (e.g. trust in parliament, legal system, police, health system, and other organs relevant to a OH issue at hand)	10. Legitimacy of institutions: Quality/conditions of various social services – health, education; Satisfaction with government and its policies) 11. Partnerships/collaboration

4.2.3.3 Evaluating the contributions of One Health to solidarity and social cohesion

The principle of solidarity in health issues is visible in the international arena, such as the need for solidarity among all member states required to achieve the SDG goal of health and well-being at all ages (Hill *et al.*, 2014, p. 3). Working on a sustainable health care system for European countries, Garcés *et al.* (2003) emphasise that intergenerational solidarity (a time dimension) should underline every decision in a sustainable health care system. To achieve this, they propose changes in the legal, care, economic, administrative and cultural dimensions (Garcés *et al.*, 2003, pp. 210-212). Social and financial co-responsibility are demanded and welfare gained as a right depends on the citizens' ability to invest during working life in order to cope with a possible future state of dependency and care need (Garcés *et al.*, 2003, p. 210). For Borgonovi and Compagni (2013), solidarity and interconnectedness are essential, for pooling resources to ensure an adequate level of cover for those in need. The question then is to what extent does a OH initiative advocate for social and financial co-responsibility for taking on the burdens and receiving the benefits of a specific intervention? And, following on from this, to what extent does the OH initiative ensure that people pay for the costs and receive the benefits according to their social and financial capabilities? Box 4.5 provides some examples of how to apply solidarity to a OH-initiative.

As OH-issues are complex, interacting across scales and factors, partnerships between health and other organisations are critical for effective OH initiatives (Degeling *et al.*, 2015). Such partnerships could be through a national coordinating body, the consideration of health aspects by industry, public education and social mobilisation (cf. Gruen *et al.*, 2008). Table 4.2 displays the constituents of social cohesion from the perspective of the relations between individuals and other social units (e.g. groups; institutions). Thus from the perspective of outcomes for individuals, OH initiatives can be evaluated for their contributions to the 11 constituents of social cohesion (Table 4.2).

Box 4.5. Evaluating the contributions of One Health to solidarity.

Solidarity – The OH-initiative

- supports cost-sharing for medical expenses /insurance premiums
- motivates people to engage in volunteer care of sick or geriatric persons
- fosters the maintenance or improvement (or does not adversely affect) ties with family/friends/the community
- makes people feel concerned/more concerned about the health situation of other people, non-human animals, our environment, interlinkages between environment, human and animal health; E.g. 'I feel a strong bond toward animals/other humans'; 'I think of myself as part of nature, not separate from it' (Amiot and Bastian, 2017, p. 4).

These questions can be assessed on 'a 1 (strongly disagree) to 5 (strongly agree) Likert-type scale' (adapted from Amiot and Bastian, 2017, p. 4).

4.3 Operationalising the social sustainability framework for evaluating OH Initiatives

Based on the foregoing, a socially sustainable OH initiative at the minimum, does not undermine individual needs and capabilities, fosters emancipation, environmental justice, solidarity and social cohesion, and thereby improves human well-being (Figure 4.1).

If social sustainability is regarded as an outcome of OH interventions, there is a need to outline how the process that is likely to lead to the achievement of this outcome as well as the outcome can be evaluated. As health cases that require a OH-approach have the potential to become fatal and pandemic, it becomes ethically questionable to apply a case control or a before and after research approach by analysing cases where a OH-approach has been adopted and cases where they have not been adopted. Yet retrospective analysis of health crises can provide insights on the added values of a OH-approach. As social sustainability is not only determined by an initiative, whether OH or other initiatives, there is a need for adopting an analytical approach that accounts for the contributions of contextual factors to social sustainability in terms of using control groups. An alternative could be simulations of integrative versus single sector approaches which was for example applied to the control of human rabies by post-exposure prevention (PEP) in humans alone versus the mass vaccination of dogs and PEP (Zinsstag *et al.*, 2009).

The limitations in defining social sustainability also affects its current measurements – whether in terms of indicators, which are incomplete and differ across time, cultures and places hence posing difficulties for measurements and comparisons (cf. Pareja-Eastaway, 2012; Popovic *et al.*, 2014). To resolve the different societal perspectives of what social sustainability ought to be requires discursive processes, social learning and deliberative negotiations in transdisciplinary processes.

A baseline and a follow-up where the various domains that constitute social sustainability are analysed at least between two time points is proposed (OH-operations and OH-outcomes). We thus conceptualise two approaches to evaluate the added value of a OH initiative from a social sustainability perspective. First, a process-based approach focuses on OH-operations and asks to what extent these operations are socially sustainable. Second, an outcome-based approach asks to what extent OH-outcomes are socially sustainable from the perspective of humans, animals, plants, microbiota, and ecosystems.

With Table 4.3, we provide a summary of an analytical framework comprising key questions (for details see Figure 4.2, Box 4.3, 4.4 and 4.5, Table 4.1 and 4.2), whose answers can provide insights on the social sustainability of OH-operations and how OH-operations contribute to social sustainability.

It is important to note that the boundaries between some concepts remain fuzzy, for example social justice (a narrow dimension of environmental justice) and social cohesion overlap to a considerable extent. Participation for instance fits well under both dimensions. Participation can either be placed in 'social justice' or 'social cohesion' according to the context, and should be only counted once in the analysis. Ideally, specific questions should be adapted to the contexts being analysed through a transdisciplinary process of co-producing the research

Table 4.3. A framework for evaluating the contributions of One Health initiatives to social sustainability.

Dimensions	Indicators
Resources	Goods and services (livelihood assets – human, natural, social, financial, physical assets)
Conversion factors	Individual, social, environmental
Basic needs	Shelter, food, income
The 10 central capabilities	Life; bodily health; bodily integrity; senses, imagination and thought; emotions; practical reason; affiliation; other species; play; and control over one's environment
Emancipation	Degrees of self-determination in health-related aspects (access to different health traditions, treatments, institutional equity independently from class, gender or race categories).
Environmental justice	Recognition; Procedural justice; Distributional justice; Animal welfare
Solidarity and social cohesion	Interpersonal trust; Social support; Density of social relations; Belonging; Openness; Participation; Bridging (inter-group) and bonding (intra-group) ties; Inclusion; Institutional trust; Legitimacy of institutions; Partnerships/ collaboration

questions with stakeholders. Collected data can then be analysed using regular qualitative and quantitative measures (cf. Bussière *et al.*, 2016) and discussed with stakeholders.

4.4 Conclusions

The goal of this chapter was to show how the contributions of OH to social sustainability can be evaluated. This is an important topic considering that many health challenges result from the interaction of humans, animals and the environment, and are thus interconnected in their drivers, impacts and outcomes. Yet social sustainability has received relatively little attention and there are few comprehensive frameworks for its evaluation, especially in relation with health issues. We first analysed social sustainability and identified its key dimensions as well as the associated indicators. We then explored how each of the dimensions and indicators have been applied to health or health related issues, and adapted them for our purpose. The obtained framework can be used for evaluating the contributions of OH to social sustainability. However, considering multiple social perspectives and values, such indicators need to be adapted to contexts and concretised through transdisciplinary deliberative processes in order to operationalise it for use in evaluating actual OH interventions. Finally, the developed framework on social sustainability can be applied to other contexts beyond

OH initiatives. With little adaptation to the specific research objectives, questions can be formulated for evaluating the contributions of other initiatives/projects/programmes to social sustainability. As this is an initial attempt at a comprehensive framework for evaluating social sustainability, we expect that future work can improve on this basis.

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Chapter 5

Assessing the ecological dimension of One Health

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