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Policy Recipes

Grassroots ideas to halt biodiversity loss

Addressing an upcoming crisis

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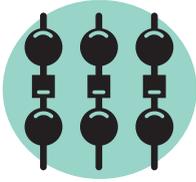
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Amuse-bouche



Executive Summary Biodiversity is in a desolate state. In their first report released in May 2019, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) finds that biodiversity is declining at rates faster than at any time in human history, threatening ecosystem functions critical to human survival and well-being.¹ Correspondingly, IPBES calls for a «transformative change» in the way humanity interacts with the natural environment surrounding us. While the report is novel in terms of its scope and multilateral backing, the overall trends were long known, yet largely outside of the awareness of society. That's why, in autumn 2018, foraus set out to crowdsource innovative ideas on how to tackle the biodiversity crisis through a newly developed online policy innovation tool: Policy Kitchen.

Together with experts, foraus defined three challenges with a link to foreign policy, in which action is particularly needed: How to square biodiversity conservation and **economic development**? How to make **trade** more biodiversity-friendly? And how to improve **global governance** around biodiversity conservation? foraus discussed these questions with over 100 participants from various backgrounds. The process resulted in 43 ideas on biodiversity conservation, four of which were developed further and are presented in the main course below:

1. Improve protection of the ecosystem services underpinning life **by declaring «nature as legal entity»**
2. Increase awareness in the general public for biodiversity loss by developing a new, **more accessible indicator called «the *Bee Equivalent*»**
3. Address biodiversity externalities due to international trade with **«differentiated tariffs depending on biodiversity conservation»**
4. Foster exchange and dissemination of best-practices in nature conservation via the **«twinning of conservation areas»**

Overall, the submitted ideas were as diverse as the topic itself and covered many important aspects of action needed to avert further biodiversity loss. The main aspects that were mentioned were 1) increasing public awareness for biodiversity loss, 2) strengthening of enforcement mechanisms around biodiversity conservation and 3) the development of a more biodiversity-friendly economic system. A summary of these ideas is presented in the *dessert* of this publication. The original submissions of all ideas remain available on policykitchen.com. ●

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The Kitchen

Crowdsourcing methodology



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Policy Kitchen² is a policy crowdsourcing methodology developed by foraus – Swiss Forum on Foreign Policy. It enables a diverse network of thinkers from Switzerland and abroad to find creative policy recipes to pressing foreign policy challenges. The methodology is built on a crowd innovation platform, physical workshops, and a support process to bring the best recipes to impact.

Policy Kitchen is public. Any person, irrespective of background or location, can participate and contribute ideas. To ensure a high level of expertise, we partner with experts and professionals of various sectors (science, government, international organizations, civil society, business, etc).

The code for Policy Kitchen is made available as open-source software. We encourage and support other actors in using participative methods in their respective domains. Policy Kitchen has been made possible with the support of the Engagement Migros foundation.

The biodiversity challenge on Policy Kitchen was launched in September 2018. More than 100 people from various sectors and levels of seniority participated in workshops and online. Seven workshops

were held in Geneva, Basel, Zürich, Bern, Lausanne, Liechtenstein and Berlin. In total, 43 ideas were uploaded to Policy Kitchen.

The ideas were selected in a multi-stage process. They were first prioritized by public voting. A senior jury reviewed this pre-selection and considered five ideas worth further elaboration. The jury consisted of three members of the Swiss National Council - Alice Glauser (Swiss People's Party), Adèle Thorens (Green Party) and Kurt Fluri (Liberal Party), as well as Pascale Baeriswyl (State Secretary of the Federal Department of Foreign Affairs), Florian Egli (Vice President of foraus), Renat Heuberger (CEO of South Pole Carbon Asset Management Ltd.), Thomas Vellacott (CEO of WWF Switzerland) and Eva Zabey (Director of Redefining Value, World Business Council on Sustainable Development).

Finally, four ideas were elaborated further in teams. Following a summary on the issue of global biodiversity decline («starter»), the four ideas are presented as «main course». The «dessert» chapter summarizes insights from the remaining proposals. We conclude with a short «digestif» and the list of participants, experts and contributors to the paper («chefs»). The menu is intended to serve as a thought-provoking meal for policy-makers. Enjoy! ●

The Starter

Background



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What is biodiversity?

Biodiversity is the variety of all living things; the different plants, animals, fungi and microorganisms, the genetic information they contain and the ecosystems they form. Biodiversity can be explored at three levels - genetic diversity, species diversity and ecosystem diversity.³ These three levels work together to create the complexity of life on earth. Biodiversity collectively describes the vast array of approximately 9 million species (including human beings: *Homo sapiens*) that inhabit the earth, together with the web of interactions amongst them. Without these organisms, ecosystems and ecological processes, human societies could not exist.⁴ They supply us with oxygen and clean water. They cycle carbon and fix nutrients. They enable plants to grow and therefore to feed us. These benefits are known as ecosystem services. So biodiversity keeps us alive, but there are other less tangible benefits. These include recreation such as fishing or hiking, the aesthetic beauty of the natural world and our spiritual connection with nature or the cultural values of plants and animals. Apart from these services that biodiversity provides directly and indirectly to human beings, its existence constitutes an immeasurable

value. The fact that planet earth is the only place known so far to host life on its surface attaches an ethical dimension to preserving these ecosystems.

What is happening to biodiversity and why is it important?

Globally, biodiversity is in rapid decline. The living planet index shows that animal populations have decreased by over 60% between 1970 and 2014, on average.⁵ Animal populations in Middle- and South America, as well as freshwater populations have suffered the most, each dropping by 89% and 83%, respectively. With declining populations, more and more species are facing the threat of extinction. Today, extinction rates are between 10 and 100 times higher than the natural rates (Figure 1), and are likely to be underestimated.⁶ These numbers resemble those of the great five mass extinction events since the appearance of life on the planet, the latest happening some 66 million years ago.⁷

While we have somewhat reliable data for the threat assessment of vertebrate animals and plants, there still remains a massive uncertainty around the existence and the threat status of many living beings, potentially leading to an underestimation of the gravity of the situation. An increasingly prominent example is the disappearance of insects that has been recorded over the past decades.^{8,9} This development will eventually pose a problem for pollination and hence agricultural production. Yet insects - being the most diverse unit in the animal kingdom - also fulfill a range of other functions that we barely notice but heavily depend upon. This issue is perhaps even more pronounced for fungi and bacteria, who fulfill elemental functions of life yet remain vastly understudied.

