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2021 Nature Awareness Study

Population survey on nature and biodiversity

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2021 Nature Awareness Study

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“Nature Awareness in Germany” is a series of studies that the Federal Ministry for the Environment and the Federal Agency for Nature Conservation publish jointly every two years (“Research and Development” project, grant number 3520850500).

The conceptual design and processing was carried out by Dr Christoph Schleer (SINUS-Institut, project management), Dr habil. Fritz Reusswig (Potsdam Institute for Climate Impact Research), and Naima Wisniewski (SINUS-Institut), in collaboration with Sociotrend GmbH (support with statistical analyses) and Ipsos GmbH (survey implementation) as well as technical support from the Federal Ministry for the Environment (BMUV, Rebecca Mole) and the Federal Agency for Nature Conservation (BfN, Dr Andreas Wilhelm Mues).

The Nature Awareness Study is part of the National Strategy on Biodiversity. The strategy stands for life, nature, and diversity. It demonstrates how we must act in order to maintain biodiversity for people living today and for future generations.

Contents

Key statements and recommendations

The **2021 Nature Awareness Study** is the seventh publication in the Nature Awareness study series, which has been published every two years by the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection and the Federal Agency for Nature Conservation since 2009. The purpose of the study series is to investigate the population's awareness of nature. In addition to observing changes in awareness through repeated questions, new topics of current relevance to nature conservation policy are addressed. The content of this study focuses on current crises related to nature: the ecosystem crisis and the loss of biodiversity, the climate crisis and the COVID pandemic. The study is also dedicated to the assumption of social responsibility to counter these crises and the willingness of the population to support a transformative change towards sustainable and environmentally compatible lifestyles and economic activities. The primary findings presented are from a comprehensive survey of 2,410 adults aged 18 and over, supplemented by a survey of 1,004 teenagers aged 14 to 17. An in-depth analysis of the youth data will be published at a later date. Both surveys were conducted in autumn 2021. The results presented are representative for the population in Germany. Selected key statements of the study as well as example recommendations for the results mentioned are presented below.

At the limit – perception of the Earth's stress limits and changes in nature and landscape

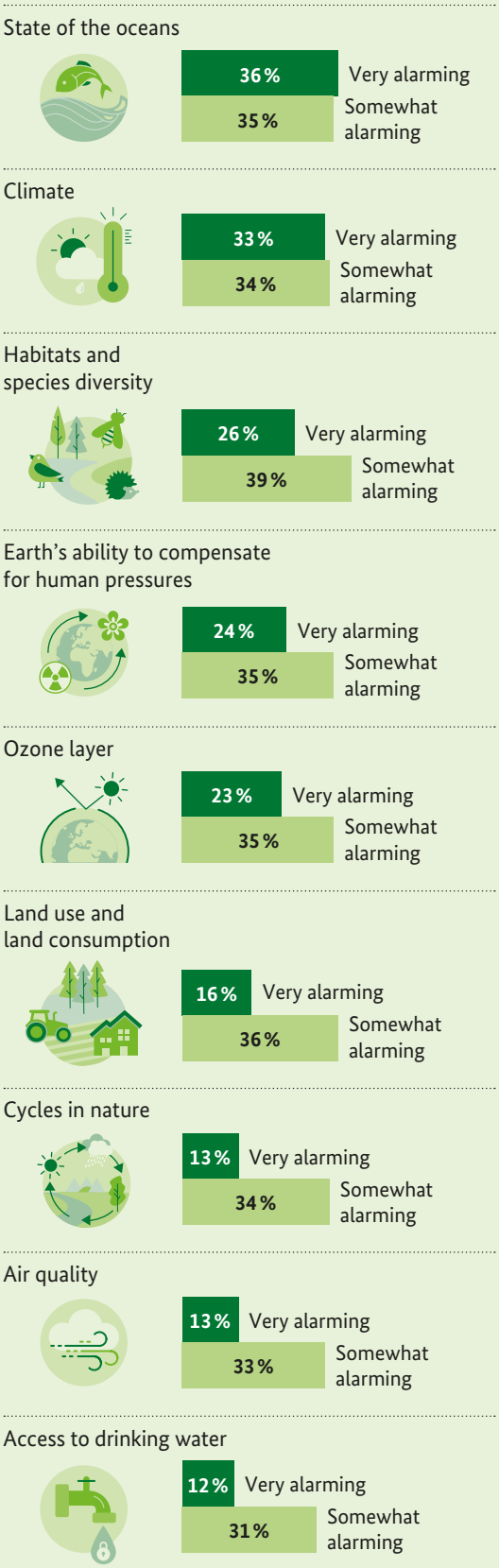
Key statements:

- Among the Earth's stress limits perceived by the respondents, the state of the oceans is considered the most alarming ("very alarming": 36 percent, a further 35 percent "somewhat alarming"), followed by the climate situation ("very alarming": 33 percent, a further 34 percent "somewhat alarming") and habitats and species diversity ("very alarming": 26 percent, a further 39 percent "somewhat alarming").
- There was a significant increase in negative assessments of the state of nature and landscape in Germany: Half of the respondents rate the development of nature and landscape in the last 20 years as significantly worse in 2021 ("it has mostly deteriorated": 50 percent, "it has mostly improved": seven percent) than in the first survey in 2011 ("it has mostly deteriorated": 27 percent, "it has mostly improved": 13 percent).
- Teenagers are more convinced of insect decline than adults. The decline in insect diversity is perceived by adults both worldwide ("agree strongly": 35 percent, "agree somewhat": 36 percent) and for Germany to almost the same extent ("agree strongly": 36 percent, "agree somewhat": 35 percent). Teenagers are more emphatic on this topic (worldwide, complete agreement: 45 percent, somewhat: 31 percent; in Germany, complete agreement: 40 percent, somewhat: 30 percent).
- In this survey, the development of bees and butterflies in agricultural areas is rated more negatively looking back over the last ten years than it was in 2015. In 2021, 70 percent perceived a decline in bees (2015: 66 percent) and 63 percent perceived a decline in butterflies (2015: 55 percent).

Recommendations:

In this Nature Awareness Study, adults were asked in a simplified form about their personal assessment of planetary pressures. To explain: The planetary boundaries model includes an assessment of nine overarching factors and some sub-factors that are crucial for sustaining the Earth's atmosphere and ecosystem for humans.[1] As of January 2022[2], according to this model, the limits of five of the nine overarching planetary boundaries have been critically exceeded: the integrity of the biosphere, climate change, biogeochemical cycles (phosphorus and nitrogen), the introduction of novel substances and materials, and land-use changes (for example, agriculture and forestry). The consumption of freshwater, ocean acidification, and ozone depletion in the stratosphere are currently still considered to be within the acceptable range. Air pollution as another planetary boundary is currently not yet sufficiently supported with data for a global assessment.

How do you rate the current state of the Earth? Please rate to what extent you see the global situation as alarming in the following areas.



The first five most alarming issues in the Nature Awareness Study were the state of the oceans ("very alarming": 36 percent, a further 35 percent "somewhat alarming"), the climate ("very alarming": 33 percent, a further 34 percent "somewhat alarming"), habitats and species diversity ("very alarming": 26 percent, a further 39 percent "somewhat alarming"), the ability of the Earth to compensate for human pressures, such as from chemicals or man-made substances ("very alarming": 24 percent, a further 35 percent "somewhat alarming") and the state of the ozone layer ("very alarming": 23 percent, a further 35 percent "somewhat alarming").

The state of the other factors surveyed (changes in land use, materials cycles, air quality, and access to drinking water) was also rated by 43 to 52 percent of respondents as "very alarming" or at least "somewhat alarming".

A similar picture emerges in the overall assessment of the development of nature and landscape looking back over the last 20 years: The majority of respondents (50 percent) state that they perceive a substantial deterioration. This is consistent with scientifically identified trends regarding the development of the state of nature.

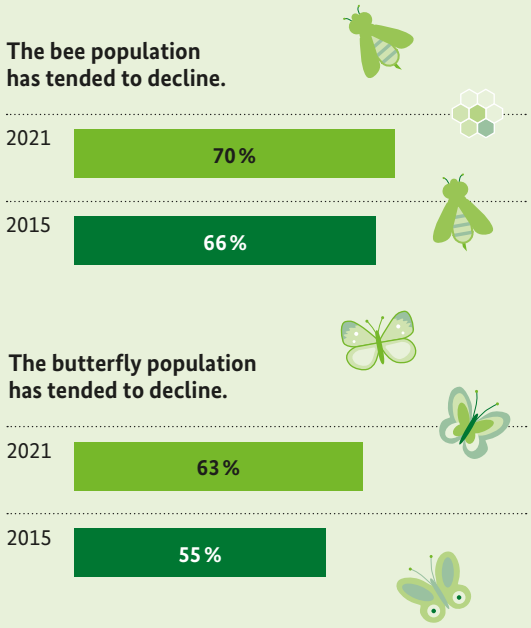
Overall, this shows that the population is **highly aware of the planetary boundaries**. On the one hand, it should be noted that the named pressure limits interact with each other (for example, the condition of the oceans has a significant influence on climate change). On the other hand, nature conservation policy measures also have synergy effects that can have a positive influence on different planetary boundaries (for example, marine nature conservation and marine management can also contribute to climate protection). In this context, raising broad awareness among the population is a good starting point for providing in-depth information about the interdependencies of planetary boundaries and for highlighting societal ways to solve the crises. It is important to maintain and further develop existing awareness through broad-based, low-threshold communication, especially in order to demonstrate the connection between planetary boundaries, human actions, and lifestyles, and to further promote the development of sustainable and environmentally compatible ways of living and doing business.

In terms of content, this also includes communicating the tipping points in the Earth system even more clearly and with a stronger focus on target groups than has been the case to date. In addition, the inter-

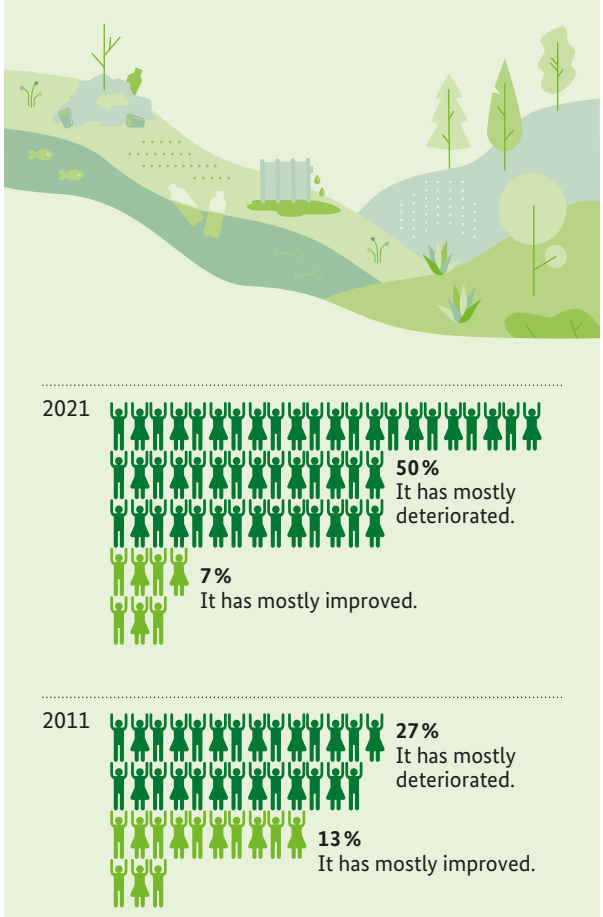
connections and interdependencies that exist between the planetary boundaries should be communicated. One example is the influence of climate on the stability of the biosphere and, in correlation to this, the positive effects of nature and biodiversity on the local and global climate.

The majority of respondents are also generally convinced of the decline in insects in Germany and worldwide. The clearly perceived negative development of butterflies and bees in agricultural landscapes between the survey dates of 2015 and 2021 is particularly noteworthy. It can therefore be assumed that there is a broad social understanding of the need for countermeasures by policy-makers, for example within the framework of the BMUV's **Insect Conservation Action Programme**.[3] Respondents cite the use of pesticides (69 percent) and the loss of insect habitats (68 percent) as the most important reasons for insect decline, which is consistent with the opinion of experts. The loss of insects and their habitats basically has a variety of causes, for example the intensification of land use, improper use of plant protection products, and light pollution. Changes in agricultural policy can be an important starting point for financing measures that have a positive impact on insects and their habitats. However, from the point of view of nature conservation, a fundamental change in the Common Agricultural Policy (CAP) of the European Union is needed so that ecological efforts can be more strongly rewarded. This means that the second pillar needs to be better supported.

How do you assess the development of the following features of agricultural areas over the last ten years?



Would you say that the state of nature and landscape in your environment has generally improved, remained the same, or deteriorated over the last 20 years?



The pandemic – the population's understanding of its causes and its influence on our relationship with nature

Key statements:

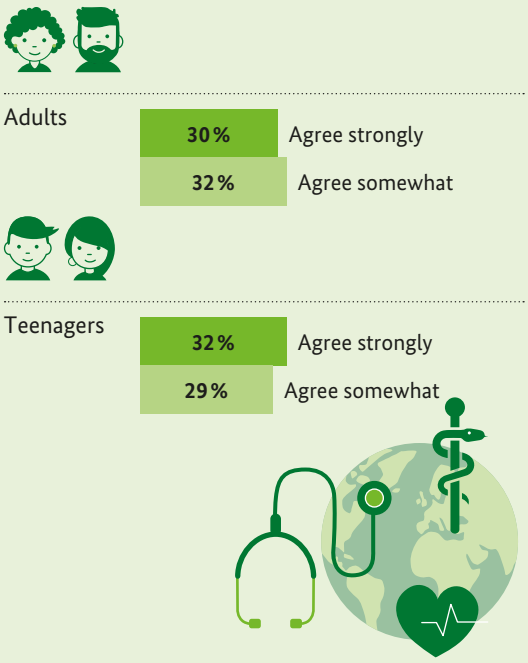
- The fundamental dependence of our health on the health of our planet is something that a majority of respondents are aware of. Some 62 percent of adults expressed this view ("agree strongly": 30 percent, "somewhat": a further 32 percent), and almost as many teenagers ("agree strongly": 32 percent, "somewhat": a further 29 percent).

- When asked if the coronavirus pandemic is exclusively a health issue and has nothing to do with the state of nature and the environment, 26 percent "agree strongly" and another 32 percent "agree somewhat". The awareness of connections between the pandemic and the state of nature is more pronounced among teenagers. Only 40 percent answer accordingly here ("agree strongly": 17 percent, "somewhat": a further 23 percent).

- In comparison to the time before the pandemic, 44 percent of teenagers say that the significance of nature has changed and become more important to them ("far more important": 15 percent, "somewhat more important": another 29 percent). However, compared to the first youth survey in 2020, the importance has slightly decreased overall (2020 results: 52 percent; of which "far more important": 18 percent, "somewhat more important": 34 percent). Adults were surveyed on this issue for the first time in 2021. The values for adults are slightly lower here than for teenagers (38 percent; of which "far more important": 13 percent, "somewhat more important": 25 percent).

- In times of coronavirus, 38 percent of adults spend more time in nature than before the pandemic (of which "far more often": eleven percent, "somewhat more often": 27 percent), and among teenagers the figure is as high as 44 percent (of whom "far more often": 16 percent, "somewhat more often": 28 percent).

Our health depends on the health of our planet.



Recommendations:

Hardly any other topic occupied and challenged society more in 2021 than the COVID-19 pandemic. However, a large proportion of the respondents were not aware of the connections between the coronavirus pandemic and the state of nature and the environment or the relationship to the destruction of habitats and the climate crisis.

Building on this result, we recommend creating information offers in the future that show the general population how **personal everyday behaviour, and social lifestyles and economic practices interact with nature, the environment, and health, and which systemic changes are necessary for positive future development**. It should be emphasised that the risk of zoonoses, in which infectious diseases are transmitted from animals to humans, can be promoted or reduced by human behaviour. In this context, a special focus should be placed on factory farming caused by high meat consumption and on the destruction of nature and the environment caused by humans, which are considered drivers of zoonoses.[4]

A possible basis for nature conservation communication is the **One Health approach**, which addresses the strong interdependence between the health of

humans, animals, nature, and the environment. By specifically considering these interdependencies and interrelations, a contribution can be made to the health of the planet and to the reduction of future health risks.[5] Essentially, the results of the 2021 Nature Awareness Study show an understanding among the population of the mutual dependence of personal well-being on the health of the planet, which is a good starting point for further expanding nature conservation communication via the One Health approach.

As a resource that is in principle freely available to everyone in times of crisis, **nature can be cited as an important protective factor in the physical and mental health of adults and teenagers**. It remains to be seen whether the increased significance of our relationship with nature in times when many alternative forms of leisure activities were restricted – which can still be measured – will be maintained and resonate even as the situation continues to normalise. The fact that 38 percent of adults and 44 percent of teenagers in 2021 say they spend more time in nature in times of coronavirus than before the pandemic is an important indication for nature conservation as well as local government policy to provide socially equitable access to natural spaces to meet the increased demand.

Yet we must also take into consideration that natural environments, especially near urban areas, have suffered from "over-use" and are still subject to **high levels of use** that cannot be compared to the time before the crisis. Those responsible in municipalities and protected areas are called upon here to regulate the pressure of use by means of measures and design plans, to steer visitor flows away from sensitive areas, and at the same time to create more nature-oriented spaces that meet the needs of the population and the substantially increased appreciation of nature in times of the coronavirus crisis.

Climate crisis and loss of biodiversity – perception of risk and awareness of the influence on nature and society

Key statements:

- Only a minority of five percent of teenagers and six percent of adults think that climate change is only caused by natural processes. The conception that there is no such thing as climate change at all is even rarer. Only a minority of three percent of adults express this opinion, and almost no teenagers (rounded: zero percent, in absolute numbers: four out of 1,004 respondents). Two percent of adults and three percent of teenagers gave no answer or were undecided.

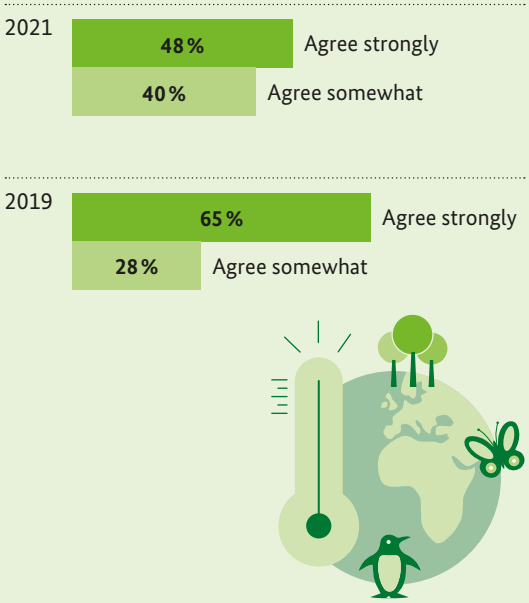
- With regard to the effects of climate change, the adults surveyed most frequently state that climate change will have an impact on extreme weather events ("very convinced": 46 percent, "somewhat convinced": a further 30 percent) as well as wild species and biodiversity ("very convinced": 39 percent, "somewhat convinced": a further 35 percent). In terms of perception, the influence of climate change on the lifestyle and quality of life of future generations, agriculture, and forestry comes next ("very convinced": 33 percent each, "somewhat convinced": a further 39 percent, 38 percent, and 36 percent respectively).

- Fifty-nine percent of teenagers ("very convinced": 25 percent, "somewhat": a further 34 percent) and 47 percent of adults ("very convinced": 14 percent, "somewhat": a further 33 percent) express concern that the climate crisis and the destruction of nature will affect their own lifestyle.

- Eighty-eight percent of adults believe that nature conservation is necessary to meet the challenges of climate change ("agree strongly": 48 percent; "somewhat": a further 40 percent). Perceptions are somewhat more subdued than in the previous survey (2019, "agree strongly": 65 percent; "somewhat": a further 28 percent). Nevertheless, agreement with natural climate protection remains very high.

› Teenagers are confident that they can personally (“agree strongly”: 18 percent, “somewhat”: a further 36 percent) or collectively (“agree strongly”: 33 percent, “somewhat”: a further 37 percent) achieve something to protect nature and the climate. Adults agree, but not quite as strongly, both in terms of personal involvement (“agree strongly”: 14 percent, “somewhat”: a further 30 percent) and with regard to collective action (“agree strongly”: 22 percent; “somewhat”: a further 37 percent). However, both teenagers and adults are more optimistic that they can achieve something together than on their own.

Nature conservation is necessary in order to meet the challenges of climate change.



Recommendations:

The climate crisis has been part of the public discourse for several years. In Germany, 2021 was overshadowed by devastating extreme weather events in the summer, which meant that citizens experienced the effects of the climate crisis at first hand. The current survey data collected in autumn 2021 shows that there is a **broad understanding about climate change** among the population. For example, the vast majority believe that climate change threatens biodiversity, and most respondents know that climate change is caused by human activity: Teenagers, at 58 percent, are more convinced of this than adults, at 45 percent. A further 34 percent of teenagers and 44 percent of adults state that climate change is caused partly by natural processes and partly by human actions.

With regard to the implementation of possible **measures to adapt to or mitigate the climate crisis**, the pronounced awareness of the population can be classified as very valuable and used as **legitimisation**, also for connections between the climate and biodiversity crises. The fundamentally high awareness values in the area of “climate change” nevertheless show a clear deviation between citizens of different **educational levels**. Thus, it is especially people with a low level of formal education who are less aware of the effects of climate change and are more sceptical about concrete protective measures. Therefore, it remains necessary to provide information about the impacts of the climate crisis and the relevance and effectiveness of protective measures. In this context, the concept of **education for sustainable development**, for example, can be further advanced. This can be done, for instance, in the form of ethical discourses on questions of intergenerational equality as well as equality towards people living today in other countries, and by teaching sustainable as well as nature- and climate-compatible behaviour in everyday life.[6]

In this context, it should be noted that the younger generation is much more concerned about climate change and the destruction of nature than adults are. This is a good starting point to further encourage and support teenagers in their existing commitment to nature and climate protection. In turn, it must also be made clearer to the adult population that they are directly affected by the climate crisis, and that people of older age are even more at risk to their health from climate change-related extreme temperatures than younger people.

The climate crisis and the loss of biodiversity are two of the central challenges of our time and can only be tackled together. An important contribution can be made by **natural climate protection**, which strengthens synergies between nature conservation and climate protection and is increasingly becoming the focus of medium- and long-term national environmental policy (see BMUV 2022, Key Issues Paper on the Federal Action Plan on Nature-based Solutions for Climate and Biodiversity[7]). The very high level of public awareness of the need for nature conservation

to address the climate crisis demonstrated in the present study represents a good social starting point for formulating corresponding goals as well as for implementing measures (for example, within the framework of the Federal Action Plan on Nature-based Solutions for Climate and Biodiversity).

Natural climate protection is also an important core element of the **United Nations Decade on Ecosystem Restoration 2021 to 2030**[8], which calls for halting the progressive degradation and destruction of ecosystems and restoring degraded ecosystems. Thanks to its global approach, the UN Decade offers a good opportunity to fill the proven principle of "think global, act local" with new ideas and innovative measures. Improved connection between habitats and protected areas is an increasingly important approach that can have a positive impact on both adaptation to climate change and protection of biodiversity.

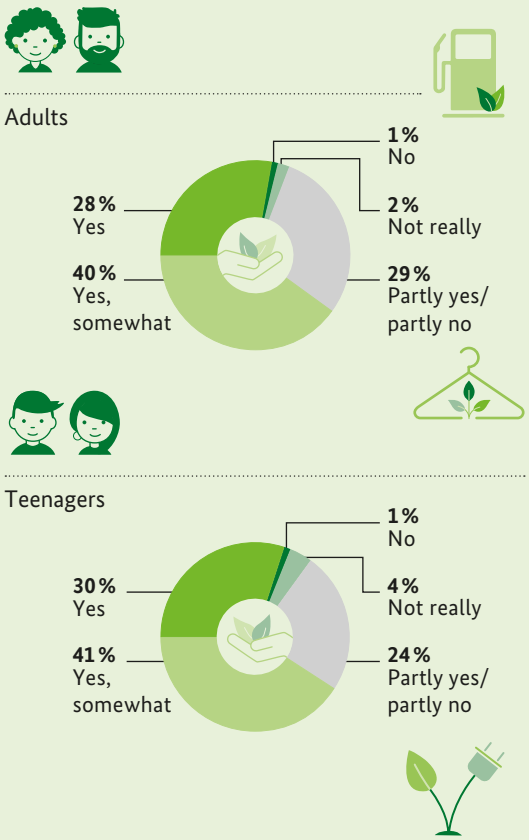
Change – responsibility, transformation, and technological progress

Key statements:

- In the ranking of policy areas by adult respondents, the following three are named as the most important: protection of nature, the environment, and the climate (57 percent), poverty and social equality (43 percent), and health (37 percent).
- Almost half of the adult respondents currently reject the idea that nature conservation will have to make do with less money in times of crisis (46 percent, of which "don't agree at all": 16 percent, "disagree somewhat": a further 30 percent). The values measured are thus almost at the same level as in the last study before the coronavirus crisis (2019: 50 percent, of which "don't agree at all": 18 percent, "disagree somewhat": a further 32 percent). Teenagers' answers were consistent with those of adults (2021: 50 percent, of which "don't agree at all": 18 percent, "disagree somewhat": a further 32 percent).
- As regards the statement that nature must not be allowed to stand in the way of economic development, a majority of adults rejected this, too (61 percent, of which "don't agree at all": 26 percent, "disagree somewhat": a further 35 percent). Teenagers are equally clear in this opinion (64 percent, of which "don't agree at all": 31 percent, "disagree somewhat": a further 33 percent).
- Amongst those who are at least somewhat convinced of the necessity of societal change, there is a notable willingness to contribute to a comprehensive change in lifestyles and economic practices through a sustainable and environmentally compatible lifestyle. Sixty-eight percent of adults ("yes": 28 percent, a further 40 percent "yes, somewhat") and 71 percent of teenagers ("yes": 30 percent, a further 41 percent "yes, somewhat") responded accordingly.
- In a comparison of the last few years, the question about approval of the energy transition receives the lowest value among adults so far in the current Nature Awareness Study. It should be borne in mind here that the survey values were collected before the Ukraine war and a reassessment of European energy policy. Overall, 48 percent considered the energy transition to be right in 2021 – in 2019 it was 60 percent. Among teenagers, support for the energy transition in 2021 remains high at 64 percent (first survey in 2020: 66 percent).
- Concerns about the use of genetic engineering in agriculture remain high in the series of Nature Awareness Studies, but fluctuate slightly. For example, among adults, 84 percent ("agree strongly": 55 percent, a further 29 percent "somewhat") are in favour of mandatory labelling of food from animals fed genetically modified food. In 2019, it was 95 percent ("agree strongly": 79 percent, a further 16 percent "somewhat") and 93 percent in 2017 ("agree strongly": 69 percent, a further 24 percent "somewhat"). For the first time, five percent of the respondents in 2021 made no statement or were undecided. Compared to adults, teenagers express the need for mandatory labelling with somewhat less emphasis (2021: 68 percent, of which 45 percent "agree strongly" and a further 23 percent "somewhat"; 2020: 83 percent, of which 59 percent "agree strongly" and a further 24 percent "somewhat").
- Twenty percent of adults ("agree strongly": six percent, a further 14 percent "somewhat")

and 34 percent of teenagers ("agree strongly": 14 percent, a further 20 percent "somewhat") have already been motivated to experience nature outdoors through digital nature offerings. Digital communication formats are therefore particularly important to inspire the young generation to make their own nature discoveries.

Are you prepared to contribute actively to a comprehensive change in lifestyles and economic activities through a sustainable and environmentally friendly lifestyle in order to stop the global nature, environment, and climate crisis?



Recommendations:

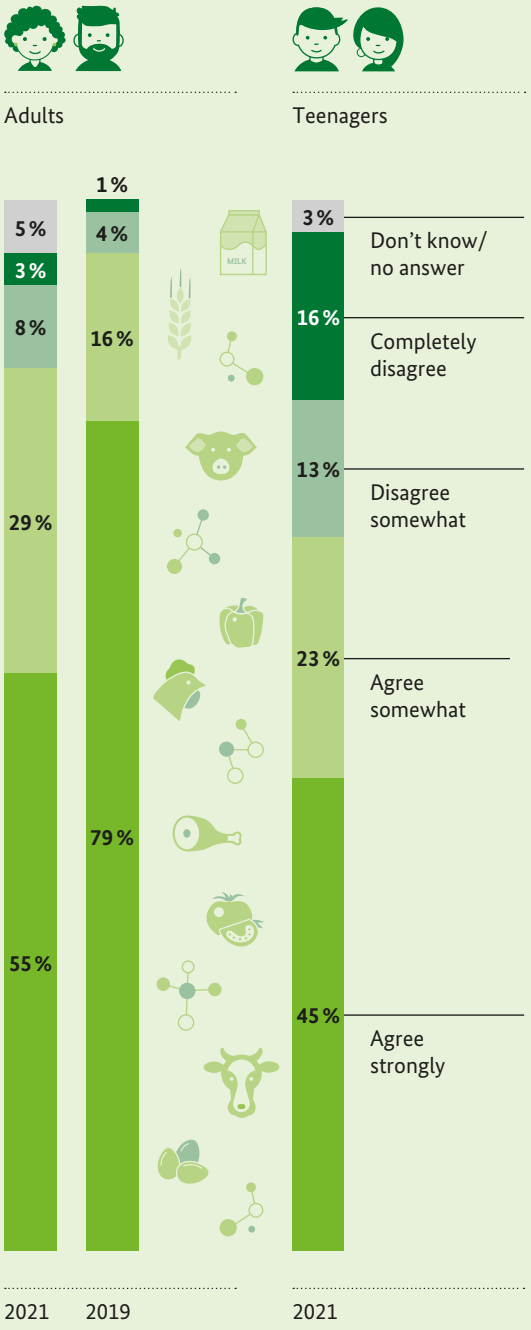
It is encouraging that the respondents of the 2021 Nature Awareness Study chose the policy area of protection of nature, the environment, and the climate at the top of the most important policy areas, closely followed by the topics of social equality and health. The political awareness of the population thus reflects the necessity of **linking these policy areas**.

For some time now, there has been call for a necessary and comprehensive transformative change in our lifestyles and economic practices, especially from scientists (see WBGU 2011[9], IPBES 2019[10]). **More than two thirds of respondents explicitly express** a personal **willingness** to **contribute to this change**. Moreover, a majority of adults and teenagers reject the statement that nature must not stand in the way of economic development. This indicates a certain degree of support in society for comprehensively integrating "environmental compatibility" into our lifestyles and economic activities; however, this cannot be managed within one policy area, one sector, or by individual initiatives alone.

Specific new and innovative solutions need to be developed here. Political strategies such as the Paris Climate Agreement or the National Strategy on Biodiversity, especially in their current development,[11] can provide the framework for social legitimisation processes for concrete measures and financial incentives. Protection of nature, the environment, and the climate must also address issues of social equality. This requires **new alliances**[12, 13] to enable real structural change in favour of collaborative and interdisciplinary approaches. The complexity of global challenges makes it necessary to think about and implement policy areas jointly that have often been thought of separately in the past, such as land use planning, social affairs, the economy, agriculture, food and energy, as well as nature, environmental and climate protection. In this context, however, conflicts of objectives must also be identified and overcome. We need to negotiate solutions that can be supported jointly.

In a comparison of the Nature Awareness Studies of the past ten years, the **approval rating for the energy transition in 2021 is the lowest to date**. Nevertheless, at 48 percent, almost half of adult respondents still think the energy transition is right. Thirty-five percent are undecided, 13 percent are against it, and four percent do not know. It should be borne in mind that the question posed in the Nature Awareness Study requires a very clear positioning from the respondents and that graded answer categories ("somewhat agree", "somewhat disagree") cannot be selected at this point. Secondly, when interpreting the results, it should be noted that the survey was conducted before the Ukraine war, and new surveys could also present higher values here again against the background of a stronger desire for energy independence and an altered view on energy policy. Possible reasons for the decline observed in 2021 can be found, for example, in rising energy prices combined with the economic consequences of the coronavirus pandemic. We there-

In my opinion, commerce should label foods made of animals that have been fed genetically modified feed.



fore recommend urgently expanding communication regarding the necessity of the energy transition. In doing so, the focus should be on the **environmental compatibility and societal dimension of the energy transition**.[14] Citizens should be addressed in this process and learn about ways in which they can participate as individuals in the success of this transition, including saving energy.

Criticism of genetic engineering remains consistently high, but has fluctuated over time and is weaker than before in the current survey. Ethical concerns remain valid, with 70 percent of respondents still of the opinion that humans have no right to genetically modify animals and plants (40 percent "agree strongly", another 30 percent "somewhat"). Politicians and associations have the task of continuing to **drive forward social discourse on the subject of genetic engineering and, in doing so, to raise the issue of other social impacts in addition to the risks**. For this purpose, it is necessary, among other things, to make sociological and economic aspects transparent and to communicate them in addition to scientific analysis of the ecological effects.

Alongside communication, **freedom of choice** is an essential aspect in taking the population's current awareness of risks and health issues with regard to genetically modified products seriously. For example, 79 percent of adults are of the opinion that humans are not able to predict the long-term effects of new genetic engineering processes ("agree strongly": 49 percent, a further 30 percent "somewhat"). The continuing wish of 84 percent of adults and 68 percent of teenagers for **labelling** of animal foodstuffs in shops that have been produced with genetically modified organisms (GMOs) as feed (for example by feeding genetically modified soya) is also a central requirement of freedom of choice. The voluntary "Ohne Gentechnik" (GMO-free) labelling and the labelling of the organic food industry in shops meet this widespread wish of the population and are a central component of freedom of choice. It is also particularly important to consumers that the possible effects on nature of plants that have been modified with new genetic engineering methods are always explored (adults, "agree strongly": 57 percent, a further 32 percent "somewhat"). This can only be guaranteed if political action on the part of the European Union (EU) and at international level continues to apply a **principle of precaution**.

Similar to the previous Nature Awareness Study, it is evident that **digitalisation is a question of age**. While younger people show interest in digital offerings, interest often decreases with age. Digital nature experience offerings, for example, are "strongly" or at least "somewhat" interesting for 27 percent of teenagers aged 14 to 17, even 33 percent of 18 to 29-year-olds answer accordingly, but only 19 percent of 50 to 65-year-olds and 16 percent of those over 65. Therefore, in addition to traditional media, modern formats should be increasingly developed and used to get digitally savvy milieus and younger age groups interested in nature conservation issues. In order to make digital

offerings attractive, elements of the "gamification" concept could be integrated, for example, in which playful aspects are integrated in a non-game context.

Regardless of the advantages of digital offerings, social discourse must be opened on how far digital offerings should be established and expanded in areas such as environmental education and participation processes in nature conservation without disadvantaging less digitally inclined milieus. Older groups of people must be specifically familiarised with the use of digital offerings in this process. In addition to **opportunities**, for example in the context of imparting information, networking stakeholders, or the reporting of nature observations by citizens (citizen science), **risks** must also be considered, such as control over sensitive environmental and nature conservation data or the increasing consumption of energy and natural resources. Furthermore, the social dimension should also be taken into account in digitalisation. In this context, the so-called "digital divide" must be addressed, caused, among other things, by differences in access to high-speed internet between urban and rural areas or to technical end devices between socially weak and upscale milieus.

Awareness of biodiversity – the previous society indicator and results of the new measurement model

Key statements:

- Compared to the previous survey in 2019, the 2021 Nature Awareness Study shows a slight decrease for the overall indicator "Awareness of biodiversity" for the adult population. The figure is currently at 26 percent, in 2019 it was 28 percent. The requirements of the overall indicator are fulfilled if a person meets all conditions in the three sub-areas of knowledge, attitudes, and willingness to change behaviour at the same time; the overall indicator is thus fundamentally lower than the measured values of the sub-indicators. The requirements of the knowledge indicator are currently met by 48 percent of respondents (2019: 44 percent), the requirements of the attitude indicator by 55 percent (2019: 60 percent), and the requirements of the behaviour indicator by 53 percent (2019: 63 percent).
- The current study also presents a new biodiversity awareness indicator for the adult population. The new empirical indicator looks at the response behaviour of respondents with regard to relevant psychological factors related to environmentally and nature-friendly behaviour. It measures attachment to nature, problem awareness, social identity, social norm, attitudes, and perceived behavioural control as well as behavioural readiness to protect sustainable and fair use of biodiversity.
- Selected findings of the new awareness indicator regarding relevant psychological factors include: 69 percent of respondents feel connected to nature (factor **attachment to nature**, "agree strongly": 31 percent, a further 38 percent "somewhat"). Seventy-four percent are convinced that biodiversity on Earth is in decline (factor **problem awareness**, "agree strongly": 39 percent, a further 35 percent "somewhat"). Thirty-five percent feel connected to groups that actively work towards protecting biodiversity (factor **social identity**, "agree strongly": ten percent, a further 25 percent "somewhat"). Thirty-eight percent of respondents state that people who are important to them prefer to buy environmentally friendly products (factor **social norm**, "agree strongly": eleven percent, a further 27 percent "somewhat"). Fifty-nine percent find it good to make everyday journeys, such as to work or to the shops, by bike or on foot (factor **attitudes**, "I find it very good": 27 percent, a further 32 percent: "I find it somewhat good"). For 36 percent of respondents, it is easy to pay more for products produced in an environmentally friendly way (factor **perceived behavioural control**, "very easy": eight percent, a further 28 percent "somewhat easy"). As an example of **willingness to change behaviour**, 69 percent of respondents state that they are willing to reduce their meat consumption ("very willing": 29 percent, a further 40 percent "somewhat").

Recommendations:

Although the overall indicator fell slightly from 28 percent in 2019 to 26 percent, what is important is the **overall trend in development** since the first survey in 2009. At that time, the measured value stood at just

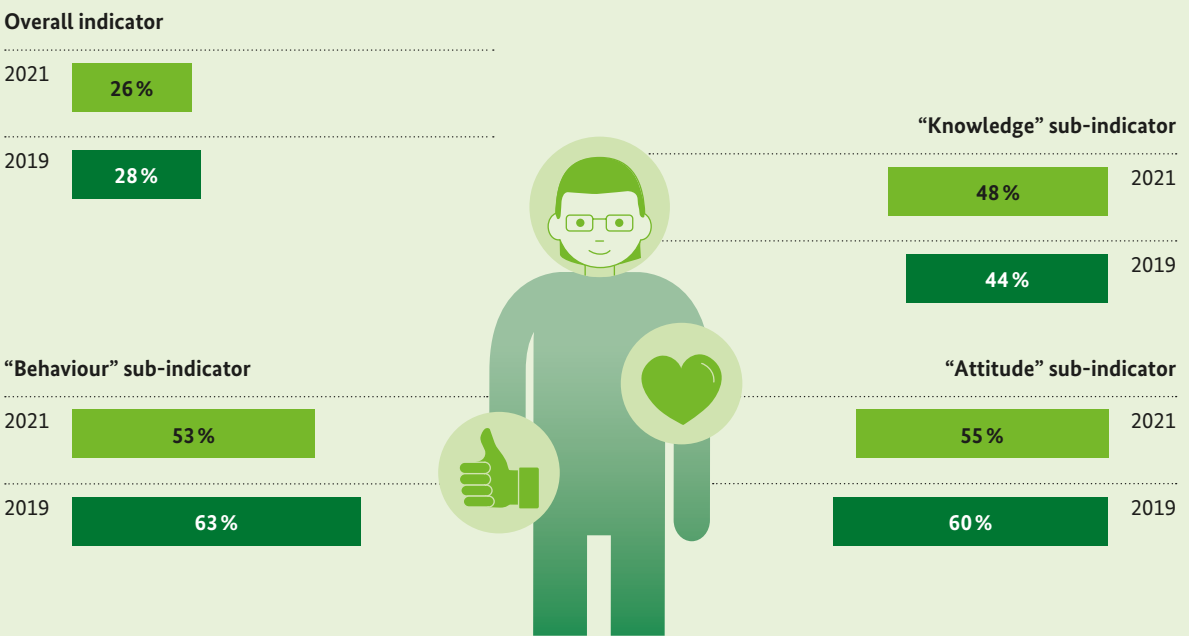
22 percent, meaning that there is still a fundamentally **positive development in awareness**. It should be borne in mind that the overall indicator requires sufficient knowledge, consistent attitudes, and **willingness to change behaviour** for biodiversity for all requirements to be considered fulfilled. Therefore the comprehensive and substantial measured increase in awareness in a ten-year period at all three levels concurrently – knowledge, attitude, and willingness to change behaviour – is a positive signal. The drop in measured values in 2021 could possibly be connected with the coronavirus crisis, during which other issues and content starkly affected day-to-day behaviour. Nevertheless, a fundamental change in awareness is taking place, but it requires **perseverance**. **Communication and education activities must be urgently continued** to stabilise the gains in awareness and to further expand them in the long term.

