

# Green Recovery:

## Investing in nature and people

Massive financial amounts are currently mobilised to mitigate the economic fall-out of the Covid-19 crisis. The EU itself will also increase its efforts and it is expected that the European Commission will publish an updated proposal for the **Multiannual Financial Framework (MFF) 2021-2027**, as well as a proposal for a **new Recovery Instrument**. The latter will mobilize significant resources from the financial markets and relay those to the Member States through existing and new programmes, to support the economic recovery of those countries.

While the political focus on mitigating the current crisis is highly justified, these financial efforts will nevertheless limit the EU's and its Member State's ability to react to other challenges in the near future. Yet, the climate and biodiversity crisis have not stopped because of Covid-19 and need urgent and continued attention. Therefore, it is crucial that the new Recovery Instrument and the MFF enable the EU to **tackle the long-term environmental crisis** and avoid undesirable trade-offs, while **simultaneously improving the Union's current economic prospects**.

One possibility to achieve these multiple objectives is the **investment in the large-scale restoration of EU's ecosystems**<sup>1</sup>. Research has shown that **restoration efforts can lead to a significant creation of employment** in various sectors<sup>2</sup>. While **creating long-lasting ecosystem services**, which deliver benefits now and for future generations, restoration would **bring people back into labour**.

Besides the immediate effects e.g. through construction and landscaping work, restoring nature will **create further long-term opportunities** e.g. for tourism, which is among the sectors hit the hardest by this crisis. Restoration efforts can also help to **rebalance the interests of rural and urban areas**, creating employment and lasting assets in rural areas, while increasing the resilience of city areas against future challenges such as climate change.

By restoring floodplains, peatlands and other habitats, which provide essential ecosystem services, the EU and its Member States **can increase its resilience towards future crises**, as well as bring back biodiversity in line with the objectives of the European Green Deal. Building on **nature's ability to absorb and store carbon** will further contribute to the EU's climate goals and help to mitigate the climate crisis. These investments will make our societies and infrastructures fit to **withstand natural disasters** like floods and storm water, which are expected to increase in their frequency and magnitude due to the changing climate. All of this will ensure future human well-being and prevent economic losses to a scale that exceeds the initial investment.

**We therefore ask for the integration of funding for natural restoration into the Recovery Fund and the next MFF.** Funding can be provided to the Member States for a variety of different projects, ensuring a balanced distribution of resources to countries most affected by Covid-19. The next section lays out **ten concrete examples** of projects, which could be rolled out within the scope of the recovery package, **highlighting their ecological, social and economic benefits**.

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<sup>1</sup> Hepburn, C. et al.. (2020): Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?, Smith School Working Paper 20-02

<sup>2</sup> BenDor T. et al. (2015): Estimating the Size and Impact of the Ecological Restoration Economy, PLoSOne 10(6)

# 10 ideas for investing in nature and people

## 1. REMOVE OBSOLETE DAMS

Dams have an undeniable function in providing water for irrigation, hydroelectric power, facilitating trade or protecting Europeans from water flooding. Since the construction of the first dam, around 3,000 BCE, dams have been a major component of the functioning of societies, requiring significant manpower and real engineering feat.

Yet, large dams (above 10m) as well as small dams have a destructive environmental impact. The high density of dams set on our European rivers have led to their detrimental fragmentation, habitat loss, introduction of invasive species<sup>3</sup>, and a serious decrease of water quality. As water flow conditions are disrupted, river habitats are drowned upstream or depleted downstream and fish populations and other freshwater animals are isolated and go extinct. Moreover, sediment, organic materials and nutrients do not naturally navigate throughout the river stream which critically affects the quality of European rivers' water and the possibility for biodiversity to thrive.

As a result, population sizes of freshwater species have declined by 81% in the period between 1970-2012 (Living Planet Report, WWF, 2016).<sup>4</sup>

Despite the serious environmental damage engendered by dams, a 2018 report<sup>5</sup> sheds the lights on the concerning inefficiencies of certain dams, with European experts estimating that "in France, Spain, Poland and the UK alone, there are up to 30,000 mainly small dams which are now obsolete." Electricity produced from these dams is now often much too expensive compared to renewable energy such as wind and solar, which also have much lower environmental impacts.

The cost to operate, repair and maintain these obsolete dams in a structurally sound state is usually much higher than the social and economic benefit they are originally aimed to provide. In that regard, an American study (Grabowski, 2018) explains that removing dams would be 10 to 30 times cheaper than repairing or maintaining them.

