

# One Health

## Building a solid and lasting One Health on the basis of Agroecology

Position paper by VSF Europa

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## 1. INTRODUCTION

### 1.1 WHY IS VSF-E TAKING POSITION ON THIS TOPIC?

Since the inception of the VSF network in 1983, VSF has always prioritized human health through animal and environmental health as a main objective of its actions. VSF believes that the first step to building long-term health is to understand the local agro and ecological systems, as well as the culture and the traditions of the communities where VSF works. VSF believes that directly experiencing life in those communities builds the relationships and trust that are necessary for a project's solid foundation.

### 1.2 WHAT IS ONE HEALTH?

"Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity". Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, New York, 19-22 June, 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948.

Our work in the field over the past several decades has been done within the walls of this definition. We are now also working within the definition of health by One Health, which explicitly links environmental health to animal and human health. However, before tackling the details of One Health, we must first define Agroecology.

Agroecology is the objective view of a social and environmental reconstruction of ecological niches and believes this reconstruction to be the cornerstone of health for all.

In recent years, our views towards animal has changed radically; the animal is no longer considered a thing (Latin: Res) but is seen as a sentient being. The Treaty of Lisbon amending the Treaty on European Union (signed December 13, 2007) officially declared that the animal is a *sentient being*. Additionally, Article III-121 of the Treaty establishing a constitution for Europe stated that "The Union and the Member States shall pay full regard to the welfare requirements of animal welfare as sentient beings." Finally,

James Tyler Kent (1849 - 1916 US), stated that the organs are not the only parts of the human or animal being. The human or animal is a psycho-emotional individual first and a set of organs second. From beginning to end, the disease and its treatment should follow the same order and not vice versa. These fundamental statements radically changed the role of the veterinarian and ethics guiding the veterinary care of animals.

The One Health concept (which is a broader view than One Medicine) is a worldwide strategy for expanding interdisciplinary collaborations and communications in all aspects of healthcare for humans, animals and the environment. Recognizing that human, animal, and ecosystem health is inextricably linked, One Health seeks to promote, improve, and defend that health by enhancing cooperation and collaboration between physicians, veterinarians, and other professionals. (Zinsstag et al 2010. [www.onehealthcommission.org](http://www.onehealthcommission.org)).

We need to tackle diseases not only through the use of medicine but also by evaluating the environmental, climatic, social and psycho-emotional situations that can affect pathological phenomena. Small-scale farming system imply close relationships between human and animal; it describes a type of production system that bears the imprint of the structural link between economic activity and family structure (VSF Europa, 2012). Even as far back as 2500 years ago, Hippocrates urged physicians to consider where their patients lived, the foods they ate and waters they drank, their lifestyles, and the seasons of the year (VSF Canada, 2010).

## 2. WHY JOIN ONE HEALTH WITH AGROECOLOGY?

Based on the definition given by One Health's initiatives, we understand that there is no health if we do not link the man, animal and earth. From its very beginnings, one of the VSF mottos (*'la terre, l' animal et l'homme'*) is aligned with that belief. The One Health Initiative proposes "*Interdisciplinary collaborations and communications*" between veterinary technicians, agronomists, doctors, biologists, and other professionals and experts. VSF, however, goes beyond what has been called transdisciplinarity, and includes traditional farming knowledge and practice at its core. (Fèvre et al., 2013).

***If we are to achieve this goal, what technical solutions must we solve?***

Agroecology helps us answer our questions.

The etymology of the word ecology (oikos {οἶκος}="house", "environment" and logos {λόγος}= "choose", "tell", "enumerate", "study"... ) gives us the foundation to build our knowledge, solidarity and professionalism. Based on decades of experience we have decided to combine the concept of One Health to the Agroecology methodology for the reasons described in this position paper. Only an integrated education of citizens enables greater awareness care with regard to management, farming, food, integration into the local ecosystem, diseases, which will lay a solid foundation for a system of One Health.

We believe that the concept expressed by the One Health initiative, where the collaboration is done mostly between technicians, is limited. VSF believes that a wealth of information and solutions to agricultural problems, are offered by local farmers on small farms who face everyday problems with their land and livestock. A foundation can be set only when these understandings are joined. There is no doubt the Agroecological transition should consider and involve all agricultural systems for the benefit of producers, consumers and the planet (AVSF, *Seminaire sur l'agroécologie*, 2012). For this reason, we think that without

an extensive understanding of Agroecology and its relation to the idea of ecohealth<sup>1</sup>, we cannot reach a state of general and long-lasting health for all. Additionally, the literature relating to One Health are structured and focused primarily on zoonoses. VSF is looking for another starting point to deal with diseases, zoonoses, and environmental and social regeneration using Agroecology and ecosystem approaches to health (see Xu et al 2008).