The new version of the awareness indicator should also contribute to this in future, taking into account the social science knowledge gained from some 40 years of environmental psychology research and enabling the **evidence-based design of target group-specific nature conservation communication** and evaluation in the foreseeable future. In concrete terms, this means that psychological factors relevant to nature conservation, such as attitudes, social norms, social identity, or perceived behavioural control, should in future be addressed more directly in public discourse and used in communication and education measures. For example, nature conservation work and communication about the "social norms" factor can be geared towards directly communicating the stronger sense of effectiveness that collectively we can achieve something for nature and climate protection ("We as a community can do it", see section on climate crisis above). Communication and education activities on "social identity" could, for example, be geared more towards the targeted development of a positive social self-perception and public image of nature conservationists. Corresponding communication activities are widespread in culture, sport, and politics, and are passed on by people with a role model function, for example influencers in the field of social media. The range of possibilities is large and far from exhausted in nature conservation.

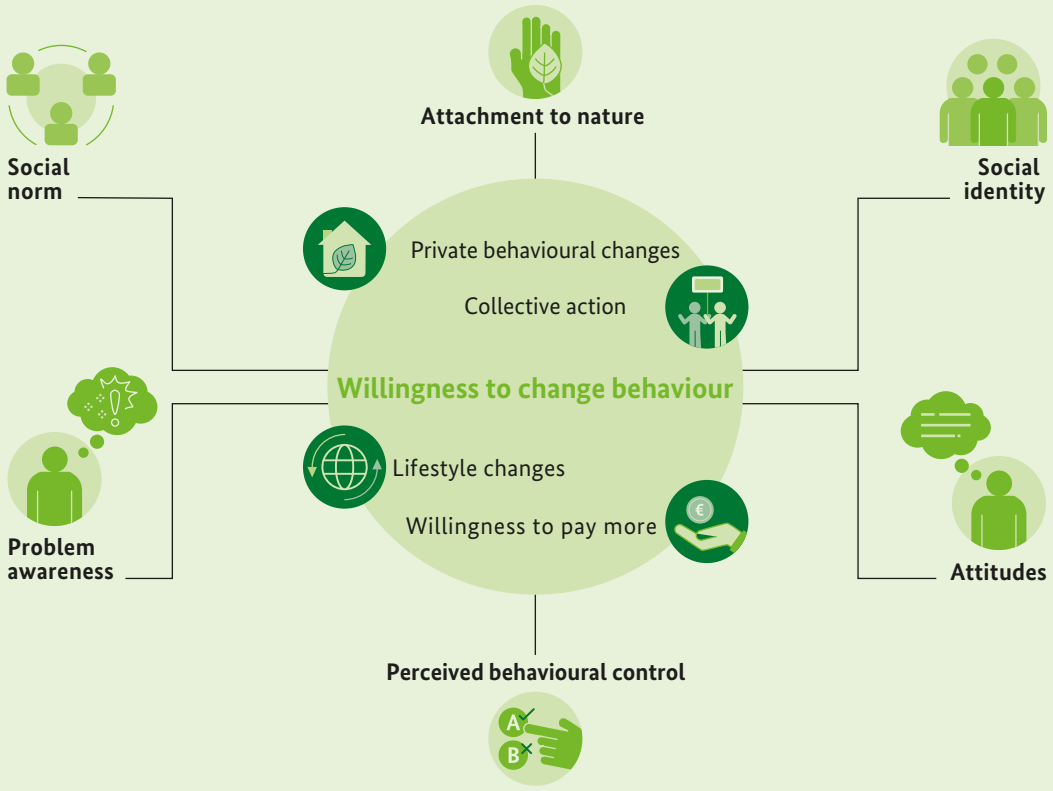
Willingness to change behaviour in order to protect biodiversity should be strengthened in communication work through the development and distribution in the media of specific options for action, and supported by offers for accompanying implementation (coaching). This opens up a wide field of work for actors in education for sustainable development.

We recommend re-examining the previously strong focus of communication work on conceptual know-

Awareness of biodiversity:
Previous measurement tool, scale of 0 to 100 percent



Awareness of biodiversity: the new overall indicator



ledge (namely simply communicating what biological diversity means, for example). Numerous psychological studies show only a slight correlation between abstract knowledge and behaviour. Instead, knowledge transfer should aim at raising awareness of the problems by informing about local and global processes and cause-effect relationships relating to the loss of biodiversity. In addition, the human relationship to nature is underpinned by culturally generated, often intuitively effective images of the world and people, which should be taken into account in communication and education processes.

The 2021 Nature Awareness Study, like its predecessors, shows that biological diversity is a valuable asset for people in Germany as a whole. On a higher, societal level, however, the **human relationship to nature and biodiversity is a paradox**. This is particularly clear from the fact that in this and previous studies – and in the previous as well as the new awareness indicator for biodiversity – we repeatedly see that members of the **upscale milieus** express a significantly stronger awareness of nature than members of the social centre or the **socially weaker milieus**. In contrast to the latter, however, socially better-off groups have a significantly poorer ecological balance and a more resource-intensive lifestyle (for example, through energy consumption or long-distance travel).

1 Introduction

The present "2021 Nature Awareness Study" is a representative population survey on nature and biological diversity in Germany. Commissioned by the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV) and the Federal Agency for Nature Conservation (BfN), the Nature Awareness Studies have been conducted and published every two years since 2009.

The Nature Awareness Study investigates how people in Germany perceive nature, what they do to preserve it, and what they think about current nature conservation policy issues. As a monitor of current trends, it provides up-to-date and empirically sound data that offers a valuable basis for nature conservation policy, public discourse, and educational work.

The base population of the present study is the German-speaking resident population aged 18 and over. The study surveyed 2,410 people between the start of October and mid-November 2021. A mixed-method design was used for data collection: Approximately half of interviews were carried out as computer-assisted personal interviews (CAPI), the other half as online interviews (CAWI). This hybrid method was applied in order to investigate whether a variation in the collection method (CAPI, CAWI) affects the results of the surveys.

Alongside the main study on nature awareness in the adult population, a separate survey of nature awareness among teenagers was carried out in December 2021. The youth survey is representative of German-speaking 14 to 17-year-olds. Online interviews were mostly used here (800 interviews). In order to reach teenagers who are difficult to contact online, the survey was also conducted using face-to-face interviews (204 interviews).

This brochure focuses primarily on the results of the adult survey. However, where questions were posed to both adults and teenagers, the findings of the youth survey are also presented. More detailed results of the youth survey will be published in a BfN report at a later date.

The study was designed by Dr Christoph Schleer and Naima Wisniewski from SINUS Markt- und Sozialforschung GmbH, Dr habil. Fritz Reusswig from the Potsdam Institute for Climate Impact Research (PIK), and with the specialist support of the BMUV and BfN. The data was collected by Ipsos GmbH. During development of the surveys and interpretation of the data, the project team was supported by an expert advisory group that included: Prof. Dr Sebastian Bamberg (Bielefeld University of Applied Sciences), Dr Nicole Bauer (WSL Switzerland), Prof. Dr Stefanie Engel (Osnabrück University), Prof. Dr Immo Fritsche (Leipzig University), Prof. Dr Ulrich Gebhard (Hamburg University), Prof. Dr Armin Lude (University of Education Ludwigsburg), Dr Manuel Rivera (Research Institute for Sustainability), Prof. Dr Johan Rockström (Potsdam Institute for Climate Impact Research), and Dr Zita Sebesvari (United Nations University).

1.1 Objectives and concept

The Nature Awareness Study is an instrument for monitoring society's awareness of nature, nature conservation, and biodiversity. The studies on nature awareness are anchored in the "National Strategy on Biodiversity" (NBS) as a specific goal for action. The studies collect the data required to calculate the indicator agreed in the reporting obligations of the NBS on the "significance of environmental policy goals and tasks" (known as the "societal indicator"). In addition, the findings are to be used to derive significant indications for the success and acceptance of nature conservation policy, general and target group-specific nature conservation communication, and educational work.

In order to identify social trends in nature awareness, a basic framework of unchanging questions is asked in each Nature Awareness Study. Furthermore, each study focuses on new topics that are linked to current discussions and nature conservation policy tasks.

The surveys for the present Nature Awareness Study were conducted in autumn 2021 and subsequently evaluated and written up. The results presented here and published in 2022 therefore reflect the social awareness of the population at the time of the survey at the end of 2021. It should be borne in mind that more recent events, such as the current crisis situation caused by Russia's war of aggression on Ukraine and the associated debates about energy and food supplies, are not included here.

The main topic of the 2021 Nature Awareness Study is "Ecological Crises, Change, and Conservation of Nature and Landscape". This focus was selected in view

of the extraordinary situation experienced in 2020 and 2021. At the time of the survey (autumn 2021), Germany was already more than one and a half years into the coronavirus pandemic. In order to prevent the spread of the virus and avoid overloading the health system, drastic contact restriction measures were taken at certain stages, which severely restricted public and private life, but also massively affected many economic sectors.

The coronavirus crisis is also significant from a conservation perspective. On the one hand, there is much scientific evidence that the outbreak of the pandemic caused by the coronavirus, which can affect humans as well as animals, was brought about by a combination of progressive destruction of nature, overexploitation of natural resources, and wildlife trade (see, among others, Gibb et al. 2020, Rulli et al. 2021). On the other hand, the massive restriction of social contact has led to many people increasingly seeking out the "great outdoors" in order to be able to leave their own homes for a short while. In view of this, the question arises as to whether and, if so, how the coronavirus has changed Germans' awareness of nature (see Chapter 3).

With its focus on crises, it is inevitable that this Nature Awareness Study also deals with the climate crisis. Science has been drawing attention to its massive significance for humans and nature at least since the founding of the IPCC (Intergovernmental Panel on Climate Change) in 1988. The closer the periodic reports of this global scientific body come to the present, the more urgent and cautionary they become. In 2019, the climate issue took a significant upswing in public perception worldwide. Sparked by the ever-growing mass protests of the Fridays for Future movement, which is strongly influenced by children and teenagers, the general perception of a crisis situation increased, as did the expectation that politicians must do more to combat the climate crisis. The coronavirus crisis deprived this movement of its most powerful tool – demonstration in the public sphere. Despite the dominance of the coronavirus crisis in the media, the climate issue remained in the public consciousness in 2020 and 2021. Various indicators (for example, good election results for parties that give high priority to the climate crisis or higher market shares for climate-friendly financial investments) suggest that we have reached a new quality of climate and environmental awareness. This is also indicated by the prominent role climate plays in the government programme of the coalition government elected in autumn 2021. Chapters 2 and 4 of this study focus primarily on the climate crisis.

Finally, the biodiversity crisis has, by its very nature, been a constant preoccupation of the Nature Awareness Study since its inception. In the present study, too, one of its facets is addressed in all chapters, namely the areas of biodiversity loss and habitat loss.

Against the backdrop of these multiple crisis situations (see Settele 2020), the question arose as to how the three crises mentioned relate to further crises in social nature relations and how these then manifest themselves in people's consciousness. The 2021 Nature Awareness Study makes use here of a scientific approach that has now also become important for environmental policy: the concept of planetary boundaries (see Rockström et al. 2009, Steffen et al. 2015). This concept attempts to find a system of goals for humanity's activities in the context of planetary ecosystems that is interdisciplinary but at the same time comprehensible to politicians and the public. The central question is: In which environmental areas, seen globally, are we still in a largely unproblematic zone where the situation can continue sustainably, where is the situation becoming critical, and where have we crossed the boundaries beyond which massive crises threaten? In addition to topics such as over-fertilisation in agriculture or acidification of the oceans, the climate crisis and the loss of biodiversity are also examined. According to the concept of planetary boundaries, we are in a critical zone in terms of climate change, but still have a slim chance of meeting the climate targets set by the Paris Agreement. In the area of species loss, we are already beyond the "planetary boundary". In the 2021 Nature Awareness Study, we wanted to know whether this scientific perception of the problem is also reflected in the population's awareness.

Furthermore, this study asks about the necessity of a socio-ecological transformation and about the role that each and every individual can play in this (see Chapter 2). In view of the dramatic consequences of the climate crisis – further evidence of which was provided by the unprecedented floods of summer 2021, especially in North Rhine-Westphalia and Rhineland-Palatinate – and the global loss of biodiversity, the voices of those who believe that a fundamental change in our lifestyles and economies is necessary are increasing. Technologies, consumption and lifestyles, business and economic models, and also political concepts would have to change fundamentally in order to avoid or reverse the overstepping of planetary boundaries. This position is shared – with different emphases – by large parts of the scientific community and the nature conservation and environmental movement. At the same time, resistance to this posi-

tion and the interpretation on which it is based can be observed. Not all people consider the social-ecological crises to be so dramatic, and not all people would welcome a social-ecological transformation. For many, the prospect of it may be fraught with uncertainties and fears, fed not only by ideological reservations but also by worries about the material consequences for their personal and professional lives. The 2021 Nature Awareness Study examines how great the readiness for comprehensive change actually is.

The topic of biodiversity[15] (see Chapter 6) is an integral part of every Nature Awareness Study. Based on knowledge, attitude, and behaviour surveys, it measures societal awareness of the importance of biodiversity and thus the societal indicator of the National Strategy on Biodiversity (NBS). This indicator, which has been used since 2009, was revised in a separate research project led by Prof. Dr Sebastian Bamberg (Bielefeld University of Applied Sciences) to reflect a broader spectrum of variables relevant to environmental behaviour. In the 2021 Nature Awareness Study, the previous established indicator and the new revised form were surveyed in parallel.

In addition to the topic area of biodiversity, other topic areas from the previous studies were continued and supplemented in parts. For example, attitudes to genetic engineering, the energy transition, and digitalisation in nature conservation were again surveyed (see Chapter 5).

1.2 Introduction to the Sinus milieus

Since 2009, the socio-cultural approach of the Sinus milieus target group model has been integrated into the research design of the Nature Awareness Study. Through differentiated evaluation of the data according to the milieus of the respondents, the socio-demographic analysis is supplemented by lifestyle and value components.

The Sinus milieus group people who are similar in their outlook on life and lifestyle (see Flaig and Barth 2018). This is a scientifically based model of society. In contrast to an inductive-empiristic approach, according to which lifestyle types are generated by means of statistical ordering procedures such as cluster and correspondence analyses and are not determined a priori, the development of the Sinus milieus was based on qualitative findings.[16]

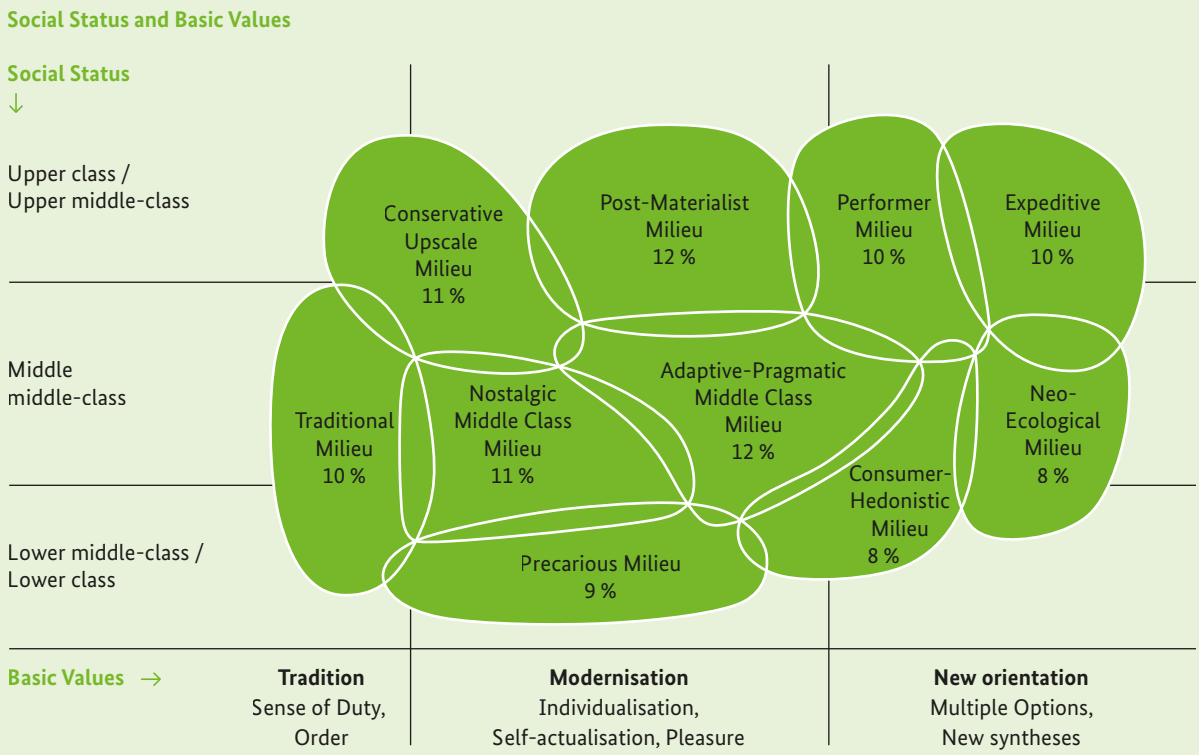
The milieu perspective does not replace the study of socio-demographic characteristics, but complements and refines them by taking into account fundamental values that determine lifestyle and life goals as well as everyday attitudes, for example to family, work, leisure, and consumption.

Since society is constantly evolving, social milieus are also constantly in flux. On the one hand, the changing cycle of socially dominant values leads to shifts in the milieu landscape, on the other hand, each youth generation is confronted with new sets of values, from which new milieus can emerge (see Bertram 2021). As a result, the German milieu model has already been fundamentally revised a number of times, most recently in 2021.

Figure 1 shows the current Sinus model for Germany. By including the Sinus milieu indicator[17] in the questionnaire design of the Nature Awareness Study, quantitative mapping of the members of the different lifeworlds in the adult population is possible.[18] This makes it clear that the individual milieus represent different proportions of the population (see Figure 1).

The 2022 Sinus model for Germany consists of ten different social milieus. Since lifeworlds supposedly cannot be delimited as precisely as social classes[19] – for example by income or school-leaving qualifications – the boundaries between the lifeworlds are fluid. Sinus calls this the “uncertainty relation of everyday reality”. This is a central component of the milieu concept: There are points of contact and transitions between the different lifeworlds. This is precisely what makes it a lifelike model.

Figure 1: The Sinus milieus in Germany 2021



The profiles of the Sinus milieus are presented below.

Conservative Upscale milieu

The Conservative Upscale milieu represents the older, structurally conservative elite with classical ethics of responsibility and success and clear claims to exclusivity and status. It is characterised by a desire for order and balance and has a self-image as a stable rock amidst the tide of post-modern arbitrariness. The Conservative Upscale see themselves as the classic conservative establishment. Their key values are, on the one hand, a sense of duty, purpose, seriousness, and responsibility towards themselves and society. On the other hand, they are advocates of Christian humanist principles and conservative middle-class values: tradition, intact family, integrity, decency, education and sophistication, authority, faith and religion. They are critics of the insubstantial post-modern zeitgeist and the progressive decline of values. In particular, they demonstratively distance themselves from the irresponsible society of fun and disposability. Accordingly, they clearly express the desire for more order, discipline, balance, and sustainability.

Socio-demographic characteristics:

- Middle-aged to older milieu: the average age is 55.
- Average to higher educational qualifications.
- Predominantly in full-time employment or already retired, slightly above average proportion of self-employed, predominantly in qualified or managerial positions.
- Net household income is significantly above the average for the population as a whole.
- Very often married; above-average number of children, who, however, often no longer live in the household.

Post-Materialist milieu

The Post-Materialist milieu is the committed and confident educated elite with post-materialist roots. Self-determination and self-development, orientation towards the common good, diversity, and

non-discriminatory relationships are key values. They typically see themselves as a social corrective, especially as advocates of post-growth and sustainability. Post-Materialists see themselves as a progressive guiding milieu of society, as bearers of global responsibility and ecological admonishers. They are characterised by a self-confident liberal attitude. Open-mindedness, tolerance, a cosmopolitan world view, anti-fundamentalism, and enlightenment are the guiding maxims in this group. Typical of this milieu is a post-materialist individualism with the central values of authenticity, self-determination, and self-development: People want to create space for themselves, realise their own ideas, and not be bullied by authoritarian structures, rigid procedures, constraints, and bureaucracy.

Socio-demographic characteristics:

- Middle age groups: focus on 40 to 70 years, average: 50 years.
- Women slightly overrepresented.
- High level of formal education; many with academic degrees.
- Often married; with children in the household.
- Highest proportion of academics, highest proportion of self-employed, above-average proportion of civil servants in the upper civil service.
- High net household income.

Performer milieu

The Performer milieu is the efficiency and progress-oriented technocratic elite of our society with liberal and global economic thinking. Those in this milieu see themselves as the modern business elite and as digital, lifestyle, and consumption trendsetters. In recent years, Performers have shown clear tendencies towards establishment and are in the process of gradually losing their former visionary élan. Performers have a basic attitude characterised by determination, ambition, performance optimism, and pragmatic thinking. Their orientation towards efficiency, competition, and career is typical, combined with the striving for self-realisation and an intensive life. “Flexible in pursuit of success” can be considered the leitmotif for the milieu. People put a lot of energy and risk-taking into pursuing their own goals, mixing work, leisure, and social life.

Socio-demographic characteristics:

- Age focus 40 to 60 years; average: 46 years.
- High proportion of couples, mostly married; often with children.
- Middle and often high level of education.
- High proportion of full-time employed; slightly above-average proportion of self-employed; mostly in skilled jobs; high net household income.

Expeditive milieu

The Expeditive milieu comprises the ambitious creative bohemians: urban, hip, digital, cosmopolitan, networked, and always in search of new frontiers and unconventional experiences, solutions, and successes. The milieu is very individualistic. Anchoring values are self-expression, uniqueness, curiosity, diversity, coolness, and experimentation. They typically have a self-image as a style-conscious and style-forming post-modern elite. Typical of Expeditives is a non-conformist, risk-accepting basic attitude without ideological fixations. They are open to everything, want to break through boundaries, expand horizons, accept new challenges, and find new solutions in unconventional ways. Many see life as a game – and the whole world as their stage. And they all have a fundamental curiosity and tolerance towards different ways of life and cultures.

Socio-demographic characteristics:

- Young milieu: over a third are under 30, average: 37 years.
- Many single people without children of their own; many still live in their parents’ household or in shared flats.
- High level of formal education: half have university entrance qualifications or have completed a university degree.
- Above-average proportion of full-time employees; above-average net household income.

Neo-Ecological milieu

The Neo-Ecological milieu is a new milieu focused on global networking, social added value, and the post-growth society. Characteristic of this lifeworld are new value syntheses: disruption and pragmatism, success and sustainability, party and protest. On the one hand, the members of this milieu show pro nounced self-development values such as independence, self-determination, authenticity, and openness to experimenting with alternative lifestyles; on the other hand, they stand for an ethic of responsibility, ecological awareness, and social conscience. In this, they clearly distance themselves from doomsday rhetoric and lamentation: It does not help to lament coral die-off or the desiccation of forests in the Harz Mountains; what is needed is realism and adaptability – a progressive pragmatism that seeks alternative solutions (for example, the cargo bike as an alternative to the car) and concentrates on a few core positions that are no longer negotiable. Neo-Ecologicals are relevant initiation points for change processes, as they advocate modernisation and rethinking and are fundamentally open to altered behaviour, but they have a much less pronounced role model function for middle or upper class milieus than, for example, the Post-Materialist milieu.

Socio-demographic characteristics:

- Young milieu: two thirds are under 50; average: 44 years.
- Many unmarried people and singles without children of their own.
- Average distribution of educational qualifications.
- Mostly employed full-time or part-time; above-average proportion of ordinary employees.
- Slightly above-average net household income.

Adaptive Pragmatic Middle Class milieu

The Adaptive Pragmatic Middle Class milieu is the modern mainstream of our society with a pronounced pragmatism towards life and utilitarian thinking as well as a strong willingness to adapt. Members of this milieu see themselves as flexible pragmatists. They typically combine a desire for experience with a need for security. Adaptive Pragmatists are determined and open to new things – and at the same time have a strong need for anchoring and belonging. Current social developments (especially the perceived polarisation of wealth) are leading to growing dissatisfaction and uncertainty in this milieu. Adaptive Pragmatists are open-minded, determined and willing to adapt, well educated and organised, but also conventional and down-to-earth. However, they distance themselves from "old-fashioned" values, lifestyles, and moral concepts. Their own guiding principle is to be fashionable and trendy, but not expressive. They strive for a higher standard of living, but not for excessive luxury.

Socio-demographic characteristics:

- Men slightly overrepresented.
- Age focus under 50 years; average: 44 years.
- Often married or living with a partner, often with children.
- Medium and high level of education; predominantly in full-time employment as white-collar or blue-collar workers.
- Often all persons in the household have their own income; average household net income.

Consumer Hedonistic milieu

The Consumer Hedonistic milieu represents the consumption and entertainment-focused lower middle class that wants to have fun in the here and now. Members of this milieu have a self-image as the cool lifestyle mainstream and often have a strong need for recognition. Many are increasingly annoyed by the dictates of sustainability and political correctness. The members of this milieu see themselves as easy-going hedonists who get on with everyday life, function in their jobs, and have fun and let their hair down in their free time. The desire is great for an intensive life in the here and now with lots of fun and action, spontaneous consumption and luxury. People are demonstratively relaxed and carefree and take things as they come. Their maxim for life is designed for short-term satisfaction of needs and is: enjoy now ("live now, pay later"), not wait and save. Their willingness to do without is correspondingly low and their "fear" of missing out is great. Leisure time is seen by many in the milieu as where life actually takes place, where they pursue special leisure interests (from mangas to motor sports) single-mindedly and with great enthusiasm.

Socio-demographic characteristics:

- Men overrepresented.
- Younger to middle age groups: focus up to 50 years; average: 45 years.
- High proportion of unmarried people; only one in two has children.
- All educational levels represented.
- Predominantly in full-time or part-time employment; slightly above-average proportion of self-employed; usually skilled workers or mid-level employees; above-average proportion of unemployed.
- All income classes.

Precarious milieu

The Precarious milieu represents the lower class striving for orientation and participation, who are trying to keep up with the standard of living of the broad middle class and often feel left behind. Those in this milieu are burdened by social disadvantages, exclusion, and bitterness. Many members of this lifeworld live in socially and financially difficult circumstances, but try to maintain the image of the normal average citizen (for themselves and to others). And many feel disadvantaged due to a series of deficits (lack of education, illness, family problems, unemployment) – through no fault of their own. There is also a widespread perception of being excluded through no fault of their own as victims of global change and neoliberal reforms.

Socio-demographic characteristics:

- Older age groups, focus on the 60+ age cohort; average: 61 years.
- Above-average number of single and widowed people; highest proportion of divorced people in the milieu comparison.
- Mostly low level of education (lower secondary school with or without apprenticeship).
- More than half are not employed (pensioners and unemployed); below-average proportion of full-time employees, often mini-jobs; well above-average proportion of white-collar workers, high proportion of blue-collar workers.
- Low net household income.

Nostalgic Middle Class milieu

The Nostalgic Middle Class milieu is the harmony-oriented middle and working-class centre of society with a desire for secure circumstances and an appropriate status. This group feels increasingly overwhelmed by the perceived loss of learned rules and certainties which leads to a longing for the "good old days". They typically see themselves as the social middle-field who are being increasingly alienated by the dominating elites. The Nostalgic Middle Class milieu sees itself as the backbone of society: reasonable, reliable, and loyal, willing to perform and adapt, realistic and prudent. They typically strive for orderly circumstances, harmony, balance, and security – both professionally and privately. Fulfilment in life means private happiness, security in an intact family, and being integrated into the local community with a reliable and accepting network of friends, neighbours, and clubs.

Socio-demographic characteristics:

- Women slightly overrepresented.
- Middle age group and older people over 50 are overrepresented; average: 56 years.
- Mainly mid-level education; low proportion of university graduates.
- High proportion of married people with children, who have often already moved out; slightly above-average proportion of divorced and widowed people.
- Predominantly in full-time employment or already retired; above-average proportion of skilled workers.
- Lower to middle income classes.

Traditional milieu

The Traditional milieu is centred around the security and order-loving older generation and is entrenched in the petit-bourgeois world or traditional working-class culture. Members of this milieu typically see themselves as the upstanding "little people". In the

course of progressive social modernisation, the members of the milieu are developing an increasing feeling of being left behind.

Members of the Traditional milieu have a hierarchical world view characterised by conformity and traditional moral concepts. They are, according to their self-image, "the little people", upstanding and the salt of the earth – but increasingly marginalised by social modernisation. The consequences are resignation and withdrawal into their own niche (home, family, community). Traditionalists are critics of the decline in morals (the too "loose morals"), the all-embracing sense of entitlement, and over-foreignisation. They also take a sceptical view of globalisation and diversity. The new norm of sustainability, on the other hand, is increasingly accepted (in the milieu-typical form of undemandingness and frugality).

Socio-demographic characteristics:

- Women overrepresented.
- The oldest milieu: focus in the 75+ age segment; average: 70 years.
- Hardly any employed people, many pensioners, widows, and widowers.
- Mostly a low level of formal education (primary/secondary school).
- Small to medium income.

1.3 Brochure explanations

The survey results of the 2021 Nature Awareness Study are presented in the following five chapters. Central findings are shown in diagrams and tables. For questions with a multi-level response scale, all response categories are shown. Four-point or five-point scales are predominantly used in such cases. The first two categories indicate the degree of agreement ("agree strongly"/"agree somewhat") and the last two levels indicate the degree of disagreement ("disagree somewhat"/"don't agree at all"). On a five-point scale, the middle category ("partly agree/partly disagree") shows that the respondent is undecided. Where necessary, the category "don't know/no answer" is listed.

In the case of percentage values, decimal places have been omitted and the figures rounded up to the nearest whole number to ensure legibility and comprehensibility. If the sum of the different figures for all answer categories was more or less than 100 percent as a result, an adjustment of up to 1.4 percentage points was made in the "don't know/no answer" category. In very rare cases, this approach was not sufficient and the highest value also had to be adjusted slightly.

The data set was examined for differences in the response behaviour of different population groups. The following socio-demographic characteristics of the people surveyed were considered here: gender, age (18 to 29 years, 30 to 49 years, 50 to 65 years, 66 years and older), level of formal education (low, medium, high)[20], and net household income (up to 999 euros, 1,000 to 1,999 euros, 2,000 to 3,499 euros, above 3,500 euros). The Sinus milieu indicator was included in the questionnaire in order to allow an evaluation according to milieu, as described in Chapter 1.2. Significant differences are explained in the text. In addition, particularly interesting findings were graphically presented in figures or tables.

Established test methods of empirical social research were used to check the statistical significance of the survey results. Differences in the response behaviour of different population groups were examined using the chi-squared test (see Sedlmeier 2013, Eid 2013, or Janssen and Laatz 2010). This is based on a confidence interval of 95 percent (over- or under-represented) or 99 percent (significantly over- or under-represented), which is customary for social science purposes. Accordingly, traits are interpreted as over-represented (above-average) or under-represented (below-average) in the random sample if the probability is at least 95 percent. Traits are considered to be significantly over-represented or significantly under-represented if a probability of 99 percent can be assumed. Over-representation and under-representation are colour-coded in the figures and tables and described in the legend. It should be noted that the results of the significance tests are also dependent on the size of the group being studied. The larger the group being studied (for example people with a high level of education), the more likely it is to prove the significance of slight over-representations or under-representations (see Janssen and Laatz 2010, page 276). For this reason, in some cases, identical numerical values are shown as being under-represented or over-represented to varying degrees.

For data series, that is for questions that are repeated in each study, parametric (t-tests) and non-parametric test procedures (Mann-Whitney test) were used to examine the significance of the change over time.

The degree of agreement with a question as well as the frequency with which a characteristic occurs in the population group were colour-coded – as described above – and explained in the legend. The numbers were also colour-coded: In the case of over-represented values and agreements ("agree strongly"/"agree somewhat"), the numbers are marked in black; for under-represented values and disagreements ("disagree somewhat"/"don't agree at all"), the numbers are marked in white. Thus, even with a black and white printout, all colour codings are distinguishable from each other. In the case of the milieu diagrams, the overlapping areas between two milieus are marked in the colour of the milieu that has the higher percentage value of the response category that is to be represented. Diagrams that present the results of the youth survey in addition to the results of the adult survey are labelled accordingly. "Teenagers" are people aged between 14 and 17. People aged 18 and above are considered "adults" in this report.

For an overview of the responses by the adult population, see the base count in the Annex. This illustrates all of the topics in table form in the order in which they appeared in the questionnaire. More in-depth analyses of the youth survey will be published in a separate report by the BfN.

A final scientific report with in-depth analyses comparing the previous and new societal indicator "awareness of biodiversity" is planned for spring 2023. This brochure is available at www.bfn.de/en/nature-awareness where you will also find studies from previous years.

2 At the limit – perception of the Earth's stress limits and changes in nature and landscape

The Club of Rome, founded in 1968, published its first report in 1972. Its German edition was entitled "Grenzen des Wachstums" (Limits to Growth), and this book, which received much attention at the time, can be considered a milestone for global nature and environmental awareness.[21] With the help of computer models, it was shown for the first time that unlimited economic and population growth would lead to more and more environmental problems and deplete humankind's resource base. A massive crisis was predicted for the middle of the 21st century. The book triggered a controversial debate and, because it questioned the optimism about growth that marked the post-war period, was also heavily attacked.

Today, half a century later, the climate crisis and global loss of biodiversity are making us very aware of the planet's limitations and vulnerability. We live in the age of the Anthropocene (see Ellis 2020). One of its characteristics is that we are about to exceed, or have already exceeded, multiple stress limits on planetary ecosystems.

In recent years, an interdisciplinary scientific community has developed an approach that looks more closely at these planetary stress limits and attempts to quantify them. The concept of planetary boundaries was formulated by Rockström et al. (2009) and further developed by Steffen et al. (2015). Planetary boundaries affect biological, chemical, and physical processes of the Earth system. The reference period of the concept is the historical Earth system state of the Holocene.[22] There are risks associated with leaving this state, because it entails reaching tipping points in the Earth system, or because escalation processes occur (see Dittrich et al. 2021 for a more detailed explanation). This concept considers nine overarching domains of the Earth system, all of which are interdependent and can influence each other (see Folke et al. 2021, Lade et al. 2019, and Rockström et al. 2021). Four of them have already been pushed to the limits or completely exceeded. In the areas of genetic diversity and the phosphorus and nitrogen cycles in particular, planetary boundaries have already been greatly exceeded, but the areas of climate change and land use change have also now left the safe space for action. This increases the risk that the stability of ecosystems and thus people's means of existence will be permanently endangered.

The term "planetary boundaries" may give the impression that the situation is bad worldwide, but that "everything is fine" in Germany. However, this is not the case. For example, the functioning of the biosphere and the state of biodiversity in Europe are in some cases very alarming, especially with regard to biodiversity (see EEA 2019 and IPBES 2021). In Germany, too, the areas of biodiversity and landscape quality, endangered species, conservation status of habitats, and ecological water status are far or very far from the target status (see BMU 2021). This also affects the insect population. Insects are the most species-rich group of all living creatures and account for a good 70 percent of animal species worldwide. This makes them an essential component of biodiversity and they can be found in almost every habitat.

Surveys in 63 German protected areas between 1989 and 2016 found a 76 percent decline (up to 82 percent in midsummer) in flying insect biomass (see Hallmann et al. 2017). Even though this method cannot directly determine species composition, it can show in connection with other studies that the number of insect species in Germany has decreased significantly in recent decades (see Scherber et al. 2017). The Red Lists of endangered animal, plant, and fungal species in Germany published by the Federal Agency for Nature Conservation (see BfN 2022) document this negative development for more than 3,000 insect species (according to expert assessments). The Red List of Biotope Types also indicates the negative development of habitats in Germany that are vital for insects (see BfN 2017).

With this in mind, the question arises as to what extent people in Germany are aware of these developments. As such, the present study asks whether and how nature and landscape changes are perceived and how people assess the development of biodiversity in Germany. The survey also explicitly asks about how people perceive the development of the insect population in Germany. The concept of planetary boundaries presented at the beginning of this chapter provides the starting point and conceptual framework for more specific questions about how facets of the biodiversity crisis are perceived (for example: state of the oceans, climate, habitats, air quality).

2.1 Is the Earth in a stable state?

The state of the oceans is the biggest planetary concern of people in Germany.

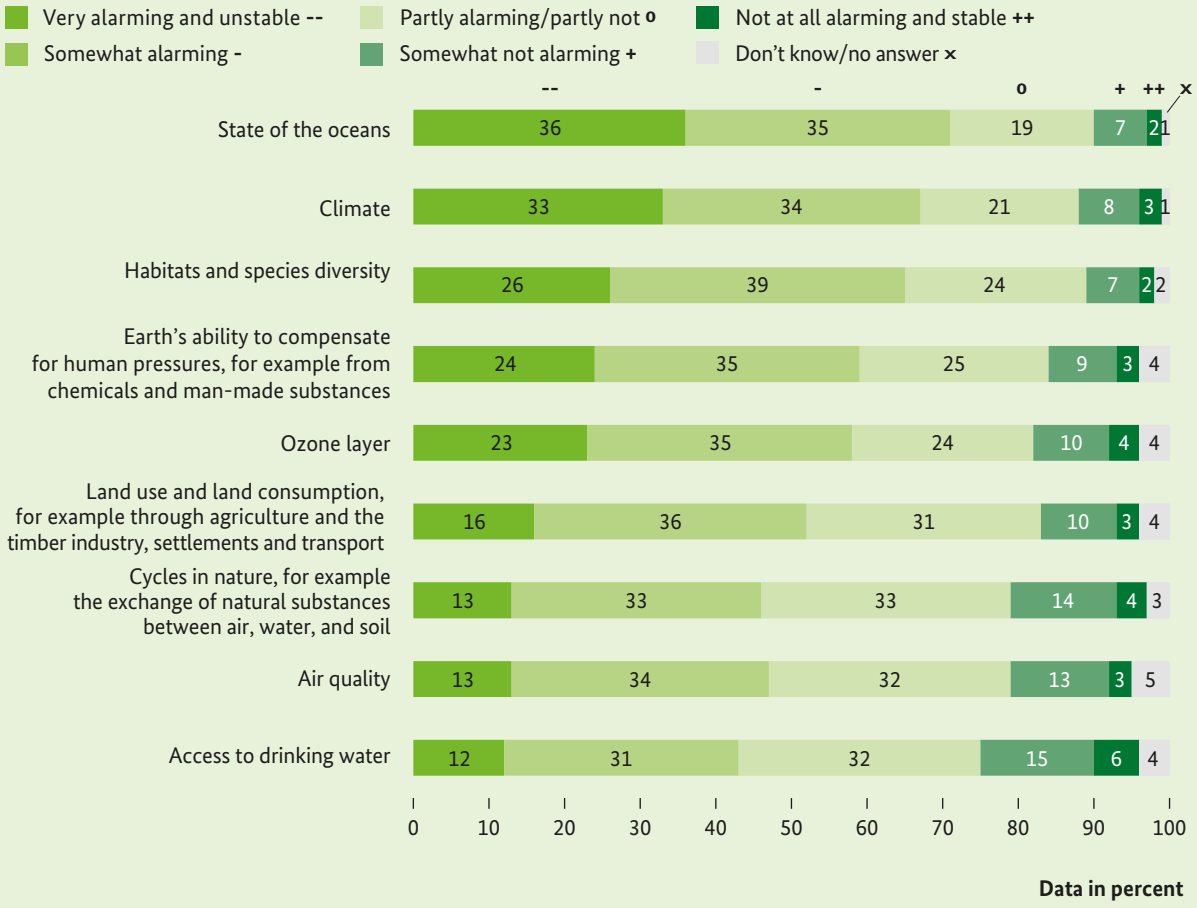
We know from previous Nature Awareness Studies (see in particular BMU and BfN 2018) that people are very concerned about the pollution of the world's oceans, for example by plastic waste – a topic that received heavy coverage in the mass media a few years ago. This could be one reason why the population considers the state of the oceans to be of greater concern than even the climate: Thirty-six percent of respondents consider the state of the oceans to be "very alarming and unstable", another 35 percent "somewhat alarming" (see Figure 2).[23]

However, when comparing climate and biodiversity, climate change is considered more problematic than habitat and species loss: 33 percent of respondents see the state of the climate as "very alarming and unstable", another 34 percent as "somewhat alarming". The state of habitats and biodiversity is considered "very alarming and unstable" by 26 percent, and "somewhat alarming" by a further 39 percent. In this case, too, the stronger media and political presence of the climate issue compared to the issue of biodiversity is probably responsible.

The Earth's ability to compensate for human stresses, for example from chemicals and artificial substances, is seen by 24 percent as "very alarming and unstable", and a further 35 percent as "somewhat alarming". The situation is similar with the ozone layer: It is classified as "very alarming and unstable" by 23 percent and "somewhat alarming" by another 35 percent.