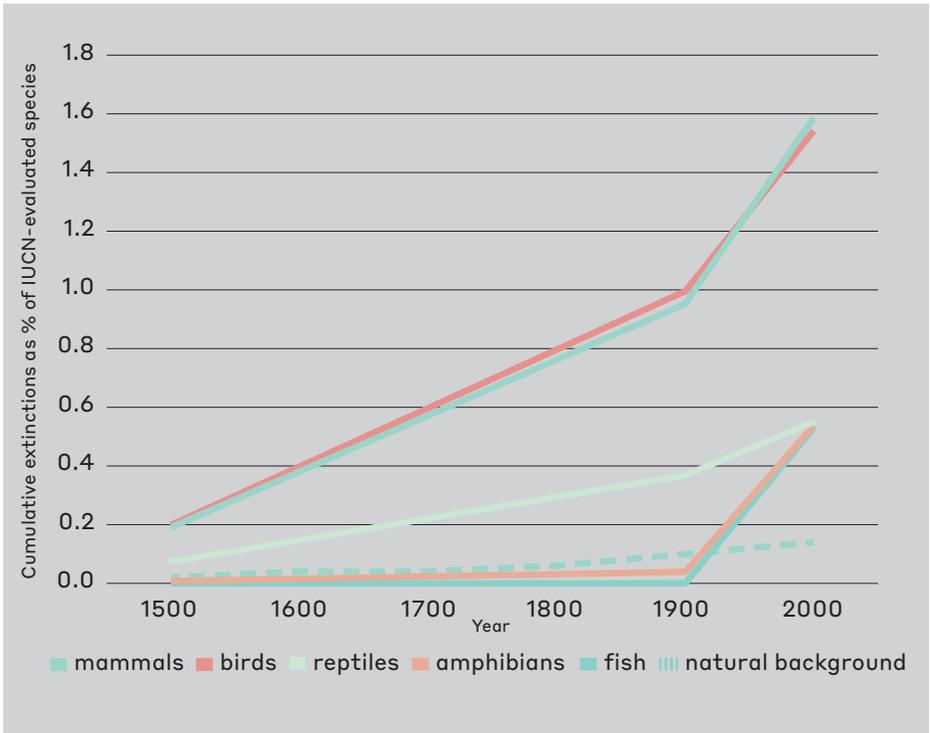


Figure 1: Cumulative extinctions of vertebrates as % of assessed species since 1500 A.D. based on the IUCN category «extinct» calculated according to Ceballos et al. (2015) and compared to the natural background extinction rate.¹⁰ While species extinction can happen naturally - and is quantified by the natural background extinction rate - the higher actual extinction rates of vertebrate species shows the human impact on these populations. Already in the middle-ages, human impact led to more extinctions than naturally occurring - a trend that has dramatically accelerated in the 20th century.

The main drivers of biodiversity loss globally are habitat loss and degradation following land-use change (e.g. turning rainforest into pasture) and overexploitation of natural resources (e.g. overfishing or overhunting). Furthermore, pollution with pesticides, industrial chemicals and nutrients, introduction of exotic or genetically modified organisms, and climate change are important drivers for biodiversity loss.¹¹ The complex interdependence of species also leads to negative feedback loops, e.g. when the loss of one species erodes the food

source of another. These main drivers are fuelled by growing populations and a dramatic increase of resource use per capita, particularly in economically advanced countries. More and more countries now exhibit a pressure on biodiversity through their consumption, that far exceeds a sustainable level.

If continuing on the current trajectory, humanity is at serious risk of undermining its own foundations to life. In its first global assessment report on the state of biodiversity, the IPBES highlights the risks to food security caused by the global decline in biodiversity. Already due to a loss in pollinators, humanity risks losing about 70% of current crop output. Adding to that, land degradation has already reduced agricultural productivity by 23%.¹² Correspondingly, the World Economic Forum (WEF) lists «biodiversity loss and ecosystem collapse» as one of the top 10 risks in its 2019 Global Risk Report.¹³

What has been done so far to halt biodiversity loss?

The issue of biodiversity loss is not new. One of the first problems addressed on a multilateral level was the overexploitation of species with the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) in 1975. It aims to ensure that international trade in specimens of wild animals and plants does not threaten the survival of the species in the wild. While a step in the right direction, CITES only covers the dimension of overexploitation attributable to international trade and does not address other drivers of biodiversity loss.

A more holistic approach was developed during the Rio Earth Summit in 1992 with the Convention on Biological Diversity (CBD). Under this framework, the parties (193 states) established the inter-governmental science to policy platform on biodiversity and ecosystem services (IPBES) and adopted the Strategic Plan for Biodiversity 2011 - 2020, a ten-year framework for action. It defined the 20 Aichi Biodiversity Targets. However, only four of the targets have been partly achieved so far and only moderate progress has been achieved for another seven targets.¹⁴ Six of the remaining targets have seen poor progress and data is lacking for the assessment of the other three. Note that the targets that have been achieved so far are the ones related to the governance of biodiversity conservation policies

(e.g. «biodiversity integrated into planning»). The actual indicators of the state of nature, however, (e.g. «habitat loss at least halved»), predominantly show poor progress. In short, the international community has so far failed to effectively protect and preserve biodiversity.

Biodiversity protection and Switzerland

Switzerland ratified the CBD in 1994 as well as multiple other conventions to protect biodiversity and the SDGs.¹⁵ Nevertheless, biodiversity protection has never really taken off. Being one of the last countries, Switzerland took 17 years to develop a biodiversity strategy and an additional five years to pass an action plan, defining concrete instruments for addressing the 20 Aichi targets. Environmental NGOs criticised further that only 5 out of its 49 sub-targets will be achieved by 2020 and only one out of the 18 strategic goals defined on a national level, the one with respect to forestry.¹⁶ In addition to that, the Environmental Report 2018 outlines that Switzerland's overall impact on biodiversity, calculated on a consumption basis, is nearly 4 times higher than the threshold value that would be in line with the planetary boundaries. More than half of its impact on biodiversity is caused abroad through the import of goods produced in a way that is harmful to biodiversity.¹⁷

In addition to the implementation of measures on a national level, there are three key areas on the international level where Switzerland could substantially contribute to halt biodiversity loss: namely by improving **international governance**, by taking into account biodiversity-impacts abroad through **trade policy** and by strategically using **development cooperation**.

Since the current Strategic Plan of the CBD will expire in 2020, the process to develop the post-2020 agenda has been launched. On the basis of comprehensive consultations on different matters concerning the possible shape and content of the post-2020 agenda for biodiversity¹⁸ the parties will negotiate the post-2020 framework and agenda for biodiversity at the 15th conference of the parties (COP15) in Kunming, China in October 2020. As a well-accepted mediator, Switzerland could help to improve global governance. The challenge

is thereby not so much to foster the acknowledgement of biodiversity loss at the national level, but more so the implementation of tangible measures.

Furthermore, Switzerland is a major hub for commodity trading, host of the World Trade Organisation (WTO) in Geneva and has concluded 30 bilateral free trade agreements. Biodiversity loss is linked to production and consumption patterns in a globalized economy. For instance, monoculture-based agriculture and deforestation of rainforests have been shown to be detrimental to ecosystems and species diversity. Yet, binding rules for biodiversity conservation in bi-/multilateral trade agreements are often lacking, or neglected. Also, assessing the impact of trade commodities over their life-cycle is often hindered by insufficient data and lack of transparency.