With the Covid-19 crisis, European economies have been severely hit. More than ever, the European Union can no longer invest in costly and dysfunctional infrastructures such as the dozens of thousands of obsolete dams that threaten European rivers. The EU must invest in sustainable solutions that will create employment and restore our most depleted habitats to mitigate the long-term the economic, environmental and social impacts of the climate and biodiversity crisis that we are already facing. About 80% of the investment in dams is provided by the public sector. Instead, European money should be quickly invested in removing all European obsolete dams. This is a strategic solutions to rapidly restore our rivers and recover species essential to the functioning of our ecosystem and providing ecosystem service, revitalising fisheries and increasing the rivers' resilience to a changing climate.

The demolition of a dam is with no doubt a great source of employment for thousands of people in a large array of sectors, from construction, tourism, fishing to conservation. With the construction sector suffering economically from the Covid-19 crisis, the EU should consider this type of

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<sup>3</sup> <https://ec.europa.eu/environment/nature/biodiversity/comm2006/pdf/2020/Fin%20Target%202.pdf>

<sup>4</sup> [https://d2ouvy59p0dg6k.cloudfront.net/downloads/dam\\_removal\\_europe\\_report\\_2018\\_def\\_1.pdf](https://d2ouvy59p0dg6k.cloudfront.net/downloads/dam_removal_europe_report_2018_def_1.pdf)

<sup>5</sup> [https://d2ouvy59p0dg6k.cloudfront.net/downloads/dam\\_removal\\_europe\\_report\\_2018\\_def\\_1.pdf](https://d2ouvy59p0dg6k.cloudfront.net/downloads/dam_removal_europe_report_2018_def_1.pdf)

infrastructure projects as crucial opportunities to employ engineers, landscapers and construction professionals. Jobs such horticulturists, lawyers, and scientists would also indirectly benefit from such project.

The restoration of the nature dynamics of rivers and the opening up of fishing migration routes can also stimulate the economy around recreational angling and commercial fishing. For instance, a report<sup>6</sup> from Nature Conservancy states that “the Sea Trout Funen Project in Denmark generates an estimated 5.8 M EUR/year in angling tourism for a \$.5M EUR/year initial investment in river restoration through dam removal.” Recreational activities such as canoeing or boating, provided that they are managed in a way that does not damage river shores and irresponsibly increase local urban development, can also thrive as a result of dam removal which can stimulate employment in guide companies, restaurants, hotels, and others.

Local communities can also gain from being involved in this restoration project and benefit from the wellbeing and health it generates, and develop a sense of care and continuity with their local environment.

## 2. RESTORE FLOODPLAINS

River engineering is threatening rivers in many ways, as their ecosystems are as wide as the channels associated with them. Dams, weirs and sluices have disconnected rivers from their floodplains, greatly reducing their crucial roles as flood defences and drought mitigation, as biodiverse habitats, and in water quality protection. Floodplains are essential host to a dense biodiversity with multiple ecosystem functions and services. The European Environment Agency estimates<sup>7</sup> that 70 to 90% of Europe’s floodplain area is ecologically degraded as a result of this intense manmade planning of rivers.

This is even more concerning that scientists warn us that climate change will lead to more intense weather, with an increase in rainfall and droughts urging for the need to invest in natural flood defences. Annual flood losses<sup>8</sup> can be expected to increase fivefold by 2050 and up to 17-fold by 2080.

Restoring floodplain is an essential nature-based solution to ensure the EU’s resilience to climate change and existing environmental legislations such as the Floods Directive, the Water Framework Directive and the Birds and Habitats Directives already provide a legal framework to achieve such objective. But real investment is missing.

Considering the climate and biodiversity crisis, and the economic impact our societies are suffering as a result of the Covid-19 crisis, the EU must rightfully invest in restoring crucial habitats such as floodplains.

Functioning natural floodplains provide countless ecosystem services of which economic benefits are hardly estimable. Quickly investing in their restoration through efficient river basin and flood risk management plans, conservation plans and climate change adaptation plans would protect economic activities and communities further downstream from flood damage. It would allow more space for water to spread, prevent erosion, replenish groundwater reservoirs, bring back healthy soils and maintain a diversity of habitats and species, crucial to resilient ecosystems.

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<sup>6</sup> <https://www.nature.org/en-us/about-us/where-we-work/europe/stories-in-europe/restoring-free-flowing-rivers-in-europe/>

<sup>7</sup> <https://www.eea.europa.eu/themes/water/european-waters/why-should-we-care-about-floodplains>

<sup>8</sup> [https://www.eea.europa.eu/data-and-maps/daviz/annual-flood-losses-for-2050#tab-chart\\_1](https://www.eea.europa.eu/data-and-maps/daviz/annual-flood-losses-for-2050#tab-chart_1)

Such investment may for instance imply lowering or raising the main river bed in order to bring it in balance with the level of the floodplain. It would require land purchases (if outside the public domain), new stop bank construction and the funding of management measures for the regeneration of natural floodplains. This would require modelling work and floodplain design so it is compatible with civilisation, as they are home to 15 % of Europe's population. A significant work force would be required to implement and monitor these restoration projects<sup>9</sup>. Geologists, engineers, landscapers, heavy equipment operators, construction workers, helicopter pilots, biotechnologist, bioengineers and project managers would be amongst the jobs that would thrive from these restoration enterprises.