Figure 2: Perception of planetary limits among adults

The Earth offers many resources and means of existence that must be available reliably and in sufficient quantity for human well-being. The stability of these means of existence is also necessary in order to be able to compensate for human pressures on nature. Please rate whether the global situation in the following areas is very alarming and unstable, somewhat alarming, partly alarming/partly not, somewhat not alarming, or not at all alarming and stable.



Data in percent

Further down the list of perceived pressures come land use and land consumption ("very alarming and unstable": 16 percent, "somewhat alarming": 36 percent), air quality ("very alarming and unstable": 13 percent, "somewhat alarming": 34 percent), natural cycles ("very alarming and unstable": 13 percent, "somewhat alarming": 33 percent), and access to drinking water ("very alarming and unstable": twelve percent, "somewhat alarming": 31 percent).

Overall, it is striking that the state of the Earth system is not even remotely considered by a majority of respondents as "not at all alarming and stable" in any of the areas surveyed. The maximum approval rating for this response category is six percent in the area of access to drinking water. In light of these results, people in the 2021 Nature Awareness Survey answered the question "Is the Earth in a stable state?" with a resounding "No".

Women are slightly more likely than men to view the state of the Earth with concern. For example, the climate is perceived as very or somewhat alarming by 71 percent of women, compared to 63 percent of men. In a comparison of ages, it is noticeable that 18 to 29-year-olds rate the state of the Earth as very or somewhat alarming with below-average frequency in four of the nine areas surveyed – oceans, compensation for human pressures, ozone layer, and drinking water (see Table 1). However, the differences are not great; rather, there is a unanimity of concern across generations. Differences in income are also only statistically relevant in isolated cases. Respondents with a high household net income (over 3,500 euros) are slightly more concerned than average in the areas of oceans, climate, and land use/land consumption. The educational comparison shows differences in the areas of oceans, habitats and biodiversity, land use and land consumption, and access to drinking water. In each case, it is respondents with a low level of formal education who rate the situation as very or somewhat alarming with below-average frequency.

Table 1: Perceptions of planetary boundaries among adults by gender, age, education, and income

Please rate whether the global situation in the following areas is very alarming and unstable, somewhat alarming, partly alarming/partly not, somewhat not alarming, or not at all alarming and stable.

Response category: "very/somewhat alarming" Data in percent	Average	Gender		Age (years)				Educational level			Net household income (euros)			
	Ø	M	F	under 29	30 to 49	50 to 65	over 65	Low	Average	High	up to 999	1,000 to 1,999	2,000 to 3,499	3,500 and more
State of the oceans	71	↓ 67	75 ↑	↓↓64	71	75 ↑	71	↓↓65	75 ↑	75 ↑	69	71	69	76 ↑
Climate	67	↓ 63	71 ↑	63	66	69	70	64	69	70	65	65	66	71 ↑
Habitats and biodiversity	65	↓ 61	69 ↑	60	66	69	63	↓↓59	69 ↑	67	63	63	65	69
Earth's ability to compensate for human pressures, for example from chemicals and man-made substances	59	↓↓54	64↑↑	↓ 52	59	65↑↑	57	55	62	60	63	59	56	62
Ozone layer	58	↓ 54	62 ↑	↓ 51	55	64↑↑	58	57	61	56	54	59	58	59
Land use and land consumption, for example through agriculture and the timber industry, settlements and transport	52	50	54	47	54	53	51	↓↓45	55	56 ↑	51	51	50	58 ↑
Cycles in nature, for example the exchange of natural substances between air, water, and soil	47	↓ 44	51 ↑	45	47	48	48	45	49	49	43	49	45	51
Air quality	46	↓ 40	50 ↑	44	45	50	45	42	50 ↑	46	49	47	45	47
Access to drinking water	43	41	46	↓ 37	44	47	43	↓ 39	48 ↑	43	43	43	43	44

Heavily over-represented ↑↑ Over-represented ↑ Under-represented ↓ Heavily under-represented ↓↓

Table 2: Perception of planetary boundaries among adults by milieu

Please rate whether the global situation in the following areas is very alarming and unstable, somewhat alarming, partly alarming/partly not, somewhat not alarming, or not at all alarming and stable.

Ø = Average
CON = Conservative Upscale
PMA = Post-Materialist
PER = Performer
EPE = Expeditive
NEO = Neo-Ecological
ADA = Adaptive Pragmatic Middle Class
HED = Consumer Hedonistic
PRE = Precarious
NOS = Nostalgic Middle Class
TRA = Traditional

Response category: "very/somewhat alarming" Data in percent	Ø	CON	PMA	PER	EPE	NEO	ADA	HED	PRE	NOS	TRA
State of the oceans	71	81↑↑	91↑↑	70	77	72	↓↓57	↓↓46	↓ 64	73	73
Climate	67	77↑↑	84↑↑	70	81↑↑	68	↓↓57	↓↓38	↓↓58	↓ 60	72
Habitats and biodiversity	65	73↑↑	81↑↑	62	73 ↑	71	↓↓55	↓↓34	62	68	63
Earth's ability to compensate for human pressures, for example from chemicals and man-made substances	59	69↑↑	75↑↑	54	67 ↑	63	↓↓51	↓↓32	55	58	60
Ozone layer	58	68↑↑	70↑↑	56	64	58	↓↓48	↓↓35	59	57	61
Land use and land consumption, for example through agriculture and the timber industry, settlements and transport	52	63↑↑	68↑↑	46	57	60 ↑	48	↓↓26	46	51	51
Cycles in nature, for example the exchange of natural substances between air, water, and soil	47	60↑↑	56↑↑	48	57↑↑	51	43	↓↓27	41	↓ 40	45
Air quality	46	55↑↑	57↑↑	42	54 ↑	57↑↑	44	↓↓26	43	42	40
Access to drinking water	43	53↑↑	57↑↑	42	50 ↑	48	39	↓↓20	40	40	41

Heavily over-represented ↑↑ Over-represented ↑ Under-represented ↓ Heavily under-represented ↓↓

Post-Materialists and the Conservative Upscale are most sensitised to the Earth's stress limits.

The differences in milieu are more pronounced than the socio-demographic differences: Across all the planetary boundaries surveyed, the sustainability-oriented Post-Materialists and the responsible Conservative Upscale view the state of the Earth with great alarm far more often than average. The state of the oceans, for example, is rated as very or somewhat alarming by 91 percent of Post-Materialists and 81 percent of the Conservative Upscale. The cosmopolitan Expeditives also find the state of the Earth worrying more often than average in some areas. This applies in particular to the areas of climate (very/somewhat alarming: 81 percent, average: 67 percent) and cycles in nature (very/somewhat alarming: 57 percent, average: 47 percent). The young Neo-Ecological milieu is concerned more often than average about land use and land consumption (very/somewhat alarmed: 60 percent, average: 52 percent) and air quality (very/somewhat alarming: 57 percent, average: 46 percent). These are more "local" issues, which seem to attract more attention in this milieu than in others.

People with an experience-oriented, consumer-hedonistic value orientation are least sensitive to the Earth's stress limits compared to the other social milieus. For example, in this milieu, only 38 percent consider the state of the climate to be very or somewhat alarming – that is 29 percentage points less than the average. Although members of the socially disadvantaged lifeworld also perceive problematic stresses with regard to climate and oceans with below-average frequency, their assessments are far closer to the population average than in the group with strongly consumer-hedonist-oriented values. In addition, members of the socially disadvantaged lifeworld show an average response pattern in all other areas of the planetary boundaries. The theory that precarious social circumstances would prevent people from perceiving global stress limits or from assessing them as being of concern does not apply here.

Among the Adaptive Pragmatic Middle Class, which is strongly characterised by utilitarian thinking, the following behavioural trend became evident: While they show average concern values for issues that are "closer to home" such as air quality or drinking water supply, they are more cautiously concerned about explicitly global issues such as the oceans or the climate. The response behaviour of the Nostalgic Middle Class, who see themselves as the social middle field and the backbone of society, only stands out in the areas of climate and natural cycles. In each case, they are slightly less likely to consider the situation as very or somewhat alarming.

2.2 Perception of nature and landscape changes

In the majority of cases, people perceive an overwhelming deterioration in the state of nature and landscape in Germany.

Settlement growth, structural change in agriculture, infrastructure development – in the past two decades, landscapes in Germany have changed. And the majority of Germans also seem to perceive such changes. In this context, 50 percent state that the condition of nature and landscape has generally deteriorated in the last 20 years, while seven percent perceive an improvement. Thirty-seven percent do not see any significant changes, and another six percent were unable to answer.

This question is particularly interesting when compared over time, because in the 2011 Nature Awareness Study, 49 percent of respondents still said they had not noticed any change in the state of nature and landscape over the past 20 years. At that time, only 27 percent were of the opinion that the condition of nature and landscape had deteriorated in their region.

Figure 3: Perception of nature and landscape change among the adult population by milieu

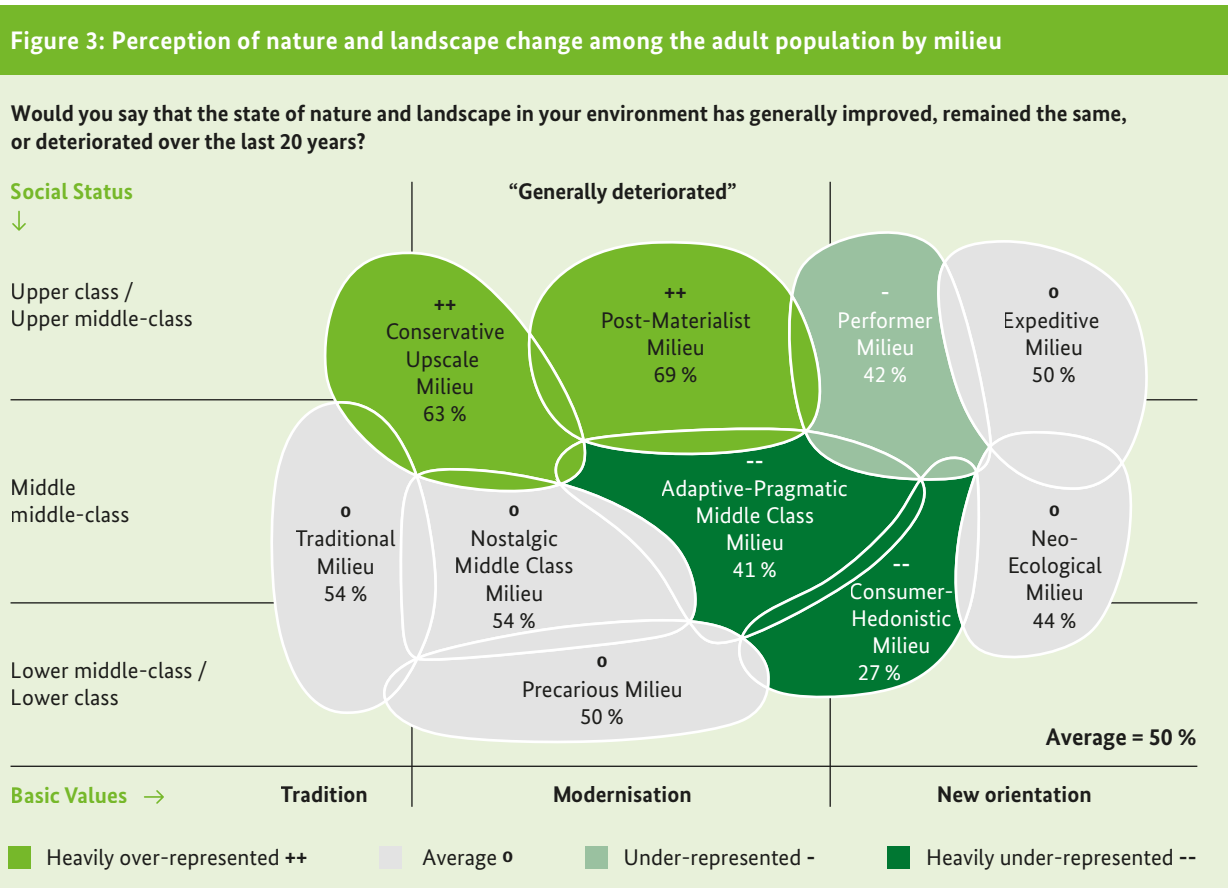
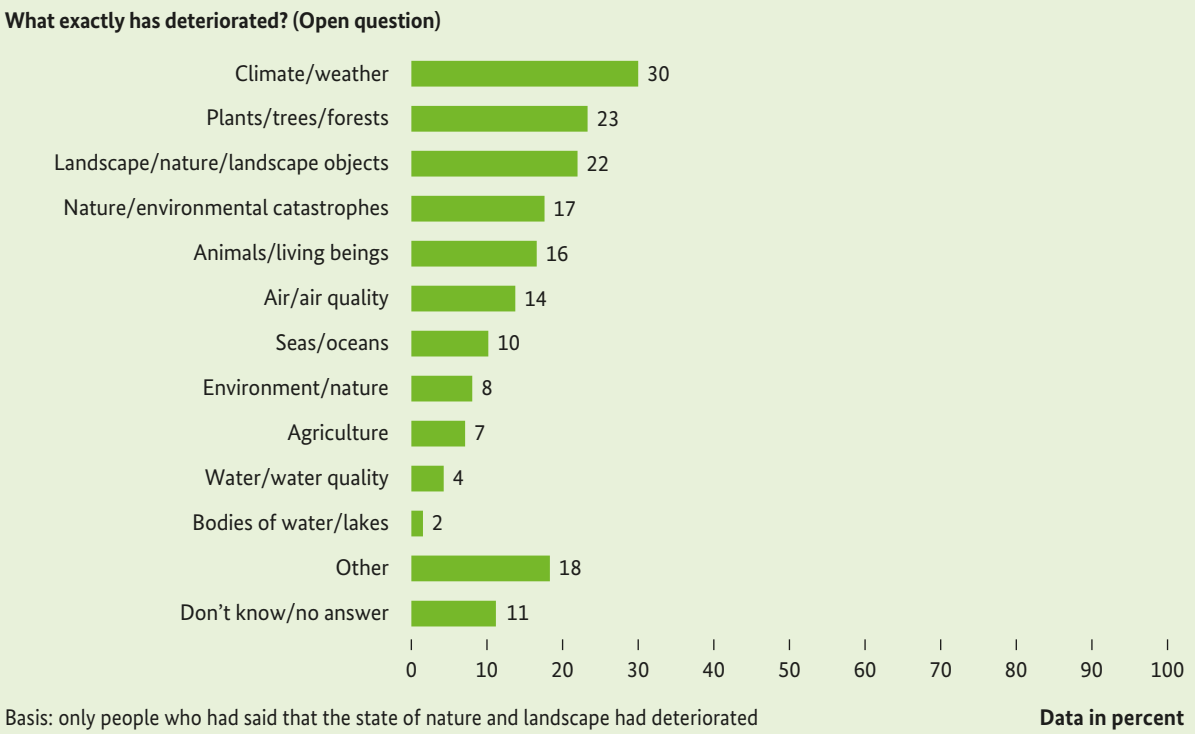


Figure 4: Perceived deterioration in the state of nature and landscape among the adult population



Thirteen percent perceived an improvement. Eleven percent were unable to give an opinion. This means that the perception of a deterioration in the state of nature and landscape in Germany has increased significantly over time.

An above-average number of women (54 percent), respondents with an average level of formal education (55 percent), and respondents with low net household income (59 percent) see a predominant deterioration in the state of nature and landscape. The fact that 18 to 29-year-olds perceive a deterioration less frequently than the population average (41 percent compared to 50 percent on average) is probably a consequence of the chosen time horizon (20 years).

In a comparison of milieus, it is above all the problem-conscious Post-Materialists and the Conservative Upscale striving for order and preservation who are of the opinion that the condition of nature and landscape in their own environment has deteriorated in the last 20 years (69 percent and 63 percent respectively). The modern business elite (the Performers) and the modern mainstream (the Adaptive Pragmatic Middle Class) are less likely than average to be convinced of a deterioration (42 percent and 41 percent respectively). The (lower) middle class, which focuses on fun and entertainment, is even more reserved. In this milieu, only 27 percent see a deterioration in nature and landscape (see Figure 3).

Most frequently, problems are seen in the climate and in the condition of forests and landscapes.

In a follow-up question, those who previously stated that they had noticed changes in nature and landscape were each asked openly, in other words without fixed response categories, what exactly had improved or deteriorated.

Of the 165 respondents who considered the state of nature and landscape to have improved, 112 (72 percent) were unable to give any precise information ("don't know"). This suggests that perceptions of improvement are not so much based on specific experiences as on more general assessments of the state of nature. Most of the concrete answers referred to an improvement in water quality (five percent) and higher air quality (four percent).

The 1,208 people who identified a predominant deterioration in the condition of nature and landscape see the problems mainly in the climate (30 percent) and in the condition of forests (23 percent) and landscapes (22 percent) (see Figure 4). Respondents are also concerned about natural and environmental catastrophes

(17 percent), declining biodiversity (16 percent), lower air quality (14 percent), and the state of the oceans (ten percent). Other mentions relate to the state of the environment/nature in general (eight percent), agricultural use of farmland (seven percent), and the quality of water and bodies of water (four percent and two percent respectively).

2.3 Assessment of the development of insects and their habitats in agricultural landscapes

Changes in agricultural landscapes and practices are a major driver of the observed decline in insects (see Hallmann et al. 2017, Seibold et al. 2019, Uhler et al. 2021). This is reason enough to ask how people perceive the development of insects and their habitats in agricultural landscapes.

Seventy percent of the adult population in Germany believe that the bee population has declined.

For all the elements of agricultural landscapes surveyed here, more citizens in Germany believe that they have decreased in the last ten years than that they have remained the same. This is especially true for bees (perceived decrease: 70 percent, remained the same: 20 percent) and butterflies (decrease: 63 percent, remained the same: 26 percent), but also for green space (decrease: 49 percent, remained the same: 38 percent) as well as for margins and wildflower strips (decrease: 44 percent, remained the same: 36 percent). Only a few of the respondents believe that the surveyed features of agricultural landscapes have increased (see Figure 5).

When asked to assess the development of the bee population, no distinction was made between honey bees and wild bees. As the Red Lists show (Westrich et al. 2011), there have been sharp declines in wild bees in particular. However, it can be assumed that the respondents were primarily concerned with the threat to honey bees when making their assessment.

Whether these perceptions are caused by the respondents' own observations or rather by social debate in the media cannot be assessed here, but a comparison over time shows that the perception of a declining development has grown or at least been reinforced (see Figure 5). In 2015, when this question was asked

Figure 5: Assessment of the adult population regarding the development of elements of agricultural landscapes compared over time

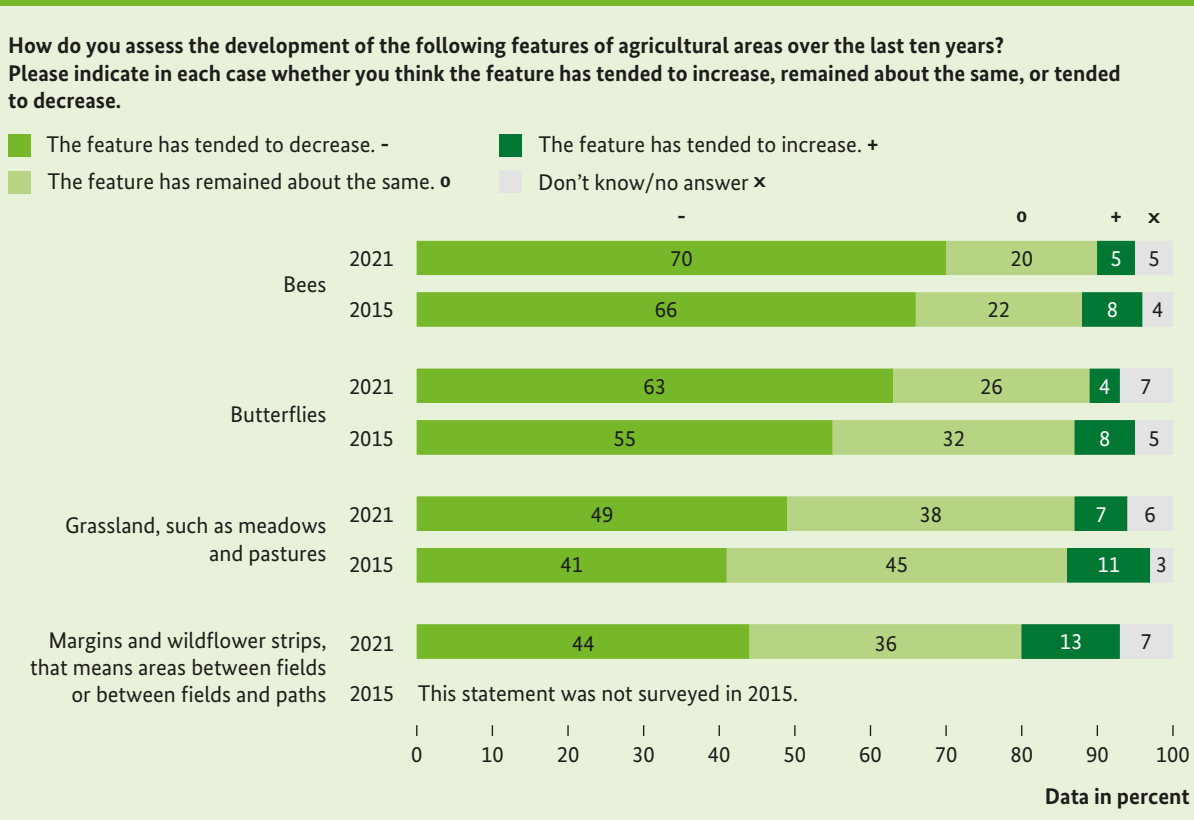


Table 3: Assessment of the adult population regarding the development of insects and their habitats in agricultural landscapes by milieu

How do you assess the development of the following features of agricultural areas over the last ten years?

Ø = Average
CON = Conservative Upscale
PMA = Post-Materialist
PER = Performer
EPE = Expeditive
NEO = Neo-Ecological
ADA = Adaptive Pragmatic Middle Class
HED = Consumer Hedonistic
PRE = Precarious
NOS = Nostalgic Middle Class
TRA = Traditional

Response category: "The feature has tended to decrease." Data in percent	Ø	CON	PMA	PER	EPE	NEO	ADA	HED	PRE	NOS	TRA
Bees	70	72	85↑↑	68	71	67	↓↓60	↓↓56	71	74	74
Butterflies	63	66	82↑↑	63	64	62	↓↓50	↓↓41	60	68	65
Green space, such as meadows and pastures	49	53	63↑↑	↓↓40	50	55	↓↓38	42	50	55	47
Margins and wildflower strips, that means areas between fields or between fields and paths	44	53↑↑	51 ↑	43	51 ↑	42	↓ 37	↓↓32	38	45	44

Heavily over-represented ↑↑ Over-represented ↑ Under-represented ↓ Heavily under-represented ↓↓

before, 55 percent said they had noticed a decline in the butterfly population; in the current survey, the figure is 63 percent. There is a similar situation for the perceived decline of green space (2015: 41 percent, 2021: 49 percent).

No significant socio-demographic differences can be seen with regard to the agri-structural elements, but they are evident in the case of insects. The gender comparison shows that women more often perceive a decline in the number of bees (75 percent) and butterflies (60 percent) than men (66 percent and 57 percent respectively). In addition, age makes itself apparent. Thus it is 50 to 65-year-olds who notice the decline in bees and butterflies the most and 18 to 29-year-olds who notice it the least, which is not particularly surprising considering that the loss of insects has been going on for some time. It is noteworthy that the assessment of the declining butterfly population among those aged 50 to 65 has increased by almost ten percentage points since 2015 (2015: 61 percent, 2021: 70 percent), although it has remained almost constant in the younger age group of 18 to 29-year-olds (2015: 49 percent, 2021: 51 percent). When it comes to a perceived decline in the bee population, the values have hardly changed since 2015 in both age groups (50 to 65-year-olds, 2015: 73 percent, 2021: 74 percent; 18 to 29-year-olds, 2015: 57 percent, 2021: 60 percent).

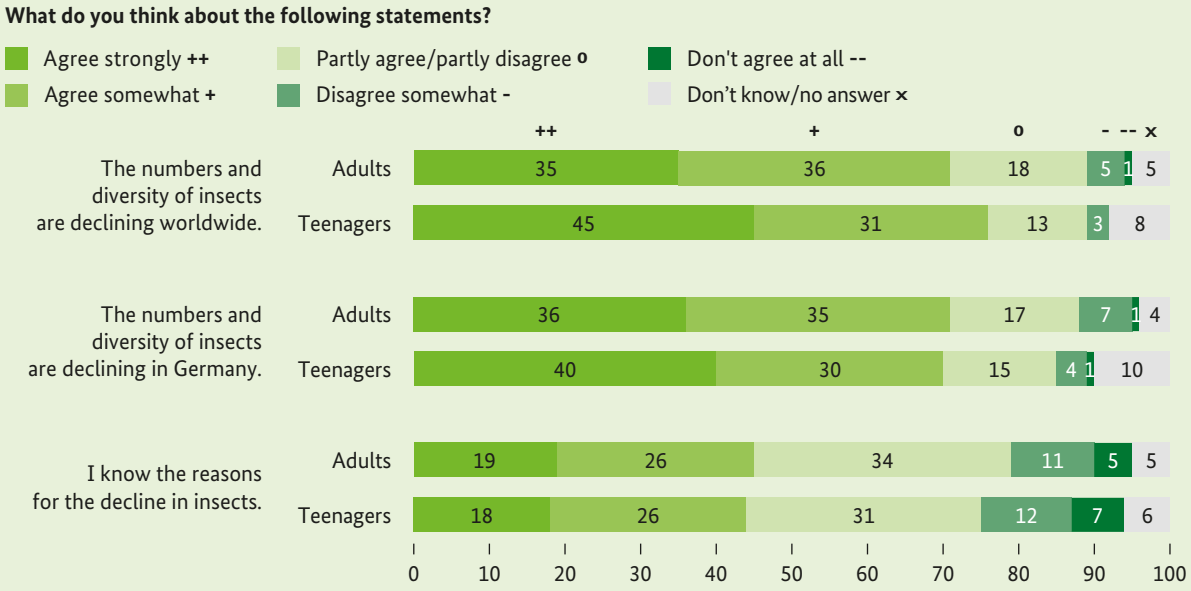
It is mainly Post-Materialists who perceive a decrease in the development of insects and their habitats in agricultural landscapes.

Eighty-five percent of Post-Materialists say they have noticed a decrease in the number of bees (average: 70 percent). For butterflies it is 82 percent (average: 63 percent), for green space 63 percent (average: 49 percent) and 51 percent (average: 44 percent). In contrast, the decrease in features of agricultural landscapes is perceived significantly less in the Adaptive Pragmatic Middle Class and in the fun and experience-oriented lifeworld (see Table 3).

Most Germans are unaware of the reasons for the decline in insects.

When asked about how the decline in insect diversity has affected different regions, it is striking that there is no difference between the reference area Germany and the reference area "worldwide" (see Figure 6): In each case it is 71 percent who think that the number and diversity of insects is decreasing (both levels of agreement). With approval ratings of 59 percent (decrease worldwide) and 61 percent (decrease in Germany), there are significantly fewer in the 18-29 age group who are convinced of a decrease. This is especially true in comparison with the age group of 50 to 65-year-olds (decrease worldwide: 78 percent, decrease in Germany: 76 percent) and the group of people with

Figure 6: Perceived decline in insect diversity and level of knowledge on causes – adults and teenagers in comparison



a high net household income (decrease worldwide and decrease in Germany: 76 percent each).

Forty-five percent of respondents aged 18 and over (both levels of agreement) say they know the reasons for the decline in insects, although only 19 percent are really sure ("completely agree"). This indicates a need for further education on the causes of the decline in insect diversity. This is especially true for people with a low level of education and a low income: In these groups, less than 40 percent say they are aware of the causes (both levels of agreement, see Table 4).

Teenagers were also asked about the perceived decline in insect diversity and their level of knowledge about the causes (see Figure 6). It is noticeable that 14 to 17-year-olds – at least in parts – are somewhat more convinced of the decrease in insect diversity. This becomes clear when looking at the highest approval rating: 45 percent of teenagers "agree strongly" that

Table 4: Perceived decline in insect diversity and level of knowledge about the causes in the adult population by age, education, and income

What do you think about the following statements?

Response category: "agree strongly/somewhat" Data in percent	Average	Age (years)				Educational level			Net household income (euros)			
	Ø	under 29	30 to 49	50 to 65	over 65	Low	Aver-age	High	up to 999	1,000 to 1,999	2,000 to 3,499	3,500 and more
Worldwide, the number and diversity of insects is declining.	71	↓↓59	71	78↑↑	72	68	75 ↑	72	71	70	69	76 ↑
In Germany, the number and diversity of insects is declining.	71	↓↓61	70	76 ↑	73	68	74	72	65	71	69	76 ↑
I know about the reasons for insect decline.	45	43	47	46	44	↓↓38	48	51↑↑	↓ 37	43	44	53↑↑

Heavily over-represented ↑↑ Over-represented ↑ Under-represented ↓ Heavily under-represented ↓↓

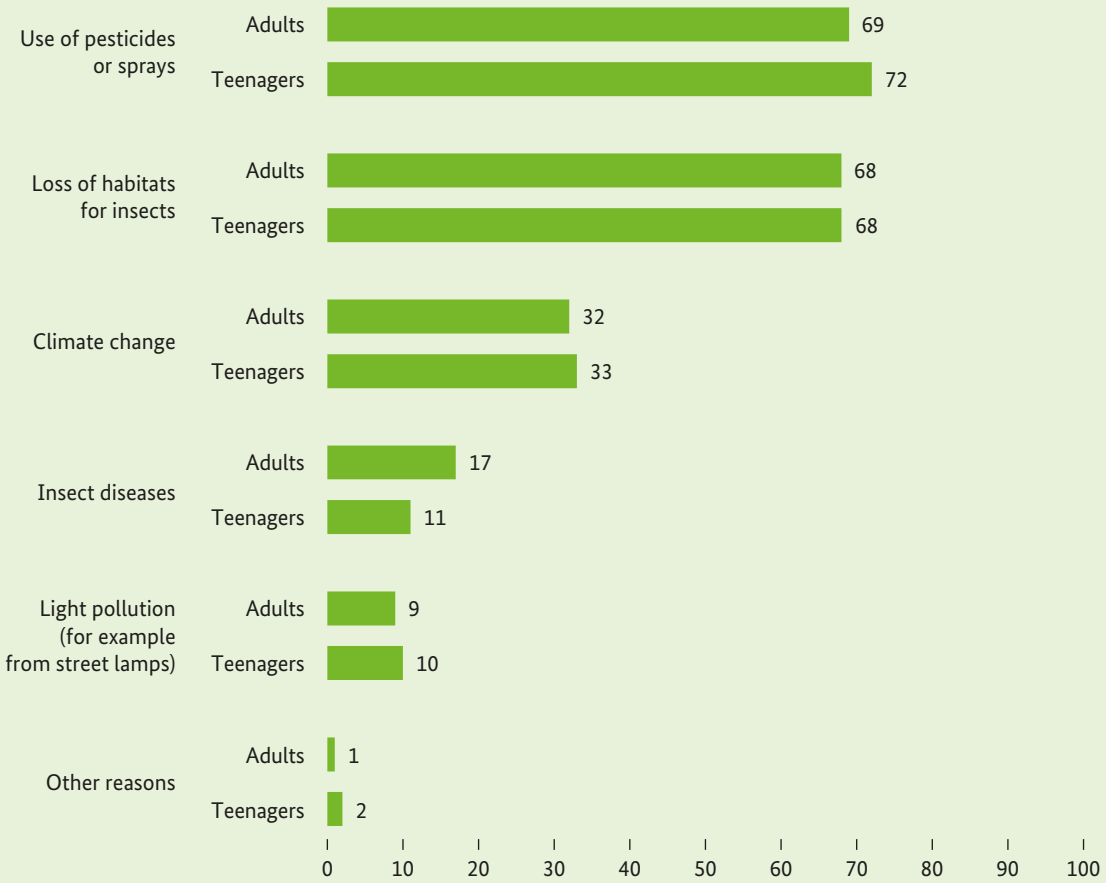
there is a global decline and 40 percent "agree strongly" that there is a decline in Germany. Among adults, the highest level of approval is 35 percent (worldwide decrease) and 36 percent (decrease in Germany). When asked about their knowledge of the causes of insect decline, no differences can be identified: 18 percent of teenagers are sure they know the reasons (adults: 19 percent), another 26 percent are somewhat sure (adults: 26 percent).

The milieu results confirm the finding that it is largely Post-Materialists who assume a decrease in insect diversity (both levels of agreement, decrease worldwide: 90 percent, decrease in Germany: 89 percent), while the Adaptive Pragmatic Middle Class (decrease worldwide: 58 percent, decrease in Germany: 57 percent) and the members of the fun and experience-oriented lifeworld (decrease worldwide: 40 percent, decrease in Germany: 41 percent) are less convinced of a decline. In addition to the Post-Materialists, the mobile, digitally oriented, and cosmopolitan Expeditives are also more likely than average to be convinced of a worldwide decline (80 percent) and a decline in Germany (79 percent). Among the Conservative Upscale milieu – the classic establishment – 78 percent, and thus a slightly above-average number, believe that the number and diversity of insects worldwide is in decline.

Knowledge about the causes of the decline in insects is expressed above all by the educated and open-minded milieus of the Post-Materialists (both levels of agreement: 61 percent) and Expeditives (54 percent). Members of the socially disadvantaged milieu (38 percent) and the group with strongly consumer-hedonistic values (26 percent) attest to considerably less knowledge.

Figure 7: Reasons for insect decline – adults and teenagers in comparison

Please select two reasons that you think are most important for insect die-off.



Basis: only people who stated that the reasons for the decline in insects were at least partly known

Data in percent

Pesticide use and habitat loss are the most commonly cited reasons for insect die-off.

In order to find out which causes the respondents suspected in insect die-off, those who stated that they had observed a decline were asked to select the two most important reasons in their view from a given list.

The result is clear: Pesticide use (69 percent) and habitat loss (68 percent) are mentioned most frequently. Climate change is in third place with 32 percent of mentions. Insect diseases (17 percent) and light pollution (nine percent) play a minor role according to respondents (see Figure 7).

Gender, education, or income differences are hardly manifest in the question about causes, although the results differ according to the age of respondents (see Table 5): In the 18-29 age group, pesticides and habitat loss play a lesser role, while climate change plays a greater role; in the 50-65 age group, the reverse is true.

Comparing the results of the adult survey with the results of the youth survey, hardly any differences can be seen overall (see Figure 7). The only point of note is that possible insect diseases are cited more frequently by adults than by teenagers (17 percent compared to eleven percent).

The milieu analysis shows that the use of pesticides and the loss of habitats are highlighted above all by Post-Materialists (85 percent and 81 percent respectively) and the security-conscious Nostalgic Middle Class (76 percent each) as reasons for insect die-off. On the other hand, climate change is cited as a reason less frequently than average in these milieus (22 percent among Post-Materialists, 19 percent among the Nostalgic Middle Class). In the Adaptive Pragmatic Middle Class and the consumption and experience-oriented lifeworld, the use of pesticides (58 percent and 54 percent respectively) and the loss of habitats (58 percent and 51 percent respectively) are seen as less causal. Comparatively often, members of the consumption and experience-oriented milieu emphasise light pollution (16 percent, average: nine percent), while the Adaptive Pragmatic Middle Class makes greater reference to possible insect disease (25 percent, average: 17 percent). Expeditives are also slightly less likely to consider habitat loss as a causal factor in the decline of insect diversity (55 percent). On the other hand, they cite climate change (41 percent) and insect diseases (27 percent) more frequently than average.

Table 5: Reasons of the adult population for insect die-off by age

Please select two reasons that you think are most important for insect die-off.

Data in percent	Average	Age (years)			
	Ø	under 29	30 to 49	50 to 65	over 65
Use of pesticides or sprays	69	↓↓57	66	77↑↑	70
Loss of habitats for insects	68	↓↓55	66	75↑↑	70
Climate change	32	42↑↑	33	↓↓25	31
Insect diseases	17	20	18	14	18
Light pollution (for example from street lamps)	9	14↑↑	9	↓ 6	8
Other reasons	1	2	2	1	1

Heavily over-represented ↑↑ Under-represented ↓ Heavily under-represented ↓↓

Basis: only people who stated that the reasons for the decline in insects were at least partly known

2.4 Agreement with the spread of wildlife

In order to counteract the decline in animal diversity, the reintroduction of various animal species was set as a target in the National Strategy on Biodiversity (see BMU 2007). But what are citizens' attitudes towards the increased spread of wildlife? This question was explored for the first time in the 2013 Nature Awareness Study. This chapter shows what the population thinks in 2021.

The spread of the non-native raccoon is met with the strongest reservations.

Citizens have a positive attitude towards the spread of otters, beavers, lynx, and wildcats: In each case, more than half of the respondents are in favour of their spread and a maximum of 25 percent are against it (see Figure 8). Here, the greatest approval is for the spread of the otter ("I find it good": 58 percent), followed by the beaver (56 percent), the lynx (55 percent), and the wildcat (54 percent).

Respondents are more reserved about the spread of wolves. Forty percent think it is good if the wolf spreads in Germany, but just as many are against it. The strongest reservations are about the raccoon. Only 34 percent think it spreading is a good thing, while 43 percent reject it. Given that raccoons are an invasive species[24], these results are positive from a conservation perspective.

Compared to the survey in 2013, agreement with the spread of the surveyed wildlife has decreased. This is especially true for the raccoon ("I find it good", 2013: 48 percent, 2021: 34 percent) and the beaver ("I find it good", 2013: 67 percent, 2021: 56 percent), but the lynx, the wildcat, and (somewhat less) the wolf have also lost popularity. With regard to approval of the spread

Figure 8: Agreement of the adult population with the spread of wild animals compared over time

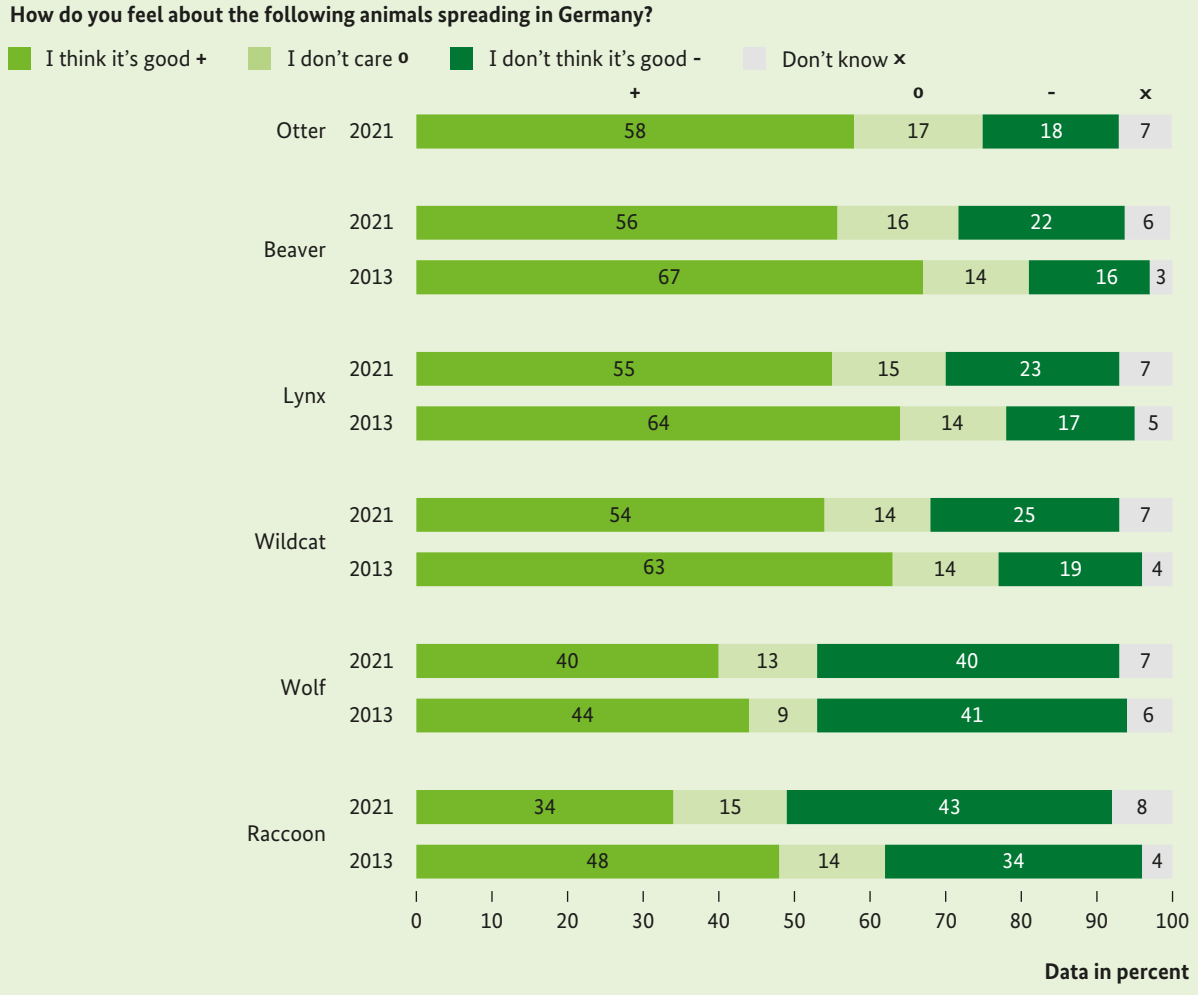


Table 6: Agreement of the adult population with the spread of wild animals by age and education

How do you feel about the following animals spreading in Germany?