VSF (in Europe and Southern countries) also believes that small-scale farming with an educated and engaged community, through agro-ecological and ecosystemic thinking, that interesting answers promoting food security, food sovereignty and climate change adaptations, will prove fundamental to the construction of One Health.

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<sup>1</sup> Ecohealth (Ecosystem Approaches to Health), has been developed over the past few decades by networks of researchers and Communities of Practice. Ecohealth is comprised of a variety of systemic, participatory approaches to understanding and promoting health and well-being in the context of complex socialecological interactions. (VSF Canada, 2010).

### 3. THROUGH AGROECOLOGY TO ONE HEALTH

VSF also believes that applied Agroecology enables animal and human health in the broadest sense, promoting improvements in the physical and psycho-emotional states of non-human animals through food security, appropriate breeding practices and appropriate breeds and species for the local environmental and cultural. We have divided the topics of the position paper into nine general chapters based on our field experience.

- 1) Empower People
- 2) Manage Ecological Relationships and Minimize Toxics
- 3) Use Renewable Resources
- 4) Conserve Soil, and Water
- 5) Conserve genetic resources and Diversify
- 6) Economics , Conserve Capital
- 7) Manage Whole Systems
- 8) Maximize Long-Term Benefits
- 9) Value Health and Zoonosis

#### 3.1 EMPOWER PEOPLE: A PARTICIPATORY APPROACH TO ENSURE POOR AND MARGINALISED GROUPS ARE MAKING THEIR OWN DECISIONS ABOUT THEIR RESOURCES AND HEALTH

##### 3.1.a) Value the indigenous knowledge and traditional Agroecological practices

The vast majority of farmers are small scale ones and they lead 60 to 70% of worldwide agricultural production. The issues of food safety and quality, individual employment, and collective livelihoods depend largely on the dynamics of small scale farming. This is where the principles of Agroecology are usually adopted. It is a scientific discipline related to ecosystems and to productive systems which often also include a social movement (Denise Van Dam et al., 2012, chapter 1). Being a social movement, Agroecology provides the foundation in a way for people to know and control their development processes and therefore their health and welfare (including animals).

An interesting example is given by the Milpa system (intercropping corn, beans and other plants) typical of the Maya people of Guatemala and Mexico. One hectare of milpa system produces the equivalent of 1.7 hectares of maize in monoculture (Miguel Altieri cited by Marie Monique Robin 2012) and the leaves of the corn are used for feeding small ruminants. After harvest, the milpa becomes pasture. The use of chemicals and fossil fuels and were significantly reduced or even zero in cases of organic production.

In many regions, the traditional farming production systems are complex and tailored to local characteristics that enable them to

face adverse conditions and meet their basic needs (Maria del Carmen Soliz et al., 2012) . Frédéric Apollin recalls that farmers are actually "historical agro-ecologists" (Séminaire sur l'agro-écologie, 2012). However, there is a serious risk of losing this important information. Obtaining it from farmers and the ability to widely disseminate the information to others is an economic barrier, and often loses the cost/benefit argument by policy makers of agricultural development. VSF is working hard to use participatory techniques of training in order to integrate this important information into enhancing local farming practices.

Marciano T. Virola said that it is important to "identify farmer adopters and innovators so that other farmers can follow and have the courage to make the transition to agro-ecological systems (Séminaire sur l'agro-écologie, 2012). Their farms can then become real farm schools; meeting places for the exchange of experiences and training of farmers. VSF adopted this system (miniproyectos) starting with the Maya Ixil native tribe in Guatemala in 1993. This is also true in the context of pastoralists systems: the pastoralist field school (PFS) has been promoted by VSF and FAO (Food and Agriculture Organisation of UN). The approach empowers pastoralists to use experiential and participatory learning

techniques rather than solely instructing or advising farmers. The purpose of the PFS is to improve the decision-making capacity of participants and their wider communities and to stimulate local innovation. (FAO and VSF Belgium 2009) Valentin Beauval emphasizes the importance of group dimensions of creativity in farmers in order to not feel

isolated from neighbours, through the creation of social relationships (Séminaire sur l'agro-écologie, 2012). Support for these efforts must be sustaining due to time it takes to consolidate the knowledge of innovative farmers and educate technicians in order to teach others.

**BOX 1****VSF's Field Experiences**

AVSF, Peru: support recovery and production and marketing of potatoes on native land for export to national and international markets. More than 100 families of indigenous persons in Huancavelica areas benefited from this support.

Sivtro VSF I, Iran: defence of pastoral transhumance.

VSF Ch, South Sudan: The LCPM aims to contribute to the rehabilitation, protection and strengthening of livelihoods in the transitional situation of South Sudan through a strategy targeting increased food production, improved nutrition and generation of income.