Local communities would highly benefit from this source of employment as well as the health, well-being and security benefits that functional floodplains can procure. An improved quality of water and soils and reduced flooding would also highly benefit the communities, economically and socially.

### 3. RESTORE OYSTER REEFS

Often only regarded for food production, oyster reefs are crucial biodiversity hotspots which provide ecosystem services on which humans' health is highly dependent. Also referred to as ecosystem engineers, oysters build reef habitats that provide better water quality, a local decrease of toxic algal blooms, an increase in nutrient uptake, an increase of benthic-pelagic coupling, an increase in species richness and multidimensional biogenic structures which provide habitat, food, and protection for numerous invertebrate and fish species.<sup>10</sup>

Yet, the intense exploitation of oysters stocks have made oyster reefs amongst the most threatened habitats on the planet. Destructive fishing techniques such as dredging and bottom trawling have contributed to the vanishing of most of our seafloor and continental shelf's rich biodiversity (Airoldi et al. 2008). According to estimates, about 85% of the worldwide oyster reef habitats have been destroyed over the course of the last century.<sup>11</sup>

The EU Habitats Directive and the Marine Strategy Framework Directive both provide the legal framework requiring EU Member States to bring reefs to a good ecological status. Such objectives can only be achieved through active restoration of these habitats.

Considering the high value of oyster reefs in maintaining the resilience of our ecosystems and therefore fighting the climate and biodiversity crisis, the EU must invest in the development and the implementation of a large-scale and long-term native oyster restoration programme.

One single project requires several steps such as governance, selection of the site to be restored, identification of the site connectivity, recommendations on technologies for reef design and seed

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<sup>9</sup> [http://nwrm.eu/sites/default/files/case\\_studies\\_ressources/cs-es-02-final\\_version.pdf](http://nwrm.eu/sites/default/files/case_studies_ressources/cs-es-02-final_version.pdf)

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[https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=2ahUKEwiDsrlDlko3pAhUQ\\_qQKHbCgAyEQFjABegQIBBAB&url=https%3A%2F%2Fwww.mdpi.com%2F2076-0787%2F8%2F1%2F9%2Fpdf-vor&usg=AOvVaw2q57ka1KILhlyEcATHKYk](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=2ahUKEwiDsrlDlko3pAhUQ_qQKHbCgAyEQFjABegQIBBAB&url=https%3A%2F%2Fwww.mdpi.com%2F2076-0787%2F8%2F1%2F9%2Fpdf-vor&usg=AOvVaw2q57ka1KILhlyEcATHKYk)

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[https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=2ahUKEwiDsrlDlko3pAhUQ\\_qQKHbCgAyEQFjABegQIBBAB&url=https%3A%2F%2Fwww.mdpi.com%2F2076-0787%2F8%2F1%2F9%2Fpdf-vor&usg=AOvVaw2q57ka1KILhlyEcATHKYk](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&cad=rja&uact=8&ved=2ahUKEwiDsrlDlko3pAhUQ_qQKHbCgAyEQFjABegQIBBAB&url=https%3A%2F%2Fwww.mdpi.com%2F2076-0787%2F8%2F1%2F9%2Fpdf-vor&usg=AOvVaw2q57ka1KILhlyEcATHKYk)

oyster production, monitoring and management that would employ highly skilled workers with experience in such restoration methods.

Estimates from NOAA in the US show that, for 1M\$ invested in oyster reef restoration, 16.6 jobs have been created.<sup>12</sup> A study also reports that an oyster reefs restoration project would cost on average 135.63 US \$ per m<sup>2</sup>.<sup>13</sup> With such investment, the EU would create:

- Direct jobs on the ground: Barge, tug operators and loading crews, fishermen, scientists, technicians, biologists, divers, mining and quarry workers, truck drivers, project managers, outreach specialists
- Indirect jobs: industries that supply materials (e.g. nurseries, lumber, steel, concrete, cement products) and administrative clerical and managerial services
- Induced jobs: economy boosted by workers employed around the oyster reef restoration programme. Tourism and recreational activities can also develop as a result of healthier oyster reefs.

As a result, local economies and communities benefit from improved ecosystem services, as well as better shoreline protection.

#### 4. RESTORE COASTAL HABITATS AS NATURE-BASED DEFENCES

Coasts are attracting nearly half of the population of EU countries that border the sea.<sup>14</sup> Living by the seaside contributes a great deal to people's well-being and mental health, and plays an important role to reconnect with nature.