Finally, biodiversity conservation is directly addressed in 3 of the 17 UN Sustainable Development Goals.¹⁹ Most international aid agencies have incorporated policies targeting biodiversity outcomes into their development partnership activities, and also in the proposed Strategic Approach for Switzerland's international cooperation 2021-2024 biodiversity protection is brought up.²⁰ Nevertheless short-term human development progress is often driven by other, more visible factors like intensive food production, economic growth or market and infrastructure development.

The three challenges can be summarized as follows:

- 1. How to improve global governance to protect biodiversity more effectively?**
- 2. How to ensure that concerns for biodiversity conservation are built into trade policies and agreements?**
- 3. How can we ensure biodiversity protection in development?**

These three challenges were set as guiding questions for the policy kitchen participants (see «Kitchen»). Their ideas did not have to be confined to one challenge only or, on the other hand, could only address sub-questions of a challenge. ●

Main Course

Four ideas to enhance biodiversity protection



In the following, we present four out of 43 ideas from the Policy Kitchen process that were elaborated further following the initial idea generation phase.

1. Nature as legal entity

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The idea of **nature as a legal entity** contributes to improving global governance to protect biodiversity more effectively than our current environmental laws. It means assigning rights to all components of biodiversity and including nature in all decisions. These

decisions would be based on what is good for the planet earth (including humans and nature) in the long term and therefore codify the concept of sustainable development into the existing legal framework.

Since the industrial revolution, nature - including trees, oceans, animals, mountains and so on - has been treated as a virtually free commodity that exists largely for the benefit of humans.²¹ Because most current environmental laws worldwide protect nature only for the benefit of people and corporations, profit usually takes priority over nature conservation. Even when environmental issues are brought to court, people must prove that the environmental damage violates their own rights since nature has no rights of its own. The legal treatment of nature as a property is therefore at the core of why environmental legislation fails to halt or reverse environmental degradation. This prevailing paradigm of legislation significantly contributed to the transgression of several planetary boundaries. As described in the Starter, the rate of biodiversity loss is considered to undermine ecosystem functioning with considerable risks for human well-being.²² However, mankind is an inseparable part of nature, and as a consequence human life depends on nature. Where the environment is harmed, people suffer from disease, violence, and shortages of food and water.²³ Despite this indisputable direct dependence of human life on a stable natural environment, the aggregated gradual degradation of the Earth's ecosystem cannot be brought to court because a direct causality with violations of individual rights cannot be proved.

As a healthy environment underpins human life, the well-being of nature should be considered a collective human right. And in order to protect human rights, we have a general obligation to protect ecosystems and biodiversity. Under this premise, assigning the nature rights of its own aims to maintain the potential of human life to prosper. In addition, we currently do not know which components of nature will be important for human survival in the future. Thus, following the precautionary principle we are obliged to conserve nature as a whole including all components of biodiversity.

Idea: Recognizing the rights of nature

Rights of nature means the **recognition and honoring that nature has rights**. Laws recognizing the rights of nature change the status of ecosystems and natural communities to

being recognized as rights-bearing entities. People, communities, and governments have the authority to defend those rights on behalf of nature.

In the traditional legal understanding, nature is an object and the human species is not part of it. For instance in Swiss Civil Law it is written, that the owner of an object is free to dispose of it as he or she sees fit within the limits of the law.²⁴ Objects (e.g. animals, plants, or stones) have no proper rights. In this traditional framework, subjective rights were reserved for humans, organizations, or economic actors such as firms or trusts. These legal persons are able to exercise their rights, and to enforce them through legal litigation.²⁵

Laws assigning rights to nature change the status of natural communities and ecosystems. They can be recognized as legal entities and their rights can be enforced by people, governments, and communities. With nature as a holder of legal rights, its status goes from a serving mean to benefit «us humans» to the legal recognition of nature's value independent of its use for humans.²⁶ The dynamics of law adapt to social changes and mirror the current thinking and set of values. Therefore, establishing a rights-based framework for the protection of nature continues a long and necessary history securing rights for the «rightless» – including women and children – who were once considered «property» under the law.

The idea that nature has the right to exist, thrive, and evolve, could be one step towards a world where we address our unmet moral obligations to future generations. When we talk about the «rights of nature», it means assigning rights to all components of biodiversity (e.g. ecosystems or species). These components are not a property that can be owned, but are entities that exist independently.

Consequently, nature would have the right to exist, persist, maintain and regenerate its vital cycles.

Nature as legal entity could enjoy rights such as:

- the right to maintain the integrity of its natural cycles and the vital processes that sustain them,
- the right to preserve the functionality of the water cycle and its existence in the quantity and quality needed to sustain life,
- the right to naturally evolve and to preserve the diversity of life including the differentiation and variety of beings comprising nature,
- and the right to timely and effective restoration to its pre-damaged state.

Giving rights to nature or parts of nature does not mean that these rights will always prevail or win in every single case. The rights of nature have to be balanced with social and economic interests. Therefore, the advantages of this concept are that it leads to fair legal trials between representatives of nature, society and economy under consideration of the principle of proportionality.²⁷ Consequently, infliction of harm to nature should only be proceeded to the extent necessary and only if the long-term social and economic benefits for several generations justify the harm of nature.²⁸

The rights of nature has already been established in some countries by giving nature recognition in legal proceedings and judicial decisions or by the concept of nature as a living being and as having intrinsic value.²⁹ In 2008, Ecuador became the first country in the world to recognize rights for nature in its constitution.³⁰ Bolivia is in the process of implementing a set of laws that recognizes certain rights for nature.³¹ The government of New Zealand changed with the adoption of an Act the status of a national park and granted it the same rights as any citizen has.³² Their parliament has adopted a bill, recognizing the spirit of river systems and acknowledging that it is owned by no-one.³³ Since 2017, the Constitution of Mexico City is giving a mandate a law that «recognize and regulate the broader protection of the rights of nature formed by all its ecosystems and species as a collective entity subject to rights.»³⁴

Implementing the rights of nature

At the international level

An international treaty would ensure that states, enterprises and individuals can be liable for actions which harm nature. The international recognition of nature as a legal person could be pushed forward at one of the upcoming United Nations Biodiversity meetings on the CBD. For example at the before-mentioned upcoming Conference of the Parties in China 2020 (COP15), where the Convention is expected to update its strategic plan and adopt a post-2020 global biodiversity framework as a follow-up for the next decade. The idea of nature's rights is not new to the United Nations. The General Assembly has already adopted this idea within the resolution on Harmony with Nature.³⁵ In addition, the International Union for Conservation of Nature (IUCN) could act to promote the concept of nature as a legal entity.