VSF Ch, Kenya: As a result of increasing pressures on natural resources in many pastoral areas, VSF-Suisse and partners will establish two learning websites in Merti (Isiolo County) and Ileret (Marsabit County) for Holistic Natural Resource Management (HNRM).

Participatory and community-based approaches like Experiential Learning approach, historical review of social-environment-livelihood changes and their causes, stakeholder mapping, collective visioning, strategic collective schedule and testing of major decisions involving land management will be shared with the communities to encourage pastoralists to identify their weaknesses and needs, as well as their strengths and existing assets.

VSF Canada: The Ecohealth Training Manual for the Field Building Initiative in SE Asia developed through collaborative consultations and authorship. Executive Editors Sonia Fèvre, Pierre Horwitz, David Waltner-Toews - and authors from around the world, including Copeh-Canada's Celine Surette and Karen Morrison

<https://www.vetswithoutborders.ca/get-involved/resources/fbli>

**3.1.b) Link farmers with consumers and marketing of their products. Ensure generational fairness. Guarantee agricultural labour and ensure equitable labour relations for farm workers.**

In the Agroecological system people who buy and eat the products from local farmers are no longer only consumers but are conscious beneficiaries. VSF considers that the construction of One Health begins with the cohesion of the three pillars of the sustainable development (social, economic and environmental) and includes the growth of awareness of producers and consumers simultaneously. Approaches to Agroecology incorporate the issue of employment; therefore considerable emphasis is applied to

labor-intensive agricultural systems and manpower, rather than only substitution by other means of production. Agroecology contributes to awareness and collective actions that lead to alternative models of production and consumption dominant. VSF believes that food security for humans and animals, natural resource conservation, and food sovereignty are the foundations for a stable One Health system. Increased consumer awareness allows the local market to be stable. First, consumers buying local,

appropriately-priced products keep alive the system. Secondly, their spending invests in the territory, and economically and culturally stabilizes the system.

As recalled by Joaquim Diniz (Séminaire sur l'agroécologie, 2012), professor of Agroecology at the Federal Education Science and Technology Institute of the State of Rio

Grande do Norte, Brazil, many agro-ecological experiments allow a gathering of families (with the possible participation of other actors such as NGOs, consumers and governments) to create networks around issues related to food security, natural resource conservation and food sovereignty (Séminaire sur l'agroécologie, 2012).

**BOX 2****VSF's Field Experiences:**

VSF Ch, Mali: Strengthening of the local milk value chain - Milk production, transformation and marketing. Cooperatives, Infrastructures, Training, Marketing, Hygiene etc. in and around Bamako

VSF Ch, Togo: income generating activities (small livestock production and horticulture) for vulnerable families at risk of sending their children into labour migration

VSF CH, South Sudan: RECAAF II is a follow-up to RECAAF I, supporting the enrolment of children under the age of 15 in school as well as livelihood opportunities with the provision of 5 goats per child/family.

AVSF, Peru: Consolidation of organisation skills and productive economic initiatives of the youth in 4 Municipalities in northern Peru (Piura) and promotion of public support for entrepreneurial initiatives of rural youth.

AVSF, Peru: Promotion of sustainable agricultural activities (agro-ecology, livestock, fish, forest management, cocoa sector) to 600 families of native Awajun community, in partnership with local governments.

AVSF, Brazil: Improved availability of Agroecology training schools to 4500 farmers settled in the perimeters of agrarian reform in the state of Parana.

Sivtro VSF Italy, Rasd: Veterinarian health care system training in Sahrawi for a systemic and homeopathic approach to livestock care.

**3.1.c) How to promote principles of Agroecology & sustainability.**

The technicians in this case are fundamental; they act as synapses in the system, given that farmers, due to work and time constraints, have little chance of moving to teach other farmers. Frédéric Apollin states that Agroecology is a way to promote the farmers' traditional work based on feeder agriculture that does not violate the nature (Séminaire sur l'agro-écologie, 2012). Agroecology fully integrates "social movement" dimension, with a strong cultural dimension (reclaiming traditional techniques, etc.) and political one (human rights and the role of the peasantry, food sovereignty, etc.). Agricultural training

of rural youth, technicians, and engineers, in the modern conception of agricultural development, is often dominated by repetitive fundamentals or even "antifarmers ideology". For many years, small scale farmers have been seen as an obstacle to development instead of development actors. However, in the past few years, small scale farming became the key of the development and 2014 has been declared the 'International Year of Family Farming by FAO. Now we must ensure that policies and programs truly meet the needs of these vulnerable groups.