However, it is now clear that these ever growing coastal populations have to cope with climate change and associated risks such sea-level rise, changing wave climate, and more frequent storm events. Even if governments would do everything in their power to mitigate climate change from now on, the crisis is already here. European government must more than ever act fast to protect their coastal populations from drowning. Only in the past century, the planet's temperatures have risen ten times faster than the average rate of ice-age-recovery warming<sup>15</sup>.

Nonetheless, the urgency to protect the coasts from these existing risks must not lead to short-termists and costly solutions. Indeed, typical solutions to protect coasts from being submerged can involve seawalls and breakwaters which are expensive and constantly need to be maintained, upgraded or rebuilt. Moreover, these structures often imply to replace natural habitats with homogenous substrata with low biodiversity and an increase of non-native species<sup>16</sup>, enhancing erosion in some cases.

These options make even less sense that nature-based solutions exist. Dunes, salt marshes, mangroves, seagrass, shellfish and coral reefs can act as physical barriers to waves and protect the coast from flooding and erosion. Yet, for decades, human activities have damaged these habitats, both affecting their capacity to regulate the climate and to then cope with climate change.

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<sup>12</sup> [https://www.naco.org/sites/default/files/documents/NACo%20Coastal%20Counties\\_Edwards.pdf](https://www.naco.org/sites/default/files/documents/NACo%20Coastal%20Counties_Edwards.pdf)

<sup>13</sup> <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0154735>

<sup>14</sup> <https://ec.europa.eu/eurostat/documents/3433488/5281405/KS-SF-09-047-EN.PDF/121dae7c-a53c-464a-baca-a314e652f4e7>

<sup>15</sup> <https://earthobservatory.nasa.gov/features/GlobalWarming/page3.php>

<sup>16</sup> Dafforn, K. A., E. L. Johnston, and T. M. Glasby. 2009. "Shallow Moving Structures Promote Marine Invader Dominance." *Biofouling* 25: 277–287. doi:10.1080/08927010802710618.

The fight against climate change cannot succeed without restoring these coastal habitats and the services they provide to protect coasts through increased bed friction, local shallowing of water, sediment deposition and building of vertical biomass<sup>17</sup>.

The EU must strategically invest in restoring these natural defences<sup>18</sup>.

An analysis done of the costs and wave reduction of such restoration projects in mangroves and salt marshes has shown that these nature-based solutions can be several times cheaper than alternative such as breakwaters, for the same level of protection<sup>19</sup>. They can self-repair after strong storms and have much lower maintenance costs than artificial infrastructures. The same study shows that, on average, coastal habitats reduce wave heights between 35% and 71%. Around 75% of oyster reefs and mangrove restoration projects and 69% salt-marshes restoration projects are implemented for coastal protection purposes.

These nature-based solutions and their long-term resilience are the most cost-effective investment the EU could make to mitigate climate change and reduce the cost of economic and social damages from flooding and erosion. The restoration of damaged coastal habitats would also quickly enable job creation in coastal safety, marine and terrestrial ecology, hydrology, geochemistry, engineering, governance and maintenance. Indirect jobs would also highly benefit from such restoration projects as healthy coastlines provide valuable ecosystem services such a fish production, water purification, carbon storage, as well as recreation and cultural values.

## 5. RESTORE PEATLANDS

Peatlands are a type of wetlands which are among the most valuable ecosystems on Earth: they are critical for preserving global biodiversity, provide safe drinking water, minimise flood risk and help address climate change.<sup>20</sup> Although they account for only 3% of terrestrial surfaces worldwide, they store nearly 30% of the soil carbon.

Drainage, agricultural conversion, burning and mining for fuel, have endangered these rich biodiverse habitats. CO<sub>2</sub> emissions from drained peatlands are estimated at 1.3 gigatonnes of CO<sub>2</sub> annually. This is equivalent to 5.6% of global anthropogenic CO<sub>2</sub> emissions.<sup>21</sup> The restoration is not only urgent to overcome their dramatic loss, but it is also one of the key solution the EU should address to meet its efforts to mitigate climate change and achieve its commitments under the Paris Agreement.

The EU should inspire itself from projects such as the LIFE Peat Restore project<sup>22</sup> to invest in peatland restoration and re-establish the climate mitigation and water absorption potential of these habitats, while creating jobs. In these types of project, rewetting peatland is a fundamental measure. It may also require further workload such as removing shrubs and trees, re-introducing peat forming vegetation or creating artificial floating islands, for instance. The contribution of peatland to climate change mitigation also needs to be quantified and monitored annually on the field.