At the national level

Once the rights of nature are recognized in an internationally binding convention, member states would have to adopt this principle in their legal system. In the light of the rights of nature, national governments would have to adapt their civil, penal and administrative laws, as well as their environmental legislation. In Switzerland the rights of nature would ideally be recognized at the constitutional level. Such a constitutional amendment would require a popular vote, which would have to be either initiated by a popular petition or by the parliament. Prior to such a popular vote there needs to be a broad debate within the society, which would introduce the concept of nature as a legal person. Alternatively, the parliament can also directly propose the adaptation of a specific law concerning the use of natural resources (e.g. forest law). At the cantonal level, recognition of the rights of nature would be possible if it doesn't contradict the Swiss constitution.

Legal representation of nature

Recognizing the rights of nature, however, implies placing obligations and responsibilities on humans, including corporate bodies and

society, to respect those rights and render them real, tangible and effective. This raises the question of who can represent these rights, as nature as such cannot claim rights for itself. The institution of legal representation is a fixed component in the legal system which can be used in this context as well. For example, the children's interests are commonly represented by their parents or an enterprise being represented by natural people. Consequently, it has to be defined who could represent nature as a legal entity.³⁶

At the national level one could for example agree that any individual or governmental, or non-governmental organization could act on behalf of nature for the purpose of protecting or defending the right of nature. In Switzerland entitled organizations have the right of appeal against cantonal or federal authorities.³⁷ This is a powerful legal instrument with an important impact on nature and environment. For further implementation of the rights of nature, states could establish an ombudsman's office, where harming activities to nature could be reported. This ombudsman could then investigate, whether nature's rights are affected and make recommendations to the putative violator to avoid a legal trial. If the violator does not follow the recommendations, the ombudsman could hand over the case to the public prosecution, which is then obliged to take legal action. Where there is no representative to speak for nature, the public prosecution should be able to appoint a legally qualified person as *amicus curiae*.

A more ambitious and long-term idea is the establishment of an international organization, which negotiates in case of conflict. It is conceivable to establish this as an international court for nature rights. As mentioned above the well-being of nature could be regarded as a collective human right. Therefore, such an international court for nature's rights could be affiliated to the existing international court of human rights. Switzerland, in particular Geneva, would be an ideal place to establish such an international court for nature rights, because no other city has a richer history of international cooperation than Geneva.

In the light of the above reflections, the idea of introducing nature as a legal person is therefore a consequential and necessary evolution of the legal framework at the national and international level.

2. The *Bee Equivalent* – A headline indicator for biodiversity loss

Björn Glaus

Cornelia Krug

Biodiversity is a complex concept. A headline indicator allows to track and communicate its development to the general public. The *Bee Equivalent* is a proposal for such an **indicator**.

It makes biodiversity loss tangible, quantifies potential positive effects and allows for comparisons between different ecosystems.

Biodiversity and ecosystem function are important for human well-being – they enhance the quality of life e.g. by regulating climate or water quality, or by contributing to physical and psychological well-being and support identity. The impacts of humanity on biodiversity and ecosystem functions are manifold; the responses of species and ecosystem to this change are varied and take place at different spatial and temporal scales. Interactions between species and feedback between ecosystems and drivers of change add a further level of complexity.

Despite policy efforts to conserve biodiversity, the loss continues, as the importance of biodiversity has not been recognized by all parts of society. Biodiversity loss is considerably less visible in the public debate compared to climate change. As an example, US, Canadian and UK news mentioned climate change 4–5 times more often than biodiversity over the last two decades.³⁸ Biodiversity effects are more local which may play a role in lowering media coverage and awareness in the broader society. Moreover, biodiversity is not adequately considered in national decision-making.³⁹

Making biodiversity loss tangible

One promising instrument to enhance the awareness of policy-makers and the general public and broaden the discussion on biodiversity

loss are intuitively comprehensible indicators and associated targets. Indicators, using target-oriented data collection to monitor a specific state, or progress to a given target, have proven to be highly useful; as they are often used to increase awareness about environmental issues and their consequences and to stimulate and guide discussion. For example, the climate scientific community uses simple, easy to understand indicators such as temperature increases, sea level rise, or arctic and antarctic sea ice extent to illustrate and communicate the impacts of climate change. Emulating this, we believe the definition and introduction of new indicators for biodiversity could facilitate to illustrate and communicate the impact of global change on biodiversity and the functioning of ecosystems.

New **headline indicators for biodiversity**, covering aspects of biodiversity loss and ecosystem functioning, should thus **fulfill the following criteria** (among others):

1. Facilitate communication with a broad public;
2. Emphasise connectivity and ecological function to reflect the interactions within ecological communities;
3. Facilitate comparisons between (disparate) ecosystems to illustrate the effects of different human impacts;
4. Facilitate the implementation of policies;
5. Bring together a broad range of actors (scientists, general public, politics, media) in the development and application of the indicators to ensure

The indicator should capture the essential features of change, be derived from key variables, or be a simple representation of more complex relationships. For example, the CO₂-equivalent is used to express the warming potential (or radiative forcing) of a mix of greenhouse gases. Existing indicators used to assess the impact of global change on biodiversity function are rather complex (e.g. mean species abundance, MSA or biodiversity intactness index, BII) or focus on species entities and specific taxa only (e.g. the living planet index, LPI). There is a need for indicators that emphasise the consequences and causal loops and feedbacks of species extinctions and biodiversity loss. Given the complexities of the relationship, and the importance

of maintaining functioning ecosystems, there is a need for headline indicators that illustrate the functional aspects of biodiversity loss, emphasise the connectivity of ecological networks and are easy to understand (and communicate). These indicators should also facilitate the comparison of impacts and the implementation of policies on biodiversity. A loss of pollinators has far-reaching consequences for the functioning of an ecosystem, as specialised plant-pollinator interactions exist. As a result, a loss of pollinators may have direct impacts on human well-being. Using the *Bee Equivalent*, we emulate the CO₂-equivalent approach of the Intergovernmental Panel on Climate Change (IPCC), using a flagship species to illustrate the impact of human actions on the environment, and the consequences for species and ecological networks.

The *Bee Equivalent* - capturing the effects of biodiversity loss

The further elaboration of our proposal will be based on the observation that ecological networks are best described focusing on their functional aspects, emphasizing their interactions and functional dependencies. We recognise that there will likely only be a few countries that have the necessary systematic data collection schemes in place to provide adequate data for the indicator, but we believe that demonstrated use case will facilitate the implementation of data collection schemes in other countries. This approach complements other approaches where the focus is on rarity status or extinction threat of individual species in order to quantify biodiversity loss.

