

## What kind of agriculture to reduce our impact on biodiversity and on our health?



**T**he year in which the Avaclim project was launched is also the year of an unprecedented pandemic and a major upheaval of habits, and even consciousness, on a planetary scale. In many parts of the world, the health crisis is causing considerable damage not only to human health, but also to the social fabric. The economic consequences are already dramatic. Global consumption and production practices, particularly with regard to food and fibre from agriculture, have faced renewed scrutiny. Attention has been refocused on the impacts on the ecosystems that support agriculture. In this context, the Avaclim project is being implemented at just the right time.

This is because, on the one hand, Avaclim aims to promote sharing of knowledge about agricultural practices in the drylands that have been proven to be sustainable and to strengthen civil society organisations. On the other hand, the scientific evaluation and validation of these practices by recognised research organisations will make a strong case to show political leaders how agroecology can be integrated and promoted in all future agricultural development programmes and policies. Avaclim will provide the data to convince decision makers that agroecology is one of the most promising approaches to strengthen the resilience of people in drylands to mitigate the effects of climate change and to mobilise the adaptation potentials of food and agricultural systems. Concretely, the principles of agroecology will need to be integrated into legislative frameworks and economic strategies at the end of the project, both internationally and in the seven countries where Avaclim activities are being carried out.

This note has been drafted to raise awareness of these issues and with the aim of clarifying the intrinsic links between agriculture, biodiversity and health. It reflects some of the urgent questions and concerns raised by scientists and civil society organisations, especially those calling for biodiversity to be safeguarded and the ecological transition of our agricultural models before irreversible damage has been done to the planet's living systems.

## 1. Pandemics that reflect our modes of development

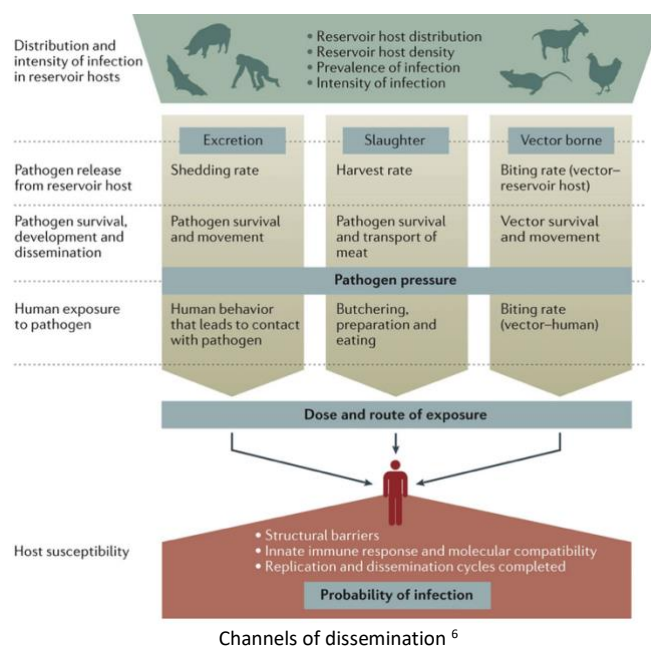
Urban sprawl, degradation of soils, transformation and the fragmentation of natural, agricultural and forest areas all contribute directly to the degradation of ecosystems. Marketing choices made by agribusinesses and retailers have paved the way for increasingly uniform agricultural systems with less biodiversity. In France alone, more than 65,000 hectares of land are degraded each year<sup>1</sup>.

The current processes that are resulting in loss of biodiversity are intrinsically linked to rapid and profound climate change at all latitudes. Since the beginning of the 21st century, average temperatures in 11 of 20 years have exceeded the average temperature in France over the period from 1961 to 1990<sup>2</sup>. As temperatures rise and species' habitats shrink, the opportunities for ecosystems to adapt naturally are diminishing. Ecosystems have always adapted to environmental changes, but these processes take time, time that the current rapid changes to the climate do not allow. Beyond the extinction of many living species, current environmental change is likely to have a negative impact on our resilience as it may enhance the development and survival rate of pathogens and increase disease transmission and host susceptibility<sup>3</sup>.