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<sup>17</sup> Morris, R. L., T. M. Konlechner, M. Ghisalberti, and S. E. Swearer. 2018. "From Grey to Green: Efficacy of Eco-engineering Solutions for Nature-based Coastal Defence." *Global Change Biology* 24: 1827–1842. doi:10.1111/gcb.14063

<sup>18</sup> See examples for natural coastal defenses around the globe <https://coastalresilience.org/project/natural-defense-projects/>

<sup>19</sup> <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0154735>

<sup>20</sup> <https://www.iucn.org/resources/issues-briefs/peatlands-and-climate-change>

<sup>21</sup> <https://www.iucn.org/resources/issues-briefs/peatlands-and-climate-change>

<sup>22</sup> <https://life-peat-restore.eu/en/wp-content/uploads/sites/7/2018/02/2018-02-comp.pdf>

A recent review of peatland restoration projects in the UK found that median costs can range from expensive techniques (e.g. damming drains with rocks) reported at £5,883/ha to least expensive (e.g. damming drains with peat) reported at £105/ha. These values are estimated based on restoration works costs, staff costs, and other restoration costs.<sup>23</sup> Nonetheless, like every restoration project, costs will vary depending on criteria such as restoration techniques and site characteristics (depth of peat, area of land to be restored, extent of degradation, weather conditions, etc.).

Such investments would also lead to the creation of a high number of jobs as a result of the need to involve peat restoration officer, peat communications officer, research officer, programme managers, hydrological engineers, builders, as well as various external consultants and contractors. Industries providing equipment such as GPS handheld computers, monitoring equipment and sundries would also benefit from a peatland restoration project. Peatland land users (e.g. managers, farmers and peat extraction industry) and the general public would also all be part of the solution to leave peatland habitats intact, and would highly benefit from ecosystem services provided by it.

Finally, the EU must ensure that the Common Agricultural Policy supports Member States to reach their climate reduction goals by 2030 by guaranteeing eligibility of farmed wet peatlands for 1st and 2nd CAP pillar payments, phasing-out CAP funding for drained peatlands and remunerating ecosystem services with results-based agricultural payment schemes.

## 6. CONVERT FARMS TO AGRO-ECOLOGY AND ORGANIC PRODUCTION

Intensive, pesticide-dependent monoculture farming is destroying nature at an alarming rate. In Europe, agriculture is the main cause of species and habitat loss. In the past 40 years alone, our system has contributed to wiping out 57% of Europe's farmland birds.

The EU must address agriculture as the main driver to the biodiversity and climate crisis now and take urgent action to halt the wiping out birds, insects and other wildlife.

If done in the right way, organic food production is a solution that is highly beneficial for biodiversity and sustainable food production. It is also a strategic investment to stimulate the rapid transition to a green economy, supporting the environment as well as people through the creation of employment and the improvement of health and well-being. The work done by organisations such as Agro-Ecology Europe are an inspiring demonstration of the benefits of these more sustainable ways of farming.<sup>24</sup>

A French study<sup>25</sup> from the national organic agency 'Agence Bio' reports that "organic farms employ on average 2.41 AWU (Annual Work Unit) instead of 1.52 AWU in conventional agriculture." This highlights that "organic farms have thus 59% higher employment content compared to the conventional sector." Between 2012 and 2017, only in France, 49,200 direct jobs have been created, showing an average annual growth of +9.5%.

Even though the number of created jobs can vary from one farm or one region to another, a study<sup>26</sup> from 2011 led in the UK, also shows that organic farms employ 135% more FTE (full time equivalent jobs) per farm than conventional farms.

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<sup>23</sup><https://www.researchgate.net/publication/331592457> How much does peatland restoration cost Insights from the UK

<sup>24</sup><https://www.agroecology-europe.org/>

<sup>25</sup>[http://www.agencebio.org/sites/default/files/upload/agencebio-dossierdepressechiffres-juin2018-bat\\_31.05.2018.pdf](http://www.agencebio.org/sites/default/files/upload/agencebio-dossierdepressechiffres-juin2018-bat_31.05.2018.pdf)

<sup>26</sup><https://www.tandfonline.com/doi/abs/10.1080/14735903.2005.9684742>



In terms of investment, the costs of conversion to organic farming vary depending on the type of farm, the size, etc. The transition can take between 1 and 3 years. For instance, in Ireland it costs on average EUR 220-300/hectare/year<sup>27</sup>, meaning that for an average farm size of 43 ha in Ireland, conversion to organic farming would cost EUR 9,640-12,900/year.

The EU must support organic farms in adequately covering all the extra costs, addressing the potential reduction in yields at the beginning and invest in their maintenance, beyond the initial costs of conversion.