### 3.2 MANAGE ECOLOGICAL RELATIONSHIPS AND MINIMIZE TOXINS

*3.2.a) Re-establish ecological relationships that can occur naturally instead of reducing and simplifying them. Use intercropping and cover cropping, integrate livestock and recycle nutrients, mulches and perennials*

Agroecology relies heavily on traditional knowledge and know-how, notably present in many civilizations and peasant communities practicing agriculture (Sylvie Guillerme, in Denise Van Dam, 2012). Even if these systems were destabilized and entered into crisis due to "over-exploitation", demographic pressure and ecosystem damage, they can be managed with sustainable ecosystem and fertility methods. It should be noted that the measurement of yield per hectare must take

into account all of the final production plants (including trees) and animals, including the production in terms of food calories, within a year. In 2003, Jules Pretty and his team achieved the inclusion of a systematic evaluation of the impact of 286 interventions to promote Agroecology in 57 poor countries covering 37 million hectares. They showed an average of 79% increase in crop yields. (Jules Pretty et al., 2006)

#### **BOX 3**

##### **VSF's Field Experiences:**

AVSF, Guatemala: Support for more than 12 indigenous organizations Quiché from the network Ut'z Che 'for community forest management, the promotion of a sustainable and profitable family farming and the development of positive public policies towards community management of natural resources

VSF Belgium, Kenia and Sivtro VSF Italy, Rasd: Natural resource management and livestock practices

*3.2.b) Manage pests, diseases, and weeds instead of "controlling" them.*

Healthy, balanced and continuous nourishment throughout the year allows animals to develop a complete and strong immune system. The elimination of one of the main causes of immunodeficiency, such as an unbalanced diet, will reduce or remove, most of the bacterial, viral and parasitic diseases. We must introduce the concept of food security and food sovereignty to animals, with similar principles as we would for humans but with different modalities. The maintenance of health through nourishment represents the first step for animal welfare and health. It satisfies the first of the "Five Animals Freedoms" (Brambell report 1965)

1. **Freedom from hunger or thirst** by readily available access to fresh

water and a diet to maintain full health and vigour

2. **Freedom from discomfort** by providing an appropriate environment including shelter and a comfortable resting area
3. **Freedom from pain, injury or disease** by prevention or rapid diagnosis and treatment
4. **Freedom to express normal behaviour** by providing sufficient space, proper facilities and company of the animal's own kind
5. **Freedom from fear and distress** by ensuring conditions and treatment which avoid mental suffering

This is prevention which provides the maintenance of health and focuses on animal welfare. The maintenance of health is one of the pillars of the "One Health System" and Agroecology represents a fundamental



solution. The integration of knowledge in Agroecology and veterinary practices allows the building of an agro-livestock-environment system within the "Five Animal Freedoms".

Increasing biodiversity also allows better control of parasites that specifically address a particular crop. The same approach is used in veterinary Agroecology medicine. The biodiversity of the environment is also a limiting factor towards the intermediate hosts of some parasites (Pisseri et al., 2013).

Based on programmed parasitic analysis (MC Master method), and check of clinical symptoms, we can know which and how many parasites are present in a herd. From the data collected including season, climate, temperature, social and environmental situation and the clinical anamnesis highlighted in the herd, we can control the parasites through the rotation of pastures, switch on the pastures animals that not have parasites in common (for example cattle and pigs or pigs and chickens), select plants in pastures that help the immune system or have direct action on parasites.

It has been demonstrated that sheep grazing on pasture containing some plant species such as chicory (*Chicorium intybus*) and birdsfoot trefoil (*Lotus corniculatus*), have lower egg outputs than sheep grazing on Lucerne (*Medicago sativa*) (Hoste et al., 2006).

These forages contain high concentrations of plant secondary metabolites (PSM) named condensed tannins, which have demonstrated to possess a direct antiparasitic effect and an indirect nutritional mechanism. Plants such as *Hedysarium coronarium* (*Sulla* spp.), *Lotus pedunculatus* and *corniculatus* (Birdsfoot trefoil), sainfoin and quebracho may indirectly improve host resistance and resilience to nematode infections (Thamsborg SM, 2001. Rahmann and Seip, 2007).

The use of homeopathic and herbal remedies (etnovet), strengthen the immune system, reduce the use of chemical medicines, meanwhile reducing the dependence on external markets and the problems caused by drugs expired or altered. Host-parasite ecological system must be monitored and administration not interrupted.