Response category: "I find it good" Data in percent	Average	Age (years)				Educational level		
	Ø	under 29	30 to 49	50 to 65	over 65	Low	Average	High
Otter	58	↓↓45	58	64↑↑	59	57	59	59
Beaver	56	↓↓47	58	57	57	55	56	57
Lynx	55	↓↓44	56	62↑↑	55	53	59 ↑	54
Wildcat	54	↓↓46	56	59 ↑	51	50	57	55
Wolf	40	↓ 34	43	44	36	36	40	44 ↑
Raccoon	34	37	38	30	31	36	32	35

Heavily over-represented ↑↑ Over-represented ↑ Under-represented ↓ Heavily under-represented ↓↓

of the wolf, it is also noticeable that the proportion of those who answered "I don't care" has increased, while the proportion of those who disagree with their spread has remained almost constant compared to 2013 (see Figure 8).

Compared to the older respondent groups – especially 50 to 65-year-olds – 18 to 29-year-olds are less likely to be in favour of the spread of the wild animals surveyed, with the exception of the raccoon (see Table 6). Furthermore, the educational comparison shows that the wolf is most popular among respondents with a high level of education (I find it good: 44 percent, average: 40 percent).

Support for the spread of wildlife comes primarily from Post-Materialists and significantly less from members of the consumption and experience-oriented lifeworld.

The spread of wildlife polarises strongly between social milieus in some cases. Whereas the committed and confident educated elite (Post-Materialists) approve of the spread of all the wild animals surveyed (exception: raccoon) much more often than the average, approval in the consumption and experience-oriented (lower) middle class is significantly lower. For example, 70 percent of Post-Materialists are in favour of the spread of the wildcat compared to only 30 percent in the consumption and experience-oriented (lower) middle class. Less support also comes from the Adaptive Pragmatic Middle Class – this concerns the spread of the otter (51 percent, average: 58 percent), the lynx (47 percent, average: 55 percent), and the wildcat (46 percent, average: 54 percent). Furthermore, it can be seen that of all milieus, the optimistic and unconventionally thinking Neo-Ecologicals most often approve of the spread of raccoons (46 percent, average: 34 percent).

3 The pandemic – the population's understanding of its causes and its influence on our relationship with nature

We have been in a pandemic for over two years. The state's reaction to the risk of infection, which was felt directly by everyone, was to impose numerous temporary restrictions on contact with other people. The cultural and catering sectors, where larger crowds congregate in small spaces or indoors, suffered particularly from the coronavirus restrictions. In contrast, outdoor activities, especially those that can take place without large crowds, are less affected. Thus, the coronavirus crisis has made spending time in nature – from city parks to nature reserves – objectively more attractive for people.

Research on internet search behaviour in twelve EU countries shows that attention to local nature and nature-related activities increased significantly during periods of massive contact restrictions (see Rousseau and Deschacht 2020). With the help of mobile tracking data, it was shown for Oslo that the use of urban parks and forests close to the city during the lockdown was almost 300 percent higher than in normal years (see Venter et al. 2021). Furthermore, about 70 percent of respondents in a study in the city of Burlington (Vermont, USA) used urban green spaces significantly more often than usual during pandemic times (see Grima et al. 2020). Furthermore, studies on behavioural patterns and attitudes of young adults showed that the pandemic influenced their attachment to nature in a positive sense (see BMU and BfN 2021, Wächter 2021).

In light of these findings, the question arises of whether nature is also being valued more highly in Germany in times of the pandemic. The Nature Awareness Study 2021 attempts to answer this question. As in all Nature Awareness Studies of recent years, this year's survey asks about the personal significance of nature. In the current study, participants were also asked to what extent their appreciation of nature had changed during the pandemic and whether they visited nature more often during the pandemic than before. In addition, it was investigated whether the respondents see a connection between the coronavirus crisis and the state of nature: Is the coronavirus crisis "only" a health issue and has nothing to do with the state of nature, or is the pandemic related to our treatment of nature, such as habitat destruction? The background for this question is the hypothesis, which has been discussed at length among experts, regarding the connection between the encroachment of human uses into natural areas (for example, deforestation of primeval forests) and the increase in zoonoses – transmissible diseases that affect humans and animals (see, among others, Gibb et al. 2020, IPBES 2020, Johnson et al. 2020, Morand, and Lajaunie 2021, Rulli et al. 2021). Contrary to what has been assumed for a long time, species-rich areas, often little shaped by human use, are not sources of risk for zoonoses, but rather protect us (see Keesing and Ostfeld 2021). The complex interrelationships between healthy environment, human and animal health are addressed by the One Health approach[25], which is becoming increasingly important in the context of the pandemic. Whether society in Germany also recognises a connection between biodiversity and planetary health is a question posed at the very beginning of this chapter.

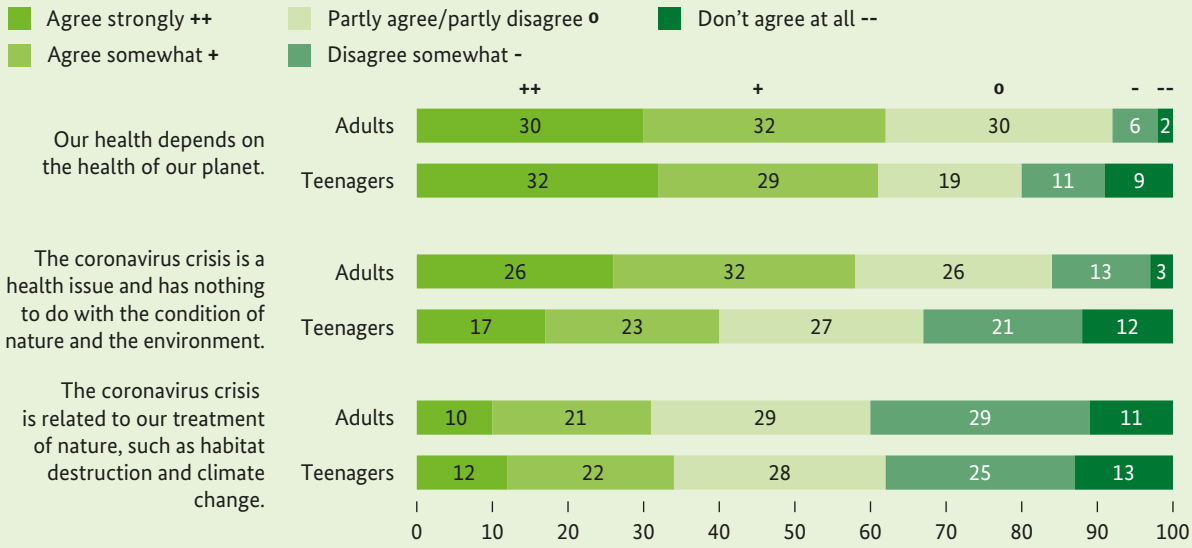
3.1 Connections between the coronavirus crisis and the state of nature and the environment

Only a minority feels that there is a connection between the coronavirus crisis and the state of nature and the environment.

Sixty-two percent (both levels of agreement) state that our health is dependent on the health of our planet. Only eight percent disagree with this view. The remaining 30 percent are undecided on this question ("partly agree/partly disagree"). However, the results also show that only a minority recognises a connection between the coronavirus crisis and the state of nature and the environment: 58 percent are of the opinion that the coronavirus crisis is a health issue and has nothing to do with the state of nature and the environment. Twenty-six percent answer with "partly agree/partly disagree", only 16 percent disagree with this view. Furthermore, only 31 percent think the coronavirus crisis is related to our treatment of nature, such as habitat destruction and climate change. However, the majority, namely 40 percent, deny this (see Figure 9).

Figure 9: Connections between the coronavirus crisis and the state of nature and the environment – adults and teenagers in comparison

To what extent do you agree with the following statements?



Women are slightly more likely than men to agree that human health is dependent on the health of our planet (both levels of agreement: 66 percent compared to 59 percent). When asked whether the coronavirus crisis is related to the state of nature and the environment, no gender differences can be discerned, but differences according to the age and education of the respondents can. The opinion that the coronavirus crisis is a health issue and has nothing to do with the state of nature and the environment is expressed more often by older respondents than by 18 to 29-year-olds, and more often by people with a low level of formal education than by people with a high level of formal education (see Table 7). The situation is similar as regards the statement that the coronavirus crisis is linked to our treatment of nature. This statement meets with agreement above all among 18 to 29-year-olds (both levels of agreement: 38 percent, average: 31 percent) and among respondents with a high level of education (36 percent).

Table 7: Connections between the coronavirus crisis and the state of nature and the environment in the adult population by gender, age, and education

To what extent do you agree with the following statements?

Response category: "agree strongly/agree somewhat" Data in percent	Average	Gender		Age (years)				Educational level		
	Ø	M	F	under 29	30 to 49	50 to 65	over 65	Low	Average	High
Our health depends on the health of our planet.	62	↓ 59	66 ↑	60	64	61	64	59	63	66
The coronavirus crisis is a health issue and has nothing to do with the condition of nature and the environment.	58	61	56	↓ 52	56	62	61	64↑↑	58	↓ 54
The coronavirus crisis is related to our treatment of nature, such as habitat destruction and climate change.	31	32	30	38↑↑	36 ↑	↓↓24	29	↓ 26	30	36↑↑

Heavily over-represented ↑↑ Over-represented ↑ Under-represented ↓ Heavily under-represented ↓↓

Teenagers are more likely than adults to see a connection between the coronavirus crisis and the state of nature and the environment.

About as many teenagers as adults (61 percent versus 62 percent) are of the opinion that our health depends on the health of our planet. The approval ratings are also close to each other when it comes to the question of whether the coronavirus crisis is related to our treatment of nature (teenagers: 34 percent, adults: 31 percent). The situation is different regarding the question of the connection between the coronavirus crisis and the state of nature and the environment (see Figure 9): Teenagers are significantly less likely to believe that the coronavirus crisis is a health issue and has nothing to do with the state of nature and the environment (40 percent compared to 58 percent among adults).

In a comparison of milieus, it is above all the responsible members of the Post-Materialists and Conservative Upscale milieus (both levels of agreement: 78 percent and 76 percent respectively), but also the young, post-modern milieus of the Expeditives and Neo-Ecologicals (76 percent and 71 percent respectively), who believe that our health is linked to the health of our planet. Significantly less approval comes from the ranks of the socially disadvantaged lifeworld (54 percent), the particularly performance-driven Performers (51 percent), and the fun and experience-oriented milieu (30 percent).

The opinion that the pandemic has nothing to do with the state of nature and the environment, but is a health issue, is most frequently stated by those living in socially weaker situations and by the security-loving older generation (Traditional milieu) (68 percent and 67 percent respectively).

Interesting findings emerge for the question of whether the coronavirus crisis is related to our treatment of nature. Above-average approval ratings are found not only among the Conservative Upscale (38 percent) and Expeditives (40 percent), but also among the Adaptive Pragmatic Middle Class (42 percent). Adaptive Pragmatics are characterised by a strong need for orientation, anchoring, and planning. The uncertainties brought about by the coronavirus crisis may lead members of this milieu to think more about the causes of the pandemic. Approval is below average among the Nostalgic Middle Class (25 percent), Performers (23 percent), Traditional (21 percent), and the socially disadvantaged (21 percent).

3.2 Personal significance of nature and altered appreciation during the pandemic

Before the participants of the study were asked whether their appreciation of nature had changed during the pandemic, they were asked to state what nature means to them personally.

Figure 10: Personal significance of nature – adults and teenagers in comparison

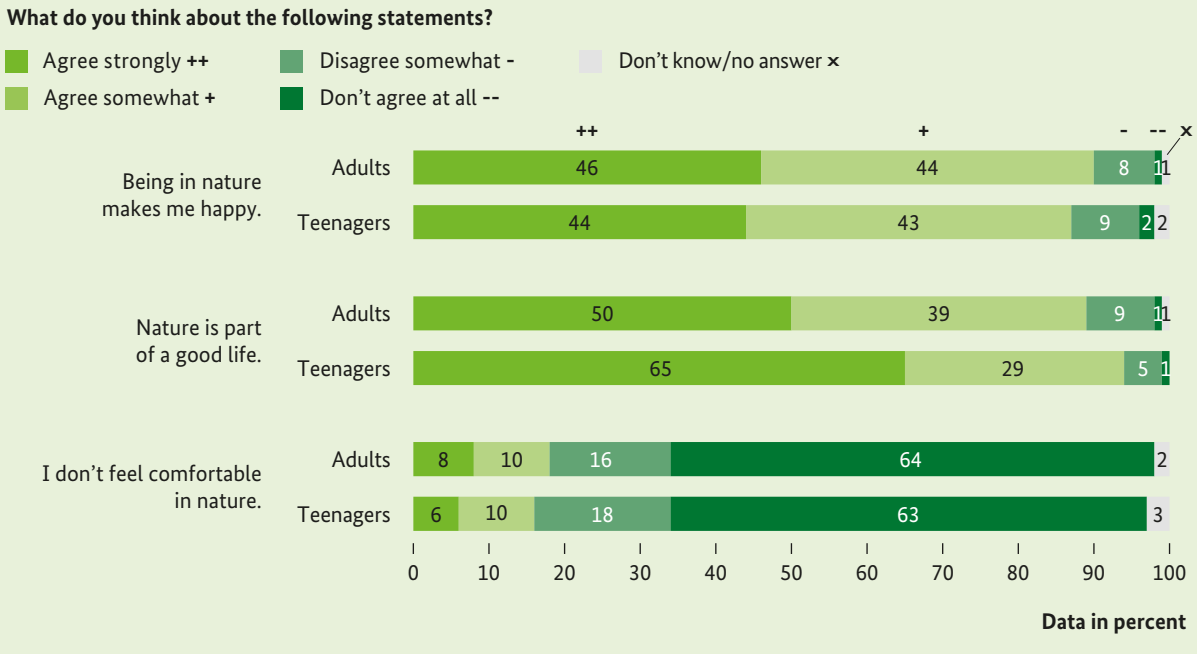
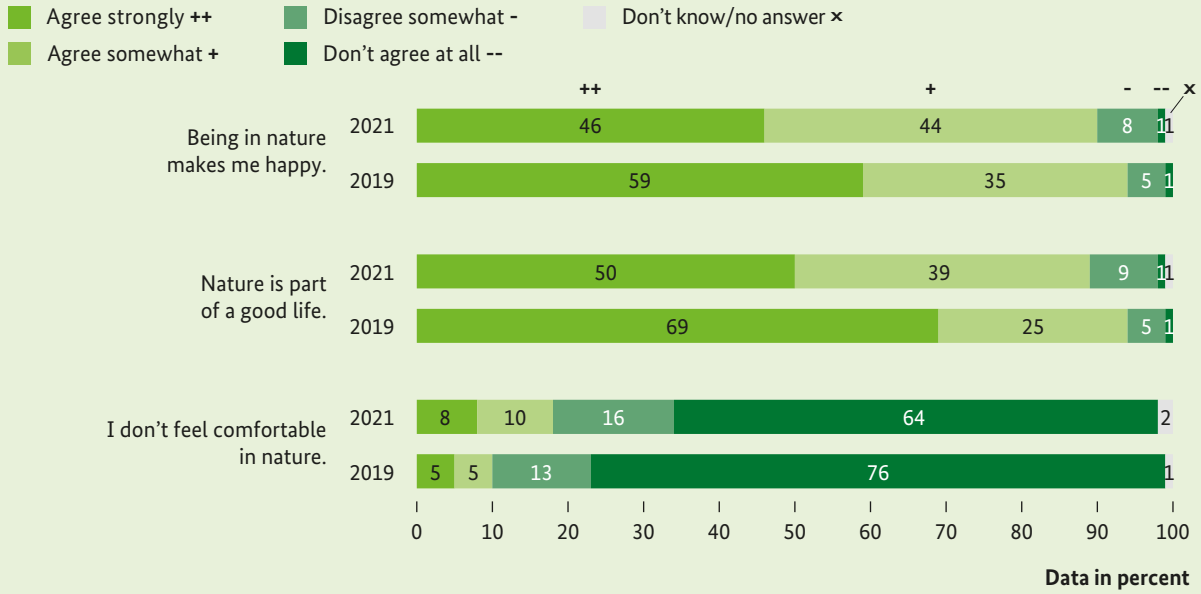


Figure 11: Personal significance of nature among the adult population compared over time



Emotional access to nature has decreased over time.

As in past Nature Awareness Studies, it can also be stated in the current survey that nature plays an important role for Germans (see Figure 10). Ninety percent of respondents say it makes them happy to be in nature (both levels of agreement). For 89 percent, nature is part of a good life, and only 18 percent say that they do not feel comfortable in nature. With regard to the highest level of approval, differences can nevertheless be seen when compared over time. In the current measurement, 46 percent said without reservation that it made them happy to be in nature, compared to 59 percent in 2019. Furthermore, 50 percent currently "agree strongly" with the opinion that nature is part of a good life. In 2019, when this question was last asked, 69 percent said that. In addition, 18 percent currently say they do not feel comfortable in nature (highest level of agreement: eight percent), compared to ten percent in 2019 (highest level of agreement: five percent) (see Figure 11). Obviously, emotional access to nature has decreased over time. One explanation could be that in the face of the pandemic and all its accompanying symptoms, many people may find it harder – both in and out of nature – to consciously perceive the feeling of happiness. This is all the more true as the surveys were conducted in autumn and winter.

Women say slightly more often than men that nature is part of a good life (both levels of agreement): 91 percent compared to 86 percent). However, the per-

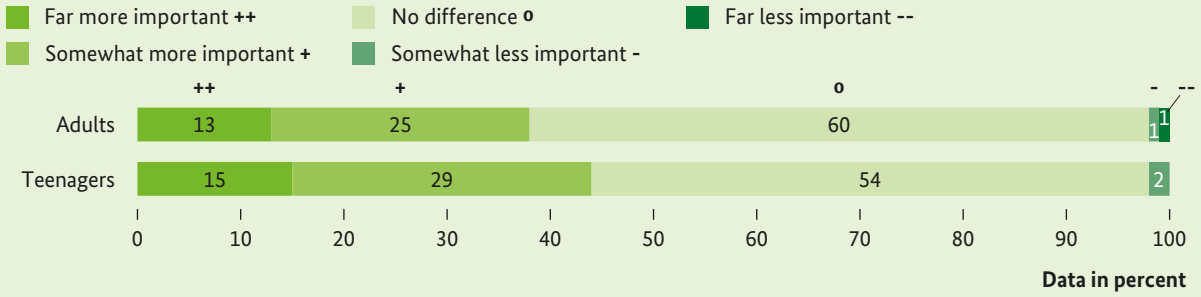
Table 8: Personal significance of nature in the adult population by gender and age

What do you think about the following statements?

Response category: "agree strongly/somewhat"	Average	Gender		Age (years)			
Data in percent	Ø	M	F	under 29	30 to 49	50 to 65	over 65
Being in nature makes me happy.	90	88	92	↓↓82	90	91	94↑↑
Nature is part of a good life.	89	↓ 86	91 ↑	↓↓79	88	94↑↑	90
I don't feel comfortable in nature.	18	19	16	27↑↑	19	15	↓↓12

Heavily over-represented ↑↑ Over-represented ↑ Under-represented ↓ Heavily under-represented ↓↓

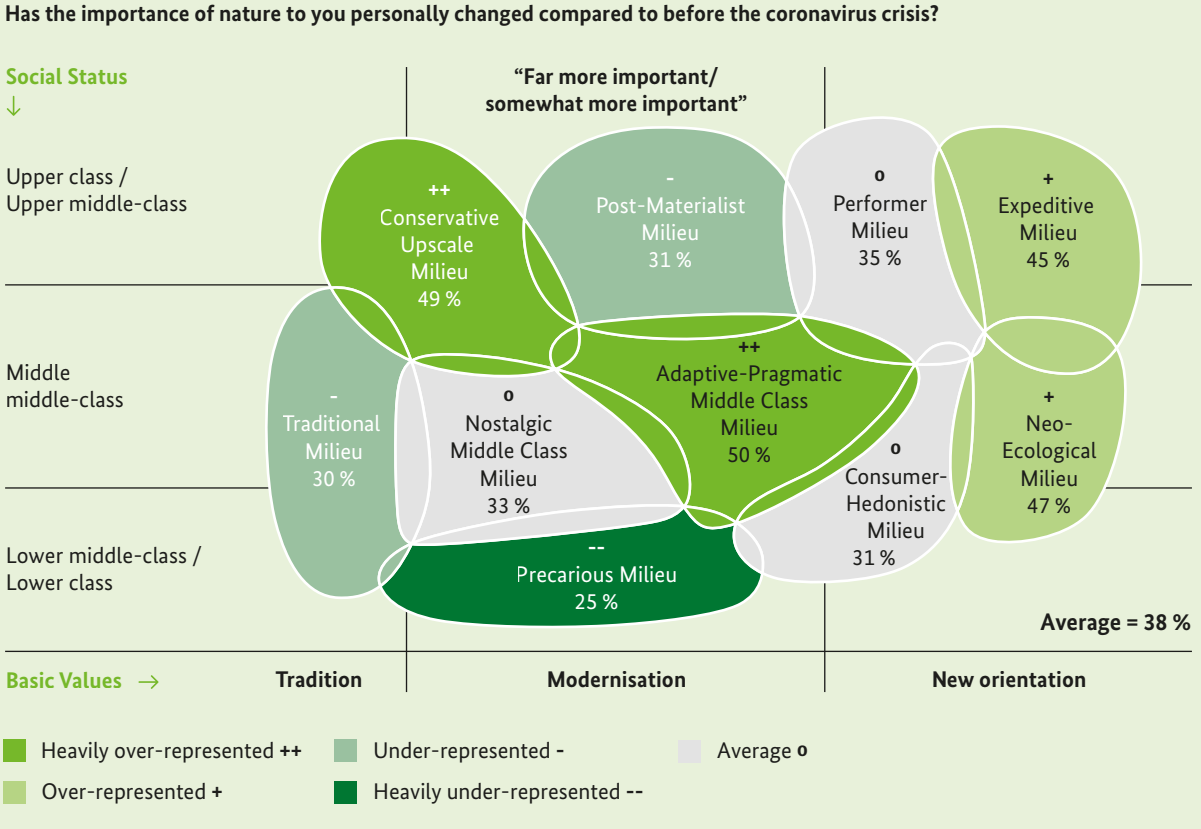
Figure 12: Altered appreciation of nature – adults and teenagers in comparison



sonal importance of nature depends more on the age of the respondents. In each case, it is the over-30s who state more frequently than the 18 to 29-year-olds that nature is part of a good life and that being in nature makes them happy. Furthermore, the proportion of those who say they do not feel comfortable in nature decreases with the age of the respondents (see Table 8).

Looking at the results of the youth survey (14 to 17-year-olds), it becomes further apparent that teenagers emphasise even more often than adults that nature is part of a good life (highest level of agreement: 65 percent compared to 50 percent for adults, see Figure 10). And this high approval rating by teenagers has not changed over time (highest approval rating in 2020: 66 percent). It is also interesting to note that when comparing teenagers (14 to 17-year-olds) with young adults (18 to 29-year-olds), the 18 to 29-year-olds state significantly more often that they do not feel comfortable in nature (both levels of agreement: 27 percent compared to 16 percent among teenagers).

Figure 13: Altered appreciation of the adult population for nature by milieu



The milieu perspective proves that in almost all social milieus, nature is largely appreciated. In each case, more than 80 percent say that nature is part of a good life and that being in nature makes them happy (both levels of agreement). Only in the group with strongly consumer-hedonistic-oriented values are both statements agreed with less frequently (around two-thirds in each case). A strong emotional closeness to nature is particularly evident in the milieus of the Conservative Upscale, the Post-Materialists, and the Traditionalists. This becomes clear when looking at the highest level of agreement. Sixty-seven percent of the Conservative Upscale, 60 percent of Post-Materialists, and 57 percent of Traditionalists unreservedly agree with the statement that being in nature makes them happy. This compares to only 16 percent in the fun and experience-oriented lifeworld.

For more than a third of Germans, nature has become more important during the pandemic.

Although emotional access to nature has decreased compared to 2019 on average in the population, there is also a not insignificant proportion of the adult population who state that the personal importance of nature has increased during the coronavirus crisis. For 38 percent of respondents, nature has become more important compared to the time before the pandemic (13 percent "far more important", another 25 percent "somewhat more important"). Sixty percent say their appreciation of nature has not changed. Only a fraction of two percent consider nature less important now compared to the time before the coronavirus crisis (see Figure 12).

The opinion that nature has become more important during the pandemic is emphasised above all by 18 to 29-year-olds (48 percent, average: 38 percent). People with a high level of education (42 percent) and high net household income (43 percent) also say this more often than average.

When comparing the youth survey with the adult survey, it is striking that teenagers (14 to 17 years) are more likely than adults to say that nature has become more important during the pandemic (teenagers: 44 percent, adults: 38 percent).

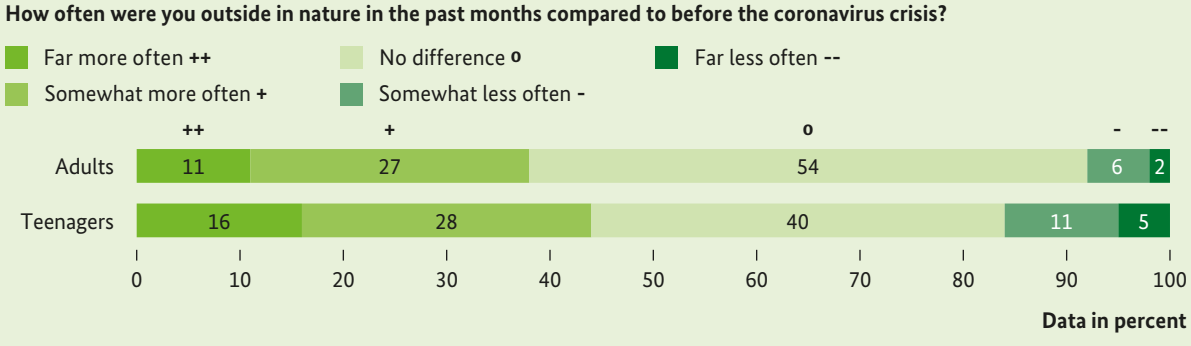
The milieu comparison shows that appreciation of nature has increased most significantly among the Adaptive Pragmatics, the Conservative Upscale, the Neo-Ecologicals, and the Expeditives (see Figure 13). Post-Materialists and Traditionalists were described as strongly nature-loving milieus even before the pandemic began. It is therefore not surprising that in these lifeworlds significantly fewer people state that nature has become even more important to them personally during the pandemic (31 percent and 30 percent respectively). The least change is noticeable in the socially weaker lifeworld. In this milieu, only a quarter say that nature has played a more important role in their lives since the coronavirus pandemic.

3.3 Spending time in nature during the pandemic

Thirty-eight percent of adults spend more time outdoors since the coronavirus crisis than before the pandemic, and among teenagers the figure is as high as 44 percent.

Of the adults surveyed, 38 percent say they have been outdoors more often in recent months than in the period before the coronavirus crisis. Eleven percent said they had been out in nature "far more often". Fifty-four percent spent just as much time in nature. Only eight percent were outdoors less frequently in

Figure 14: Spending time in nature during the pandemic – adults and teenagers in comparison



recent months than before the pandemic (see Figure 14).

The socio-demographic analysis makes it clear that among 18 to 29-year-olds, not only has their appreciation of nature increased during the pandemic, in this age group particularly many also state that they have spent more time in nature in recent months than in the time before the coronavirus crisis (far more often or somewhat more often: 44 percent and 48 percent respectively, average: 38 percent). In addition to 18 to 29-year-olds, people with a high level of formal education and high income were also more likely than average to have spent more time in nature during the pandemic (42 percent and 44 percent respectively).

Furthermore, the results of the youth survey show that teenagers are more likely than adults to say they have spent more time in nature in recent months (far more or somewhat more often) compared to before the coronavirus crisis (44 percent, adults: 38 percent).

In a milieu comparison, it is the Adaptive Pragmatists, who strive for security and stability, and the young Neo-Ecologicals, who are particularly open to new experiences, who claim to have spent more time in nature in recent months than before the coronavirus crisis began (53 percent and 48 percent respectively). Members of the Traditional milieu and the socially weaker lifeworld are the least likely to say that they have spent more time in nature since the pandemic (30 percent and 29 percent respectively).

4 Climate crisis and loss of biodiversity – perception of risk and awareness of the influence on nature and society

The climate crisis is one of the major environmental challenges of our time. In contrast to biodiversity, where the planetary boundary has already been exceeded (see Chapter 2), there is still a small chance of meeting the targets of the Paris Climate Agreement (well below 2 degrees Celsius, but if possible a maximum of 1.5 degrees Celsius of global warming compared to pre-industrial levels). But time is running out and global greenhouse gas emissions are still rising (see GCP 2021). The multiple restrictions on economic activities in the context of the COVID-19 pandemic caused global emissions to plummet by 5.4 percent in 2020, but by 2021 this short-term dip had been almost completely ironed out (see Jackson et al. 2021).

Social movements for more climate protection such as Fridays for Future, which received worldwide attention immediately before the outbreak of the coronavirus crisis, or extreme weather events such as the heavy rains in the summer of 2021 in western Germany, have ensured that the climate crisis continues to be highly relevant for a broad majority of the population despite the coronavirus (see BMUV and UBA 2022). At the same time, there are still voices that deny or downplay the climate change we are currently observing (see Björnberg et al. 2017). It is either claimed that climate change is not happening at all, or that it is happening but is due to natural causes alone, without human intervention. It is also not uncommon for people to argue that the climate crisis has no negative consequences at all or that it has more positive than negative consequences for nature and society on balance. These different types or levels of climate change denial are studied in more detail and their causes discussed in the social sciences (see Cohen 2001, Norgaard 2011). In this context, the 2021 Nature Awareness Study also asks how people assess the causes of climate change.

In addition to the causes of the climate crisis, this study asks about the feared effects. As part of the German Strategy for Adaptation to Climate Change (DAS) adopted in 2008, risk assessments are regularly carried out for various sectors and regions in Germany; the latest of these Climate Impact and Risk Assessments (KWRA) was published in 2021 (see UBA 2021). In the 2021 Nature Awareness Study, some of the DAS sectors were selected and supplemented with the area of "personal lifestyle" (today and in the future).

Scientific studies show that climate crisis and biodiversity are closely related (see Folke et al. 2021, Lade et al. 2019, Pörtner et al. 2021, Rockström et al. 2021). For example, forests not only absorb a great deal of carbon dioxide, but are also habitats for many animal and plant species. As a result, the positive contribution of nature conservation to climate protection is clearly emphasised (see Settele 2020, Shin et al. 2022). The 2021 Nature Awareness Study asks whether this connection is also recognised by citizens in Germany, whether they feel that their lifestyle is threatened by the climate crisis and the destruction of nature, and to what extent they believe that they can make a difference for the protection of nature and the climate through collective action and their own efforts.

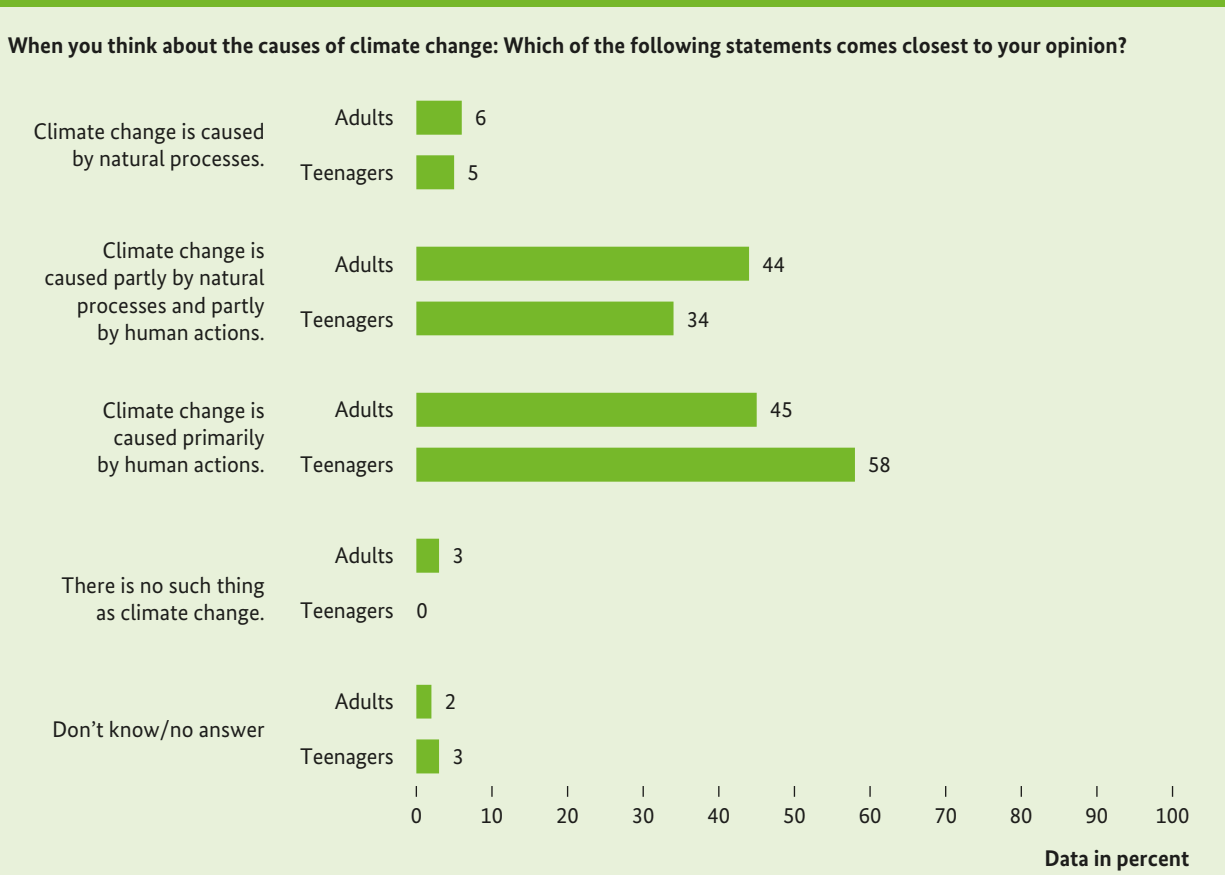
4.1 Causes and effects of climate change

The main cause of the change in the climate that has been observed for about the past 100 years is human activity, such as the burning of fossil fuels, land use changes, intensification of agriculture, or deforestation. The contribution of natural fluctuations in the global climate system is currently very small. There is now overwhelming scientific consensus on this (see Lynas et al. 2021). Nevertheless, the view is repeatedly expressed that climate change is a purely natural phenomenon or does not occur at all. How do people in Germany see it?

The people of Germany agree that climate change is a reality.

The results from the adult survey make it clear that only a small minority of three percent deny climate change. Two percent are not certain enough to answer. All others (95 percent) consider climate change to be a reality. Yet six percent of adults believe that climate change is caused by natural processes. Forty-four percent think that climate change is partly due to natural processes and partly due to human activity. The state of research – climate change is predominantly caused

Figure 15: Causes of climate change – adults and teenagers in comparison



by human activity (see Lynas et al. 2021) – is shared by 45 percent (see Figure 15). It is striking that the age group of 18 to 29-year-olds is below average in its opinion that climate change is mainly caused by human activity (38 percent). The figure is 44 percent for 30 to 49-year-olds and 48 percent for both the 50-65 and over-65 age groups.

Teenagers see climate change as being caused more by human activity than adults.

The results from the survey of teenagers (14 to 17 years) are interesting: Just four of the teenagers surveyed are of the opinion that there is no such thing as climate change (0.4 percent). Fifty-eight percent – a significant 13 percentage points more than among adults – think that climate change is mainly caused by human activity. Another 34 percent say climate change is partly due to natural processes and partly due to human activity (adults: 44 percent).

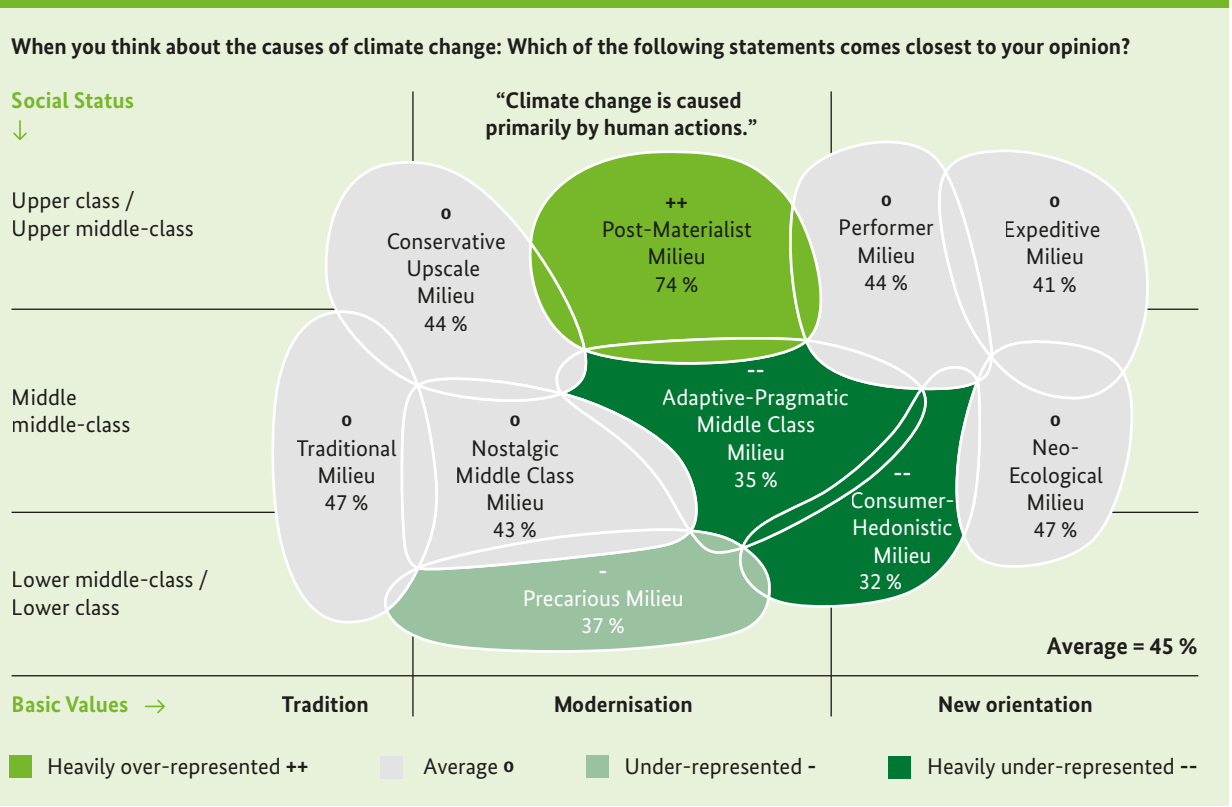
Post-Materialists in particular share the view that climate change is due to human activity.

Around three quarters of Post-Materialists, who are critical of society, are convinced that climate change is mainly caused by human activity. In contrast, it is 37 percent in the socially disadvantaged milieu, 35 percent in the modern mainstream (Adaptive Pragmatic Middle Class), and 32 percent in the fun and experience-oriented lifeworld. It is also striking that members of the fun and experience-oriented lifeworld are strongly overrepresented among climate deniers at eleven percent (average: three percent).

Three quarters of the adult population are convinced that extreme weather events are a consequence of climate change.