Many members of the public are aware of the role and importance of pollinators and have recently been sensitised to the loss of insect diversity and abundance over the last decades: the Entomological Society Krefeld documented, over a period of 27 years, a 75% decline in insect abundance in nature reserves,⁴⁰ and, under the heading 'Rettet die Bienen' the citizens of Bavaria, Germany petitioned for a referendum to conserve biodiversity, which was later accepted in parliament. Bees (as representatives of insect pollinators) play an important role in the ecosystem. Pollination and the diversity of pollinators is not only important to maintain plant populations and

functioning ecosystems; pollination is also an important ecosystem service and economic factor.⁴¹ We therefore propose to develop a *Bee Equivalent* indicator. The indicator is based on bee and pollinator decline and its significance for biodiversity and ecosystem function. Pollination is a prime example of an ecological process connecting plants and pollinators and therefore puts the functional view into the centre. Pollinators are impacted by the same drivers that impact ecosystems; they could be thus used to monitor ecosystem status and function. Nevertheless, there is only very little information available on the threat status of invertebrate pollinators.

Exactly how the *Bee Equivalent* will be measured technically will be developed collaboratively with different actors. What should the *Bee Equivalent* indicator be able to do? It should be able to express different events and trends in biodiversity. As an example:

1. Quantify specific measures with respect to bee decline, e.g. the substitution of habitat in agricultural environment with urban habitats;
2. Compare disparate declines in biodiversity in a consistent manner, e.g. express the reduction a specific habitat type in Switzerland in *Bee Equivalents*;
3. Illustrate the effectiveness of conservation or restoration measures implemented, e.g. the timing of mowing of pastures, or planting of hedgerows with indigenous species;
4. Compare different types of land management of different types of land use, e.g. fertilised and non-fertilised pastures.

The main audience for the indicators are national authorities, e.g. the federal office for the environment FOEN or its biodiversity monitoring initiative (Biodiversitätsmonitoring, BDM) in Switzerland responsible for monitoring biodiversity change; citizen science initiatives and conservation organisations such as WWF or ProNatura involved with public awareness raising and observing biodiversity change; as well international intergovernmental organisations concerned with biodiversity data and monitoring (like The Group on Earth Observations Biodiversity Observation Network (GEO BON) or the Global Biodiversity Information Facility, GBIF) to provide support in the development of the indicator.

The *Bee Equivalent* - development and implementation

The development and testing of the indicator requires a range of

actors, on national and international level. Partner organisations to develop the indicator include research institutions, national and international monitoring programmes (GEO BON, BDM), national decision-making authorities (e.g. FOEN), citizen science programmes, national and international conservation organisations as well as conservation practitioners and environmental consultancies. The work would build on existing (scientific) literature, results from national monitoring programmes, citizen scientists documenting the occurrence selected species and modelling exercises, to determine the impacts of different human actions on the occurrence and abundance of pollinating species and the resulting changes in the ecosystems. The FOEN publication «Environmental Footprints of Switzerland»⁴² includes biodiversity footprints, here, the proposed indicator could complement existing indicators. The considerations in this proposal can stimulate further elaboration in specific research programs. The development of a headline indicator based on functional consequences requires advanced methodological competences and is highly relevant.

3. Differentiated tariffs depending on biodiversity conservation

Thomas Wirth

The impacts of trade on biodiversity has so far not been adequately integrated into the global trade framework. A market-based instrument could take biodiversity better into account in trade: The introduction of a **global system of tariffs based on biodiversity conservation** and the

respective biodiversity impact of each class of goods. By refunding the tariff-income from the goods originating from each country for biodiversity protection, funds are made available for capacity-building and improvement in biodiversity conservation.

Global trade has seen a rapid growth since 1970. After World War II, domestic production and consumption was the general rule and international trade of minor importance. Today, this has changed and shipping goods around the globe is common. The livelihood of billions of people improved, especially in developing countries. End consumers benefit from cheaper products.



Figure 2: Development of global trade (on the basis of exports) from 1960 to 2017 (Data: WTO, World Bank)

Free trade strengthens economic growth, biodiversity pays the price

This development comes at an environmental price. Growth in production led to the destruction of pristine areas through land use changes. Harmful production practices cause an accelerating decline of biodiversity.⁴³ This growth in trade also means that consumers in rich countries, as for Switzerland for example, tend to export the environmental burden of their demand to distant regions,⁴⁴ By awarding eco-labels for some goods such as timber (Forest Stewardship Council, FSC) or palmoil (Roundtable on Sustainable Palmoil, RSPO),

some attempts have been undertaken to increase transparency and to reduce the negative impact on the environment. This works to some extent where consumers are ready to pay higher prices for the label. This requires that consumers are sufficiently aware of the potential environmental consequences of the product. However, this approach so far only succeeds in covering a minor share of traded goods. To halt the ongoing decline in biodiversity a new system is needed that covers the entirety of goods produced and traded.

Production of goods and its related processes is a main threat to biodiversity, for example through land use, overexploitation and harmful emissions.⁴⁵ The extent of the threats strongly depends on how and, to a lesser extent, where the production takes place. Low environmental standards often lead to cheaper production costs and thus an advantage in price competitive markets. However, from a societal point of view, it should be cheaper to buy a product that conserves biodiversity rather than one that causes damage. Environmental regulation intended to control for these effects has traditionally been in the hands of the individual countries. An international trading system that provides an incentive for each country to protect and promote biodiversity would be a possible way to stop environmental dumping.

Differentiated tariffs as an incentive for environmental friendly production

The IBPES report argues that the global trading system is a lever that is in need of «transformative change».⁴⁶ A new set of rules to promote a biodiversity-friendly global trade system is necessary. One possible way: lower tariffs would be applied to goods originating from countries with a good environmental standards and a good biodiversity conservation. Thus products from those countries would get an advantage on the world market. Potentially higher production costs would be compensated by lower tariffs.

This adjustment of tariffs would be based on different aspects (which are interdependent and could potentially be measured by a single indicator):

- minimum environmental standards and its successful implementations,
- biodiversity conservation and restoration efforts and
- the difference between the current and the potential state of biodiversity in each country.

Consideration of the potential state of biodiversity is important because it would be unfair to reward a country with favorable minimum tariffs that has already largely destroyed its biodiversity (and thus cannot make it worse). If countries that have enabled the destruction of their biodiversity and habitats in the past, those that still have high natural values would be disadvantaged if the reference point was set at today's status.

The discussions around a carbon border adjustment tax show that a product-by-product approach is very challenging on a technical level. Therefore, perhaps it would make sense to apply the tariffs on a more general level. A difficult question is the range of products to be covered by this system. On the two extremes, it could cover all products or only those with a direct impact on biodiversity. The latter would include primary resources such as minerals, agricultural and forest products.

To maximize the positive environmental effect and minimize unwanted effects on trade, an interdisciplinary team should assess which categories of goods should be included in the system of minimum tariffs (on the basis of the globally used Harmonized System, HS). One option could be to group HS categories into three segments according to their scientifically assessed risk of negatively impacting biodiversity («high», «medium» and «low-risk» products). Low-risk products could be exempt from the additional tariffs and high-risk products show a higher adjustment of the tariffs than medium-risk products. Furthermore, an interesting, but perhaps too complicated feature, would be if producers of high- or medium-risk products would minimise their biodiversity impact (e.g. by going organic), could become certified and exempt from tariffs. However, this would probably necessitate a global standard on what constitutes biodiversity-friendly means of production.