**BOX 4****VSF's Relevant field experiences.**

Sivtro Vsf Italy, Rasd: Introduction to homeopathy, study, data collection and use of local medicinal plantscf

**3.2.c) Minimize toxins**

In this context, agro-ecological practices facilitate the regeneration of the soil organic fertility, improving its structure and biology and lowering erosion, can lead to an improvement in the crops' ability to take advantage of chemical fertilizers, particularly nitrogen fertilizers. In addition, the reconstitution of the organic and mineral fertility of some soils may be obtained by combining organic inputs and external chemical inputs (phosphorus and especially potassium). There may therefore be complementary agro-ecological practices and external mineral inputs, while remaining at levels of chemical inputs widely below the levels prevailing in many systems from the Green Revolution.

The same approach used in agriculture is also used in veterinary technical maintenance of health, prevention and treatment. The

presence of drug residues in the faeces and urine of animals causes damage to biodiversity (Pisseri, 2012). Avermectins, the major class of anthelmintics used in the world, are mainly excreted with stool of treated animals and have a long persistence in the environment (Edwards et al., 2001. Kövecses and Marcogliese, 2005). Avermectins are harmful towards many invertebrate species, profoundly influencing the conservation and balance of both the terrestrial and aquatic ecosystems, belonging to the following taxonomic orders: Dictyoptera, Anoplura, Homoptera, Thysanoptera, Coloptera, Siphonaptera, Diptera, Lepidoptera and Hymenoptera, as well as some species of fish. (Liebig et al., 2010. Jensen et al. 2009. Lumaret and Errouissi, 2002).

An animal that never has a preventive contact with worms cannot develop resistance and is extremely vulnerable when exposed to a parasite. Resistance or immunity is the ability to prevent or limit the establishment or subsequent development of worm infections. Tolerance or resilience is the ability to maintain good productivity despite infection. Contrarily, susceptibility to parasites is defined by how easily the animal becomes infected. Ideally, grazing animals - especially the youngest ones - should ingest parasites in small quantities so that they may progressively develop immunity (Ambrosi, 1995. Burke and Miller, 2008).

In case of massive infestation and serious health problems for the herd or in resource-

poor settings where the survival of the herd-owners is constantly at risk, we can use targeted chemicals or drugs, based on laboratory tests, avoiding broad-spectrum drugs and routine use. One has to make sure that only well-trained personnel will administer the drugs them in order to avoid resistance and ensure sustainability of the treatment. Reducing or eliminating the use of drugs that have the potential to harm the environment or the health of farmers, farm workers, or consumers is also important. The general application in an Agroecological system allows us to raise animals in optimal conditions by reducing the use of antibiotics for example. Drug resistance is a huge problem, even in Europe, with new zoonotic diseases

**BOX 5****VSF's field experiences.**

Avsf, Madagascar: increase the income of 355 farming families and protection of degraded lake Alaotra relating to the use of agroecological practices and crop-livestock integration.

Avsf, Senegal: pilot project Vélingara with 200 local families to promote the welfare of equines for animal traction

VSF Germany: The formation of Community Animal Health Workers is part of most VSF Germany projects in order to make sure that no resistance develops if chemical medicines must be used.

### 3.3 USE RENEWABLE RESOURCES - CONSERVE ENERGY

#### 3.3a) Use renewable sources of energy instead of non-renewable sources.

Energy security is a growing challenge for communities around the world. Whenever possible, we support the development of affordable, safe, efficient renewable energies (Hubbert's peak). In addition to innovative technical solutions (passive solar panels, photovoltaic, micro-hydro power, biogas etc.) we can find some interesting experiences in

farming traditions such as water mills, windmills, hand work tools and animal traction. The local production of energy from renewable sources is a fundamental pillar for the construction of One Health. VSF considers that partnering with groups involved in developing renewable energy for small communities can be valuable.

**BOX 6****VSF's Field Experiences:**

Avsf, Senegal: adaptation actions to climatic change: joint management of water and pasture, information and early warning experimental biogas development for 40 pilot families

Avsf, Mali: Establishment of 100 biogas digesters in dairy basins Bougouni and Sikasso in the fight against climate change and improve access to energy

3.3b) Use biological nitrogen fixation, use on-farm resources as much as possible and recycle on-farm nutrients.

Nitrogen is a key component of proteins in animals and plants. Agroecology favours the uptake of atmospheric nitrogen, available free and in unlimited quantities in the atmosphere, through leguminous plants. They indeed have a capacity of protein synthesis from atmospheric nitrogen.

Proteins synthesized from atmospheric nitrogen can contribute to human or animal food. Part of the fixed nitrogen can also be returned to the soil directly (legume crop residues remained on the ground, leaves and fruits of leguminous tree fell to the ground) or indirectly (nitrogen rich manure). The manure without chemical residues (pesticides, antibiotics, anthelmintics, etc.)

or with a minimum component of residues allow a complete degradation (microbiological and coprophagous insects), the possibility of producing compost, without the risk of polluting land and water. In Nicaragua, the "Campesino to Campesino" movement has promoted the use of legumes to recover degraded land, but also with a view to reduce the doses chemical fertilizers. Chemical fertilizers are past 1.7 to 0.4 quintal / ha, while yields increased from 0.7 to 2 tons / ha. (Maria del Carmen Soliz et al., 2012). Small-scale farming and traditional production are really close to the nature system where nothing is thrown away and everything is recycled.