Those who had not denied climate change in the previous question were then asked about their views on the impact of climate change. The results show that of all the impacts surveyed, extreme weather events such as heat, drought, or heavy precipitation are seen most frequently as a consequence of climate change:

Figure 16: Causes of climate change according to adults by milieu



76 percent are convinced that climate change is causing extreme weather events (both levels of agreement). Forty-six percent are even very convinced of this. The fact that climate change will have these effects has long been emphasised by climate research, and this was also reconfirmed by the latest report from the global climate council IPCC (see IPCC 2022). At the forefront of respondents' minds, however, were most likely the catastrophic consequences of the July 2021 floods in North Rhine-Westphalia and Rhineland-Palatinate, which claimed 184 lives and caused a record loss of 33 billion euros (see Munich Re 2022). The German media reported extensively, and the connection to climate change was also highlighted repeatedly. This result is therefore easy to explain both from a climate science perspective and against the background of mass media reporting.

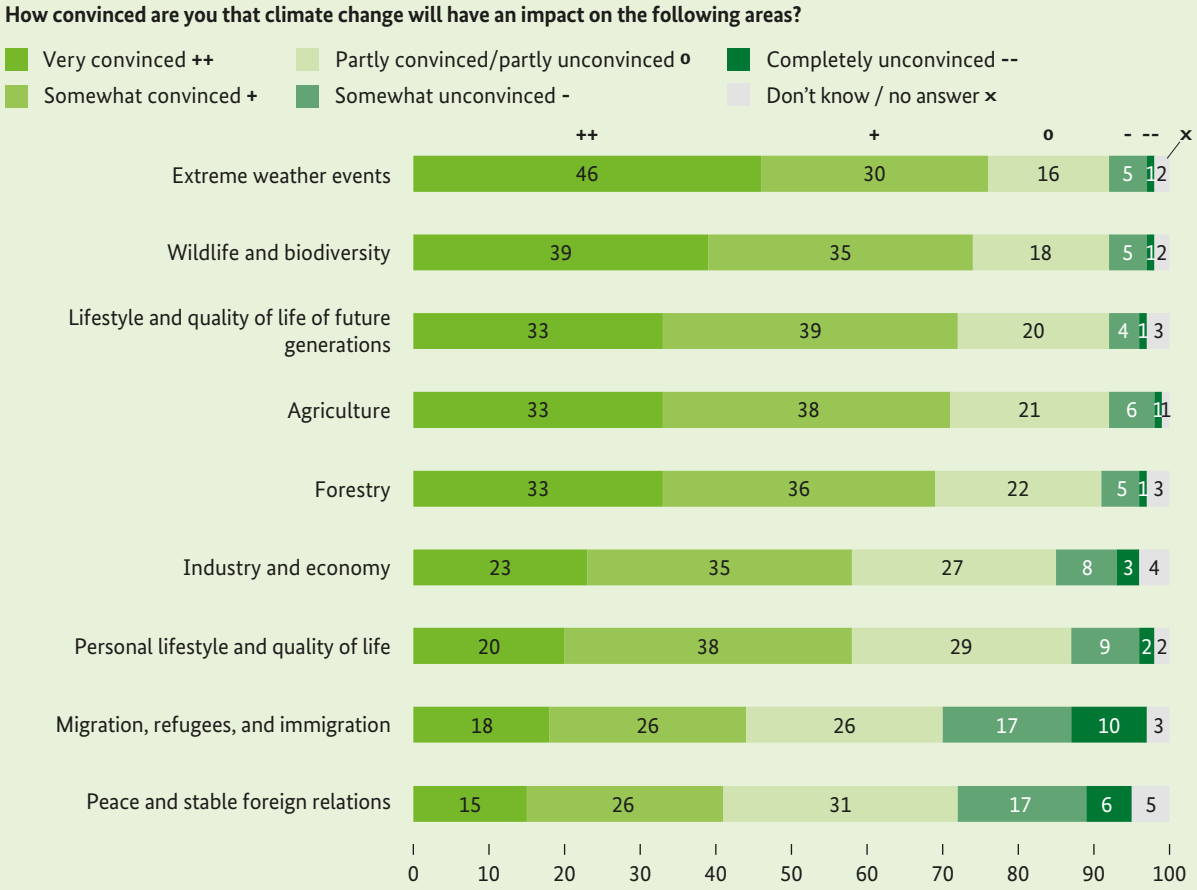
Wildlife species and biodiversity rank second among the perceived climate impacts. Thirty-nine percent are very convinced that climate change will have an impact on this area, another 35 percent answer with "somewhat convinced". The climate impact and risk analysis for Germany currently assesses the climate risk for biodiversity in Germany as "still low", but for the middle of the century as "medium" (optimistic case) or "medium-high" (pessimistic case) if no adaptation measures are taken (see Kahlenborn et al. 2021).[26]

The impact of climate change on the lifestyle and quality of life of future generations is seen third most often (very convinced: 33 percent, somewhat convinced: 39 percent), closely followed by the feared impact on agriculture (very convinced: 33 percent, somewhat convinced: 38 percent) and forestry (very convinced: 33 percent, somewhat convinced: 36 percent) (see Figure 17).

The majority also assume that climate change has an impact on industry and the economy (23 percent, somewhat convinced: 35 percent) and on their own lifestyle or quality of life (very convinced: 20 percent, somewhat convinced: 38 percent). Respondents are less convinced of possible consequences in the areas of "migration, refugees, and immigration" (very convinced: 18 percent, somewhat convinced: 26 percent) and "peace and stable foreign relations" (very convinced: 15 percent, somewhat convinced: 26 percent).

As the findings show, respondents see the quality of life of future generations as being more affected by

Figure 17: Convictions about the effects of climate change among the adult population



Basis: only people who did not answer "There is no such thing as climate change"

Data in percent

climate change than the quality of life of the current generation. While this result is understandable, the relatively small proportion of those who are unreservedly convinced of effects on their own quality of life (very convinced: 20 percent) indicates a general underestimation of the effects on oneself. It can already be observed today that the frequency and intensity of heat events (daily maximum temperature above 30 degrees Celsius) has increased significantly; depending on the climate change scenario, heat will already increase significantly by 2050. Heat is perceived very differently depending on age and constitution – older people in particular, but also chronically ill people, pregnant women, and small children have increased health risks here. Between 1992 and 2017, according to evaluations by the Robert Koch Institute, around 2,500 people died each year in this context, mostly older people (an der Heiden et al. 2020).[27] Demographic change – together with climate change – increases the vulnerability of the German population to heat-related morbidity and mortality.

In the socio-demographic analysis of the findings, different assessments of the effects of climate change can be seen depending on the level of education. People with a high level of formal education are slightly more often convinced of the existence of climate impacts than people with a low level of formal education (both levels of agreement, see Table 9). In addition, 18 to 29-year-olds see the impact of climate change on extreme weather events, agriculture, and forestry as somewhat less pronounced than the older respondent groups. Plus, people with high net household incomes are more likely than average to fear that climate change will have consequences for the quality of life of their own and future generations, for agriculture, and for migration and refugee movements.

Table 9: Feared effects of climate change in the adult population by age, education, and income

How convinced are you that climate change will have an impact on the following areas?

Response category: "very/somewhat convinced" Data in percent	Average	Age (years)				Educational level			Net household income (euros)			
	Ø	under 29	30 to 49	50 to 65	over 65	Low	Aver-age	High	up to 999	1,000 to 1,999	2,000 to 3,499	3,500 and more
Extreme weather events	76	↓↓69	75	81 ↑	77	↓ 72	78	78	↓ 68	77	75	79
Wildlife and biodiversity	74	70	74	77	74	↓ 70	75	77	↓ 64	72	75	78
Lifestyle and quality of life of future generations	72	67	72	76	72	↓↓66	74	76 ↑	↓ 64	72	71	78↑↑
Agriculture	71	↓↓63	71	74	73	↓↓66	73	75 ↑	66	68	71	75 ↑
Forestry	69	↓ 62	68	73	69	↓↓61	72	73 ↑	63	67	69	72
Industry and economy	58	54	57	62	59	56	58	60	52	57	59	59
Personal lifestyle and quality of life	58	55	58	60	59	55	58	62	52	57	58	63 ↑
Migration, refugees, and immigration	44	47	45	43	40	↓ 39	42	49 ↑	39	41	41	51↑↑
Peace and stable foreign relations	41	43	41	40	38	37	38	45 ↑	40	39	40	44

Heavily over-represented ↑↑ Over-represented ↑ Under-represented ↓ Heavily under-represented ↓↓

Basis: only people who did not state "There is no such thing as climate change"

Post-Materialists, Expeditives, and the Conservative Upscale are most convinced of the effects of climate change.

Differentiated according to social milieus, the findings make it clear that three lifeworlds are particularly often very or somewhat convinced of the consequences of climate change – the educated elite (Post-Materialists), the old structurally conservative elite (Conservative Upscale), and the post-modern elite (Expeditives) (see Table 10). Among the Neo-Ecologicals, it is noticeable that of all milieus they most frequently assume effects on the areas of migration/refugees/immigration (58 percent) as well as peace and stable foreign relations (55 percent). This relatively young milieu, which is well networked via social media, is obviously more sensitised to the indirect consequences of climate change – namely those consequences that arise elsewhere on Earth but only indirectly affect the situation in Germany through conflicts, trade chains, or migration events.

Furthermore, it can be seen that risk awareness for the consequences of climate change is significantly lower in the Adaptive Pragmatic Middle Class, among members of the socially disadvantaged milieu, and in the fun and experience-oriented lifeworld. Risk awareness is by far the lowest in the fun and experience-oriented lifeworld. For example, in this milieu only 38 percent are very or somewhat convinced that climate change will have an impact on agriculture (average: 71 percent). The comparison between people in precarious living conditions and people with an experience-oriented, consumer-hedonistic value orientation makes it clear that it is not so much income as lifestyle and value orientations that determine awareness of the consequences of climate change. Although the members of the precarious milieu have on average a lower household income than the members of the fun and experience-oriented milieu, the risk awareness of the group focused on consumption and entertainment is significantly lower again. Here, it is obviously the basic orientation towards life (enjoying life today and not letting anyone spoil the fun) that leads to a broad disregard of the indirect, but also the direct consequences of climate change.

Table 10: Feared effects of climate change in the adult population by milieu

How convinced are you that climate change will have an impact on the following areas?

Ø = Average
CON = Conservative Upscale
PMA = Post-Materialist
PER = Performer
EPE = Expeditive
NEO = Neo-Ecological
ADA = Adaptive Pragmatic Middle Class
HED = Consumer Hedonistic
PRE = Precarious
NOS = Nostalgic Middle Class
TRA = Traditional

Response category: "very/somewhat convinced" Data in percent	Ø	CON	PMA	PER	EPE	NEO	ADA	HED	PRE	NOS	TRA
Extreme weather events	76	86↑↑	89↑↑	78	87↑↑	75	↓ 70	↓↓46	↓ 70	71	80
Wild species and biodiversity	74	83↑↑	89↑↑	75	88↑↑	81 ↑	↓↓62	↓↓47	68	↓ 68	74
Lifestyle and quality of life of future generations	72	82↑↑	89↑↑	67	84↑↑	75	↓ 65	↓↓52	↓↓60	↓ 66	75
Agriculture	71	80↑↑	86↑↑	71	80↑↑	73	↓↓62	↓↓38	↓↓62	71	75
Forestry sector	69	80↑↑	83↑↑	68	79↑↑	71	↓↓60	↓↓38	↓↓55	71	72
Industry and economy	58	67↑↑	64	53	73↑↑	64	54	↓↓38	↓↓47	56	62
Personal lifestyle and quality of life	58	68↑↑	72↑↑	55	69↑↑	63	55	↓↓29	↓ 50	↓ 52	61
Migration, refugees, and immigration	44	47	55↑↑	39	56↑↑	58↑↑	43	↓↓28	↓↓30	42	↓↓34
Peace and stable foreign relations	41	48 ↑	46	36	48 ↑	55↑↑	45	↓↓21	↓↓30	↓ 33	37

Heavily over-represented ↑↑ Over-represented ↑ Under-represented ↓ Heavily under-represented ↓↓

Basis: only people who did not state "There is no such thing as climate change"

4.2 Perceptions of threats and effectiveness

In order to find out whether people in Germany recognise a connection between the climate crisis, biodiversity, and nature conservation, respondents were asked to indicate to what extent they believe that climate change threatens biodiversity and that nature conservation is a necessity in order to meet the challenges of climate change. Those who had stated that there was no such thing as climate change were excluded from these questions.

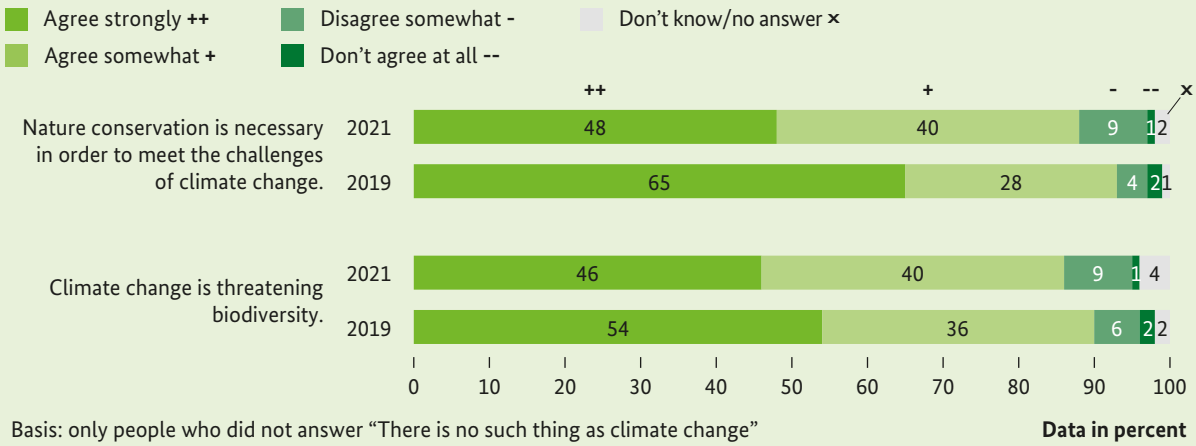
Around 90 percent of adults see nature conservation as a necessity to meet the challenges of climate change.

Eighty-six percent of respondents are of the opinion that climate change threatens biodiversity, 46 percent are even "very convinced" of this (see Figure 18). Men are somewhat less convinced (highest level of agreement: 42 percent), as are 18 to 29-year-olds (41 percent) and respondents with a low level of formal education (44 percent). It is similar with the statement that nature conservation is necessary to meet the challenges of climate change: 48 percent agree strongly, another 40 percent agree somewhat. Again, it is the 18 to 29-year-olds (highest level of approval: 41 percent) and respondents with a low level of formal education (40 percent) whose agreement is somewhat more restrained.

Compared to the previous survey, the proportion of those who completely agree that climate change is a threat to biodiversity has decreased (see Figure 18): In 2019, 54 percent strongly agreed that climate change posed a threat to biodiversity, compared to 46 percent in the current measurement. The proportion of those who strongly agree that nature conservation is necessary to meet the challenges of climate change has also fallen – from 65 percent in 2019 to 48 percent in 2021.

This decline must be seen against the backdrop of the ups and downs in public reporting on climate change (see Boykoff et al. 2022). 2019 was a year of unusually high-intensity climate reporting, not least due to the global Fridays for Future protests. The following year, the coronavirus pandemic broke out, becoming the centre of public attention continuously into 2021. It may be assumed that this process also influenced

Figure 18: Perception of threats among the adult population compared over time



Basis: only people who did not answer "There is no such thing as climate change"

Data in percent

perceptions of the threat of climate change – the Nature Awareness Studies of the following years will no doubt show this.

The milieu analysis reveals major differences: Post-Materialists and the Conservative Upscale are far more likely than average to express the belief that climate change threatens biodiversity and that nature conservation is necessary to meet the challenges of climate change. Significantly less conviction comes from the Adaptive Pragmatists, the lifeworld in a socially weaker position, and above all from the consumption and experience-oriented group (see Table 11). This reinforces a constellation of milieus that was already apparent in the previous questions:

The members of the Adaptive Pragmatic Middle Class, the socially weaker milieu, and above all the (lower) middle class, which is focused on consumption and entertainment, show significantly lower values than the average across all milieus, both in diagnosing problems and in assessing the necessity for action. If we take the core characteristics of the lifestyle and value attitudes of these three lifeworlds as an interpretive background, then we can assume that there are three barriers to more clearly perceiving the double crisis of "climate change and biodiversity loss": scarce financial resources, fun in the here and now, and a subjective-pragmatic utilitarian thinking (Adaptive Pragmatic Middle Class).

Table 11: Perceptions of threats in the adult population by milieu

What do you think about the following statements?

Ø = Average
CON = Conservative Upscale
PMA = Post-Materialist
PER = Performer
EPE = Expeditive
NEO = Neo-Ecological
ADA = Adaptive Pragmatic Middle Class
HED = Consumer Hedonistic
PRE = Precarious
NOS = Nostalgic Middle Class
TRA = Traditional

Response category: "agree strongly" Data in percent	Ø	CON	PMA	PER	EPE	NEO	ADA	HED	PRE	NOS	TRA
Nature conservation is necessary in order to meet the challenges of climate change.	48	59↑↑	76↑↑	45	52	46	↓↓36	↓↓15	↓↓37	44	53
Climate change is threatening biodiversity.	46	63↑↑	73↑↑	41	49	47	↓↓36	↓↓16	↓↓35	41	50

Heavily over-represented ↑↑ Heavily under-represented ↓↓

Basis: only people who did not answer "There is no such thing as climate change"

Given the scale, complexity, and speed with which climate action must be taken to meet the goals of the Paris Climate Agreement, purely individual efforts (waste separation, purchasing ecological products, vegan diet, and so on) are very unlikely to be sufficient. Collective action is necessary, for example to achieve political majorities for more climate protection. This raises the question of how the effectiveness of action is perceived (see Bostrom et al. 2018, Hamann and Reese 2020, Fritsche et al. 2021, Masson and Fritsche 2021). How effective do people consider their own actions and their actions in the collective?

Only a small minority believe that they are unable to contribute to the protection of nature and the climate, either personally or collectively.

Sixty percent believe that we in Germany can work together to achieve something to protect nature and the climate (both levels of agreement, see Figure 19), and 59 percent say that we in Germany are in a position to work together to protect nature and the climate (both levels of agreement). Furthermore, 48 percent think they can also personally achieve something to protect nature and the climate (both levels of agreement), and 44 percent think they are personally in a position to make an active contribution to protect nature and the climate (both levels of agreement). In this context, 47 percent say they are afraid that the climate crisis and the destruction of nature will negatively impact their own lifestyle (both levels of agreement).

The fact that collective effectiveness (achieved through joint efforts) is rated higher than individual effectiveness by the respondents is not a surprising finding given the size of the task. What is more interesting is that only very few respondents somewhat disagree or don't agree at all that they can make a difference, either collectively or personally. For example, only eight percent "somewhat disagree" and only four percent "don't agree at all" that we in Germany can work together to achieve something to protect nature and the climate.

Figure 19: Individual and collective perceptions of effectiveness in the context of climate change – adults and teenagers in comparison

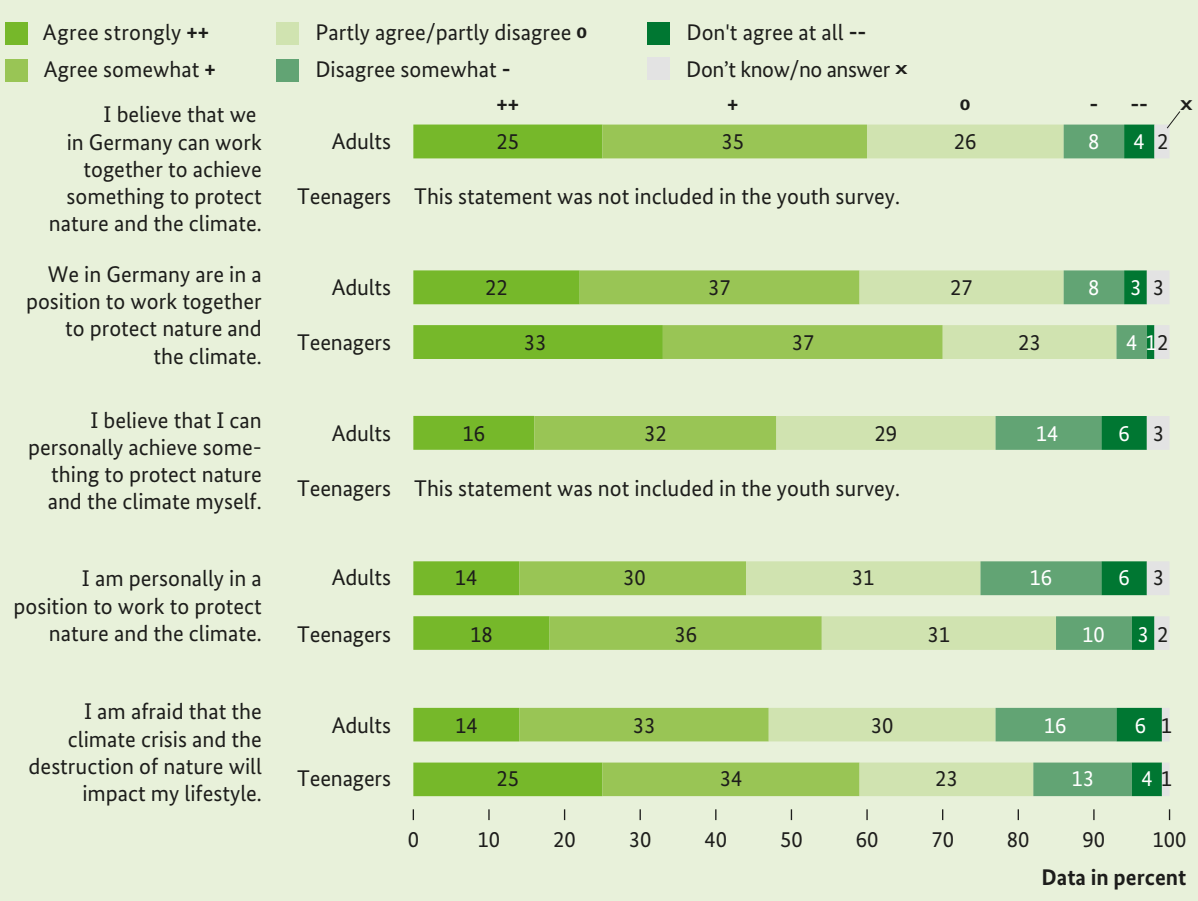


Table 12: Individual and collective perceptions of effectiveness among the adult population by milieu

Below you can see some statements on the topic of climate and nature. To what extent do you personally agree with the statements?

Ø = Average
CON = Conservative Upscale
PMA = Post-Materialist
PER = Performer
EPE = Expeditive
NEO = Neo-Ecological
ADA = Adaptive Pragmatic Middle Class
HED = Consumer Hedonistic
PRE = Precarious
NOS = Nostalgic Middle Class
TRA = Traditional

Response category: "agree strongly" Data in percent	Ø	CON	PMA	PER	EPE	NEO	ADA	HED	PRE	NOS	TRA
I believe that we in Germany can work together to achieve something to protect nature and the climate.	60	75↑↑	76↑↑	62	76↑↑	70↑↑	54	↓↓26	↓↓43	↓ 49	58
We in Germany are in a position to work together to protect nature and the climate.	59	78↑↑	77↑↑	59	77↑↑	70↑↑	57	↓↓30	↓↓45	↓↓44	↓↓53
I believe that I can personally achieve something to protect nature and the climate myself.	48	65↑↑	65↑↑	48	69↑↑	65↑↑	43	↓↓21	↓↓36	↓↓35	↓↓36
I am personally in a position to make an active contribution to protect nature and the climate.	44	58↑↑	58↑↑	42	67↑↑	63↑↑	46	↓↓24	↓↓25	↓↓26	↓↓28
I am afraid that the climate crisis and the destruction of nature will impact my lifestyle.	47	60↑↑	52	↓↓32	67↑↑	53	48	↓↓25	↓ 38	42	40

Heavily over-represented ↑↑ Under-represented ↓ Heavily under-represented ↓↓

The oldest respondents and those with a low level of formal education express the least confidence overall that they can do something themselves to protect nature and the climate. Thus, only 35 percent of the over-65s and 36 percent of those with a low level of education agree strongly or somewhat that they are personally in a position to make an active contribution to protect nature and the climate. This contrasts with 51 percent of 18 to 29-year-olds and 52 percent of those with a high level of formal education. In the group with a high household income, too, an above-average number agree that they are personally in a position to make an active contribution to protect nature and the climate (both levels of agreement: 54 percent).

Furthermore, it is evident that collective action is seen as effective especially by women and people with high incomes. For example, 65 percent of women and 67 percent of high-income respondents believe that we in Germany can work together to achieve something to protect nature and the climate. Among men, it is 54 percent and in the group with a low level of formal education 55 percent.

Teenagers express more confidence that they can personally and collectively achieve something to protect nature and the climate.

The results of the youth survey make it clear that teenagers are more confident than adults about getting involved in protecting nature and the climate together with others and as individuals. Seventy percent of 14 to 17-year-olds think that we in Germany are in a position to work together to protect nature and the climate (adults: 59 percent) and 54 percent say they are also in a position to get involved on a personal level (adults: 44 percent). In addition, teenagers are much more likely than adults to say they are afraid that the climate crisis and the destruction of nature will affect their lifestyle (59 percent compared to 47 percent of adults).

Collective and individual perceptions of effectiveness are least pronounced in the traditional mainstream, in the fun and experience-oriented lifeworld, and in the socially disadvantaged milieu.

A clear picture emerges when looking at the milieu findings. Both collective and individual effectiveness are rated higher among the Conservative Upscale,

Post-Materialist, Expeditive, and Neo-Ecological milieus than among the other milieus. On the other hand, the belief in being able to make an active contribution to protect nature and the climate, either personally or collectively, is much weaker in the traditional mainstream (Nostalgic Middle Class milieu, Traditional milieu), among members of the socially weaker milieu, and in the fun and experience-oriented lifeworld (see Table 12). Members of the traditional mainstream and the socially weaker milieu share concerns about securing prosperity, equal opportunities, and the feeling that they are no longer being heard. On the other hand, the members of the fun and experience-oriented lifeworld see themselves as unburdened pleasure-seekers who function in their jobs but mainly want entertainment in their leisure time. Among the progress-oriented performers, it is striking that they comparatively rarely fear that the climate crisis and the destruction of nature could affect their own lifestyle.

5 Change – responsibility, transformative change, and technological progress

As planetary boundaries are being exceeded, the debate on the need for a "major transformation" of the economy and society (WBGU 2011) has reignited. The 2020 Environmental Awareness Study asked for the first time about Germans' willingness for transformation and revealed strong support values for a consistent climate policy, but also great willingness to make personal behavioural changes (see BMUV and UBA 2022). Transformative environmental policy is not a departure from previous environmental policy, but rather a complement to it (see Jacob et al. 2020). However, the range of what is understood by "transformation" is very wide. While some understand this to mean structural change towards a climate-friendly and green economy (see Hünecke et al. 2020), others are focused on a post-growth society (see Roos 2020) or even overcoming capitalism in the sense of a sustainability revolution (see Dörre 2019). There is a correspondingly wide range of views on the opportunities and risks involved in the concept of transformation in the field of sustainability (see Luks 2019). Since a uniform conceptual understanding of socio-ecological transformation has not yet emerged, we want to leave it at a definition that is as simple as it is sufficiently vague – a comprehensive change in lifestyles and economic activities.

On the one hand, this chapter deals with the question of whether a change in lifestyles and economic activities for more nature conservation should be initiated, and, if so, by whom. On the other hand, it also addresses the role that selected technologies can play in this – here using the examples of renewable energies, agro-genetic engineering, and digitalisation. The introductory question enquired about which policy areas respondents currently perceive as most important. This not only provides an insight into the political priorities that citizens currently have, but also examines the importance they assign to the broad policy area of nature, environmental, and climate protection. Furthermore, we wanted to know which actors people mainly see as holding responsibility for the protection of nature in particular. In addition to sectoral actors (for example agriculture), the political levels in the federal system (federal, state, municipal) as well as the citizens themselves are suggested as potential contributors. For each of these actors, respondents are asked to state whether they are involved enough, too little, or even too much in nature conservation.

In continuation of the previous Nature Awareness Studies, emotional and moral aspects of nature endangerment and conservation were also examined this year. How angry does it make people that others treat nature carelessly? Do they perceive it as a duty to protect nature? And to what extent is the principle of sustainable use of nature accepted? While the question of the priority of nature conservation in relation to economic interests is repeatedly asked in the Nature Awareness Studies, the questions about willingness to make a fundamental change in lifestyles and economic activities – both on a collective level and with a view to oneself – are new to the 2021 Nature Awareness Study.

The public's attitude towards the energy transition has been investigated in the Nature Awareness Study series from the very beginning. The combination of nuclear phase-out and climate protection, which is characteristic of the German energy transition, means that the expansion of renewable energies must take place particularly quickly and comprehensively. The challenges involved in this are enormous and carry considerable potential for conflict (see the Copernicus Project Ariadne 2021). The coalition government of SPD, Bündnis 90/Die Grünen, and FDP, which has been in office since December 2021, has therefore set out to drive forward the energy transition, among other things by accelerating approval procedures for renewable energies (see BMWK 2022). Russia's war against Ukraine and its political and economic consequences have also made the rapid expansion of renewable energies – especially with regard to the heating and mobility sector – a necessity in the arena of foreign policy and security policy. However, this aspect is not yet reflected in this year's Nature Awareness Study.

Even today, though, there is a great deal of local protest against the expansion of wind power plants or the power grid. In addition to the question of health impacts and the involvement of citizens, which is considered inadequate, nature conservation often plays a major role in these conflicts (see Hoeft et al. 2017, Hübner 2019, Reusswig et al. 2016). That is why environmental and nature conservation associations are often found on the side of those who actively oppose specific projects. However, right-wing populist arguments against the energy transition have also

been voiced in recent years – especially with regard to the expansion of wind power and the coal phase-out (see Eichenauer et al. 2018, Radtke et al. 2020, Reusswig et al. 2020). These are statements made by a small but vocal minority who are able to generate resonance through social media and party political connections (see Reusswig and Schleer 2021). This is without prejudice to objectively justified nature conservation concerns about individual energy transition projects. The Federal Agency for Nature Conservation supports the environmentally friendly expansion of renewable energies with its research funding (see BfN 2018, Riedl et al. 2020).

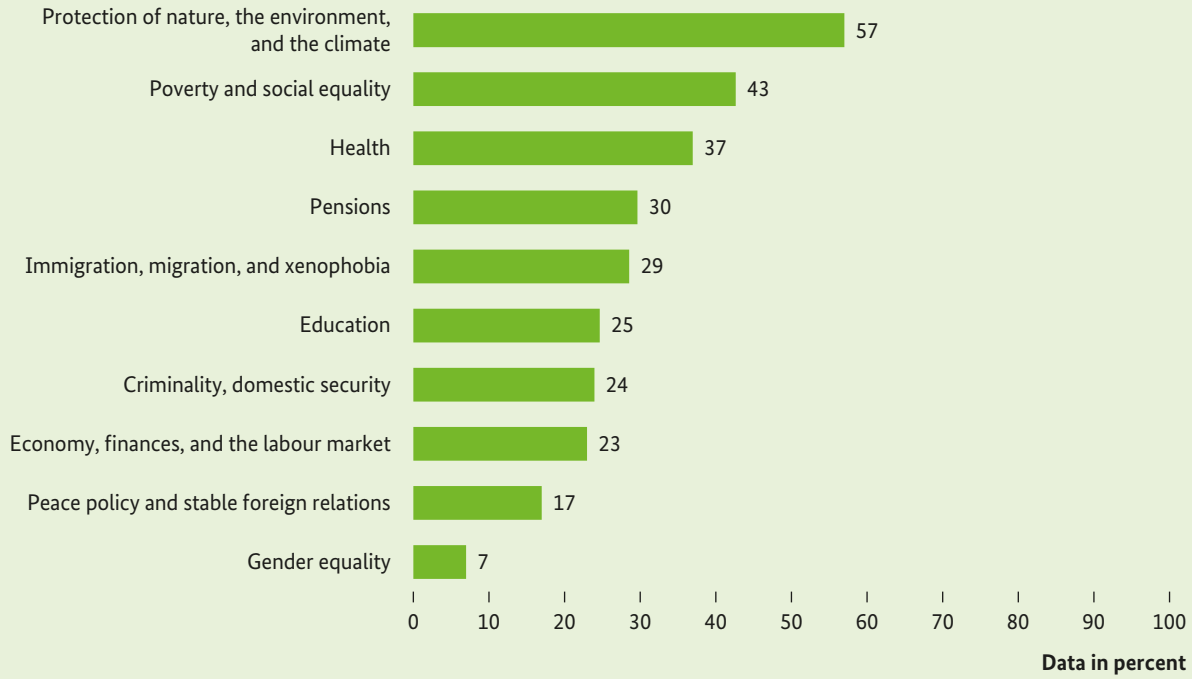
This year, too, the 2021 Nature Awareness Study continues the long-running data series on general acceptance of the energy transition. A new addition is the question of whether people would support implementation of the energy transition due to climate protection despite possible negative impacts on nature (biodiversity, landscape).

This chapter concludes with questions on genetic engineering and digitalisation. Undoubtedly, there are significant differences between these two fields of technology. Nevertheless, both technology areas can have significant impacts in terms of nature conservation. As in the past Nature Awareness Studies, the survey asks about approval of compulsory labelling of genetically modified food. The question on how people view newer genetic engineering methods, which also include genome editing, for example "gene scissors", was repeated, too. Technical progress has been made here, but it is accompanied by new risks (see Kawall et al. 2020). In this respect, it is interesting to find out what the population thinks of these new procedures.

The questions on digitalisation – a field of technology that is highly relevant to transformation – examine the extent to which digital offerings can replace, prevent, or enhance actual experiences of nature. The background to this is the debate about the advantages and disadvantages of digital media and usage patterns for sustainable development in general and nature conservation in particular (see Höfner and Frick 2019). To go into more detail in this context, people were also asked whether they could imagine using a conservation app that provides information about threats to nature conservation and points out personal opportunities for action, for example.

Figure 20: The most important policy areas according to the adult population (top 3)

Which of the policy areas named below are currently most important in your opinion? Please name the three most important policy areas for you.



5.1 Policy areas ranking: Perceived significance of the protection of nature, the environment, and the climate

In order to examine the importance that the population attaches to the protection of nature, the environment, and the climate in the context of other policy areas, the respondents were presented with a list of ten policy areas, of which they were asked to name the three that they considered to be the most important.

More than half of the population ranks the protection of nature, the environment, and the climate among the most important tasks of politics.

With 57 percent of mentions, the protection of nature, the environment, and the climate is by far the most frequently mentioned among the three most important policy areas (see Figure 20). The second most frequently mentioned topic is poverty and social equality (43 percent), and the third is health (37 percent). These are followed by the policy areas of pensions (30 percent); immigration, migration, and xenophobia (29 percent); education (25 percent); crime, domestic security (24 percent); economy, finance, labour market (23 percent); peace policy and stable foreign relations (17 percent); and gender equality (seven percent).

A policy area ranking is naturally very dependent on which topics and problems are currently occupying a society and being discussed in the mass media. It must thus be borne in mind for the rating of the importance of "peace policy and stable foreign relations" that the survey of the present study took place before Russia's attack on Ukraine (in February 2022). The topic of health in third place is not surprising in times of a pandemic – the same goes for the performance of gender equality in the context of other, currently burning issues. However, the results of the policy area ranking clearly show that the population attaches the highest importance to the protection of nature, the environment, and the climate.[28]

The socio-demographic analysis reveals that the protection of nature, the environment, and the climate is still slightly more frequently counted by women than by men as one of the three most important policy areas (61 percent compared to 53 percent). People with a high level of formal education (62 percent) and a high net household income (63 percent) also rank the protection of nature, the environment, and the climate among the three most important policy areas

Table 13: Policy areas ranking: Perceived significance of the protection of nature, the environment, and the climate among the adult population by gender, education, and income

Which of the policy areas named below are currently most important in your opinion? Please name the three most important policy areas for you.

Data in percent	Average	Gender		Educational level			Net household income (euros)			
	Ø	M	F	Low	Average	High	up to 999	1,000 to 1,999	2,000 to 3,499	3,500 and more
Protection of nature, the environment, and the climate	57	↓ 53	61 ↑	↓↓49	60	62 ↑	52	54	57	63↑↑
Poverty and social equality	43	40	45	46	41	41	57↑↑	46	42	↓↓36
Health	37	↓ 33	41 ↑	39	39	↓ 33	36	39	37	34
Pensions	30	30	30	43↑↑	29	↓↓18	35	37↑↑	28	↓↓22
Immigration, migration, and xenophobia	29	32	26	31	28	28	↓ 21	27	30	31
Educational level	25	24	26	↓↓18	23	33↑↑	20	↓ 20	25	31↑↑
Criminality, domestic security	24	27	21	25	24	22	18	25	24	23
Economy, finances, and the labour market	23	26	21	21	23	25	20	21	24	25
Peace policy and stable foreign relations	17	18	15	↓↓13	17	21↑↑	13	16	17	19
Gender equality	7	6	8	5	7	8	7	5	7	8

Heavily over-represented ↑↑ Over-represented ↑ Under-represented ↓ Heavily under-represented ↓↓

more frequently than average. It is worth noting that for almost all socio-demographic groups considered, the protection of nature, the environment, and the climate is the most important policy area (see Table 13). Only in the group with a net household income of less than 1,000 euros is it not in first place (instead it is poverty and equality: 57 percent), but in second place (52 percent).

The milieu analysis also confirms that the protection of nature, the environment, and the climate is highly valued by the population. However, the differences between the milieus are much greater. While 79 percent of sustainability-oriented Post-Materialists, 73 percent of the responsible Conservative Upscale, and 72 percent of the young and mobile Expeditive milieu rank the protection of nature, the environment, and the climate among the three most important policy areas, the figure is 44 percent among the Adaptive Pragmatic Middle Class, 38 percent among people in precarious living conditions, and 30 percent among people with an experience-oriented, consumer-hedonist value orientation.

5.2 Responsibility for the protection of nature

Business and industry are most often held accountable.