Investing in organic farming is making a safe bet for the future as consumer demand and jobs related to organic production increase in Europe every year. The outcome results in direct employment along the supply chain. Aside of employment in farming, the construction sector is also mobilised to develop agro-ecological infrastructures and other necessary changes to farm buildings, as well as the transformation sector and the distribution sector. Functions in research and training, administrative services or specific monitoring and controlling related to organic production would also flourish. Indeed, controlling the concrete details of organic farming deployment is essential, as if done in the wrong places and in the wrong way, it can turn out to be as damaging for biodiversity as traditional intensive farming practices.

## 7. CREATE BIODIVERSE SOLAR FARMS: MAKE SPACE FOR NATURE

A stream of recent studies has shown that the loss of nature is reducing farmers' yields, whereas bringing it back can have a positive effect. A thriving wildlife helps us produce food by pollinating crops, and providing natural pest predators, helping the move from dependence on agro-chemicals that work against nature. The viability of food production—and much beyond—in Europe is dependent on functioning ecosystems. For this, the EU needs to rapidly invest in solutions to re-establish habitats for wild animals to breed, shelter and source foods, such as: hedgerows, flower strips, field margins, ponds and fallow (uncultivated) land.

One solution to this critical problem would be to support farmers to set biodiverse solar farms.

Through an EU funded programme, farmers would set aside part of their land to install solar panels, leaving sufficient space between the rows for grassland to expand and biodiversity to thrive. In this way, farmers are encouraged to leave space for nature on their land, while benefiting from the energy provided by solar panel and the ecosystems services provided by a proven increased biodiversity on these solar farms<sup>28</sup>. Indeed, in addition to providing renewal energy, solar farms can contribute to the restoration of polluted sites or intensively cultivated arable lands by providing space for biodiversity to come back. For instance, a 2010 paper<sup>29</sup> from the German NGO NABU explains that setting solar farms on former military or industrial areas has made possible the restoration of contaminated soil.

The EU should develop a set of criteria to identify farms that could benefit from such scheme with regard for instance to structural diversity or the protection of ground-nesting bird species. On that basis, funding from the EU would support employment in consultancy, planning and construction of

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<sup>27</sup> <https://www.teagasc.ie/media/website/rural-economy/rural-development/equine/Organic-Farming---a-step-by-step-guide-to-conversion-March-2020.pdf>

<sup>28</sup> [https://www.bne-online.de/fileadmin/bne/Dokumente/20191119\\_bne\\_Studie\\_Solarparks\\_Gewinne\\_fuer\\_die\\_Biodiversitaet\\_online.pdf](https://www.bne-online.de/fileadmin/bne/Dokumente/20191119_bne_Studie_Solarparks_Gewinne_fuer_die_Biodiversitaet_online.pdf)

<sup>29</sup> <https://www.nabu.de/imperia/md/content/nabude/energie/solarenergie/170629-nabu-kriterien-solarparks.pdf>



solar farms, while indirectly supporting farmers with renewable energy and healthier surrounding ecosystems.

Newly created solar spaces could then be taken into consideration as Ecological Focus Areas under the new CAP if they fulfil biodiversity criteria.

## **8. MAINSTREAM AGROFORESTRY FOR SUSTAINABLE FOOD PRODUCTIVITY**

In 2050, it is estimated that there will be 9.3 billion people to feed on the planet. Our current agricultural model, based on intensive exploitation and monoculture has severely affected the fertility, and thus the productivity of our soils, hampering the capacity of our ecosystems to sustain the world's population. Where we would have once found trees and a diversity of plants, 2020 offers only flat and harmonised agriculture landscapes leaving no room for species like birds to find food, shelter and habitats.

The model of intensive farming is a threat to food security on the long-term but also employment. It has proven not to be economically and socially viable for traditional farmers losing employment and for job creation as it requires less jobs per unit of food produced.

Our agricultural sector is deficient and the EU urgently needs to adopt solutions that will guarantee sustainable food production for all, while reducing the current environmental impact of the sector on biodiversity and the climate. Agroforestry must be mainstreamed for food production. This alternative to monoculture systems integrates mutually beneficial trees, crops and and/or animal to re-create the complementarity and balance found in the natural environment.

What we consider a new paradigm of using the interaction of agriculture and trees to increase the resilience of our soils, improve food productivity, while bringing back biodiversity and mitigating climate change, has long been used by traditional farming communities. Agroforestry creates mutual benefits as trees can provide fodder for livestock, shade (benefitting grazing livestock and reducing heat stress on crops), food such as fruits and nuts, wood fuel, incomes from products such as timber, oil, biofuel, as well as crucial ecosystem services such as carbon sequestration, preventing erosion and water evaporation. Agroforestry systems in Europe have also shown<sup>30</sup> to increase overall yields by up to 40% in comparison to monoculture systems. Indeed, more fertile soils and maintained rich topsoil can better support crops and balance damages from unwanted pests and plagues.<sup>31</sup> Therefore, farmers can also save money from not using chemical fertilizers and pesticides and protect human health and the environment.