As indicated in the joint report published in 2015 by the Convention on Biological Diversity and the World Health Organization, the spread of disease is intensified by climate change, ecosystem destruction, land-use change, deforestation, biodiversity loss and the removal of key protective barriers. For example, intensive livestock production concentrates risks on a small number of biological parameters and increases threats of disease emergence and spread. The containment of large numbers of animals in small areas, low genetic diversity, rapid turnover of livestock and the disappearance of natural habitats due to the expansion of intensive livestock farming significantly increase the risk of zoonoses emerging and spreading.

Zoonoses are among the diseases whose increased spread is observed. Zoonoses can be defined as pathogens transmitted from a vertebrate animal to

humans. The spread of zoonoses requires an alignment of several factors, including ecological, epidemiological and behavioral determinants of exposure to pathogens<sup>4</sup>. The current SARS-CoV-2 pandemic is a prime example. Studies show that the main confirmed reservoirs of this pandemic are animals and that human consumption of an infected animal is likely the main cause of transmission of this virus from animals to humans. Thereafter the virus is transmitted to healthy people through close contact with an infected person<sup>5</sup>.



This pandemic may not be an exception. Our way of life increases the risk of the spread of several diseases. The US Centers for Disease Control and Prevention estimates that three-quarters of new and emerging diseases that infect humans come from animals<sup>7</sup>. Before 1970, only nine countries had serious dengue epidemics. Today dengue is endemic in more than 100 countries, particularly in Asia. The threat of a possible dengue epidemic now exists in Europe; local transmission was reported for the first time in France and Croatia in 2010 and imported cases have been detected in three other European countries<sup>8</sup>.

<sup>1</sup> Artificial soils cover built-up and paved and stabilised soils and the French Ministry of Agriculture has a broader definition that also covers building sites, waste land and artificial green spaces: [www.gouvernement.fr/indicateur-artificialisation-sols](http://www.gouvernement.fr/indicateur-artificialisation-sols)

<sup>2</sup> French Ministry of Ecological Transition, *Biodiversity Plan*, 2018

<sup>3</sup> Science, *Climate Warming and Disease Risks for Terrestrial and Marine Biota*, 2002

<sup>4</sup> Nature, *Pathways to zoonotic spillover*, 2017

<sup>5</sup> Journal of Advanced Research, *COVID-19 infection: Origin, transmission, and characteristics of human coronaviruses*, 2020

<sup>6</sup> Nature, *Pathways to zoonotic spillover*, 2017

<sup>7</sup> The Guardian, *"Tip of the iceberg": is our destruction of nature responsible for Covid-19?*, 2020

<sup>8</sup> World Health Organization, *Dengue and severe dengue*, 2020

### a) Environmentally efficient agriculture can be part of the solution

Agriculture sustains all of humanity, producing an average of 23.7 million tons of food per day and providing a livelihood for 2.5 billion people. According to the World Bank: *"Agricultural development is one of the most powerful tools to end extreme poverty, boost shared prosperity and feed a projected 9.7 billion people by 2050. Growth in the agriculture sector is two to four times more effective in raising incomes among the poorest compared to other sectors. Analysis in 2016 found that 65 % of poor working adults made a living through agriculture. Agriculture is also crucial to economic growth. In 2018, it accounted for 4 % of global gross domestic product (GDP) and in some developing countries, it can account for more than 25 % of GDP."*<sup>9</sup>

The impacts of agriculture on biodiversity vary according to the agricultural practices adopted. Modern agriculture has become a threat to biodiversity and to human and animal health. It includes practices such as monocultures that degrade soils, and largely relies on unsustainable water consumption and the unsustainable use of pesticides and fertilisers<sup>10</sup>. Historically, antibiotics have been used in the management of diseases affecting crops with a high economic impact (such as in the US or China). This has led to the emergence of resistance in bacteria, reducing the effectiveness of treatments and posing the threat of transfer of resistant genes to other bacteria that are pathogenic to animals and humans.