A key feature of this idea is about the revenue collection. When

importing a good from country A, country B collects the biodiversity tariff revenue relevant for the product in question originating from the firm located in country A. However, country B doesn't keep this revenue but transfers it to a multilateral fund responsible for biodiversity conservation (for example the Global Environment Fund, GEF). Each year, country A and B receive the collected tariffs for goods originating from their territories back with the money being earmarked for biodiversity conservation. In practice, this means that due to the relatively higher consumption in developed countries, funds would flow from developed to developing countries because the latter are often the producers of biodiversity-intensive goods. That way, the mechanism would fulfil a longstanding demand by developing countries with regards to international environmental finance. The funds would be paid by the consumers in the developed countries through the tariffs. Due to the different tariffs based on the status of biodiversity in each country, however, consumers would favour products where no or little additional tariffs have to be paid, thus favouring products from countries where biodiversity conservation is functional and effective. The solution thus constitutes a market-based mechanism combined with a reallocation of funds earmarked for biodiversity conservation.

With this proposed solution, countries with an intact biodiversity and good and effectively enforced environmental legislation would profit most. For countries with degraded biodiversity an incentive is created to invest more in restoring biodiversity and they also receive the necessary funds to do so.

The challenge that remains is how to measure the state of the biodiversity. One option is the *Bee Equivalent* proposed in this book. Beside this, several multilateral organizations, international NGOs and universities developed indicators which could be used to estimate transparent and concisely the different scopes. The following table shows some available indicators. The Biodiversity Indicators Partnership and the United Nations Statistics Division have further indicators to monitor the Aichi Targets and the SDGs, which can be used. Indeed, the best way would be if the new biodiversity targets

that are to be developed under the Convention of Biological Diversity at the Conference of the Parties in Kunming in 2020 would allow for the creation of a quantifiable score.

Scope	Indicator	Index / System	Organization
Status of biodiversity	Status	Agrobiodiversity Index	Biodiversity International
	Forest, Species Habitat	Environmental Performance Index	Yale University
	Red List Indicator	Red List Indicator	IUCN
	Difference Extinction rate of natural land cover – current land use	Model	Different research
Goals / policies / laws	Commitments, Action	Agrobiodiversity Index	Biodiversity International
	Protected biomes and others	Environmental Performance Index	Yale University

Table 1: Some existing indicators, which could be used for the implementation of the proposed system (own compilation)

Innovative WTO member from North and South should explore the concept

One of the fundamental principles of the WTO is the protection and preservation of the environment.⁴⁷ So far, the discussions how to include this goal in their activities, have resulted in some punctual improvements. These improvements occurred mainly through rulings by the dispute settlement under article XX of the GATT. With their limited scope, these rulings fail to move the whole trade towards an environmentally friendly system. If the WTO takes its goals seriously, a fundamental change is needed. As the most important rule setting organization for global and regional trade agreements, it is also the best actor to implement the idea. However, to take this decision, the member countries must agree on it.

In a first step, the idea must be further developed, with a focus

on technical issues. For example, it must be examined which existing indicators are particularly suitable or how they can be improved and supplemented. A proposal is then needed on how the indicators can be linked together in order to translate the indicator values into minimum tariffs. As a country with an established biodiversity and life-cycle research community and the host to the WTO, Switzerland could commission the work of this proposal. It should do so together with a developing country, in order to bridge the often seen developed-developing-country-gap in the WTO when it comes to sustainability questions. Perhaps Madagascar, a country rich in biodiversity, could join the effort. Potential agencies that could develop such a system include the UN Environment Programme (UNEP) and the United Nations Conference on Trade and Development (UNCTAD). Business-oriented organizations such as the WEF or sustainable business initiatives, such as the World Business Council on Sustainable Development (WBCSD), should also be included in further developing this idea.

Transparency and the assumption of responsibility for the entire value chain is becoming increasingly important. Biodiversity adjusted tariffs would have two advantages for companies managing their value chain. The WTO would publish all the data needed for the system, thus offering them a recognized basis to identify the high risk products from high risk countries. Besides the data for a risk based approach, higher risks also mean higher tariffs and in an international value chain, these price adjustments would remain throughout the whole production process. Of course, this would not be enough for the sustainability champions, but a solid basis for the bulk of companies.

The outlined idea is one way how the global trading system could become more environmentally sustainable, while taking into account the specific needs of developing countries. An increased focus on environmental sustainability on part of the developed countries has at times been protectionist or accused of being so. This proposed solution takes this critique into account and represents a market-based, open-border based approach that makes available the necessary funds for more effective biodiversity conservation and increases the price for products from countries destroying their biodiversity.

4 ■ Twinning conservation areas

Philippe Brunet

Oliver Graf

By **twinning conservation areas** partnerships between protected areas are established. This promotes the exchange of know-how, best practices and resources. Areas could be twinned based on shared ecosystems and species or on common cultural and political interests.

Protected areas are an effective and essential tool for preserving biodiversity in locations with an exceptionally rich nature, that assume important ecological functions and where ecosystems with their plants and animals can thrive.⁴⁸ Conservation areas can also be the foundation for sustainable development, providing livelihoods to local populations through ecotourism, securing ecosystem services and nourishing ways of life well within safe planetary boundaries⁴⁹. At the same time, protected areas around the world face challenges ranging from chronic underfunding to poaching, pollution, lack of appropriate management, and encroachment by conflicting uses like agriculture, forestry, construction or mining. Furthermore, many areas rich in natural assets do not profit from legal forms of protection, leaving them vulnerable to damaging economic interests and development that may result in their destruction. At the same time, it must be acknowledged that the establishment of protected areas has sometimes led to the exclusion of local populations, testifying to a lack of participation and the absence of democratic institutions to guide these processes.

In order to further support and strengthen their role in biodiversity conservation, we propose that protected areas be “twinned”, extending the concept of twinning cities. The twinning of towns and cities across Europe and other continents became very popular after World War II. The aim of these initiatives initially was to foster reconciliation and to establish acts of peace at a local level, directly involving populations. Town twinning has since developed into a

continuous exchange of knowledge and experiences across a wide, yet personal, network that spans most of the globe. More recently, town twinning is developing into what may be called «city diplomacy»: As cities share many interests, they are seeking initiatives that free them from the constraints sometimes imposed by national policies. Similarly, conservation areas can also be twinned as a means of establishing partnerships between protected areas, thereby intensifying exchanges of know-how, best practices and resources, while building trust and solidarity. While the concept has been tested in different contexts, this policy recipe argues that twinning conservation areas can be a smart and versatile tool to foster biodiversity that should be scaled up.