Considering that climate will gradually increase the number and strength of rainstorms and droughts, trees and shrubs can also protect crops from strong winds while their root systems can absorb heavy rain, and improve nutrient cycling. This water retention capacity can also be a life changer for populations in dry regions where water is scarce.

Broadly investing in agroforestry and green infrastructures on agricultural landscapes must be one of the EU's priority solution to meet the post-2020 climate and biodiversity agenda. Grants for farmers and land managers/owners should be provided for undertaking such projects and increasing jobs on farms. Turning monocultures into agroforestry would stimulate employment for the design, development, management and benefit to supply industries. It would also require trainings of farmers

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<sup>30</sup> <https://dspace.lib.cranfield.ac.uk/bitstream/handle/1826/2726/Bio-economic%20modelling-three%20European%20countries-2007.pdf?sequence=1>

<sup>31</sup> <http://climate.org/wp-content/uploads/2017/03/Agroforestry-Article-3.6.17.pdf>

on business planning and management of the agroforestry project, as well as for increasing their ability to access future funding (e.g. under a reformed CAP) for ecological-environmental purposes. Specialists and local authorities would also be mobilised to undertake measuring, monitoring and evaluating of carbon and water storage and the benefits of the new combination of crops, trees and animals.

In terms of investments, hedge laying costs on average £12-15 per metre<sup>32</sup>. For instance, considering that the UK lost 425,000 km of hedgerows between 1946 and 1993, restoring those would cost between GBP 5.1 and 6.4 bn (c. EUR 5.9-7.3bn). The LIFE Green Change project<sup>33</sup>, funding green infrastructure in agricultural landscapes in Italy and Malta, had been given a budget of EUR3.1 million (with EUR1.9 million of contribution from the EU).

Agroforestry contributes to nine out of 17 Sustainable Development Goals (SDGs). Trees have multiple uses including enhancing cultural values. Rural communities would be the first beneficiaries of this new paradigm of food production.

## 9. FUND URBAN GREENING: GREEN ROOFS

Science shows that a healthy environment and being in contact with nature are major factors of good human health, and of well-being. With cities now starting to plan their revival post-Covid-19, it is a timely opportunity for the EU to invest in bringing back nature based solutions to city planning and protect the near 25% of city residents at risk of poverty or social exclusion. Incorporating networks of green spaces throughout cities can provide passageways for people and nature while following flood sensitive low-lying terrain.

The ‘renovation wave’ is being highlighted as an action of the European Green Deal that should be prioritised in recovery plans to help boost economic activity. On top of increasing insulation and energy efficiency, structural renovations should look at the incorporation of green roofs. Adding green roofs is a highly strategic investment for the EU in the framework of the Green Recovery as it can:

- Provide 50 – 80% runoff retention<sup>34</sup> and therefore relieve some of the load on the sewage systems in cities by absorbing precipitation water;
- Create cleaner air;
- Reduce city temperatures by up to 3°C;
- Increase solar panel efficiency by cooling the roof;
- Contribute to food production: A project from French company Agripolis is planning to open a 150,000-square-foot urban farm in Paris, where, more than 900kg of fruits and vegetables could grow every day during high season<sup>35</sup>;
- Reduce ambient noise;
- Protect and insulate roofs;
- Increase biodiversity and habitats;

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<sup>32</sup> [http://www.hedgelink.org.uk/cms/cms\\_content/files/65\\_hedgerow\\_management\\_and\\_wildlife.pdf](http://www.hedgelink.org.uk/cms/cms_content/files/65_hedgerow_management_and_wildlife.pdf)

<sup>33</sup> <http://lifegreenchange.eu/en/>

<sup>34</sup> Shafique, Muhammad & Kim, Reeho & Kyung-Ho, Kwon. (2018). Green Roof for Stormwater Management in a Highly Urbanized Area: The Case of Seoul, Korea. Sustainability. 10. 10.3390/su10030584.

<sup>35</sup> <https://www.theguardian.com/cities/2019/aug/13/worlds-largest-urban-farm-to-open-on-a-paris-rooftop>

- Increase demonstrated health benefits<sup>3637</sup> - as they can also be used for recreational purposes, sport or even shared gardens.

The EU could follow the example of the German city Hamburg which has developed a Green Roof Strategy<sup>38</sup>, planning to plant 100 hectares of green roof surface with a financial support of € 3 million between 2016 and 2019 from the Hamburg Ministry for Environment and Energy. Subsidies to cover up to 60% of installation costs are also provided to building owners. Beyond the benefits listed above, this investment also allows on the long-term a reduction of maintenance cost as roofs are of better quality, and of energy costs thanks to improved building insulation. For the latter, it is estimated to reduce the costs by 2/3, which therefore reduces the energy demand, allowing a greater transition to renewables.