But agriculture is also part of the solution because sustainable production methods exist and are already practiced by millions of farmers. They help protect biodiversity.

At the crossroads between traditional knowledge and scientific research, the agroecological approach embraces methods for the environmentally efficient intensification of agricultural systems. This approach is based on concepts of diversification, synergy, efficient use and recycling of resources, and appreciation of

generally neglected indigenous and ancestral knowledge and cultures<sup>11</sup>. Beyond the farmer's plot, it also considers the territory and the wider agroecological system. The positive impacts of agroecology on the preservation of biodiversity are enhanced. For example, organic farming has on average increased species richness in farmland by around 30%. This result has been corroborated by studies published over the last thirty years and shows no sign of decline<sup>12</sup>.

The unique ability of agroecology to reconcile the economic, environmental and social dimensions is recognised by the FAO and in major reports of the Intergovernmental Panel on Climate Change, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, and in the World Bank-FAO Assessment of World Agriculture (IAASTD)<sup>13</sup>.

### b) Systemic approaches can provide integrated responses

Diversification of fields, farms and landscapes promises to make food systems more sustainable. However, enlightened farmers alone cannot achieve this major transformation. Action is needed along the entire agricultural value chain, from producer to consumer, as well as investment in innovative models<sup>14</sup>.

General awareness of the interconnections between human, animal and environmental health, and of the effect of global changes on these interactions also reinforces the appropriation of systemic approaches in development strategies.

As highlighted in the Agropolis International publication on "Global Health", systemic approaches such as the "One Health" approach have in common *"to connect different disciplines; to manage different spatial and temporal scales; to widen the circle of knowledge sharing through intersectoral implementation; and to co-construct management methods by involving all stakeholders"*<sup>15</sup>.

<sup>9</sup> World Bank, *Agriculture and Food*, 2019

<sup>10</sup> Convention on Biological Diversity, *Agriculture must be part of the solution, not the problem*, 2020

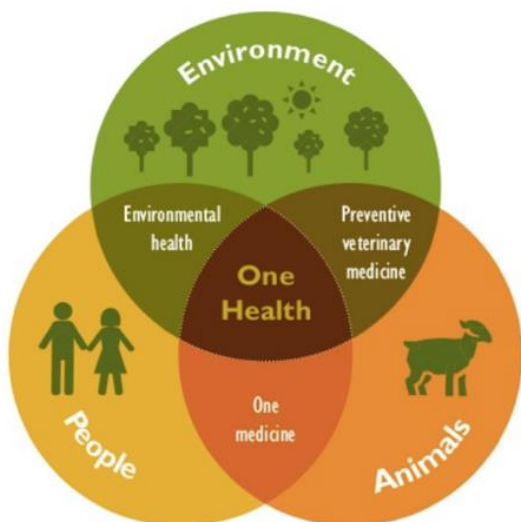
<sup>11</sup> Convention on Biological Diversity, *Biodiversity and Agriculture - Safeguarding Biodiversity and Securing Food for the World*, 2020

<sup>12</sup> Journal of Applied Ecology, *Land-use intensity and the effects of organic farming*, 2014

<sup>13</sup> Global Agriculture, *Agriculture at a Crossroads - Agroecology*

<sup>14</sup> Nature, *Integrating agroecological production in a robust post-2020 Global Biodiversity Framework*, 2020

<sup>15</sup> Agropolis International, *Global Health: Human, Animal, Plant and Environmental Health: Towards Integrated Approaches to Health*, 2019



The "One Health" approach <sup>16</sup>

## 2. A societal transition takes place in a favourable institutional environment

### a) Example of concerns in Europe

In May 2020, the European Commission published its biodiversity strategy and the "From Farm to Fork" strategy. These documents present the main features of EU policies to make European food systems more sustainable. Adopted in the midst of the COVID-19 pandemic, these strategies will also form a central part of the EU's recovery plan for the coming decade.

In this strategy, the European Commission underlines the "urgent need to reduce dependence on pesticides and antimicrobials, reduce over-fertilisation, develop organic farming, improve animal welfare and reverse biodiversity loss"<sup>17</sup>. To this end, it seeks to support and stimulate the spread of sustainable practices, such as precision farming, agroecology (including organic farming) and agroforestry. This is a major shift in outlook for the world's third largest agricultural power.