#### **BOX 7**

##### **Vet's field experiences.**

Avsf, Guatemala: barriers at the level curve with trees and shrubs (nitrogen fixers) to prevent erosion, animal feed

Avsf, Mongolia: support for 120 families of farmers' cooperative of yak Khangai for the production and marketing of fiber combed yak

Avsf, Peru and Bolivia: Improving the economic situation of more than 500 peasant families Andean Northern Bolivia and South Peru by promoting alpaca breeding and marketing of its products, especially the fiber.

Avsf Laos: Preservation of the biodiversity of the area of the Upper Nam Phaak and improving food security in 2000 peasant families: small-scale irrigation, rice, development of non-timber forest products, livestock and animal health

### **3.4 CONSERVE SOIL AND WATER**

#### **3.4.a) Soil conservation**

It is important to sustain soil nutrients and organic matter stocks, minimize erosion using perennials, live barriers, mulch, compost production, and initiate pastoral agro forestry systems. We should invest in soil fertility and organic soil for the long term future. In Ethiopia, a study conducted in the Tigray region that covers nearly a thousand plots farmers in 19 communities has

compared average cereal yields (2000-06) depending on the type fertilization: no external fertilization, compost and chemical fertilizers. The performance obtained with the compost (2.5 ton / ha) is not only higher than the plots unfertilized (1.2 ton / ha), but also the plots fertilized using in-chemical fertilizers (1.8 tons / ha) (Sue Edwards et al., cited by Christian Aid, 2011).

**3.4.b) Dry farm and use efficient irrigation systems.**

Many agro-ecological practices, including agroforestry, allow improvement of organic soil fertility - and thus their ability to retain

water. This reduces the risk of lower returns and respects the first and the second animal freedom of the "Five Animal Freedoms".

**BOX 8****VSF's field experiences.**

Vsf Germany, Kenia: higher resilience by drought preparedness

Avsf, Madagascar: Development of agro-ecological farming techniques conservative water and soil fertility in 10 villages in the area

Vsf Germany, Kenia: improvement of access to water

Avsf, Mongolia: Promoting sustainable management of grazing and water resources for more than 850 semi-nomadic herders Arkhangai and support the development of livestock products quality (milk, meat, fiber) and the vegetable production in 45 disadvantaged families settled in small urban centers

Avsf, Laos: Preservation of the biodiversity of the area of the Upper Nam Phaak and improving food security in 2000 peasant families: small-scale irrigation, rice, development of non-timber forest products, livestock and animal health

Avsf, Madagascar: Strengthening food security and nutrition in 2500 families agro through sustainable management of rangelands, secure access to water, agro-ecology and the introduction of crops with high nutritional power

Avsf, Equador: Direct technical assistance to the Regional Government of Pichincha and local government Cangahua for the establishment of a policy of food sovereignty for the benefit of more than 38,000 families through investments in irrigation, agro-ecology and community marketing

**3.5 CONSERVE GENETIC RESOURCES AND DIVERSIFY****3.5.a) maintain local animal races, save seed and use heirloom varieties.**

The local breeds, such as seeds, are the result of centuries of selection and adaptation to the territory and the economic, social and cultural rights of small scale farmers. We need to assess the presence of local breeds in the local economy, not only considering the mono production like milk or meat. The local breeds are typically multipurpose and tend to have smaller dimensions than those genetically selected for mono production. The size of local breeds

is adequate to the territory, for example, mountains, avoiding overweight and degradation of turf. Oftentimes, they are more resistant to local diseases, scarcity of food and water, extreme weather conditions. All of these characteristics allow the breeding of animals that do not need much veterinary care, preserve the environment, and maintain the complete homeostasis needed in the One Health concept.

*3.5.b) Maintain undisturbed areas as buffer zones, use contour and strip tillage, maintain riparian buffer zones and use rotational grazing. Integrate animals in system. Use multiple species of crops and animals on farm. Use polyculture Use multiple varieties and landraces of crops and animals on farm. Minimize impacts on neighboring ecosystems*

The existence of high biodiversity within species and breeds allows better adaptation to different types of situations leading to a reduction in risk. Olivier de Schutter

(Séminaire sur l'agroécologie, 2012) said that "the diversity of food, made possible by the increasing diversity in fields, is particularly important for women and children."