A wide array of possible twinning approaches

Twinning of conservation areas can take place at different scales starting from within the same region to spanning across continents, and according to different goals. The twinning approach is flexible. It can primarily focus on natural features like shared ecosystems, migratory species or physical borders. Alternatively, twinning can take place based on common cultural and political interests as in the case of peace parks or partnerships between developed and developing countries. Possible approaches include:

Transfrontier Conservation Areas

Ecosystems often transcend geopolitical borders. Adjacent protected areas separated by national borders can be twinned to form larger transfrontier conservation areas. Such protected areas can share and coordinate management practices such as biodiversity monitoring or anti-poaching operations, but can also build complementary ecotourism offers. Where artificial physical barriers like fences or walls separate protected areas, removing these can benefit biodiversity by allowing for the migration of species across broader ranges.⁵⁰ The Swiss National Park, created in 1914, actually borders on the Stelvio National Park in Italy. The frontier, however, lies in the high Alps and is marked by natural topography. Existing cooperation between the two National Parks includes projects aiming at the

reintroduction of the bearded vulture, anti-poaching operations exchanges and monitoring. At the other extreme of Switzerland, the Emerald Site «Complex alluvial du Rhône Genevois» is joined across the border by the French Regional Nature Park of «Haut-Jura». The Greater Geneva Area («Grand Genève»), extending on both sides of the border, counts the preservation and sustainable development of its natural environment among its priorities and already coordinates its planning so as to safeguard wildlife corridors.

Peace Parks

Many ecosystems essential for conservation are found in areas with geopolitical tensions or marked by conflict. In these contexts, trans-frontier conservation areas can serve as «peace parks», fostering cooperation and trust on the generally not politicised issue of biodiversity. Several peace parks were established in southern Africa, such as the Great Limpopo Transfrontier Park which brings together the Kruger National Park in South Africa, the Limpopo National Park in Mozambique and the Gonarezhou National Park in Zimbabwe. The twinning of conservation areas can be an additional and innovative approach to confidence- and peace-building in conflict-affected areas around the world, from the Balkans to the Middle East or the Korean peninsula.⁵¹

Long-distance partnerships

A «natural» extension of twinning transfrontier conservation areas is to twin conservation areas on which species rely at different times throughout their seasonal migratory trajectories. There is a total of 11 «Ramsar sites» in Switzerland (named after the town of Ramsar on the shores of the Caspian Sea where in 1971 the international «Convention on Wetlands» was signed). The sites include sections of lake shorelines (e.g. the Grande Cariçaie on Lake Neuchâtel), dammed rivers, river deltas (like the Bolle di Magadino in Ticino), marshes, glacier forelands and one bog site. Ramsar sites are habitats for waterbirds and migratory birds. Most of them arrive around October from their summer habitats in northern and eastern Europe and leave their wintering sites in Spring. Protected areas are also home to migratory birds joining Switzerland in Summer and leaving the country in autumn for protected areas in the wintering grounds for example

in Sub-Saharan Africa, or along migratory routes where those birds rest. In the same vein, marine species migrate across large distances, some of them eventually even reaching Switzerland like the Atlantic salmon.⁵² The value added of twinning protected areas in this context could reside in improving biodiversity monitoring and protecting complementary ecosystems on which migratory species depend. Twinning could also help in raising funds for a conservation area with less means from a wealthier partner conservation area.

Twinning for solidarity and exchange

Protected areas need not share common borders or direct ecological links to be twinned.⁵³ Biodiversity is a common heritage and a global public good, and its conservation a global challenge. Protected areas across regions and continents could enter into twinning partnerships like many cities around the world have done as a means of creating links, fostering cultural exchange and solidarity. Again, given the chronic underfunding faced by many protected areas in developing countries, twinning with protected areas in wealthier areas could also be a means to raise funds for conservation. The community around a twinned conservation area in Switzerland, for example, could raise funds for conservation in its partner area, through donations from individuals and companies or by selling sustainably harvested products from its partner conservation area. Such partnerships could also help raise awareness about the conservation challenges faced in other parts of the world.

Twinning for common problem solving

One of the key challenges in conservation is how to initiate a productive dialogue, involving local populations, biodiversity expertise, various levels of governance, land owners, finance, knowhow on participation and so on. Protected areas may have a very diverse ownership. For instance, the first Swiss conservation area (Creux du Van) was bought by a private association in 1882 and the first and only Swiss National Park was the result of a private initiative but was formalized shortly after. In the following decades many protected areas were bought by

Pro Natura, one of the major NGOs in Switzerland. A considerable share of protected areas is located on public lands owned by the Cantons or the Communes. Finally, there are many sites that are privately owned – often by farmers or cooperatives, where conservation is guaranteed by long- or mid-term management contracts. Given this diversity of institutional arrangements, speaking up for a given or potential future conservation area and exchanging knowledge, practices and other kind of experiences is far from trivial. A conservation area in the process of being established might benefit greatly from being twinned with an existing area that could share experiences. Furthermore, a long-term process aimed at twinning conservation areas across borders (geographic, cultural, intellectual) may encourage non-confrontational dialogue and address questions like «What could make this conservation area a success story?» «How can its benefits be simultaneously increased for both nature and society?»

Interesting topics for exchange among twinning conservation areas from a Swiss perspective might be:

1. How can the institutions of existing conservation areas be strengthened?
2. How can standards to enhance and secure conservation measures be developed and implemented (e.g. following the IUCN Green List and considering the difficulty for certain conservation areas to significantly enhance biodiversity values in their perimeter)?
3. How can the process of establishing additional conservation areas through participation or other means of dialogue be improved (especially given the failure in Switzerland to create new National Parks and the challenge to achieve the Aichi target of a 17% share of land for conservation areas)?

Making it happen – Swiss-based actors who can enable the twinning of conservation areas

The concept of twinning conservation areas could be promoted through a dedicated programme, inviting conservation areas around the globe to participate and share their experience. Leading international biodiversity conservation organisations, such as the International Union for Conservation of Nature (IUCN) or WWF International,

both headquartered in Switzerland, would be well placed to host such a program and encourage other actors to integrate the twinning of conservation areas into their regular activities (organising conferences, development assistance, regional development, etc.). The upcoming 15th Conference of the Parties (COP 15) to the Convention on Biological Diversity, which will be held in China in 2020, provides an ideal forum for creating momentum around the twinning of conservation areas.

Further Swiss actors who could champion and enable the twinning of conservation areas include the Swiss Parks Network and its member Regional Nature Parks, the Swiss National Park, Emerald Sites like «Smaragdgebiet Oberaargau», Pro Natura, BirdLife Switzerland, WWF Switzerland, private sector enterprises with corporate social responsibility programmes, fair trade companies, philanthropist and private foundations as well as government agencies at national and cantonal level. ●

Dessert

Additional ideas from the participatory process



Oskar Jönsson

Anna Stünzi

In addition to the four ideas presented as a main course, there were another 39 ideas that were submitted to the Policy Kitchen platform. In the following, we will briefly discuss the different policy levers that were suggested to address the biodiversity decline (see figure 3 on page 41). The full list of ideas is public on www.policykitchen.com.