According to the member organisations of Good Food Farming, the EU's Green Pact sets out the path that the post-2020 Common Agricultural Policy (CAP) must take, namely a major change in the farming and food system from one end of the chain to the other<sup>18</sup>. Neither an extension nor an optimisation of the current

system would be acceptable options. Profound changes to the CAP are necessary to ensure the sustainability of agricultural production in Europe. This includes rebuilding functional ecosystems, bringing the agricultural sector into line with the legal obligations of the Paris Agreement and encouraging a shift towards healthy diets. This strategic plan also emphasises the need to pursue these same commitments within the framework of European international cooperation policy.

### b) Overview on three continents

The implementation of the agricultural policy of the Economic Community of West African States (ECOWAS) States, known as ECOWAP, could be positively impacted by this strategic plan of the European Union. ECOWAP, in its strategic orientation framework up to 2025, aims at ensuring an intensification of production systems, adapted to the different agroecological contexts, in order to ensure production growth while enhancing and preserving natural resources and biodiversity. In this sense, the results of the experiments of the ECOWAS-led Project to Support the AgroEcological Transition in West Africa (PATAE) will also be used to support the production of sufficient quantities of quality food in a sustainable manner, while coping with climate change through more productive systems that are more economical in terms of natural resources<sup>19</sup>.

In Brazil, the institutional environment is less favourable at the national level. The 2012 National Plan for Agroecology and Organic Food Production (PNAPO), known as Brasil Agroecológico, has stalled under the current administration. In a challenging political and health context, the Scientific Society of Latin American Agroecology (SOCLA) organised the eighth Latin American Congress of Agroecology in November 2020. It brought together researchers and practitioners with a view to strengthening strategies for scaling up and building public policies in favour of agroecology.

<sup>16</sup> Ibid.

<sup>17</sup> European Commission, *A Farm to Fork Strategy for a fair, healthy and environmentally-friendly food system*, 2020

<sup>18</sup> Good Food Good Farming, *Open letter for a better CAP*, 2020

<sup>19</sup> ECOWAS, *ECOWAP*, 2005



Cirad researchers and development actors such as Gret are launching a new project in South-East Asia to generate and transform the accumulated agroecological knowledge into sustainable innovation processes<sup>20</sup>. In India a report by the VikasAnvesh Foundation has identified and analysed the policies and practical obstacles that prevent farmers from adopting agroecological practices and scaling up sustainable agricultural practices<sup>21</sup>. In South Africa, abroad coalition of civil society organisations within the Agroecology South Africa platform succeeded in lobbying the government to revise criteria for providing COVID-19 relief for subsistence producers and vulnerable households so as to include organic farming inputs that will not have a negative impact on the environment. The platform has also platform has mobilised to ensure that government allocates adequate funds in the budget for land reform and food security<sup>22</sup>.

### 3. The promises of the Avaclim project

The Avaclim project, led by CARI and its partners, aims to create the necessary conditions for the expansion of agroecology in drylands. To this end, development practitioners and scientists are engaging with and studying agroecological initiatives in seven countries: Brazil, Burkina Faso, Ethiopia, India, Morocco, Senegal, and South Africa. The process is generating the knowledge needed to help decision-makers prioritise the implementation of agroecological systems in drylands, with a view to achieving food security and reducing environmental degradation and greenhouse gas emissions. The sharing of the knowledge acquired among practitioners is closely linked to the multidimensional evaluation of the impact of these initiatives using a scientific method.

<sup>20</sup> Gret, *Agroecology and Safe food System Transitions in Southeast Asia*, 2019

<sup>21</sup> VikasAnvesh Foundation, *Sustainable Agriculture in India: Why does it not Scale Up*, 2020

The Global Environment Facility (GEF) and the French Global Environment Facility (FFEM) are supporting Avaclim financially, particularly as they see agroecology as a potential contribution to climate change mitigation through carbon storage capacity in soils. More broadly, Avaclim is contributing to the implementation of the multilateral environmental agreements on climate change, biological diversity and combating desertification that virtually all dryland countries have signed.