**BOX 9****VSF's field experiences.**

Vsf Belgium, Burkina Faso: breeding local race

Avsf, Peru: Support recovery, production and marketing of native potatoes ( more than 100 families of indigenous peasant) on national and international markets

VSF Ch, Kenya: This is a sub-award project takes an integrated approach That Which Strengthens and diversifies livelihood opportunities through dry land rain fed and irrigated agriculture, small livestock production and diversification of existing Livelihoods for pastoralists. Also it will improve the management and productivity of natural resources through strengthening governance, improving land use and water management. The project will improve conflict management also among the pastoralist communities and in particular those arising from natural resources, drought management and the set up of fodder banks to reduce demand on communal pasture. Generally, the aims of project to deliver a program that will achieve economic resilience among the communities of the pastoral zones of Northern Kenya and reducing recurring their need for humanitarian relief through an integrated approach.

### 3.6 ECONOMIC WELL-BEING – CONSERVE CAPITAL

*3.6.a) Avoid dependence on single crops/products; use alternative organic markets. Add value to agricultural products. Community Supported Agriculture. Find alternative incomes such as Agrotourism, responsible tourism and ethical tourism. Avoid dependence on external subsidies. Use multiple crops to diversify seasonal timing of production over the year.*

The focus on the value of self-sufficiency, small production, and processing/sales is very important.

Enabling producers to market fairly supports the possibility of building One Health. It is important to understand public policy decisions for improving prices for producers versus making it less expensive for consumers. This is important for national food security through the import/export balance as well as local markets.

Distributing wealth as local revenue also depends on the economic reports and resulting price due to various climatic phenomena (high temperatures or heavy rainfall for expample); allowing compensation for poor harvests that can happens cyclically

(due to climatic aberrations, a parasitic attack, or viral and bacterial diseases in animals). Agroecology defends the population from "extractive agriculture", agriculture similar of mining, because ecosystems are gradually degraded. Conversion to organic farming requires massive and prolonged incorporation of organic matter incompatible with the current orientation systems (Maria del Carmen Soliz et al., 2012). Olivier de Schutter stressed that "the support of the State may extend the scope of these efforts," (De Schutter Olivier, 2010).

3.6.b) *Keep bank debt to a minimum, reduce expenditures, use ethical banks instead of banks that invest in armaments, or investments that generate a profit at the expense of poverty*

The development of agro-ecology may depend in part on reorganization of the supply chain, markets and enhancement of products. A strong local economy allows the maintenance of social welfare the

fundamental basis for the development of One Health. Many associations have weakened the local social system based on wrong banking systems.

**BOX 10****VSF's field experiences**

Vsf Switzerland, Kenia: implementation of the livestock component with focus on improving livestock production and product quality. This included the training of pastoralist producers and traders in matters related to milk hygiene, handling and processing as well as support given to producers in the form of subsidized private veterinary service delivery. The project is aimed at stimulating market function and food production benefiting local agricultural producers, traders and consumers in pastoral and marginal areas by increasing the incomes of local food producers and traders and the food security of consumers through the local purchase and distribution of food aid through local markets.

Vsf Germany, Ethiopia & Cross Border: improvement of value chain (market access)

### 3.7 SYSTEMS APPROACHES

Vision is not seeing things as they are but as they will be (D. Holmgren) so we must think about the actions today by providing the future results in terms of productivity and a management system. Only a change of mentality of the individual can generate a trickle-down effect that will extend to his family and community.

"We have, in the South as in the North, multiple farms-schools. Scientists must learn to work with farmers, so they can collaborate on adapting the solutions to the different needs and lands. If we want sustainable agriculture, the principle of one-size-fits-all, the single universal solution, is exceeded" (Hoffmann Ulrich, 2008). Climate change, the slow disappearance of the small-scale farmers and fewer economic possibilities are the result of social laws and market conditions that are enforced without collective buy-in. National or international laws dictated by economic objectives and not by social objectives results in the failure of

One Health for everyone.

**Use planning processes and methods that recognize the different scales of Agroecosystems:**

1. Clear prioritization and identification of issues with local organizations and farming communities
2. Identification of historical and existing local knowledge of sustainable and environmental methods
3. Identification of economic methods for development and sale of local Agroecological products
4. Building alliances among farmers, municipalities, government, private commercial sector, research, NGOs and other cooperatives.
5. Adaptation and capacity building for making new producer organizations in order to support agro-ecological transitions at the local level (AVSF)

**BOX 11****VSF's Field Experiences**

Avsf, Peru: Promotion of sustainable agricultural activities (agro-ecology, livestock, fish, forest management, cocoa sector) to 600 families of native Awajun community, in partnership with local governments