Nature conservation is no different from environmental or climate protection: These are complex community tasks in which many actors must participate in order to achieve success. However, it is questionable whether they are already doing this to a sufficient extent. In the opinion of the respondents, business and industry should primarily be responsible for doing more to protect nature (see Figure 21). Sixty-five percent consider the involvement of business and industry to be insufficient. The efforts of the federal government (too little: 61 percent), their own state government (56 percent), citizens (50 percent), and their own city and municipal councils (49 percent) are also rated as inadequate by a large proportion of respondents. Respondents are somewhat less critical of the involvement of the agriculture and forestry sectors (46 percent and 38 percent respectively). People gave by far the best rating to environmental and na-

Figure 21: Responsibility for the protection of nature among the adult population

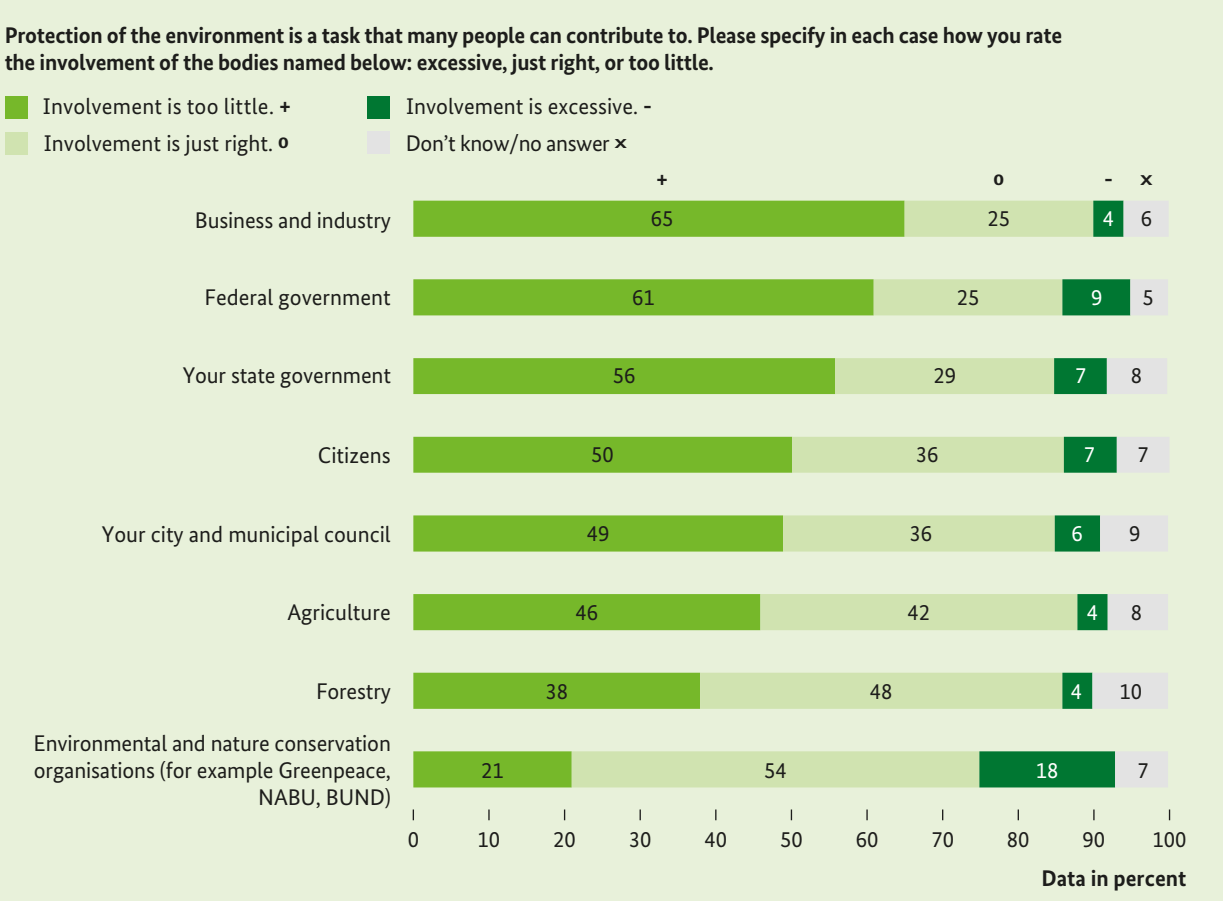
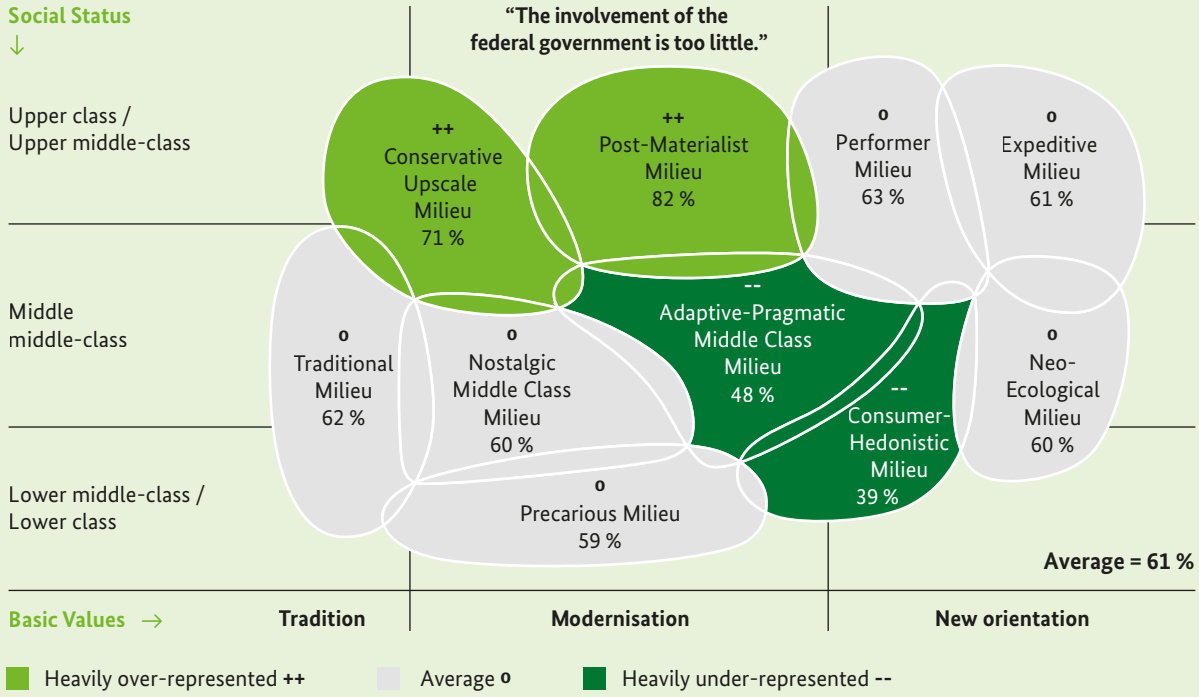


Figure 22: Responsibility for the protection of nature among the adult population by milieu

Protection of the environment is a task that many people can contribute to. Please specify in each case how you rate the involvement of the bodies named below.



ture conservation associations: Only 21 percent consider the involvement of environmental and nature conservation associations to be too little, 54 percent perceive it to be just right, and 18 percent even think that the involvement of nature and environmental protection associations is excessive.

The socio-demographic differences are very small. It is worth mentioning that those aged 18-29 (57 percent) and those with a low level of formal education (60 percent) perceive the involvement of business and industry to be too little at a lower than average rate (average: 65 percent). Moreover, women are slightly more likely than men to rate the federal government's efforts as insufficient (64 percent compared to 58 percent). The 50-65 age group is the most likely to hold its own state government accountable (too little involvement: 62 percent, average: 56 percent).

In the comparison of milieus, it is above all the Post-Materialists and the Conservative Upscale who complain that social actors are not doing enough. Far less criticism comes from the modern, non-ideological Adaptive Pragmatist Middle Class and the fun and experience-oriented lifeworld. For example, 82 percent of Post-Materialists and 71 percent of the Conservative Upscale say that the federal government's involvement is too little. Conversely, the figure is 48 percent of the Adaptive Pragmatic Middle Class and 39 percent of the fun and experience-oriented lifeworld (see Figure 22).

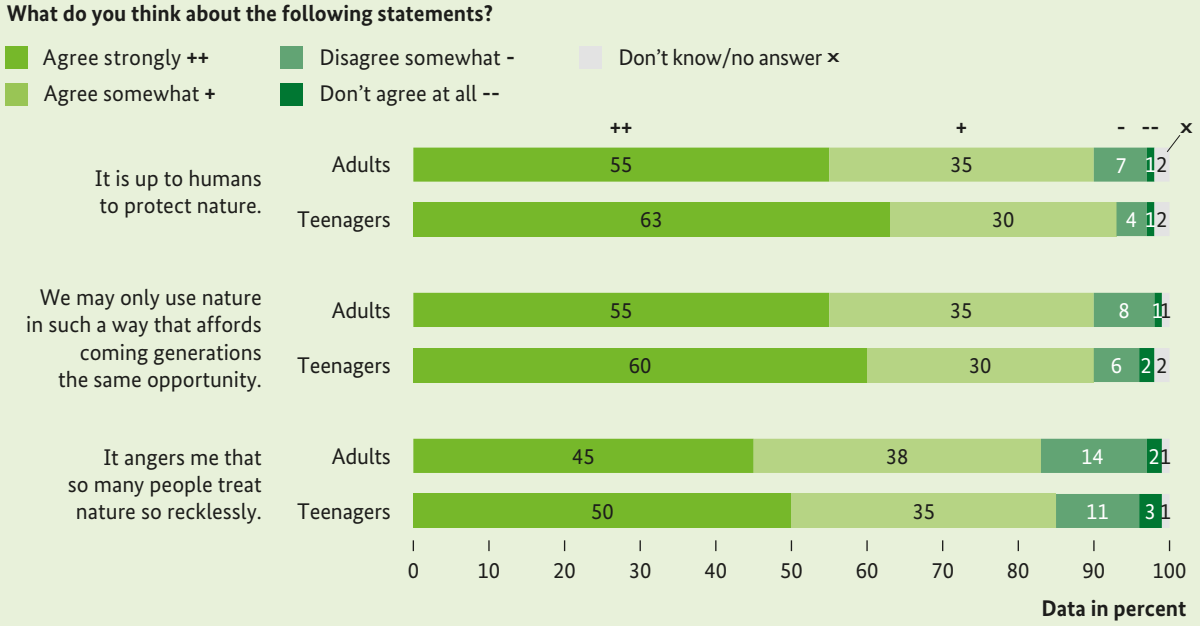
5.3 Attitudes towards the endangerment and protection of nature

Nine out of ten Germans believe that the protection of nature is the responsibility of humans.

Eighty-three percent of adults surveyed are annoyed that many people are so careless with nature (both levels of agreement). Ninety percent say that it is the duty of humans to protect nature, and 90 percent likewise think that we should only use nature in such a way that this will also be possible to the same extent for future generations (see Figure 23).

The socio-demographic analysis shows that unreserved agreement with all three statements is below average in the 18-29 age group (see Table 14). It is also worth noting that the fact that many people treat nature so carelessly annoys women somewhat more than men (highest level of agreement: 49 percent compared to 41 percent). Furthermore, women stress more often

Figure 23: Attitudes towards the endangerment and protection of nature – adults and teenagers in comparison



than men that it is humankind's duty to protect nature (60 percent compared to 50 percent).

A comparison over time makes it clear that the proportion of respondents who unreservedly agree with the statements on the endangerment of nature has decreased significantly. For example, in the current survey 55 percent "agree strongly" that it is the duty of humans to protect nature. In 2019, the figure was 75 percent. Perhaps two years of the coronavirus crisis have shifted some people's priorities so that nature conservation is no longer pursued with the same vigour. However, this is a hypothesis that would have to be investigated. When both response levels are taken into account, the differences are put into perspective (see Figure 24).

Teenagers were also asked to express their attitudes towards the endangerment and protection of nature. This reveals that teenagers agree unreservedly with all three statements slightly more often than adults (see Figure 23). For example, 60 percent of 14 to 17-year-olds believe that we should only use nature in a way that will allow future generations to do the same, compared to 55 percent of adults.

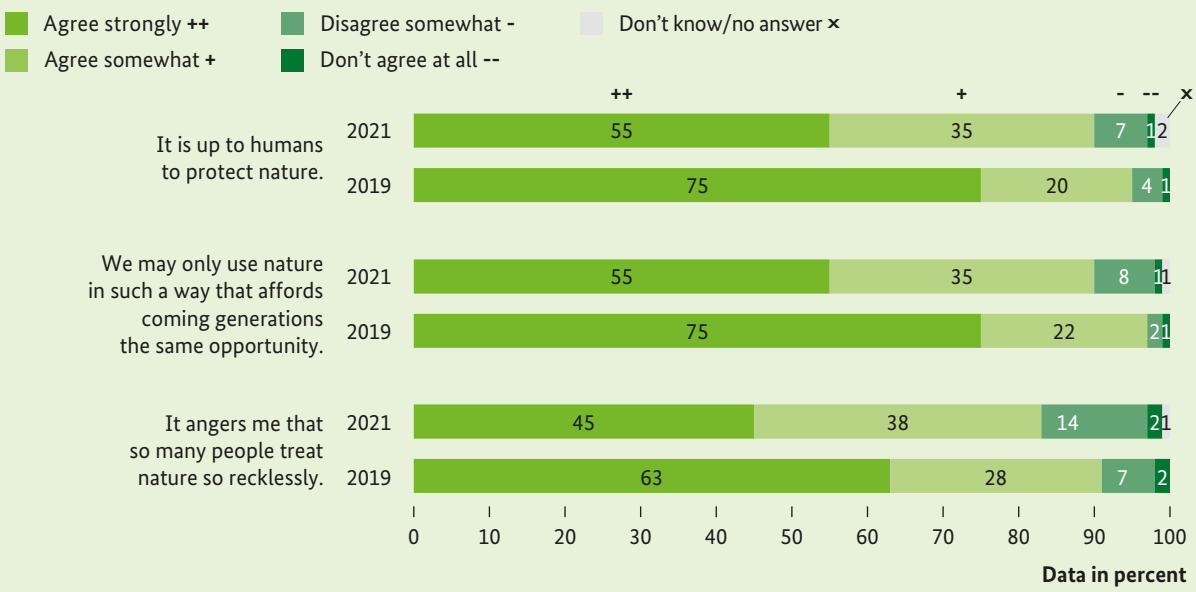
Table 14: Attitudes towards the endangerment and protection of nature among the adult population by gender and age

What do you think about the following statements?

Response category: "agree strongly"	Average	Gender		Age (years)			
Data in percent	Ø	M	F	under 29	30 to 49	50 to 65	over 65
It is up to humans to protect nature.	55	↓↓50	60↑↑	↓↓45	54	61↑↑	56
We may only use nature in such a way that affords coming generations the same opportunity.	55	52	57	↓↓44	54	60↑↑	56
It angers me that so many people treat nature so recklessly.	45	↓ 41	49 ↑	↓↓35	46	50	46

Heavily over-represented ↑↑ Over-represented ↑ Under-represented ↓ Heavily under-represented ↓↓

Figure 24: Attitudes of the adult population towards the endangerment and protection of nature year on year



Demands to protect nature meet with unreserved approval especially among the Post-Materialists and the Conservative Upscale.

For all three statements, unreserved agreement is highest among members of the committed and confident educated elite (Post-Materialists) and the classical establishment (Conservative Upscale) (see Table 15). Significantly lower values are found in the modern mainstream (Adaptive Pragmatists) and in the milieu of the consumer and entertainment-focused (lower) middle class. Among the efficiency-oriented and progress-driven Performers, it is noticeable that they are outraged less frequently than average by the careless treatment of nature.

Even during the coronavirus pandemic, only a minority ascribes greater importance to economic development than to nature.

Table 15: Attitudes towards the endangerment and protection of nature among the adult population by milieu

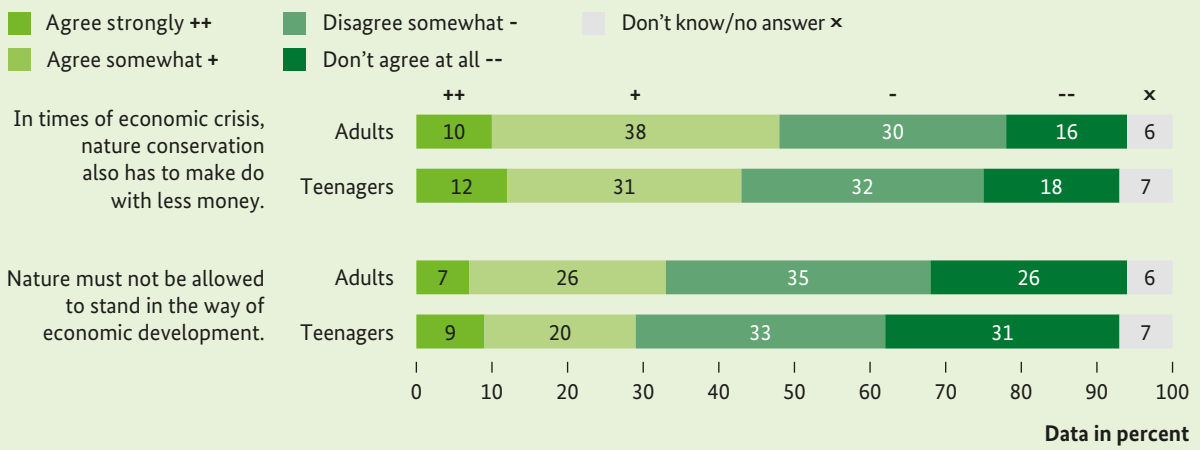
What do you think about the following statements?

Ø = Average
CON = Conservative Upscale
PMA = Post-Materialist
PER = Performer
EPE = Expeditive
NEO = Neo-Ecological
ADA = Adaptive Pragmatic Middle Class
HED = Consumer Hedonistic
PRE = Precarious
NOS = Nostalgic Middle Class
TRA = Traditional

Response category: "agree strongly" Data in percent	Ø	CON	PMA	PER	EPE	NEO	ADA	HED	PRE	NOS	TRA
It is up to humans to protect nature.	55	71↑↑	80↑↑	49	54	58	↓↓44	↓↓20	51	60	53
We may only use nature in such a way that affords coming generations the same opportunity.	55	66↑↑	79↑↑	52	55	61	↓↓45	↓↓23	48	50	58
It angers me that so many people treat nature so recklessly.	45	56↑↑	65↑↑	↓ 38	49	49	↓↓36	↓↓23	43	46	43

Heavily over-represented ↑↑ Under-represented ↓ Heavily under-represented ↓↓

Figure 25: Nature conservation caught between politics and economics – adults and teenagers in comparison



In the current survey, 33 percent of respondents think that nature should not stand in the way of economic development (both levels of agreement). A clear majority of 61 percent do not share this opinion (see Figure 25). The situation is different when it comes to the question of whether nature conservation also has to make do with less money in times of economic crisis: 48 percent agree with this statement (both levels of agreement). Almost as many are not of this opinion (disagree somewhat/don't agree at all: 46 percent).

A comparison of education shows that agreement with both statements decreases with the respondents' level of education (see Table 16). For example, 53 percent of those with a low level of formal education say that in times of economic crisis, nature conservation also has to make do with less money (both levels of agreement). The figure is 47 percent for people with medium formal education and 43 percent for people with a high level of formal education. The age comparison also shows differences: When it comes to the statement that nature should not stand in the way of economic development, it is the 18 to 29-year-olds who agree more often than average (both levels of agreement: 39 percent, average: 33 percent). As for the statement that in times of economic crisis, nature conservation must also make do with less money, it is the over-65s who agree most often (53 percent, average: 48 percent).

The comparison over time reveals that the proportion of those who think that in times of crisis nature conservation also has to make do with less money has remained relatively constant (2019: 46 percent, 2021: 48 percent). But the proportion of those who attribute greater importance to economic development than

Table 16: Nature conservation caught between politics and economics among the adult population by age and education

What do you think about the following statements?

Response category: "agree strongly/somewhat" Data in percent	Average	Age (years)				Educational level		
	Ø	under 29	30 to 49	50 to 65	over 65	Low	Average	High
In times of economic crisis, nature conservation also has to make do with less money.	48	43	47	47	53 ↑	53 ↑↑	47	↓ 43
Nature must not be allowed to stand in the way of economic development.	33	39 ↑	30	31	36	41 ↑↑	33	↓↓ 27

Heavily over-represented ↑↑ Over-represented ↑ Under-represented ↓ Heavily under-represented ↓↓

Figure 26: Nature conservation caught between politics and economics – adult population compared year on year

to nature has increased (2019: 26 percent, 2021: 33 percent) (see Figure 26). In view of the fact that at the time of the survey people in Germany had been in the grip of a pandemic with enormous economic consequences for about two years, this slight increase is quite understandable.

Compared to the youth survey, no major differences can be seen (see Figure 25): Slightly fewer teenagers than adults agree with the statement that nature should not stand in the way of economic development (both levels of agreement: 29 percent compared to 33 percent). The same applies to the statement that in times of economic crisis, nature conservation must also make do with less money. The approval of teenagers here is 43 percent (both levels of agreement), the approval of adults is 48 percent.

In the Post-Materialist milieu especially, nature conservation is given priority over economic development.

Of all milieus, the nature conservation-oriented Post-Materialists are the least likely to think that nature should not stand in the way of economic development (both levels of agreement: 15 percent, average: 33 percent). The approval ratings are significantly higher among people in precarious living conditions (41 percent), members of the experience-oriented, consumer-hedonistic lifeworld (43 percent), and the Adaptive Pragmatists (48 percent). An above-average number of those in the Precarious (57 percent) and Adaptive Pragmatist milieus (60 percent) say that in times of economic crisis, nature conservation also has to make do with less money. Approval ratings are lower among the Conservative Upscale (40 percent) and again among the Post-Materialists (27 percent).

Figure 27: Financial funding of nature conservation – adult population compared over time

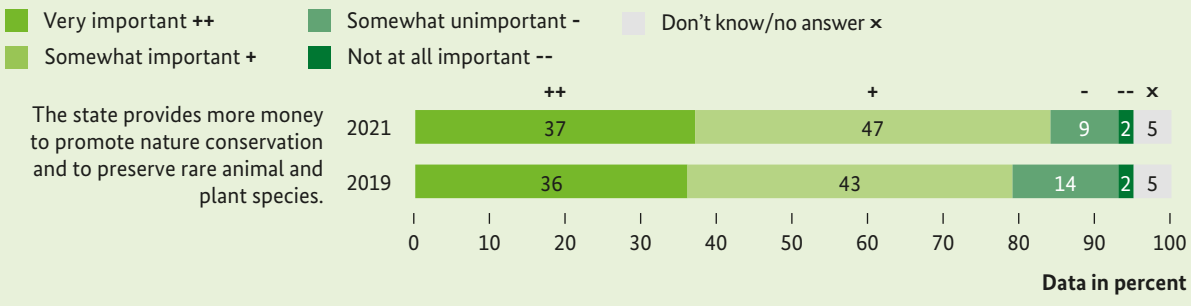
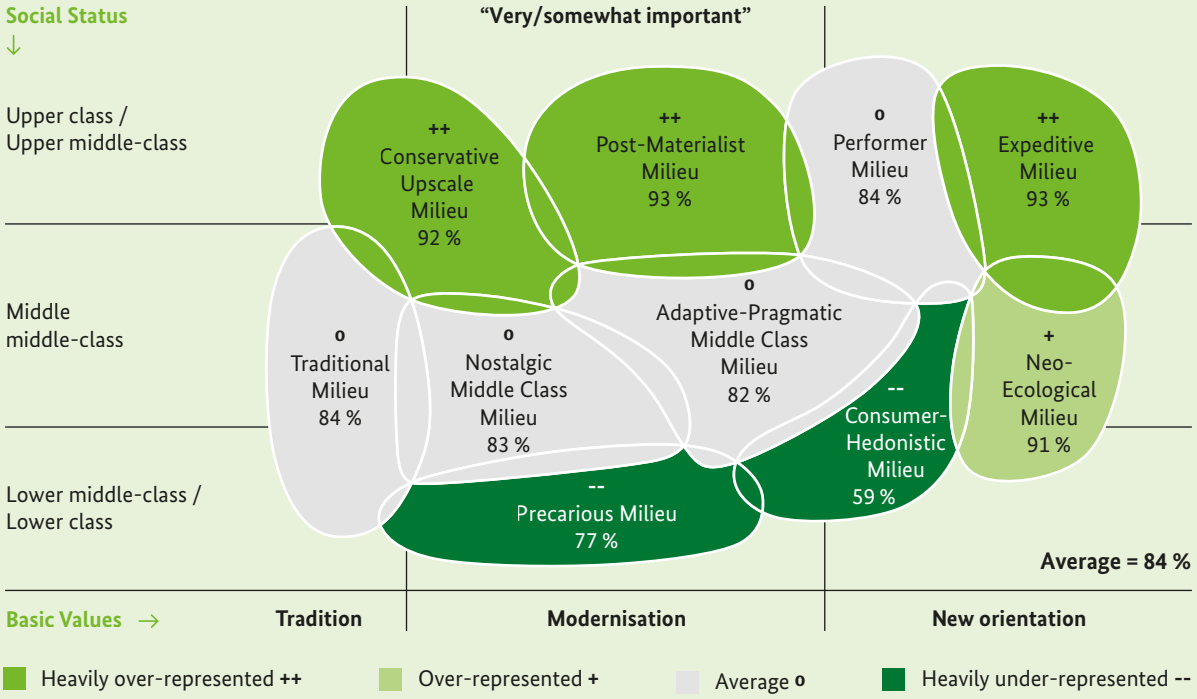


Figure 28: Financial funding of nature conservation – adult population by milieu

How important do you think it is that the following nature conservation measure is prioritised?
"The state provides more money to promote nature conservation and to preserve rare animal and plant species."



A clear majority favours greater government spending to promote nature conservation.

Eighty-four percent of respondents think it is very or somewhat important that the state provide more money to promote nature conservation and the preservation of rare animal and plant species (see Figure 27). Women and the financially well-off are still slightly more in favour of greater financial support for nature conservation than the average (women: 87 percent, net household income over 3,500 euros: 88 percent).

Compared to the last measurement of this question, approval ratings have increased slightly (see Figure 27): In 2019, it was 79 percent who supported greater spending by the state to promote nature conservation.

The milieu analysis confirms that financial support for nature conservation meets with great approval across the population. Taking into account both response levels (very/somewhat important), the approval rate is clearly above 50 percent even among people in socially weaker situations and in the experience-oriented, consumer-hedonistic lifeworld (see Figure 28).

5.4 Attitude and willingness to change lifestyles and economic activities

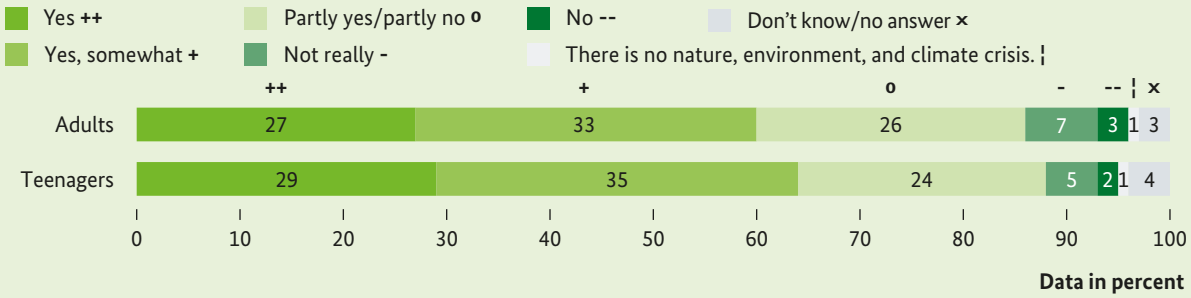
More than half of the population believes that a change in the way we live and do business in Germany is necessary.

Sixty percent of respondents aged 18 and over believe that a comprehensive change in the way we live and do business in Germany is necessary to stop the global nature, environmental, and climate crisis. More than a quarter of respondents are unreservedly of this opinion ("yes": 27 percent). Twenty-six percent are undecided on this question ("partly yes/partly no"), only ten percent answer "no" or "not really" and one percent say there is no nature, environmental, and climate crisis (see Figure 29).

In the groups with a high level of formal education (both levels of agreement: 65 percent) and high net household income (over 3,500 euros: 69 percent), the need for change is seen more frequently than average. However, the differences from the average are not too great (average: 60 percent).

Figure 29: Attitude towards the need for change – adults and teenagers in comparison

In your opinion, is a comprehensive change in lifestyles and economic practices in Germany necessary to stop the global nature, environment, and climate crisis?



The comparison with the youth survey also reveals only slight differences (see Figure 29). According to the survey, teenagers are slightly more likely than adults to believe that a comprehensive change in lifestyles and economic activities is necessary to stop the global nature, environmental, and climate crisis (both levels of agreement: 64 percent compared to 60 percent).

The milieu analysis shows a different picture (see Figure 30): While 79 percent of the committed and confident Post-Materialists and the particularly conscientious Conservative Upscale, and 75 percent of the young trendsetters of the Expeditive milieu consider a comprehensive change in lifestyles and economic activities in Germany to be necessary, the Nostalgic Middle Class are increasingly concerned with social decline (48 percent), people in precarious living conditions (47 percent), and, above all, the lifeworld focused on consumption and entertainment (26 percent) are clearly less convinced.

Figure 30: Attitude towards the need for change in the adult population by milieu

In your opinion, is a comprehensive change in lifestyles and economic practices in Germany necessary to stop the global nature, environment, and climate crisis?

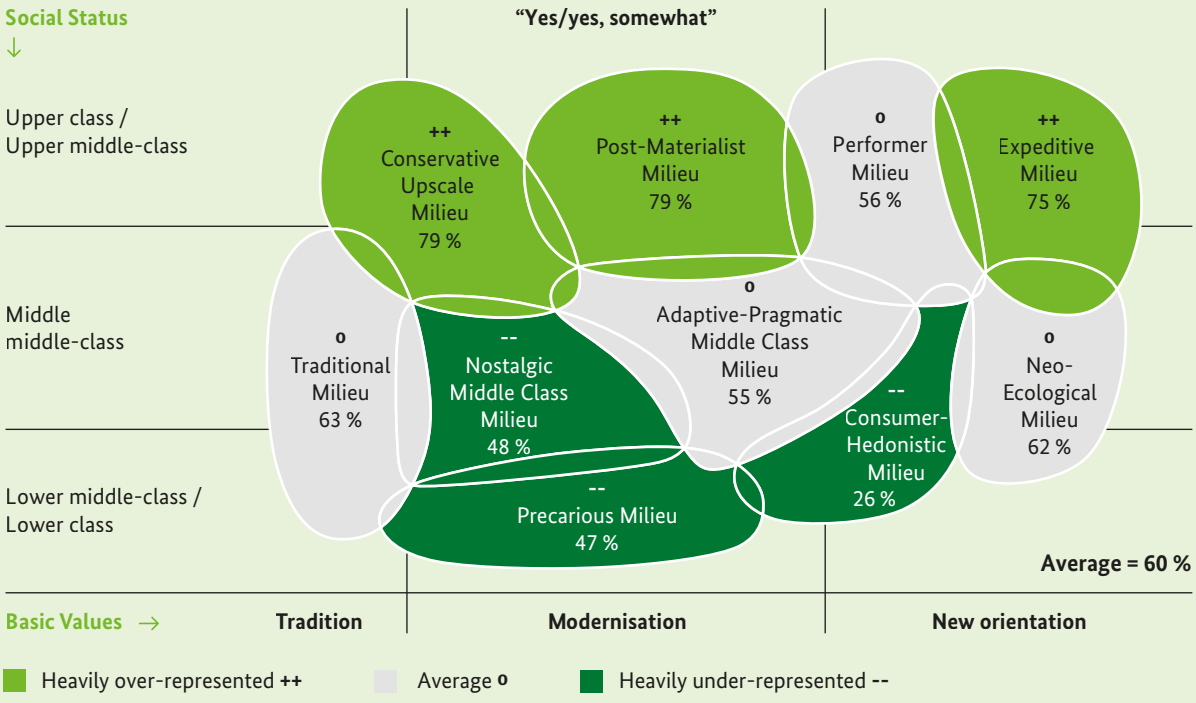
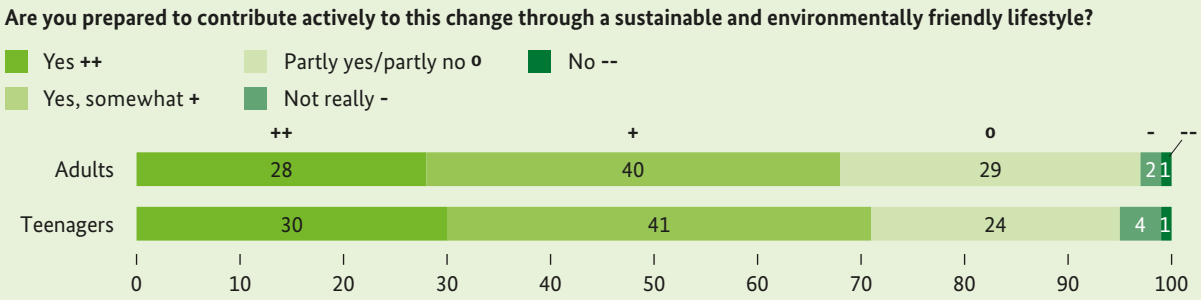


Figure 31: Willingness to change lifestyles and economic activities – adults and teenagers in comparison



Basis: only people who had said that a comprehensive change in lifestyles and economic practices in Germany is necessary ("yes", "yes, somewhat", "partly yes, partly no")

Data in percent

Advocating a comprehensive change in lifestyles and economic activities is one thing. But what about the willingness to support this change through a sustainable and environmentally friendly lifestyle? This question was also asked. Those who had stated that comprehensive change was not necessary ("not really", "no") were excluded from this question.

More than two thirds declare their willingness to actively contribute to a change in lifestyles and economic activities.

Sixty-eight percent of respondents declare themselves willing to actively contribute to social change through a sustainable and environmentally-friendly lifestyle – 28 percent even agree unreservedly (see Figure 31). This contrasts with only three percent who say they are not or not really prepared to do so. A further 29 percent are undecided on this question ("partly yes/partly no").

The socio-demographic analysis again reveals only minor differences: The groups with a high level of formal education (both levels of agreement: 72 percent) and high net household income (over 3,500 euros: 73 percent), state slightly more frequently than average that they want to contribute to a change in lifestyles and economic activities (average: 68 percent). The comparison with the youth survey does not reveal any major differences either (see Figure 31).

The milieu perspective is more revealing. The picture here is similar to the previous question: Post-Materialists (both levels of agreement: 85 percent), Expeditives (81 percent), and the Conservative Upscale (79 percent) are most likely to actively contribute to social change themselves by adopting a sustainable and environmentally friendly lifestyle. Much less willingness comes from the ranks of the Nostalgic Middle Class (60 percent), people in precarious living situations (56 percent), and the experience-oriented, consumer-hedonistic lifeworld (41 percent). It is striking that the business-oriented and highly competitive Performers also only want to actively contribute to a change in lifestyles and economic activities themselves with below-average frequency (59 percent).

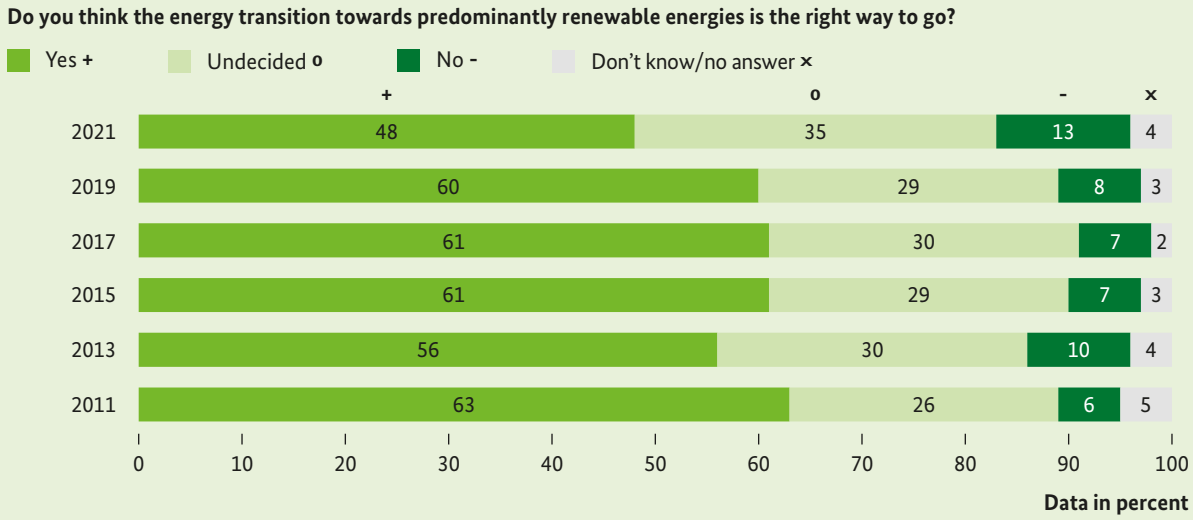
5.5 Attitudes towards the energy transition and impacts on nature

Approval of the energy transition has declined.

The question of the population's attitude towards the energy transition is regularly asked in the Nature Awareness Study. Since 2011, the approval ratings have hovered around 60 percent with minor fluctuations. In 2021, however, a significant decline must be reported: Just under half of respondents think the energy transition is the right thing to do, 35 percent are undecided (more than in recent years), and 13 percent are against it (see Figure 32).

This decrease in approval of the energy transition must be considered in light of the timing of the survey. The survey was conducted in autumn 2021, when the parliamentary election had been decided in favour of the coalition government and even then there was public discussion about rising energy prices and a general increase in the risk of inflation. The "government effect" is likely to have caused "energy transition" and "implementation" to move closer together in people's minds; or to put it another way: It became foreseeable that the energy transition would affect people's everyday lives more strongly in the future. For all those for whom the energy transition had been a key

Figure 32: Attitude towards the energy transition among the adult population compared over time



concern for some time, this is good news – and no reason to change anything in one's attitude, especially if one's circumstances can cushion an impending price increase for energy. However, the looming changes have apparently caused other people's support for the energy transition to crumble. From the time of the survey until the publication of the study, events have continued to escalate: The Ukraine war has put the issue of dependence on Russian fossil fuels high on the agenda. Only a future survey can show how this will affect attitudes towards the energy transition in the medium to long term.

Teenagers support the energy transition significantly more often than adults.

Approval of the energy transition increases with the respondents' level of education (basic education: 43 percent, medium education level: 49 percent, high education level: 53 percent). The comparison with the youth survey shows greater differences (see Figure 33). With an approval rating of 64 percent, teenagers are significantly more likely than adults to think that the energy transition – towards a predominantly renewable energy supply – is the right thing to do.

Approval of the energy transition polarises between the social milieus.

The differences in the milieu analysis are striking (see Figure 34). Particularly among the Post-Materialists (71 percent), but also among the Expeditives (65 percent) and the Conservative Upscale (62 percent), the levels of agreement are above 60 percent – and thus above the value measured for the population as a whole in previous years. On the other hand, approval in three social milieus is clearly below 50 percent – in the Nostalgic Middle Class milieu it is 33 percent,

Figure 33: Attitude towards the energy transition – adults and teenagers in comparison

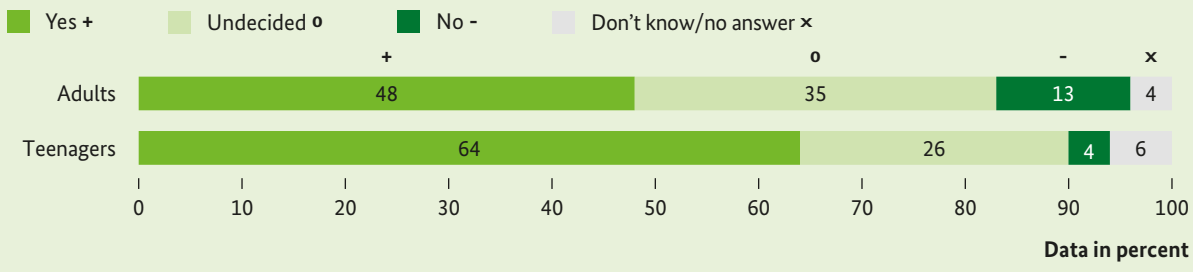
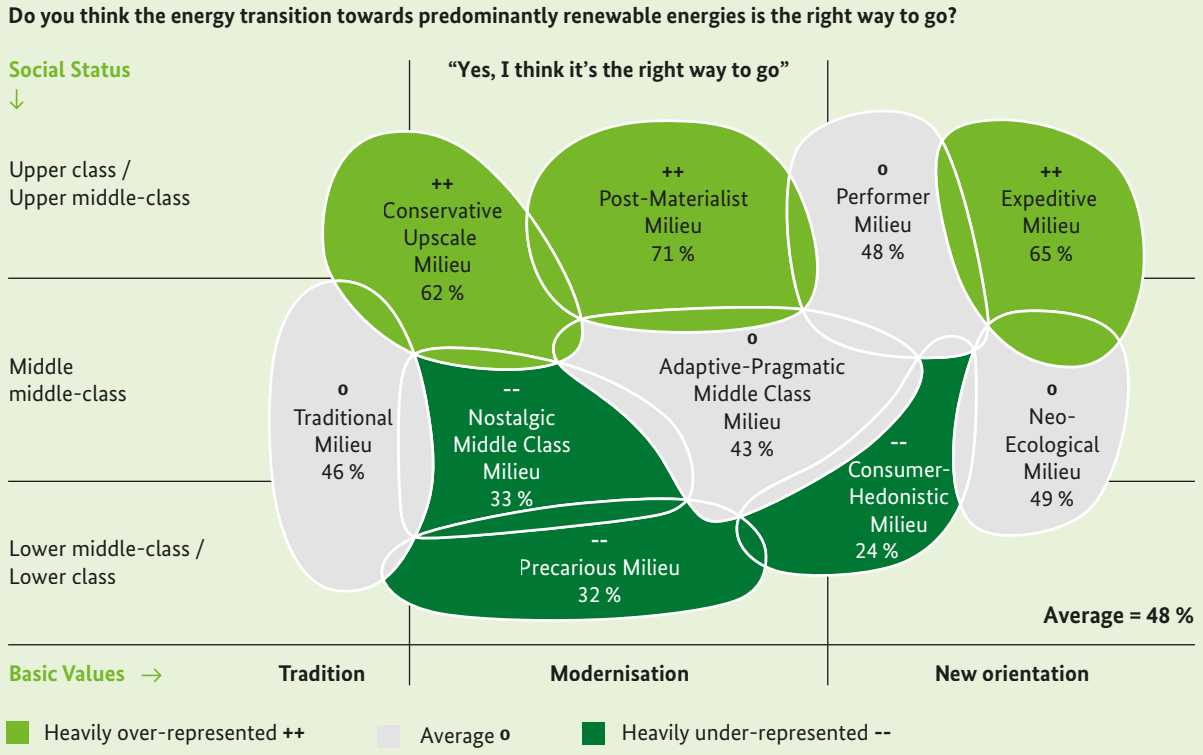


Figure 34: Agreement with the energy transition among the adult population by milieu



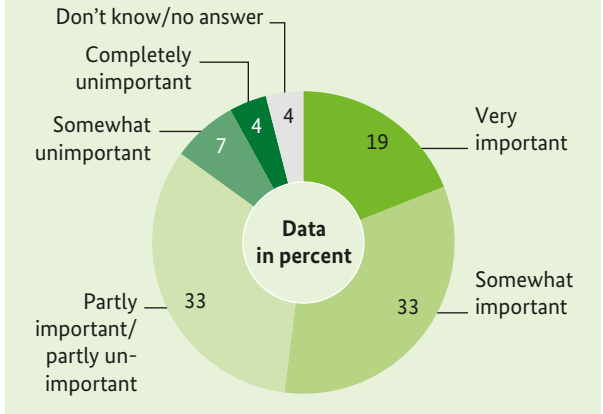
in the socially weaker milieu 32 percent, and in the milieu with a consumer-hedonistic value orientation 24 percent. Among these milieus, the approaching energy transition has apparently led to various counter-reactions – from fears of the energy transition being a "buzzkill" and fears of increasing ecologically motivated regulations to fears of decline in parts of the middle-class and socially disadvantaged milieus.