At least five relevant agroecological initiatives have already been documented in each of the seven participating countries, and the information has been disseminated. Using innovative methods of mobilisation adapted to the current pandemic, experience-sharing seminars have been held in most of the participating countries, convening and encouraging the agroecological communities of practice in each of them.

A review of the state of the art of existing systems and tools for monitoring and evaluation of agroecological initiatives has been carried out. This review has made it possible to identify gaps, needs and criteria on which the evaluation of initiatives will be based. Priorities are emerging as regards resilience, quality of life, productivity and ecosystem health. The evaluation tool is being built through a participatory and iterative approach, with a first version of the prototype expected following the international scientific workshop scheduled for February 2021. Avaclim thus intends to produce results, evaluations and recommendations which will be brought to the attention of institutions and political and economic leaders. The national and international targets, identified throughout the project as potential actors of change, will be the subject of a well-argued advocacy campaign aimed at influencing the main levers for the deployment of agroecology in arid zones.

<sup>22</sup> Agroecology South Africa, *Civil society statement on the Supplementary Budget and the implications for food security and land reform*, 2020

## In conclusion

The scale and urgency of the challenges facing agriculture and food systems are greatly accentuated by the global health crisis. And the situation is particularly critical in drylands, covering 40% of the world's land area, which are subject to increasingly extreme climatic events and where a significant proportion of the world's poor live.

The dynamics at work to reverse the trend exist and illustrate why a multisectoral approach must be adopted by agroecological organisations if they are to provide concrete responses to the global problems of biodiversity loss and the development of epidemics. For beyond considering biodiversity as a living environment favourable to human life, it is becoming imperative to recognise the need to preserve it in order to ensure the health of the human species. This vision, at the crossroads between agriculture and ecology, is one of the founding principles of agroecology.

The FAO's 10 principles of agroecology form an analytical framework<sup>23</sup> for Avaclim, and illustrate that agroecology promotes a holistic vision that helps to respond to global environmental challenges that can contribute to better decision-making by political and economic decision-makers. The aims of agroecology include ensuring both quality and quantity of agricultural production while maintaining of the productive potential of ecosystems and our cultural food heritages.

Although significant and effective practices exist throughout the world, their scientific evaluation has thus far been incomplete and a lack of reliable arguments for undertaking large-scale public policies remains an obstacle. Because these initiatives face challenges from a conglomerate of agricultural actors that base their arguments on the long-advocated principles of the "Green Revolution", it is imperative to overcome these obstacles to ensure the health of future agricultural ecosystems. If not, the current concentration of financial and technical resources (including synthetic chemistry) and control of the distribution, storage and processing of food products will remain in place and will not contribute to enhancing the health of people and the ecosystems on which we depend.

In collaboration with other emerging initiatives, the Avaclim partners in seven countries on four continents aim to provide the material to overcome these obstacles. This will complement other initiatives such as the tool and associated methodology developed by French civil society organisations to assess the effects and "conditions for the development of agroecology"<sup>24</sup>.

World agriculture is clearly in a deadlock: stagnating yields, land degradation, chemical pollution, competition for water resources and erosion of genetic diversity have contributed to the ruin of many farmers and have increased the risks of food insecurity. The transition of agricultural systems to more sustainable ones is thus not merely an option, but a pressing obligation: profound transformations must be achieved, both in our modes of production and consumption!

Follow the news of the Avaclim project and its partners on the website:

[www.avaclim.org](http://www.avaclim.org)

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The points of view presented in this document in no way represent the official point of view of the FFEM and the GEF.

<sup>23</sup> Ecosystems and People, *The 10 Elements of Agroecology: enabling transitions towards sustainable agriculture and food systems through visual narratives*, 2020

<sup>24</sup> GTAE, *Memento for the Evaluation of Agroecology*, 2019

\* Photo credits: [www.avaclim.org/en/medias-credits](http://www.avaclim.org/en/medias-credits)