### 3.8 MAXIMIZE LONG-TERM BENEFITS

Ulrich Hoffmann, one of the authors of the report of Cnuced: Organic agriculture and food security in Africa published in 2008, reported that organic farming practices can increase yields from 120% to 130% in three to ten years, with a faster increase when biological techniques are applied to systems using little chemical inputs (Robin M., 2012) This is the case of practical integration between agriculture and livestock: use of forage and crop sub-products (straws, etc.) or livestock (whey from cheese production used in pig farms) to feed animals and fertilize the fields with manure. This is also the case of practicing crop associations and the use of

nitrogen-fixing trees (legumes). The deep-rooting allows the recovery of minerals and water sub-ground, as the *Gliciridia sepium* (American native tree), or *Acacia albida* in Sahelian Africa. Such trees are palatable to animals and are banks of protein that are available in the dry seasons. Another study conducted for the British government covered 40 projects to promote agro-ecology in 40 African countries. It included 10.4 million farmers and 12.8 million hectares, yielding similar conclusions with a 113% increase in crop yields over a period of three to six years (Jules Pretty, 2011).

#### **BOX 12**

#### **VSF's field experiences.**

Vsf Germany Kenya: peace and conflict resolution

Vsf Belgium, South Sudan, Uganda, Kenia, Niger and Sivtro Vsf Italy Saharawi (Algeria): natural resources management

Vsf Suisse, Kenia: strengthen and diversifie livelihood opportunities through dry land rain fed and irrigated agriculture, small livestock production and diversification of existing Livelihoods for pastoralists. Also improve the management and productivity of natural resources through strengthening governance, improving land use and water management. Improve conflict management also among the pastoralist communities and in particular those arising from natural resources, drought management and the set up of fodder banks to reduce demand on communal pasture.

Avsf ,Peru:Advisory support to the regional association of producers of Cusco for the consolidation of the management of the farmer market Huancaro directly connecting more than 7,000 farmers producers and consumers

Avsf, Bolivia: Implementation of peasant community reforestation initiatives in agroforestry systems and creating carbon sinks (Carbon Fix) on more than 800 hectares with 182 small producers of coffee and cocoa

Avsf, Brazil: Improvement of living conditions of 5,500 families of farmers Nodeste and fight against desertification through agroecology.

Avsf, Guatemala: Support the transition from farming to agricultural frontier agriculture stabilized and legal security of access to land for more than 10 Indian communities Q'eqc'hi.

Avsf, Haiti: Support 500 farming families Southeast for the restoration of the environment and biodiversity through reforestation plots and enrichment "rak-bwa"

Vsf Ch Kenia: project implemented in the Somali Region of Ethiopia with focus on Liben and Dollow Adow, and Among the agro-pastoralist communities along the river Daua in Mandera, Kenya Have you have-nots in the beans included CMDRR projects in the area. VSF-Suisse is intending to target communities thesis to Develop contingency plans, and community based Introduce Pastoral Field Schools (PFS) and Village Community Banking (VICOBA) as a tool to mitigate disasters developed and implement the contingency plans.

### 3.9 VALUE HEALTH AND ZOOZONOSIS

Reducing the use of chemical inputs often contributes to a reduction of risk to the health of farm workers, the surrounding community, consumers, and animal and plant life. Indirectly, these practices such as the recycling of certain wastes on farms, contribute to reducing discharges into the environment. We avoid pesticide residues, antibiotics, nitrate, dioxins, heavy metals among others. However, there are an insufficient number of studies, especially in developing countries, on the relationship between agricultural production patterns and animal/human health. In order to highlight the negative effects of conventional agriculture in terms of costs and reduced welfare for the community, we must know the causes of animal and human diseases. Do they result from overexposure to chemicals in food, water, environment? These are likely the externalities of the agro-ecology on public health. Therefore, subsidy mechanisms of the transition to ecological agriculture are often relevant during this transition period.

The transition period is critical: investments are underway adding in extra costs. Without

further impact on production, tree plantations in particular, the growth period can be several years without production or significant positive impact. The brutal suppression of chemical fertilizers may even result in lower yields, making a case for a transition to organic farming. In any case, Agroecology is not a "return to autarchy" but a promotion farming systems and more independent exchanges. It limits the risks for producers, consumers, and the whole of society.

In conclusion, we emphasize the need to simultaneously support different components of Agro-ecological farming in the context of a realistic and pragmatic approach to Agro-ecological transition. This poses challenges to a plurality of actors and therefore, we need a shared ambition.

At last but not least, we want to underline the importance of zoonosis when talking about One Health even if in this article it is clear that VSF go beyond this definition (more information about zoonosis in the document produced by VSF Canada: VSF Canada, 2010).

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