The majority supports the energy transition despite concerns about possible negative impacts on nature, landscape, and biodiversity.

For acceptance of renewable energy plants, consideration of both nature conservation and species protection concerns and those of the landscape are important factors (see Hübner et al. 2019). In view of the fact that a predominant supply from renewable energies can also have negative impacts on nature, landscape, and biodiversity, the question arises as to whether people vote for an expansion of renewables despite these concerns.

Nineteen percent of respondents aged 18 and over consider expansion to be very important despite these concerns, and a third consider it to be somewhat important. Another third is undecided ("partly important/partly unimportant"), and eleven percent find the expansion somewhat unimportant or completely unimportant. Four percent cannot give an answer to this question (see Figure 35). This means that a majority

Figure 35: Agreement of the adult population with the energy transition taking into consideration the needs of nature and species conservation



of respondents (52 percent) are in favour of a predominantly renewable energy supply – knowing full well that the expansion of renewables can also have negative impacts on nature, landscape, and biodiversity.

In socio-demographic terms, it is mainly people with a high level of formal education (very/somewhat important: 58 percent) and high net household income (60 percent), as well as those aged 18 to 29 (60 percent), who are in favour of the energy transition despite concerns about possible negative impacts on nature, landscape, and biodiversity (average: 52 percent).

The milieu analysis confirms that most supporters come from the ranks of the Post-Materialists (very/somewhat important: 64 percent), the Expeditives (64 percent), and the Conservative Upscale (62 percent). The down-to-earth and particularly home-loving Traditional milieu (43 percent), the harmony-oriented middle field of society (Nostalgic Middle Class: 35 percent), members of the consumption and experience-oriented lifeworld (37 percent), and people who are in precarious living conditions (40 percent) are far more reserved in their opinion.

5.6 Agro-genetic engineering and new genetic engineering processes in nature conservation

Four out of five Germans are in favour of compulsory labelling of food from animals fed with genetically modified feed.

In Germany, genetically modified feed is labelled. So far, there is no labelling obligation for food produced from animals fed with genetically modified feed. However, such a labelling obligation is supported by most respondents: 84 percent are "strongly" or "somewhat" in favour of labelling products from animals fed with genetically modified feed in shops. Here, 18 to 29-year-olds (highest level of agreement: 44 percent), those with a low level of formal education (50 percent), and men (51 percent) are less likely than average to be "strongly" in favour of compulsory labelling (average: 55 percent).

A comparison over time shows a fluctuating demand for compulsory labelling (see Figure 36). In 2019, unreserved approval was up ten percentage points compared to 2017 (from 69 percent to 79 percent). In the current survey, it has decreased again and now stands at 55 percent. Furthermore, it is notable that in 2021, for the first time, five percent of respondents made no statement or are undecided.

Teenagers were also asked this question: 45 percent of 14 to 17-year-olds "strongly agree" with compulsory labelling, another 23 percent "somewhat agree". Thus, approval of compulsory labelling among teenagers – even though it is at a high level – is significantly lower than among adults (see Figure 37).

In a comparison of milieus, it is above all the Post-Materialists and the Conservative Upscale who expressly agree with compulsory labelling (highest level of agreement: 74 percent and 63 percent respectively). Significantly less approval comes from the ranks of the Adaptive Pragmatists and people with a consumption and experience-oriented value model (46 percent and 23 percent respectively).

Figure 36: Agreement with mandatory labelling among the adult population compared over time

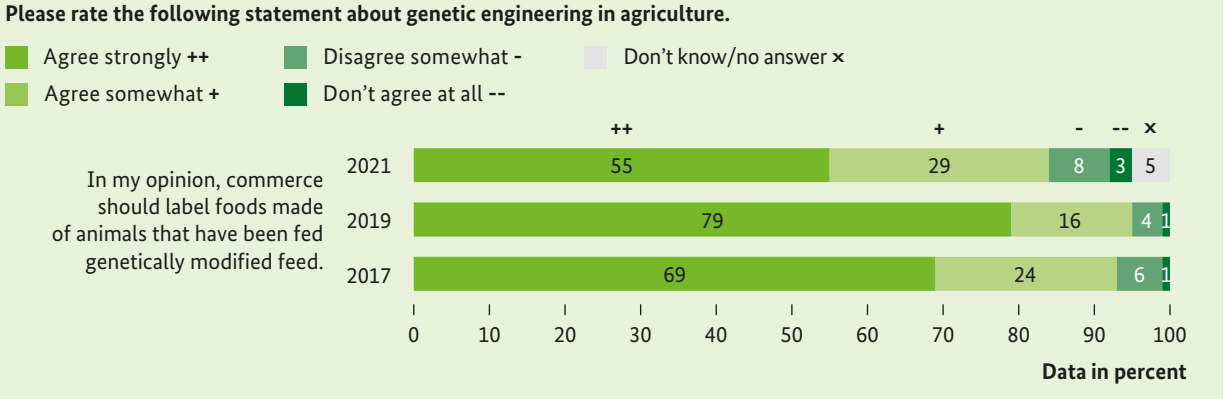
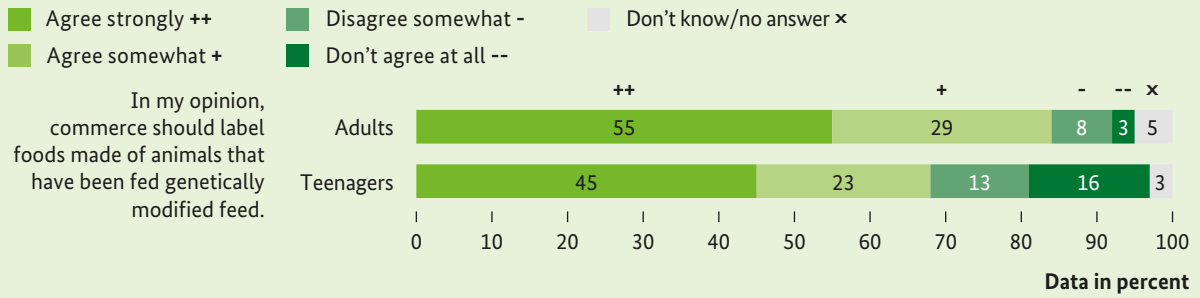


Figure 37: Agreement with mandatory labelling – adults and teenagers in comparison



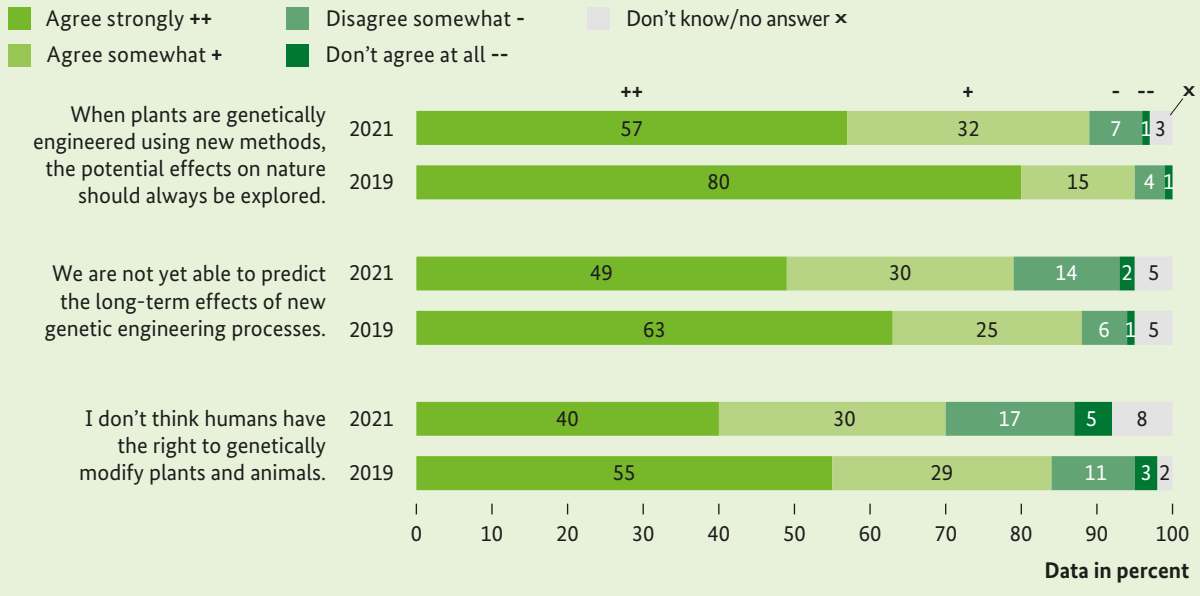
Concerns about new procedures in genetic engineering have decreased, but remain at a high level.

Eighty-nine percent of respondents believe that possible effects on nature should always be investigated when plants are genetically modified with new processes (both levels of agreement) – 57 percent agree "strongly" with this demand (see Figure 38). Unreserved approval is highest in the 50-65 age group (65 percent).

Concerns about new genetic engineering methods are also reflected in the fact that more than three quarters of respondents (79 percent) believe that the long-term consequences of new genetic engineering methods cannot currently be foreseen (highest level of agreement: 49 percent, "agree somewhat": another 30 percent). This is particularly emphasised by women and by those aged 50 to 65 (highest level of agreement: 52 percent and 56 percent respectively). In addition, respondents also express ethical concerns: 70 percent are of the opinion that humans have no right to deliberately genetically modify plants and animals – 40 percent are "strongly" of this opinion. Ethical reservations are most frequently emphasised by women and by people with a medium level of formal education (highest level of agreement: 46 percent each).

All in all, the findings show that the majority of the population has reservations about new genetic engineering methods. However, a comparison over time also shows that the number of those who are unde-

Figure 38: Attitude of the adult population towards agro-genetic engineering compared over time



cided is increasing and concerns have decreased (see Figure 38). For example, in 2019, 84 percent still held the opinion that humans have no right to deliberately genetically modify animals and plants (both levels of agreement). In the current survey, the figure is 70 percent. In the same period, the proportion of those who answered "I don't know" to this question increased from two percent to eight percent.

The Post-Materialists and Conservative Upscale most often emphasise that possible impacts on nature should always be investigated.

The educated elite (Post-Materialists) and the responsible Conservative Upscale most often emphasise that possible effects on nature should always be investigated when plants are genetically modified using new methods (highest level of agreement: 78 percent and 66 percent respectively). In comparison, the benefit-oriented Adaptive Pragmatists (44 percent), but above all people with a fun and experience-oriented, consumer-hedonistic value orientation (20 percent) are much more reserved (see Table 17). Among the Post-Materialists, it is also noticeable that they have the greatest doubts of all milieus that the long-term consequences of new genetic engineering methods can be foreseen. In this milieu, 59 percent express their reservations unreservedly (highest level of agreement). The fewest concerns again come from the fun and experience-oriented lifeworld (highest level of agreement: 19 percent). The ethical argument is most often emphasised in the Expeditive milieu: 48 percent of Expeditives think that humans have no right to deliberately genetically modify plants and animals.

5.7 Digitalisation and nature conservation

Interest in digital nature offerings is primarily a question of age.

Twenty-three percent of respondents find digital offerings for a nature experience, such as a virtual forest walk or a virtual safari, interesting (both levels of agreement). This contrasts with a majority of 50 percent who do not really find such offerings interesting or not at all. Twenty-three percent are undecided ("partly agree/partly disagree"), four percent cannot give an answer. A similar response pattern is elicited to the question of whether it is reassuring that animal and plant species that are becoming extinct in their real habitats can still be experienced digitally (see Figure 39): 23 percent agree strongly or somewhat with this question, while 49 percent somewhat disagree or don't agree at all. Agreement with the third statement is also limited: 20 percent say that digital offerings, such as virtual nature experiences or information sites on the internet, have already motivated them to experience nature outdoors (both levels of agreement). A majority of 53 percent somewhat disagree or don't agree at all with this statement.

Table 17: Attitudes towards new procedures in genetic engineering among the adult population by milieu

To what extent do you agree with the following statements?

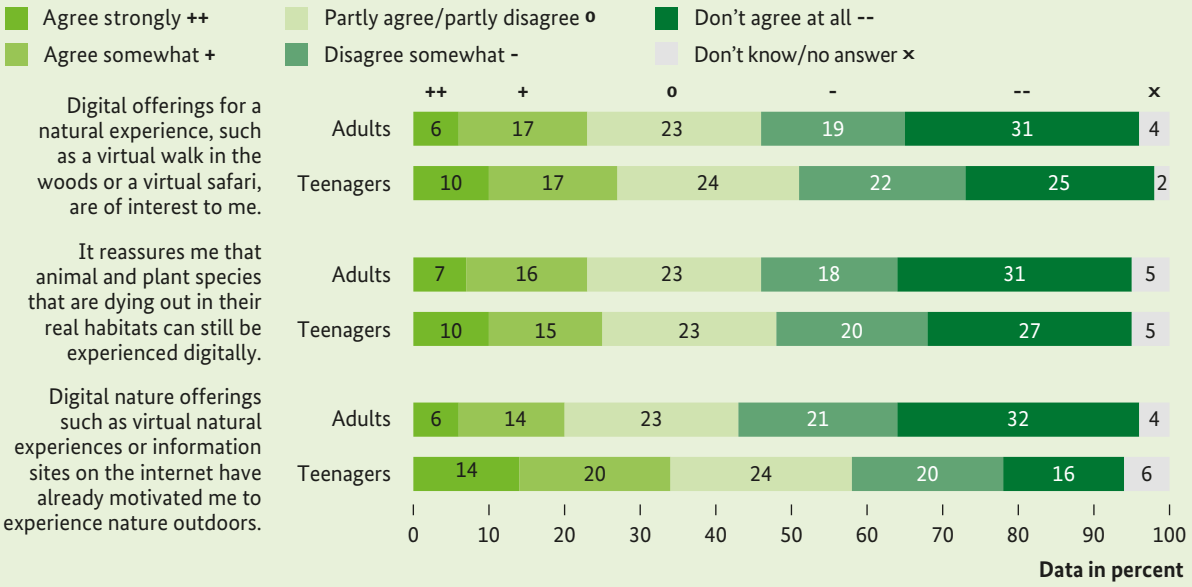
Ø = Average; CON = Conservative Upscale; PMA = Post-Materialist; PER = Performer; EPE = Expeditive; NEO = Neo-Ecological; ADA = Adaptive Pragmatic Middle Class; HED = Consumer Hedonistic; PRE = Precarious; NOS = Nostalgic Middle Class; TRA = Traditional

Response category: "agree strongly" Data in percent	Ø	CON	PMA	PER	EPE	NEO	ADA	HED	PRE	NOS	TRA
When plants are genetically engineered using new methods, the potential effects on nature should always be explored.	57	66↑↑	78↑↑	55	61	54	↓↓44	↓↓20	56	61	62
We are not yet able to predict the long-term effects of new genetic engineering processes.	49	53	59↑↑	48	49	51	43	↓↓19	49	54	54
I don't think humans have the right to genetically modify plants and animals.	40	45	41	39	48 ↑	40	35	↓↓16	46	47	44

Heavily over-represented ↑↑ Over-represented ↑ Heavily under-represented ↓↓

Figure 39: Interest in digital offerings related to nature – adults and teenagers in comparison

The lifeworld of many people is becoming increasingly digital. With this in mind, what do you think about the following statements about virtual and digital experiences of nature?



The socio-demographic analysis shows that interest in digital nature offerings is primarily a question of age. It is mainly younger respondents who are enthusiastic about digital nature offerings (see Table 18). For example, one third of 18 to 29-year-olds are interested in digital offerings such as a virtual forest walk. In the over-65 age group, the figure is only 16 percent.

The comparison with the youth survey is interesting (see Figure 39). This makes it clear that it is primarily teenagers who feel motivated by digital nature offerings to experience nature outdoors. For example, 34 percent of 14 to 17-year-olds say that digital nature offerings, such as virtual nature experiences or information sites on the internet, have already motivated them to experience nature outdoors. In the adult survey, only 20 percent said this.

The milieu perspective is also revealing (see Table 19). It is the younger and technology-savvy milieus of the Expeditives, Neo-Ecologicals, and Adaptive Pragmatists in particular who express enthusiasm about

Table 18: Interest among the adult population in digital offerings related to nature by age of respondents

The lifeworld of many people is becoming increasingly digital. With this in mind, what do you think about the following statements about virtual and digital experiences of nature?

Response category: "agree strongly/agree somewhat" Data in percent	Average	Age (years)			
	Ø	under 29	30 to 49	50 to 65	over 65
Digital offerings for a natural experience, such as a virtual walk in the woods or a virtual safari, are of interest to me.	23	33↑↑	27 ↑	↓ 19	↓↓16
It reassures me that animal and plant species that are dying out in their real habitats can still be experienced digitally.	23	30↑↑	26	↓ 18	↓ 19
Digital nature offerings such as virtual natural experiences or information sites on the internet have already motivated me to experience nature outdoors.	20	24	26↑↑	18	↓↓15

Heavily over-represented ↑↑ Over-represented ↑ Under-represented ↓ Heavily under-represented ↓↓

Table 19: Interest among the adult population in digital offerings related to nature by milieu

The lifeworld of many people is becoming increasingly digital. With this in mind, what do you think about the following statements about virtual and digital experiences of nature?

Ø = Average
CON = Conservative Upscale
PMA = Post-Materialist
PER = Performer
EPE = Expeditive
NEO = Neo-Ecological
ADA = Adaptive Pragmatic Middle Class
HED = Consumer Hedonistic
PRE = Precarious
NOS = Nostalgic Middle Class
TRA = Traditional

Response category: "agree strongly/agree somewhat" Data in percent	Ø	CON	PMA	PER	EPE	NEO	ADA	HED	PRE	NOS	TRA
Digital offerings for a natural experience, such as a virtual walk in the woods or a virtual safari, are of interest to me.	23	27	↓↓12	21	47↑↑	40↑↑	35↑↑	21	↓↓13	↓↓11	↓↓ 9
It reassures me that animal and plant species that are dying out in their real habitats can still be experienced digitally.	23	24	↓↓11	19	35↑↑	40↑↑	35↑↑	24	19	↓ 17	↓↓ 7
Digital nature offerings such as virtual natural experiences or information sites on the internet have already motivated me to experience nature outdoors.	20	29↑↑	↓↓12	16	37↑↑	37↑↑	29↑↑	15	↓↓12	↓ 14	↓↓ 6

Heavily over-represented ↑↑ Under-represented ↓ Heavily under-represented ↓↓

digitalisation in nature conservation. Thus, 37 percent of Expeditives and Neo-Ecologicals, and 29 percent of the Adaptive Pragmatists say that digital nature offerings have already motivated them to experience nature outdoors. Not surprisingly, the older generation (Traditional milieu), which loves security and order, is the least interested of all milieus in digital nature offerings. The Nostalgic Middle Class and those in socially disadvantaged situations also have little enthusiasm for digital nature offerings. The fact that Post-Materialists are also less attracted to such offerings is probably related to the fact that they do not want to experience nature digitally, but outdoors, preferably in the forest.

Many citizens can imagine using a conservation app.

Forty-three percent of the adults surveyed can also imagine using an app that provides information about endangerment of nature, conservation successes, or even personal opportunities for action (both levels of agreement), 30 percent are (somewhat) unlikely to use such an app, 22 percent are not sure, and five percent do not have an opinion. Compared to the previous survey, there has thus been no significant change in the response behaviour (see Figure 40). Willingness to use such an app is greater among 18 to 29-year-olds (60 percent), 30 to 49-year-olds (51 percent), people with a high level of formal education (53 percent), and the

Figure 40: Interest among the adult population in using a nature conservation app, compared over time

To what extent do you agree with the following statements?

Agree strongly ++ Agree somewhat + Partly agree/partly disagree o Disagree somewhat - Don't agree at all -- Don't know/no answer ×

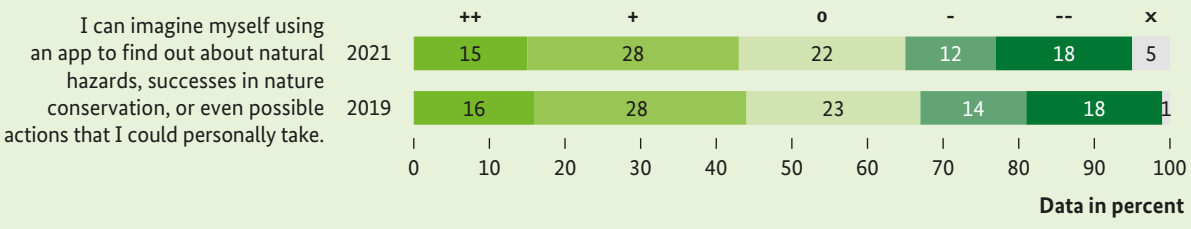
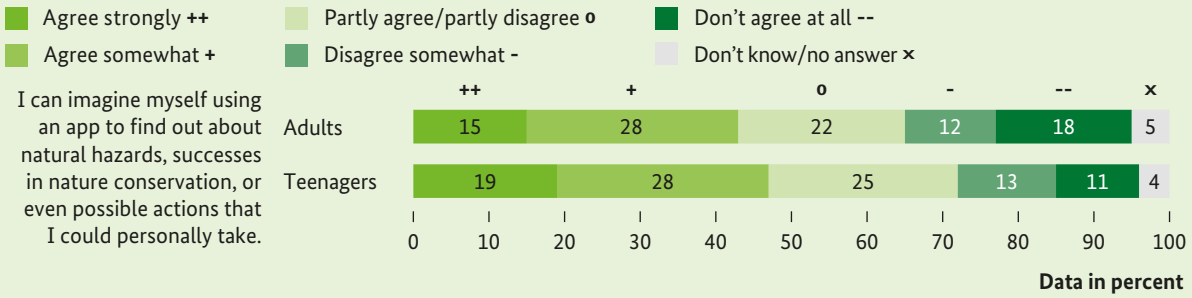


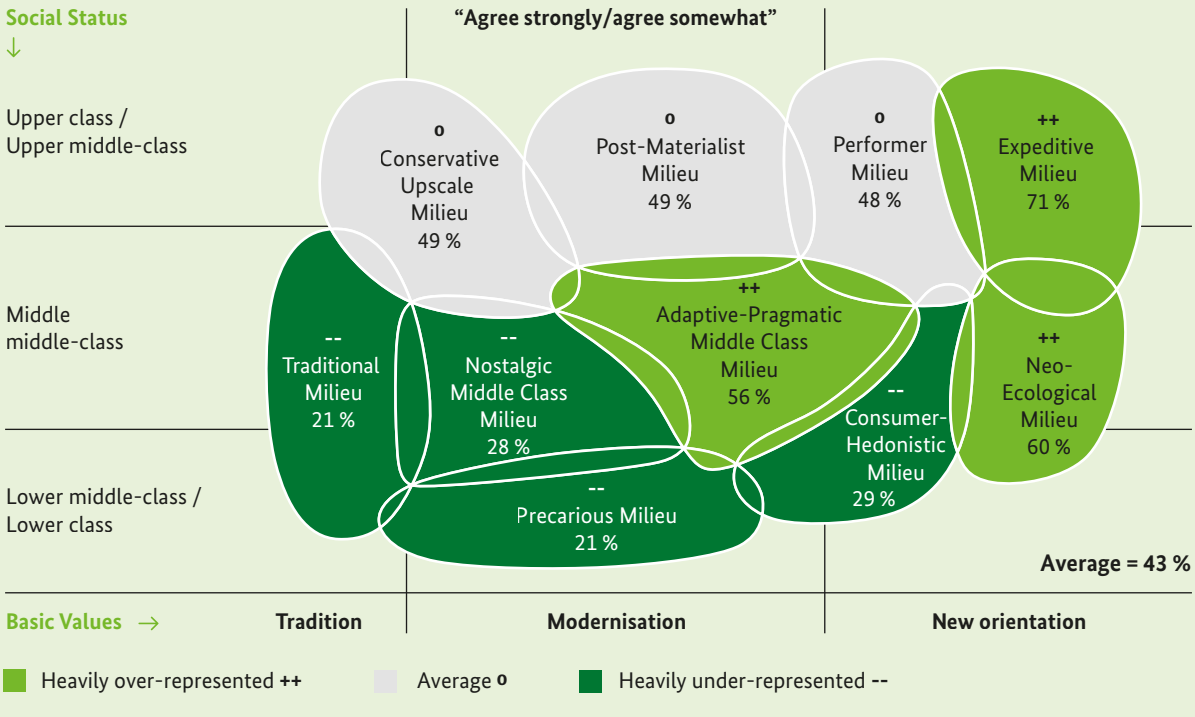
Figure 41: Interest in using a nature conservation app – adults and teenagers in comparison



financially well-off (56 percent). Teenagers' willingness to use one is 47 percent (both levels of agreement) (see Figure 41).

The milieu analysis shows that Expeditives (71 percent), Neo-Ecologicals (60 percent), and Adaptive Pragmatists (56 percent) are the most willing to use an app that provides information on endangerment of nature, conservation successes, or even personal opportunities for action. Willingness to use an app is significantly lower among the milieus that are sceptical about the increasing digitalisation of everyday life – among the Nostalgic Middle Class (28 percent), the Traditional milieu (21 percent), and people in socially weaker situations (21 percent). The fact that the (lower) middle class, which is focused on consumption and entertainment, also expresses less interest in a nature conservation app is due to the fact that nature hardly features in their lives and they are generally not very concerned about the endangerment of nature (see Figure 42).

Figure 42: Interest in using a nature conservation app – adult population by milieu



6 Awareness of biodiversity – the previous societal indicator and results of the new measurement model

The topic of biodiversity has been one of the core themes of the Nature Awareness Studies from the very beginning. The term "biological diversity" – or "biodiversity" – refers to the "variability among living organisms of any origin [...] and the ecological complexes to which they belong" (see UN 1992, page 3). This comprises three levels: diversity within species (that is genetic diversity), diversity between species, and diversity of ecosystems (habitats and landscapes with their biotic communities). The term biodiversity was first used in the 1980s by renowned US biologists, and even then political-strategic considerations played a role: The intention was to draw attention to the global decline in species, destruction of habitats, and the rapid loss of genetic diversity in crops and livestock. The 1988 book of the same name by evolutionary biologist Edward O. Wilson (see Wilson 1988) contributed to the wider dissemination of the biodiversity concept because, in addition to its scientific significance, it also aimed to promote social awareness (see Takacs 1996). This was reflected just a few years later by the adoption of the Convention on Biological Diversity (CBD) at the UN Conference on Environment and Development in Rio de Janeiro in 1992. All member states of the Convention have committed to developing strategies at national level for the conservation and sustainable use of biological diversity. Germany fulfilled this obligation with the National Strategy on Biological Diversity (NBS) in 2007 (see BMU 2007).

Strengthening societal awareness of the importance of biodiversity and the need for its protection is a key requirement for bringing such a National Strategy on Biological Diversity to life and developing it further (see Zinngrebe et al. 2021). This is one of the reasons why the Nature Awareness Studies report on the "societal indicator", which measures the population's awareness of biodiversity. This indicator, which has been in use since 2009, has been revised to reflect a broader range of variables relevant to environmental behaviour. This chapter presents the previously used indicator and the newly developed indicator – in each case for the survey date 2021 and including the empirical findings of the questions on which the calculation of the indicators is based. In future, starting with the 2023 Nature Awareness Study, societal awareness of biodiversity will only be surveyed using the new indicator. Both indicators were developed for the adult population in terms of content and level of complexity and can therefore not be calculated for teenagers.

6.1 Awareness of biodiversity: The previous overall indicator

The previous societal indicator "awareness of biodiversity" is composed of the sub-areas "knowledge", "attitude", and "behaviour". For each of these sub-areas, requirements are specified which express the targets of the National Strategy on Biological Diversity. Based on these requirements and on the survey data, a sub-indicator is calculated for all three areas:

- The **knowledge indicator** measures awareness and understanding of the term "biodiversity".
- The **attitude indicator** determines appreciation for biodiversity.
- The **behavioural indicator** measures the willingness to make one's own contribution to the conservation of biodiversity.

The set of questions used to calculate the three sub-indicators consists of two questions on knowledge, seven questions on attitude, and six questions on willingness to change behaviour. The overall indicator is calculated from the three sub-indicators and records what percentage of the population meets the requirements in all three sub-areas (knowledge, attitude, behaviour). According to this definition, the level of the overall indicator corresponds to the percentage of people who (1) can name at least one sub-component of biodiversity (diversity of species, ecosystems, genes), (2) express a positive attitude towards biodiversity, and (3) express a strong willingness to contribute to the protection of biodiversity themselves.

Since, according to the established construction of the overall indicator, it is not sufficient for a person

Figure 43: Sub-indicators and overall indicator "Awareness of biodiversity"

to fulfil the defined requirements in only one or two sub-areas (for example, sufficient knowledge and positive attitude, but not sufficient willingness to change behaviour), the overall indicator can be at most as high as the lowest sub-indicator – as a rule, it is significantly lower (see also Figure 43).[29]

A good quarter of Germans have a high awareness of the importance of biodiversity.

According to the current measurements, 48 percent of Germans can name at least one of the three sub-aspects of biological diversity (knowledge indicator), 55 percent are sufficiently sensitised to the conservation of biological diversity (attitude indicator), and 53 percent express a high degree of willingness to contribute to the protection of biodiversity themselves (behaviour indicator). The requirements in all three sub-areas are met by 26 percent (overall indicator). According to the definition of the overall indicator, a good quarter of Germans are highly aware of biodiversity. The proportion is considerably higher in the group with a high level of education (33 percent) and in the group with a high net household income (3,500 euros and above: 33 percent). In contrast, people with a low level of formal education (17 percent) and people with a net household income of 1,000 to 1,999 euros (22 percent) are underrepresented.

The time comparison reveals that from the start of the survey in 2009 until the measurement in 2017, the overall indicator was relatively stable at between 22 and 25 percent. In 2019, it was above the 25 percent mark for the first time, at 28 percent. This also applies to the current measurement, but the overall indicator has fallen to 26 percent within two years (see Table 20). The overall indicator has decreased especially among men (2019: 30 percent, 2021: 24 percent) and in the group with a high level of education (2019: 39 percent, 2021: 33 percent).

Looking at the three sub-areas, it can be seen that the attitude indicator and especially the behaviour indicator have decreased compared to 2019 (attitude indicator: 2019: 60 percent, 2021: 55 percent; behaviour indicator: 2019: 63 percent, 2021: 53 percent). Interestingly, however, this does not apply to the knowledge indicator. This has increased once again compared to 2019 (44 percent) and now reaches the highest value measured to date at 48 percent.

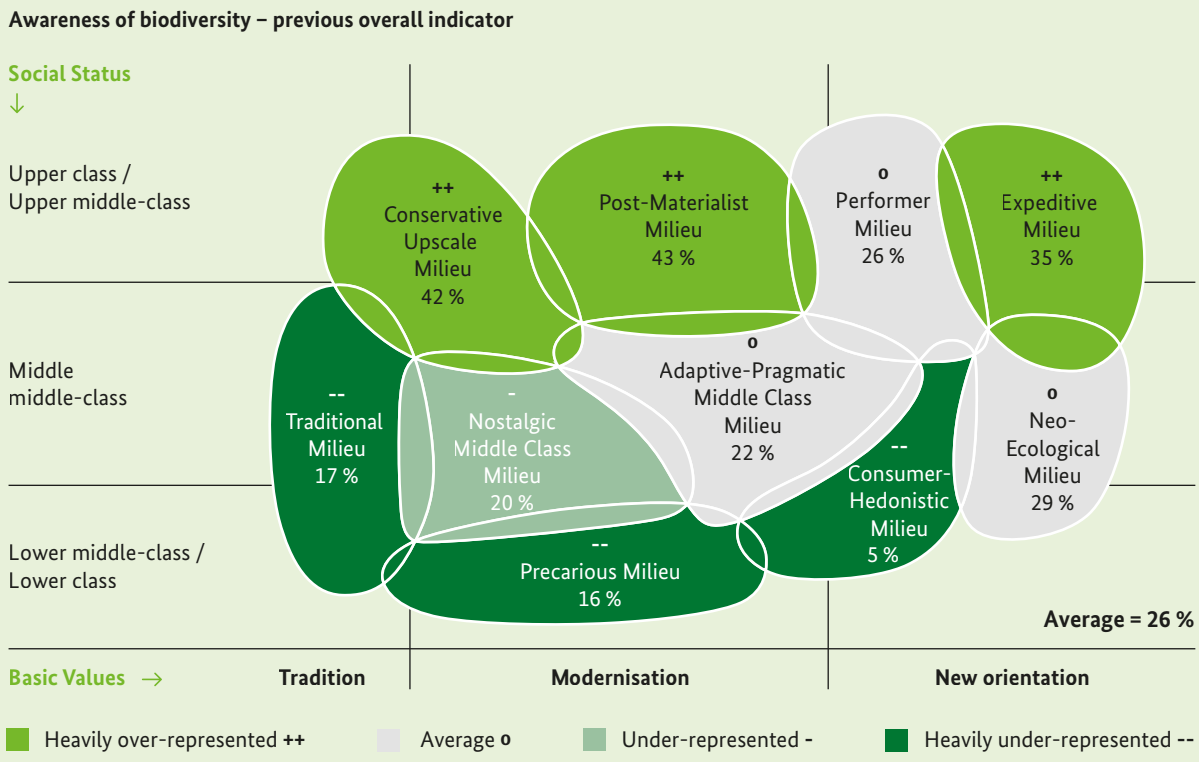
In a comparison of milieus, it is the members of the nature conservation-oriented Post-Materialists and the conscientious Conservative Upscale who achieve the highest values for the overall indicator with their attitudes, their willingness to change behaviour, and their level of knowledge (43 percent and 42 percent respectively). The young and very mobile milieu of the Expeditives (35 percent) also has a higher than average awareness of the importance of biodiversity. In comparison, the values in the Nostalgic Middle Class

Table 20: Development over time of the indicator "awareness of biodiversity" – adult population

Overall indicator and sub-indicators compared over time

Data in percent	2009	2011	2013	2015	2017	2019	2021
"Knowledge" sub-indicator	42	41	40	41	42	44	48
"Attitude" sub-indicator	54	51	54	53	54	60	55
"Behaviour" sub-indicator	50	46	50	59	56	63	53
Overall indicator	22	23	25	24	25	28	26

Figure 44: Overall indicator – adult population by milieu



(20 percent), in the security and order-loving older generation (Traditional: 17 percent), the lifeworld at the lower fringe of society (16 percent), and in the fun and experience-oriented milieu (five percent) are significantly lower (see Figure 44).

For a more in-depth look, the survey results for all three sub-areas are presented in the following section.

6.2 Results of the previous sub-indicators: Knowledge, attitudes, and willingness to change behaviour

Awareness and understanding

Fewer and fewer people say they have never heard the term "biodiversity".

In the current survey, eleven percent of respondents have never heard the term biodiversity. Thirty-nine percent say they have heard the term before but do not know what biodiversity means, and 47 percent say they not only know the term "biodiversity" but are also aware of what it means (see Figure 45).

It is mainly people with a high level of formal education and a high net household income who state that they are aware of the importance of biodiversity in terms of content (formally well-educated: 59 percent, net household income over 3,500 euros: 58 percent). In contrast, the term is less well known among people with a low level of formal education (34 percent) and people with a net household income of less than 2,000 euros (1,000 to 1,999 euros: 40 percent, under 1,000 euros: 39 percent).

A comparison of milieus shows that the meaning of biodiversity is best known in the socially upscale milieus (see Figure 46). This is especially true for the Post-Materialists (69 percent). The modern, young middle of society (Adaptive Pragmatic Middle Class) and the lifeworld focused on consumption and entertainment are less familiar than average with the meaning of biodiversity (40 percent and 38 percent respectively). In the Traditional milieu (34 percent) and in the socially disadvantaged lifeworld (32 percent), the fewest people state that they know what the term "biodiversity" means.

In a comparison over time, it is noticeable that the proportion of those who do not associate anything with the term "biodiversity" has continued to decline (see

Figure 45: Familiarity with the term "biodiversity" – adult population compared over time

Are you familiar with the term "biodiversity"?

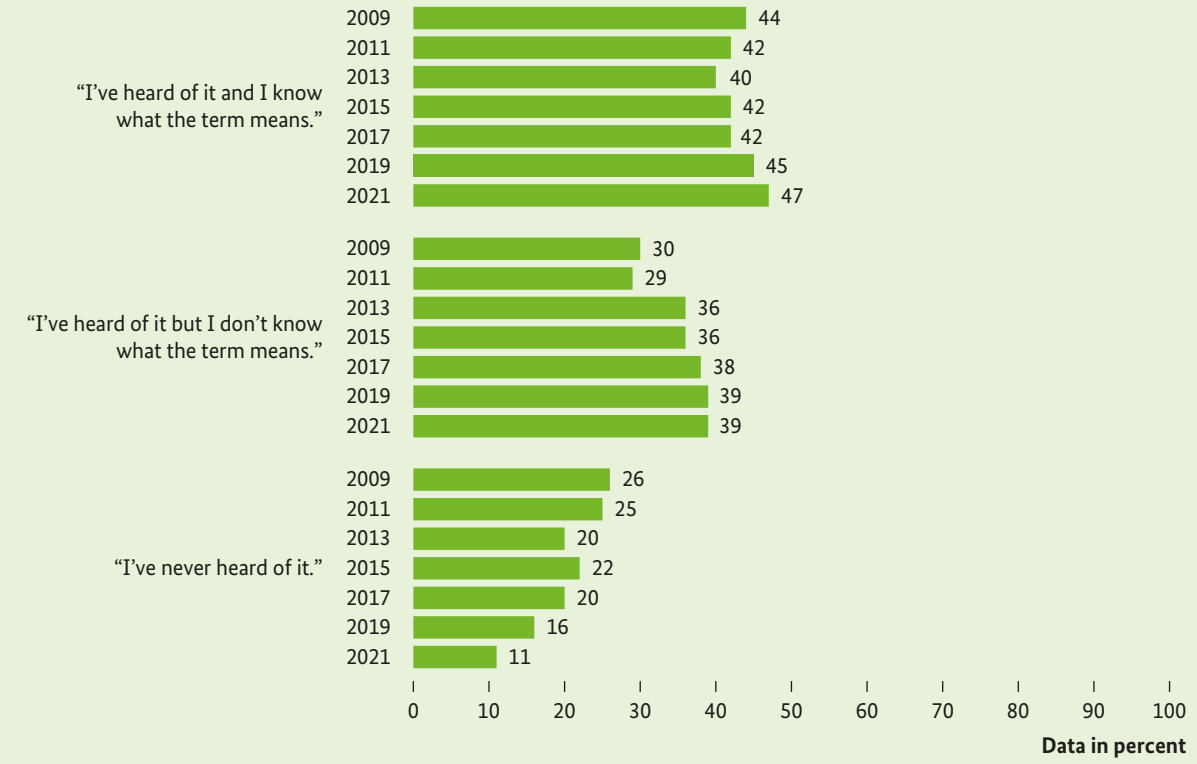


Figure 46: Familiarity with the term "biodiversity" – adult population by milieu

Are you familiar with the term "biodiversity"?