In the framework of the economic crisis created by Covid-19, investing in urban greening and in particular greens roofs, is a way for the EU to quickly invest in creating thousands of jobs. The construction sector would highly benefit from such funding programme and high skills jobs such as education and training, competences in conferences and networks building, urban designers, engineering or research and development would increase. It would also reinvigorate water service providers, local authorities, land or housing associations, drainage consultants or suppliers and flooding managers.

In terms of investment, the European Federation Green Roofs & Walls reported<sup>39</sup> in 2015 that “if a fifth of every capital city in the Union had the potential to be retrofitted with green roofs with an average price of € 30 m<sup>2</sup> the potential market size in Europe would be in the order of € 3.36 billion.”

## 10. SUPPORT ENVIRONMENTAL AUTHORITIES TO REBUILD THEIR ENFORCEMENT CAPACITIES

The EU already has good environmental legislation that could help halting the biodiversity and climate crisis. Unfortunately, there is a huge implementation and enforcement gap. The SOER 2020 report of the EEA<sup>40</sup> reveals that the EU and its Member States failed to achieve any of the environmental objectives given by EU's environmental law and strategies.

In 2016, a study commissioned by the European Commission has shown that enforcement action of EU environmental legislations would reduce loss caused by the lack of implementation and benefit citizens, duty-holders (authorities and businesses) and the society as a whole.<sup>41</sup> Therefore, the EU would highly benefit from a European Enforcement Programme.

Countries around the EU have been for years trying to promote healthcare and school education training, with a promise of employment afterwards to ensure enough nurses, doctors and teachers can go into the workforce. A similar training programme could be financed by the EU in order for

<sup>36</sup> See the results from the LifeMedGreenRoof - Constructing two demonstration green roofs to illustrate the potential of meeting environmental and energy targets:  
[https://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n\\_proj\\_id=4748](https://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=4748)

<sup>37</sup> <https://www.sempergreen.com/en/solutions/green-roofs/green-roof-benefits>

<sup>38</sup> <https://climate-adapt.eea.europa.eu/metadata/case-studies/four-pillars-to-hamburg2019s-green-roof-strategy-financial-incentive-dialogue-regulation-and-science>

<sup>39</sup> [https://efb-greenroof.eu/wp-content/uploads/2016/12/efb\\_whitepaper\\_2015.pdf](https://efb-greenroof.eu/wp-content/uploads/2016/12/efb_whitepaper_2015.pdf)

<sup>40</sup> <https://www.eea.europa.eu/soer-2020>

<sup>41</sup> [https://ec.europa.eu/environment/pubs/pdf/benefits\\_of\\_enforcement\\_presentation.pdf](https://ec.europa.eu/environment/pubs/pdf/benefits_of_enforcement_presentation.pdf)

Member States to train people in the environmental enforcement chain (such as law enforcers, prosecutors or judges). This would allow Member States to build up, train and retain a healthy environmental law enforcement workforce. The enforcement programme should focus on:

- a) Providing training in the Member States;
- b) Providing technical equipment needed for effective enforcement;
- c) Capacity building and (time-limited) staffing. It should mostly aim at local, regional and higher-level authorities. The European Commission could refer to experiences gained with funding programmes such as Erasmus or programmes under the ESF.

For getting a rough cost-estimate, the Commission could refer to the number of regions in the EU, with the assumption of financing a certain number of posts per region for a certain number of years. Eurostat classifies regions according to different levels. For specific diagnoses it looks at a small scale 1,348 (NUTS 3) regions in the EU; for regional diagnoses it (only) looks at 283 (NUTS 2) basic regions<sup>42</sup>. BirdLife suggests for the Commission to plan for either one enforcement officer per NUTS 3 region or a team of 3 enforcement officers per NUTS 2 region.

The financing should at least last for 4 years, considering that the training needed takes time, and that benefits of effective law enforcement pay back only after a certain while. This number would then need to be multiplied by the EU average annual labour cost of an enforcement officer.

Such enforcement programme would create a significant number of jobs, some of which in rural areas. The EU investment could also partly be directly recovered in the form of penalties and fines collected from offences against the environment and indirectly decrease the economic cost of environmental degradation. Such enforcement programme would be extremely cost-effective as a study commissioned by the Commission from 2019 for the EIR report estimates that the total costs for society of current environmental implementation gaps are around EUR 55 billion annually.

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<sup>42</sup> <https://ec.europa.eu/eurostat/web/nuts/background>