Alternative Economic Paradigms

The lever receiving most attention across the three different challenges was the change of current economic paradigms. Correspondingly, participants proposed a variety of possible actions that could transform the current economic system to be more biodiversity-friendly. The removal of harmful subsidies, for example, or establishing an economy less focused on the growth-paradigm were two of the ideas. Another suggestion was to introduce a complementary currency - EarthboundMoney - through which states would attach value to preserving biodiversity.

Awareness Creation

Another prominent lever was awareness creation. Despite the risks that we are facing due to biodiversity loss, and despite these losses being visible on a local level, the biodiversity crisis still receives little

attention.⁵⁴ Some of the ideas in this cluster target actors beyond the policy-level, such as a book with 100 practical solutions for biodiversity conservation or the development of a biodiversity-themed panini-booklet.

Multilateral Enforcement Mechanisms

Many of the ideas tabled in the trade challenge concern the inability of the multilateral trading framework to effectively address biodiversity externalities. Governance changes on the level of the World Trade Organization may be challenging. But nevertheless, ideas such as the establishment of an expert pool on the impact of trade on biodiversity and conducting impact assessments on the links between trade and biodiversity impacts could potentially be initiated.

Local implementation & grassroots action

The cluster on local implementation & grassroots action summarizes ideas arguing that local communities have to be integrated to effectively protect biodiversity. Connecting across borders and sharing of knowledge and best-practices, these actions can have a multiplying effect and result in true impact. Among them the establishment of city alliances to better protecting biodiversity in urban areas was proposed.

Cost internalization

Originating from the trade challenge, multiple ideas proposed the internalization of biodiversity costs throughout the supply-chain. One idea concerns the transportation of goods. While the greenhouse gas emissions from transportation is already relatively easy to quantify, the biodiversity impacts of transportation are diverse and difficult to assess to date.

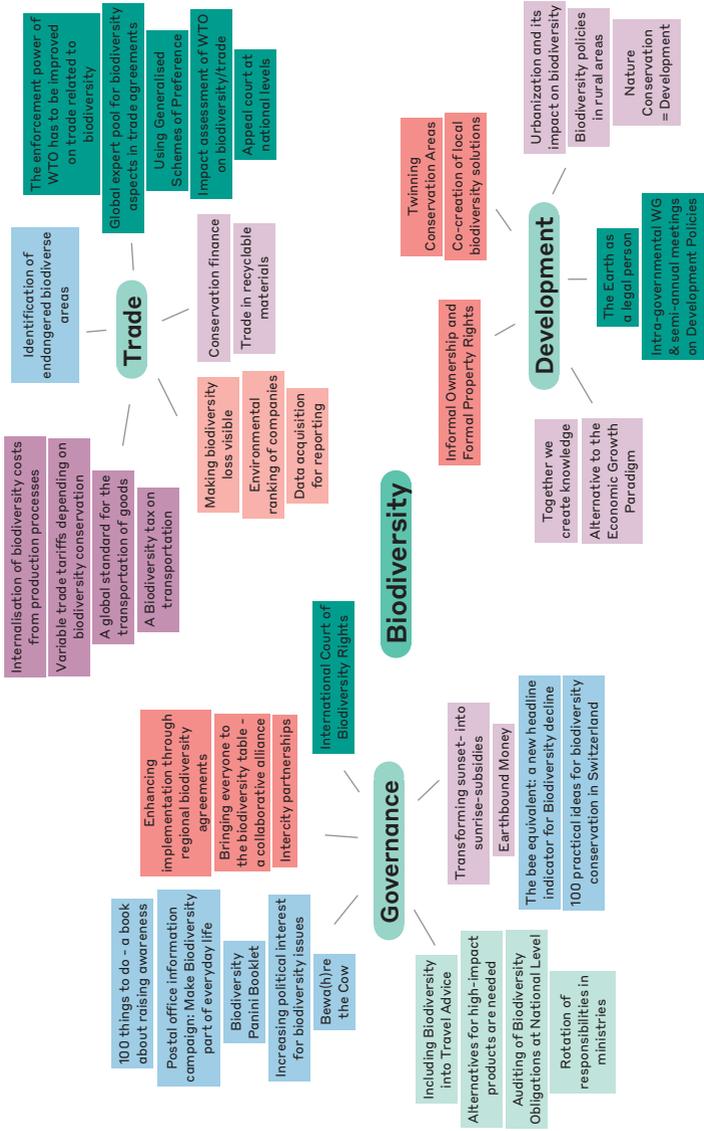
Domestic political action

Despite the international focus of our challenges, some ideas point to domestic policymakers and administrations. One idea for example suggests that the current organization of ministries is not able to handle the transformative change needed to avert further biodiversity decline. Sharing responsibilities for biodiversity conservation

among the ministries could induce so far non-responsible ministries to take the challenge more seriously.

Labelling

One cluster consists of suggestions for product or even company labels, in order to make their respective impact on biodiversity visible to the end-consumer. Another proposition was to raise awareness on biodiversity issues in travel advice. ●



Awareness Creation **Cost Internalization** **Localization of implementation / Grassroots action**
Political Action on national level **Labelling** **Alternative Economic Systems** **Multilateral Enforcement Mechanisms**

Figure 3: Idea clusters from the participatory process

Digestif

Conclusion



Oskar Jönsson

Anna Stünzi

At the time when foraus chose biodiversity as the first pilot theme for Policy Kitchen in summer 2018, the challenges were mostly known to experts only. In the meantime, the issues around biodiversity loss are discussed more often. Following the reports by WEF, IPBES etc. the topic has increasingly received attention in the media, in politics and in society. The ideas presented in this publication all require further elaboration and discussion. Both the federal administration and stakeholders from civil society could foster such dialogues by sponsoring and facilitating respective fora, for example at the upcoming COP15 in China. We hope that with the discussion process initiated by the foraus Policy Kitchen, we contribute to improving biodiversity governance on the international and national level and halt the decline in biodiversity.

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Event partners

Polis180

«Polis180» was founded in 2015 and ranked No. 8 of the «Best New Think Tanks 2016» worldwide by the University of Pennsylvania. Polis creates innovative debating formats that enable a better discussion of the questions that bother citizens most. Whether by organizing a «speed-dating» session with politicians or a crisis simulation with decision-makers, their aim is to inspire a German and international audience with fresh ideas. An integral part of Polis' programmes is that members themselves develop policy recommendations, which are then published on the Polis Blog or as a Polis Paper. All of their analyses are conducted according to acknowledged academic standards, but are also written in an accessible way in order to reach and inform a wider audience. www.polis180.org

Bosch Alumni Network

The Bosch Alumni Network brings together former and current fellows, grantees and staff members of the Robert Bosch Stiftung and its partners. By connecting network members with common interests but different backgrounds, cross-sectoral exchange and international collaborations can be fostered. On boschalumni.net this community is connected online.

Endnotes

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