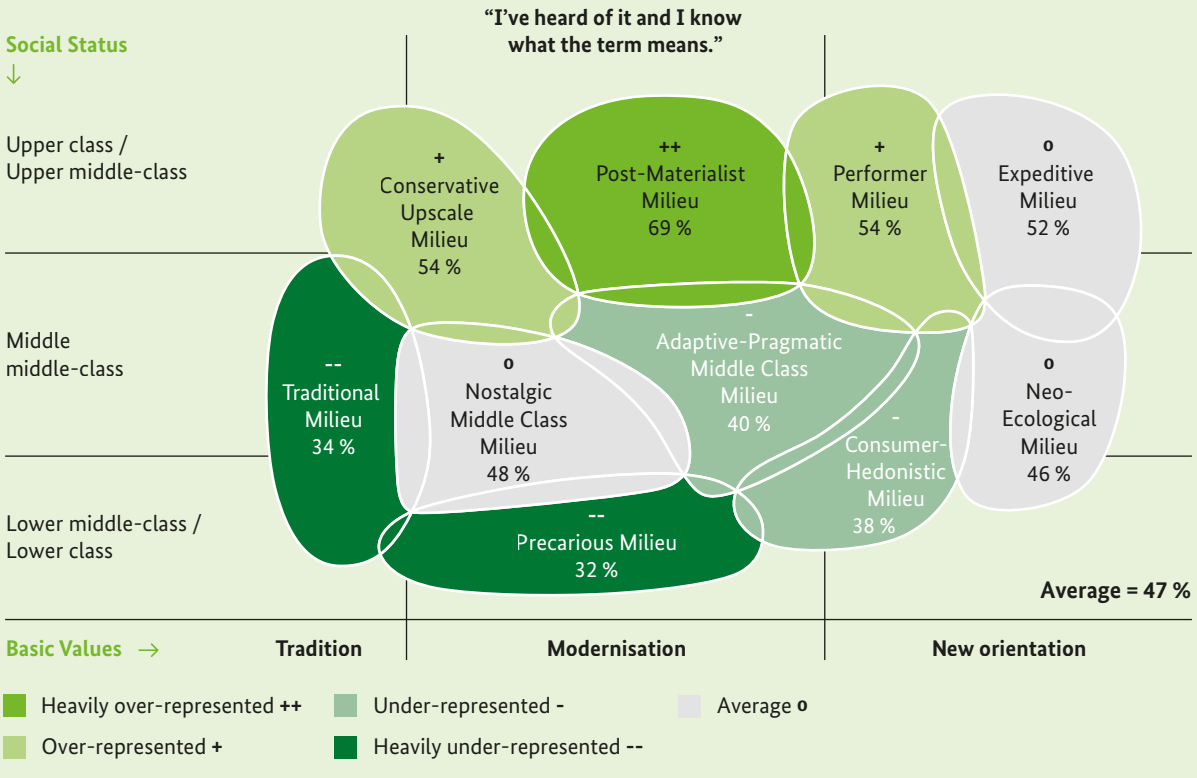
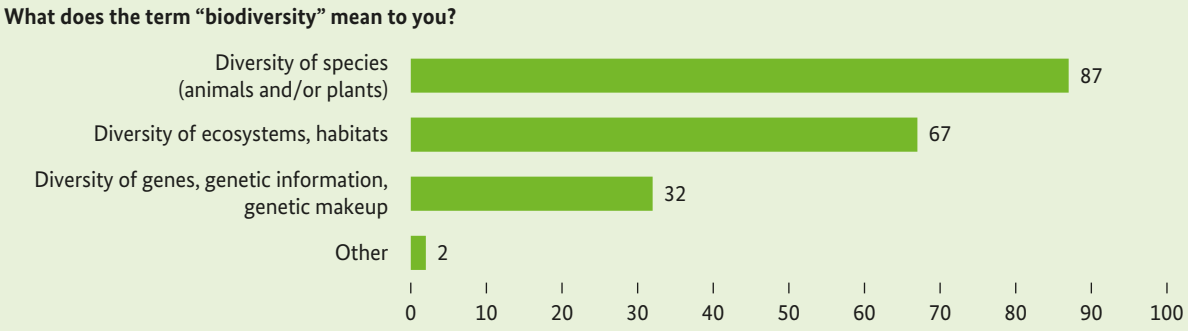


Figure 47: Understanding of the term "biodiversity" – adult population



Basis: only respondents who claim to know what "biodiversity" means

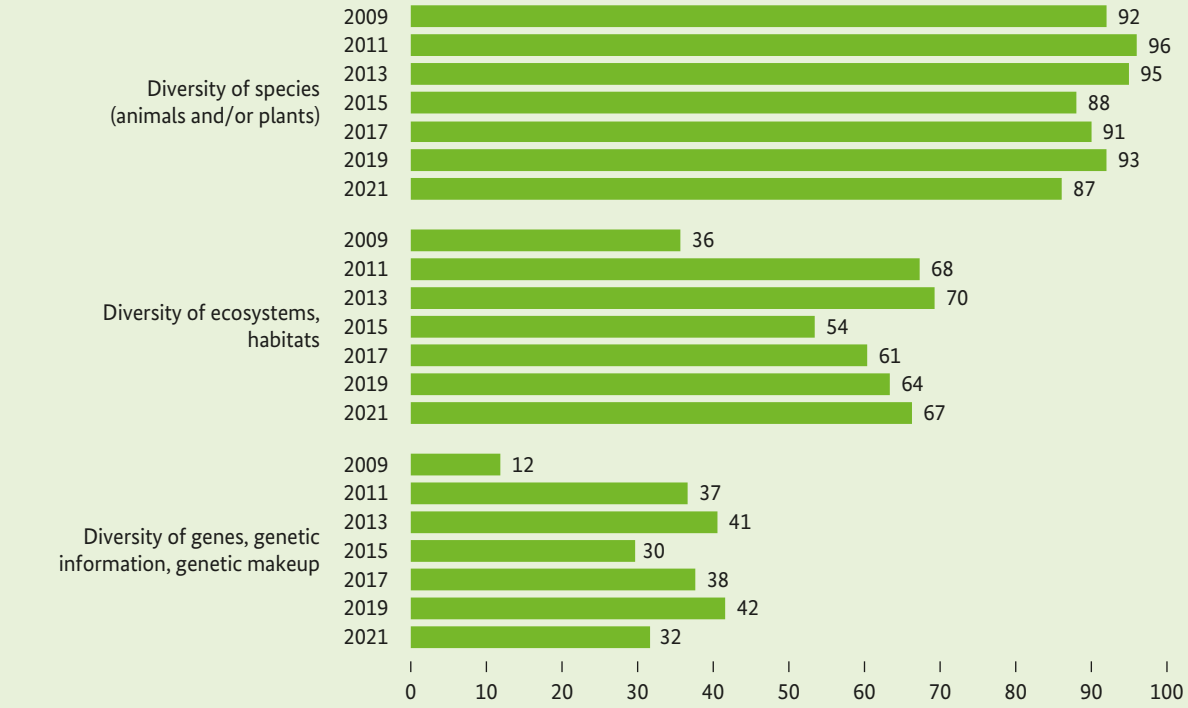
Data in percent

Figure 45). After it stood well below one-fifth for the first time in 2019 at 16 percent, it is just eleven percent in 2021. The proportion of those who do not know the meaning but have heard the term before has remained constant compared to 2019 (39 percent). The number of people who can describe the meaning of the term has increased only slightly, but has reached the highest value to date (47 percent).

Biodiversity is by far most often associated with species diversity.

Eighty-seven percent of respondents who are familiar with the term "biodiversity" associate it with the diversity of animal and plant species (see Figure 47). This figure is slightly lower in the group with low educational qualifications (82 percent). Sixty-seven percent of respondents also think about the diversity

Figure 48: Understanding of the term "biodiversity" – adult population compared over time



Basis: only respondents who claim to know what "biodiversity" means

Data in percent

of ecosystems and habitats. The fact that biodiversity also includes the diversity of genes, hereditary information, and genetic material is familiar to 32 percent of respondents.

In a comparison of milieus, the number of those who also think of ecosystems and habitats when they think of biodiversity is greatest in the Post-Materialist milieu (77 percent, average: 67 percent). The same applies to respondents who also associate biodiversity with the diversity of genes – Post-Materialists are overrepresented in this group too (40 percent, average: 32 percent).

Compared to the previous survey, it is evident that the proportion of respondents who associate biodiversity with species diversity has decreased by six percentage points (see Figure 48). There has also been a decrease in the proportion of those who understand biodiversity to mean the diversity of genes, hereditary information, and genetic material as well (2019: 42 percent, 2021: 32 percent). On the other hand, the proportion of those who also associate biodiversity with the diversity of ecosystems and habitats has increased by three percentage points.

Appreciation for biodiversity

After answering the questions in the "knowledge" sub-area, all respondents were presented with a definition of biodiversity in order to ensure that they had a comparable level of knowledge regarding the meaning of the term.[30] This was followed by questions on attitude and willingness to change behaviour.

Three out of four Germans are convinced of the decline in biodiversity.

Seventy-four percent of respondents are very convinced or somewhat convinced that biodiversity on Earth is in decline, 17 percent are undecided, and only a fraction of six percent are somewhat unconvinced or completely unconvinced. Three percent were unable to give an answer (see Figure 49). It is striking that the proportion of those who are "very convinced" of the decline in biodiversity has decreased by 14 percentage points compared to 2019 (2019: 43 percent, 2021: 29 percent). When both levels of agreement are taken into account, the difference is smaller (very/somewhat convinced: 2019: 82 percent, 2021: 74 percent).

The conviction that biodiversity on Earth is in decline is stronger in the groups with higher educational qualifications than in the group with a low level of formal education (very convinced: low education level: 25 percent, medium education level: 31 percent, high education level: 33 percent).

Compared to the youth survey, no differences are apparent (see Figure 49). Like adults, 14 to 17-year-olds are largely convinced that biodiversity is in decline worldwide (very convinced: 28 percent, somewhat convinced: 46 percent).

The milieu analysis shows that it is above all the well-educated and information-savvy milieus of the Post-Materialists and Expeditives who are sensitised to the threat to biodiversity (very convinced: 49 percent and 37 percent respectively). Awareness of the decline in biodiversity is least pronounced in the Adaptive Pragmatic Middle Class (20 percent) and in the lifeworld with a strong consumer-hedonist value orientation (nine percent).

Figure 49: Perceived decline of biodiversity – adults and teenagers in comparison

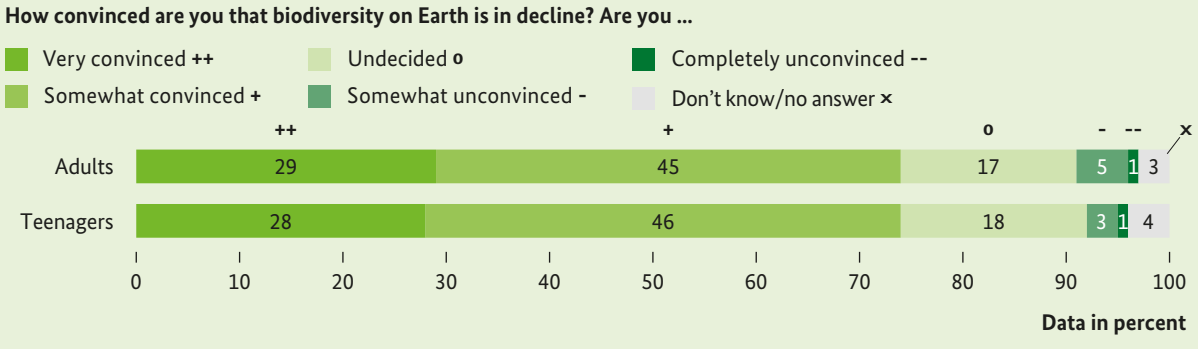
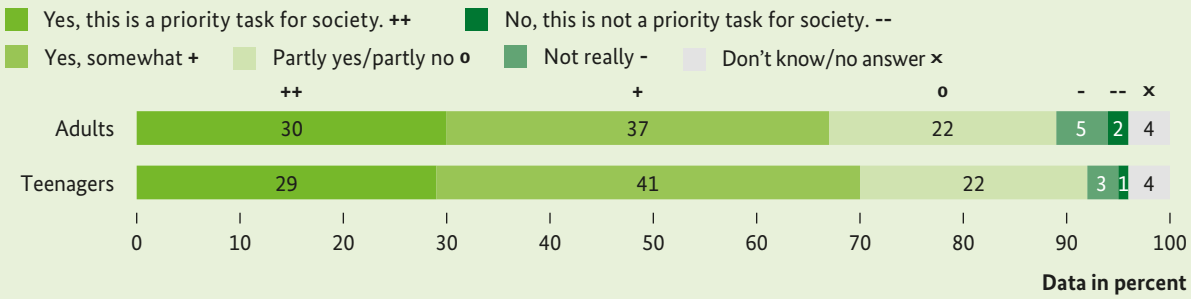


Figure 50: Social significance of the conservation of biodiversity – adults and teenagers in comparison



Two thirds of Germans consider the protection of biodiversity to be a priority task for society.

Asked whether the conservation of biodiversity was a priority task for society, 30 percent answered unreservedly with "yes", another 37 percent with "yes, somewhat" (see Figure 50). This means that general agreement on this question has decreased by ten percentage points compared to 2019 (2019: "yes"/"yes, somewhat": 77 percent). Unreserved approval has declined by 13 percentage points (2019: "yes": 43 percent).

Unreserved agreement is highest in the group with high net household income (over 3,500 euros: 35 percent), and below average in the 18-29 age group (24 percent). Among teenagers (14 to 17-year-olds), 29 percent unreservedly regard the protection of biodiversity as a priority task for society (see Figure 50).

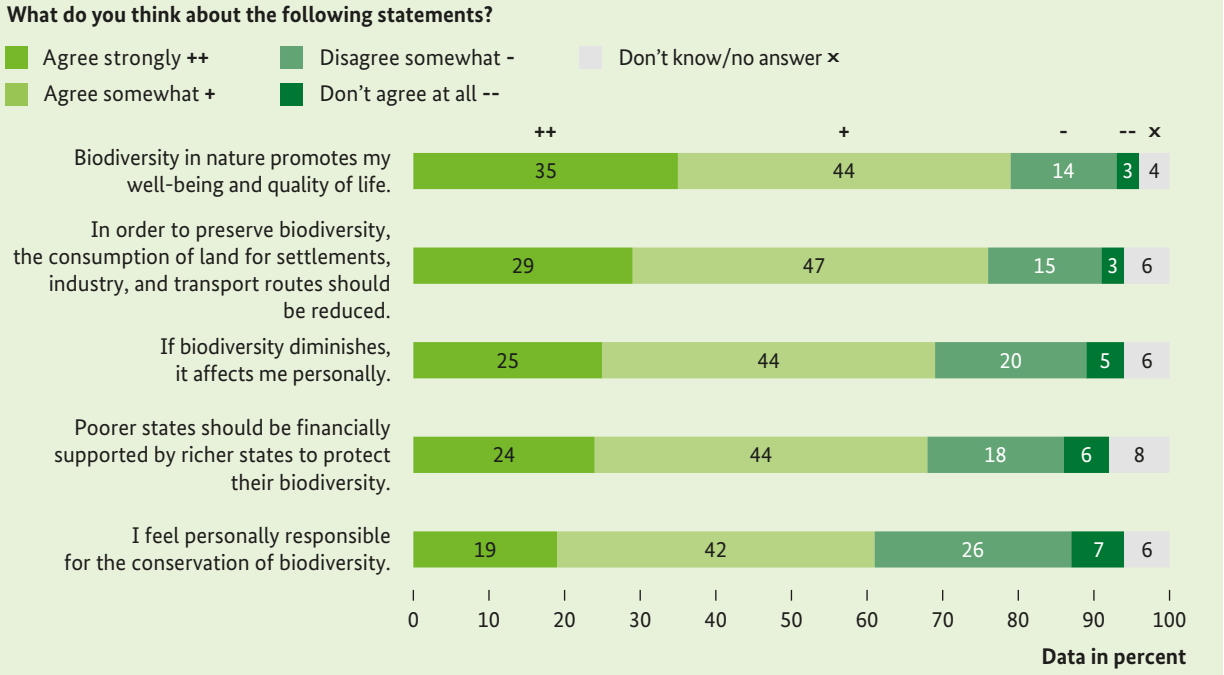
Differentiated according to social milieus, it is above all the Post-Materialists ("yes": 49 percent), the Conservative Upscale (43 percent), and the Expeditives (37 percent) who unreservedly consider the conservation of biodiversity to be a priority task for society. In contrast, awareness of the problem is below average among the Adaptive Pragmatic Middle Class ("yes": 22 percent), people living in precarious circumstances (22 percent), and in the fun and experience-oriented lifeworld (seven percent).

In large parts of the population, demands for political measures to preserve biodiversity meet with approval.

The immediate consequences that a loss of biodiversity can have on one's own life are an important argument for its conservation for most respondents. As such, 79 percent agree "strongly" or at least "somewhat" that biodiversity in nature promotes their well-being and quality of life – women in particular share this view (both levels of agreement: 83 percent). In addition, 69 percent of respondents say that it would affect them personally if biodiversity were to diminish (see Figure 51). People with high educational qualifications are more likely to provide such a response (both levels of agreement: 73 percent). Compared to the previous survey, agreement with both statements has declined somewhat: In 2019, 87 percent believed that biodiversity in nature promotes their well-being and quality of life (2021: 79 percent), and 74 percent said it would affect them personally if biodiversity diminished (2021: 69 percent).

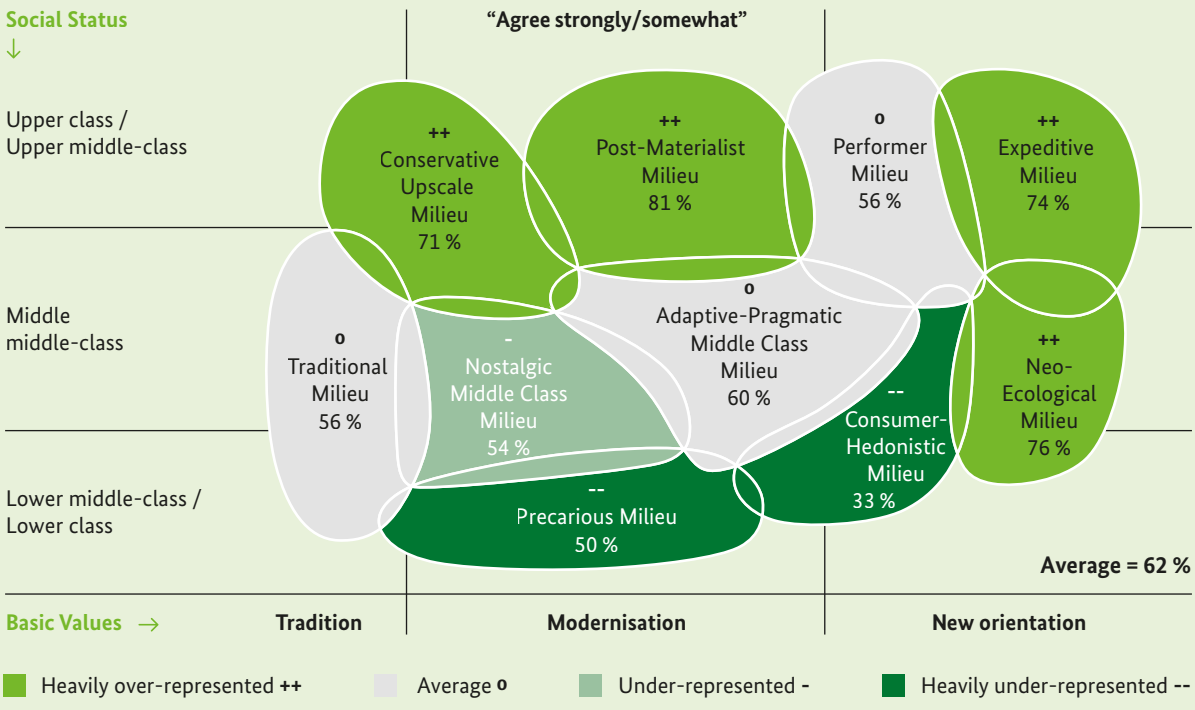
The fact that the preservation of biodiversity is an important concern for many Germans is also shown by the fact that demands for political measures meet with approval in large parts of the population: 76 percent agree "strongly" or at least "somewhat" with limiting the use of land for settlements, industry, and transport routes in order to preserve biodiversity. The figure is slightly more in the group with a medium level of education (81 percent). In addition, 68 percent of respondents are in favour of poorer states receiving financial support from richer states to protect their biodiversity. This demand is most frequently shared by the groups with a high level of formal education (71 percent) and high net household income (74 percent). Compared to 2019, the proportion of those who agree with a reduction in the consumption of land for settlements, industry, and transport routes has decreased: In 2019, 81 percent agreed "strongly" or at least "somewhat", compared to 76 percent in the current survey. The approval of financial support for poorer states has also declined (2019: 76 percent, 2021: 68 percent).

Figure 51: Personal significance of biodiversity among the adult population



Although most respondents consider the conservation of biodiversity to be a priority task for society, willingness to take responsibility themselves is lower: 61 percent say they feel personally responsible for the conservation of biodiversity, but 33 percent do not see themselves as responsible. Awareness of one's own

Figure 52: Perceived responsibility among the adult population by milieu



responsibility is most widespread in the groups with high educational qualifications (68 percent) and high net household income (67 percent). Compared to 2019, the perceived responsibility has only changed insignificantly (2019: 59 percent, 2021: 61 percent).

The social milieus differ considerably in some parts in their appreciation of biodiversity. This is particularly evident in their attitude towards being personally responsible for the protection of biodiversity. A sense of responsibility is widespread in the Post-Materialist milieu, the Conservative Upscale milieu, and the post-modernist milieus of the Neo-Ecologicals and Expeditives. In each case, it is more than 70 percent who agree "strongly" or at least "somewhat" that they feel personally responsible for the conservation of biodiversity (see Figure 52). In contrast, the harmony-oriented middle of society (Nostalgic Middle Class: 54 percent), the economically, socially, and culturally disadvantaged (50 percent), and the consumer and entertainment-focused (33 percent) perceive less of a personal responsibility.

Willingness to take action

Willingness to actively contribute to the conservation of biodiversity has decreased.

General willingness to personally contribute to the protection of biodiversity is widespread among the population (see Figure 53): 78 percent are very or somewhat willing to switch to natural cosmetics and toiletries. Finding out about current developments in the area of biodiversity is an option for 75 percent. Seventy percent can imagine making friends and acquaintances aware of the protection of biodiversity. More than 60 percent also say they are willing to use a guide when shopping, for example one that provides information about endangered fish species. Furthermore, 57 percent declare their willingness to donate to the upkeep and conservation of a nature reserve. General willingness to actively work for a nature conservation association is still at 42 percent.

A look at the top level of agreement shows how seriously people express their willingness to change their behaviour. This reveals that unreserved willingness to actively contribute to the conservation of biodiversity is clearly below 50 percent for all listed behavioural

Figure 53: Willingness of the adult population to actively contribute to the conservation of biodiversity

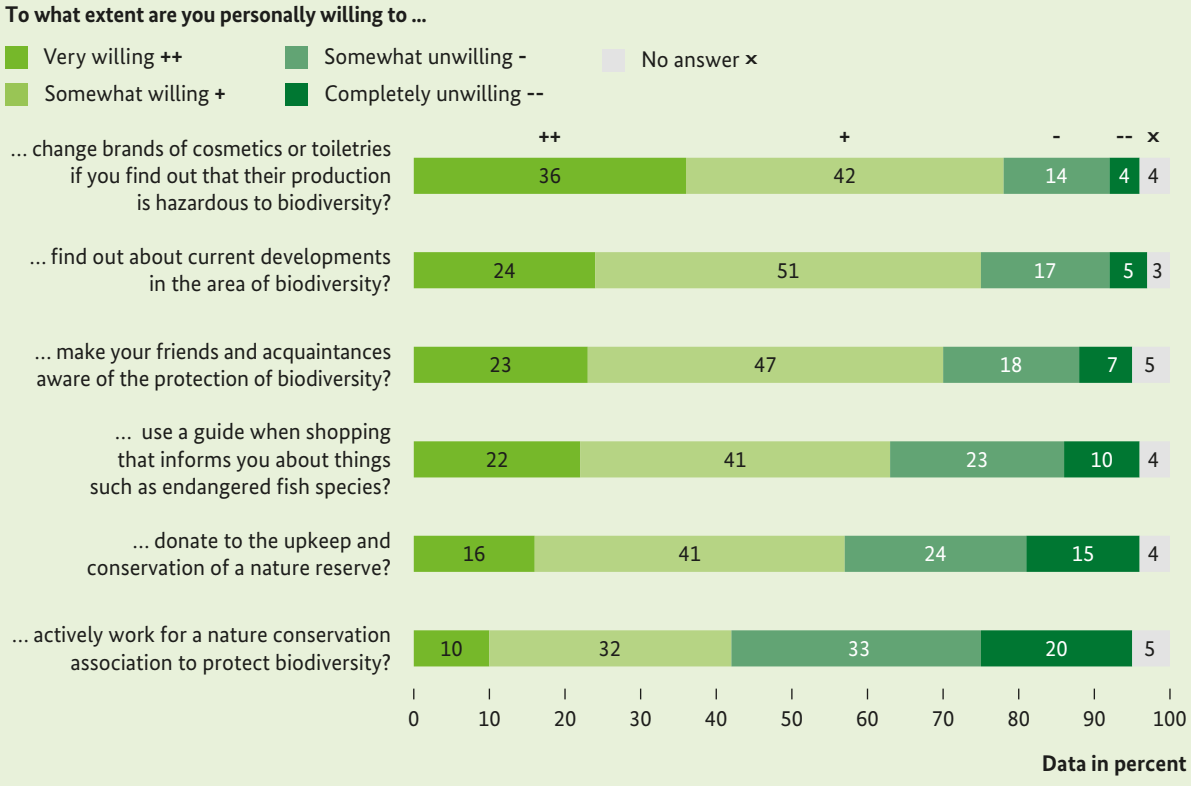


Table 21: Development over time of willingness to actively contribute to the conservation of biodiversity – adult population

To what extent are you personally willing to ...

Response category: "very willing" Data in percent	2009	2011	2013	2015	2017	2019	2021
... change brands of cosmetics or toiletries if you find out that their production is hazardous to biodiversity?	42	37	34	40	46	54	36
... find out about current developments in the area of biodiversity?	18	23	25	26	24	32	24
... make your friends and acquaintances aware of the protection of biodiversity?	24	23	21	32	27	34	23
... use a guide when shopping that provides information about endangered fish species, for example?	19	24	22	27	26	34	22
... donate to the upkeep and conservation of a nature reserve?	13	10	11	14	14	16	16
... actively work for a nature conservation association to protect biodiversity?	11	8	9	13	8	10	10

Basis: Nature Awareness Study Series from 2009 to 2021

options. It should also be noted that the unreserved willingness for four of the six behavioural options surveyed has decreased compared to the previous survey. Only the willingness to donate and the willingness to actively participate in a nature conservation association have remained more or less the same (see Table 21). Whether this decline is a consequence of the coronavirus pandemic – for example, because people tend to feel overwhelmed in everyday life anyway – can unfortunately not be verified here.

Table 22: Willingness to actively contribute to the conservation of biodiversity – adult population by gender, education, and income

To what extent are you personally willing to ...

Response category: "very willing" Data in percent	Average	Gender		Educational level			Net household income (euros)			
	Ø	M	F	Low	Average	High	up to 999	1,000 to 1,999	2,000 to 3,499	3,500 and more
... change brands of cosmetics or toiletries if you find out that their production is hazardous to biodiversity?	36	↓ 33	40 ↑	↓ 32	40	37	41	35	35	40
... find out about current developments in the area of biodiversity?	24	22	27	↓↓18	26	29↑↑	23	24	23	28
... make your friends and acquaintances aware of the protection of biodiversity?	23	↓ 20	26 ↑	↓↓18	24	28 ↑	25	21	24	26
... use a guide when shopping that provides information about endangered fish species, for example?	22	19	24	↓ 18	22	26 ↑	23	21	20	26 ↑
... donate to the upkeep and conservation of a nature reserve?	16	16	16	↓↓11	15	21↑↑	11	13	17	19
... actively work for a nature conservation association to protect biodiversity?	10	9	11	8	10	12	11	↓ 7	10	13

Heavily over-represented ↑↑ Over-represented ↑ Under-represented ↓ Heavily under-represented ↓↓

The socio-demographic analysis makes it clear that willingness to take action increases strongly with the level of education (see Table 22). Furthermore, it is striking that women emphasise more often than men their willingness to make friends and acquaintances aware of the protection of biodiversity (26 percent compared to 20 percent) and to change brands of cosmetics or toiletries if they learn that their production endangers biodiversity (40 percent compared to 33 percent). A look at net household income further shows that those who are financially well off are more likely than average to be willing to use a guide when shopping that provides information about endangered fish species, for example (26 percent, average: 22 percent).

When looking at the social milieus, it is noticeable that the willingness to protect biodiversity is strongest among Post-Materialists, the Conservative Upscale, and Expeditives. For example, 38 percent of Post-Materialists, 31 percent of the Conservative Upscale, and 30 percent of Expeditives are very willing to find out about current developments in the area of biodiversity. In the harmony-oriented centre of society (Nostalgic Middle Class milieu), on the other hand, the figure is 17 percent. Willingness is even lower among people in socially weaker situations (13 percent) and in the group with strongly consumer-hedonistic values (six percent). It is also striking that the two post-modern milieus of the Expeditives and Neo-Ecologicals most frequently express an unreserved willingness to become actively involved in a nature conservation association (18 percent and 17 percent respectively, average: ten percent).

6.3 Awareness of biodiversity – psychologically based design of the new indicator

The societal indicator "awareness of biodiversity", which has been used since 2009, was revised in 2020/2021 in a research project led by Prof. Dr Sebastian Bamberg (Bielefeld University of Applied Sciences). The revision came about through a re-analysis of the data from the Nature Awareness Studies from 2009 to 2015. In this analysis, Hoppe et al. (2019) were able to demonstrate that the three sub-indicators developed by Kuckartz and Rädiker (2009) (knowledge, attitudes, willingness to change behaviour) are reliable measurement instruments. However, their analyses also show that the guiding idea underlying the development of the indicator, namely to conceptualise awareness of the importance of biodiversity as a combination of the three sub-indicators, is poorly supported empirically and through the theoretical design. The knowledge indicator in particular contributes only insignificantly to explaining the behavioural intentions queried. In addition, a broader range of variables relevant to environment-related behaviour is needed to comprehensively measure biodiversity awareness. In their conclusion, Hoppe et al. (2019) recommend redeveloping the societal indicator based on the current state of environmental psychology theory.

For the empirical recording of the new societal indicator, Bamberg et al. (2022) developed and tested a set of 33 questions. It should be emphasised that the selected variables are not only theory-based and empirically well supported, but also cover central psychological factors of nature-protecting behavioural intentions.

Based on content-related and methodological criteria, 17 questions were developed to measure six psychological factors that are significant in explaining nature-friendly and environmentally friendly behaviour and represent the findings of some 40 years of research in environmental psychology: Attachment to nature, awareness of the problem, connectedness with groups working to protect biodiversity (social identity), perception of environmentally friendly behaviour as a social norm, attitudes towards environmentally friendly behaviour, and perceived behavioural control.

Another 16 questions related to conservation and sustainable and fair use of biodiversity were used to measure four facets of behavioural intentions: willingness to make lifestyle changes, willingness to make private behavioural changes, willingness to take collective action, and willingness to pay to protect nature. In this context, it should be noted that the six questions measuring willingness to change behaviour in the previous societal indicator were considered still suitable, integrated into the new indicator, and supplemented with ten new questions. The corresponding questions in the previous indicator are therefore presented several times in different contexts below. Moreover, the advantage of adopting these questions is that it retains the possibility of data series analysis over time for these questions.

All in all, the new societal indicator thus consists of ten psychological factors that can be combined into a single overall index value. The index value formed per

Table 23: Comparison of new and previously used societal indicator – adult population by education and income

NBS indicator "awareness of biodiversity" (new and previous calculation in comparison)

Data in percent	Average	Educational level			Net household income (euros)			
	Ø	Low	Average	High	up to 999	1,000 to 1,999	2,000 to 3,499	3,500 and more
New overall indicator	25	↓↓18	25	32↑↑	24	↓↓20	25	32↑↑
Overall indicator to date	26	↓↓17	28	33↑↑	21	↓ 22	26	33↑↑

Heavily over-represented ↑↑ Under-represented ↓ Heavily under-represented ↓↓

person is based on the sum of the mean values of the psychological factors, weighted by the standardised factor loadings.[31] Here, the higher the index value, the more likely it can be assumed that there is a strong awareness of the significance of biodiversity.

According to the previous societal indicator, every fourth German currently has a sufficiently high awareness of biodiversity (2021: 26 percent). In order to ensure the transition to the new indicator, this must also apply to the new societal indicator. For this reason, three thresholds were calculated for the new societal indicator, dividing the sample of respondents into four equally sized groups. The fourth group includes the 25 percent of respondents with the highest index scores. These top 25 percent of respondents with the strongest awareness of biodiversity form a new empirical calibration value. In the upcoming surveys, the new indicator will measure whether the proportion of the population with the highest awareness will change in relation to the level in 2021.

Tables 23 and 24 show a comparison of the new and the previously used societal indicator. This makes it clear that regardless of the calculation methodology, it is the groups with a high level of formal education and high net household income that show the highest values in the socio-demographic analysis (see Table 23). The results of the milieu differentiation are also very comparable with each other (see Table 24): In both the previously used and the new societal indicator, Post-Materialists, the Conservative Upscale, and Expeditives are overrepresented, while the Traditional, the Nostalgic Middle Class, the socially disadvantaged milieu, and the lifeworld focused on consumption and entertainment are underrepresented. Only two differences are striking: According to the new societal indicator, Neo-Ecologicals have an above-average awareness of biodiversity; according to the previously used societal indicator, they are also above average, but statistical significance cannot be demonstrated. The situation is similar with regard to the Adaptive Pragmatic Middle Class: According to the new societal

Table 24: Comparison of new and previously used societal indicator – adult population by milieu

NBS indicator "awareness of biodiversity" (new and previous calculation in comparison)

Ø = Average
CON = Conservative Upscale
PMA = Post-Materialist
PER = Performer
EPE = Expeditive
NEO = Neo-Ecological
ADA = Adaptive Pragmatic Middle Class
HED = Consumer Hedonistic
PRE = Precarious
NOS = Nostalgic Middle Class
TRA = Traditional

Data in percent	Ø	CON	PMA	PER	EPE	NEO	ADA	HED	PRE	NOS	TRA
New overall indicator	25	43↑↑	42↑↑	23	45↑↑	34↑↑	↓ 19	↓↓ 3	↓↓10	↓↓11	↓ 17
Overall indicator to date	26	42↑↑	43↑↑	26	35↑↑	29	22	↓↓ 5	↓↓16	↓ 20	↓↓17

Heavily over-represented ↑↑ Under-represented ↓ Heavily under-represented ↓↓

indicator, members of this milieu have a lower than average awareness of biodiversity; according to the previously used societal indicator, the value measured for this milieu is below average, but the difference is not significant.

Against this background and considering the fact that the new societal indicator is a theory-based, empirically supported measurement tool that also covers central factors of behavioural intentions to protect nature, the newly developed "awareness of biodiversity" indicator will be used in future Nature Awareness Studies.

For a closer look at the individual factors used for the calculation of the new societal indicator, the survey results for all ten psychological factors are presented below and differentiated by socio-demographic characteristics and social milieus.

6.4 Awareness of biodiversity in the new individual psychological factors

Attachment to nature

Around 70 percent of Germans feel connected to nature.

Sixty-nine percent of respondents feel connected to nature (both levels of agreement), 62 percent see themselves as part of nature, and 40 percent say they feel connected to something greater when in nature (see Figure 54).

The sociodemographic analysis reveals that women (both levels of agreement: 72 percent), people with medium and high levels of education (73 percent each), and the financially well-off (74 percent) are more likely than average to feel connected to nature (average: 69 percent). Below-average values are found among men (66 percent), 18 to 29-year-olds (58 percent), and in the group with low educational qualifications (61 percent). Furthermore, it is noticeable that 18 to 29-year-olds (53 percent) and the group with low educational qualifications (85 percent) are less likely than average (63 percent) to state that they perceive themselves as part of nature.

Post-Materialists and the Conservative Upscale especially feel connected to nature.

In a comparison of milieus, the greatest attachment to nature can be seen in the milieus of the Post-Materialists and the Conservative Upscale (see Figure 55). In each case, 84 percent state that they feel connected to nature (both levels of agreement). In the milieu of young trendsetters (Expeditives), too, an attachment to nature is widespread (76 percent). In the modern mainstream of society (Adaptive Pragmatic Middle Class), emotional attachment to nature is below average (63 percent). The same applies to the socially, economically, and culturally disadvantaged group (61 percent). By far the fewest feel connected to nature in the lifeworld focused on consumption and entertainment (32 percent).

Figure 54: Attachment to nature among the adult population

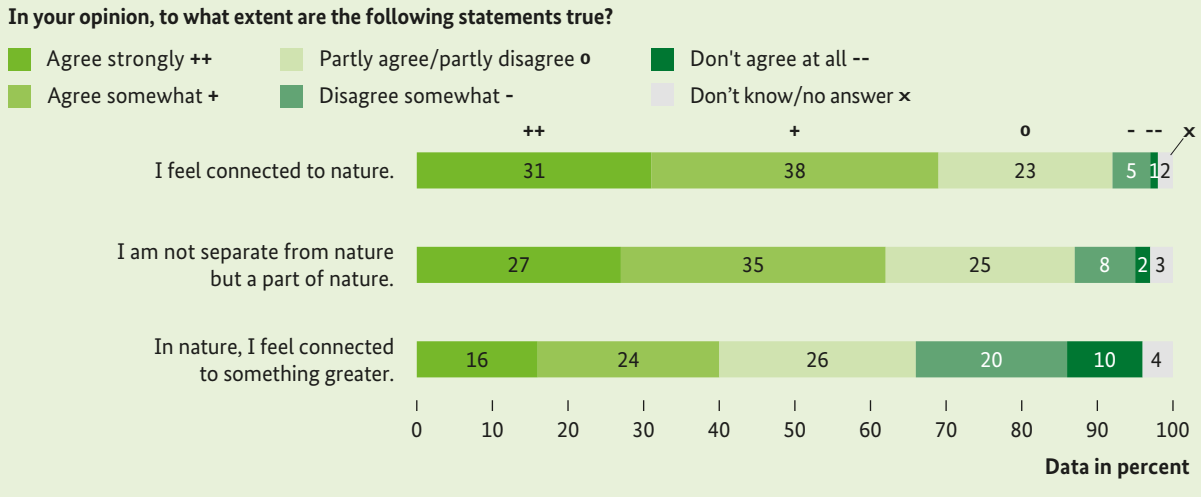
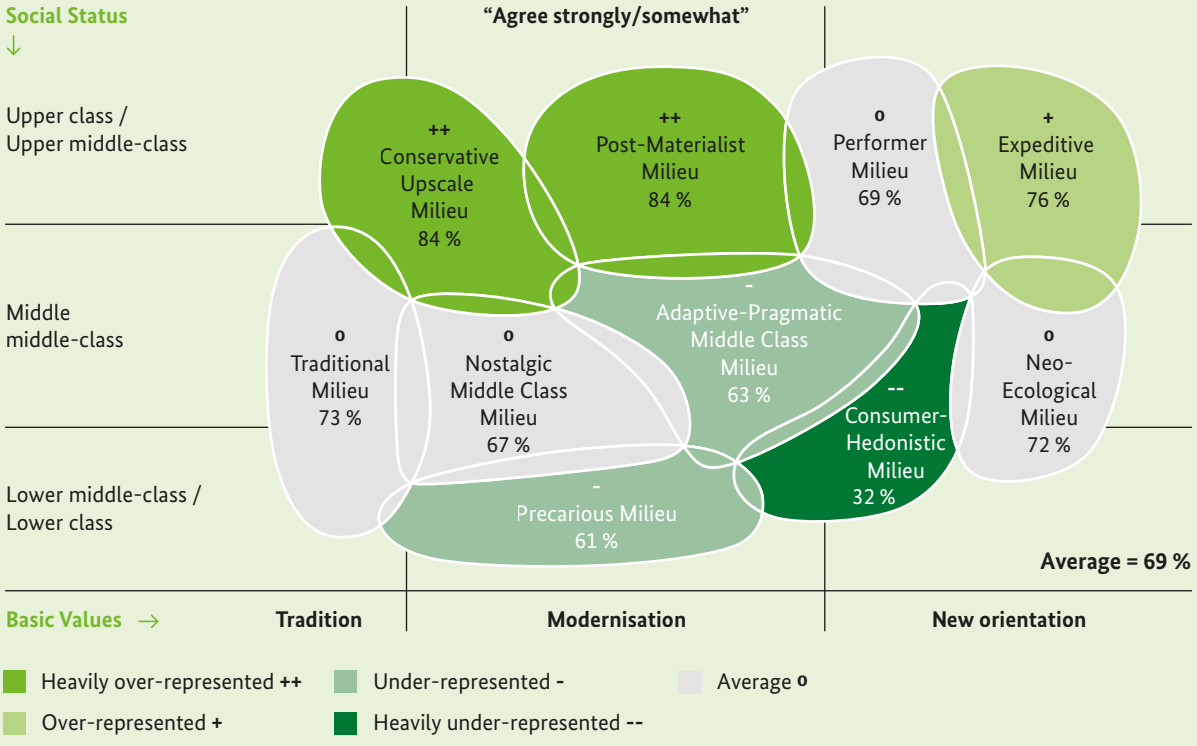


Figure 55: Attachment to nature among the adult population by milieu

In your opinion, to what extent are the following statements true? "I feel connected to nature."



Problem awareness

Around four out of five Germans believe that by destroying biodiversity, humanity is endangering its means of existence.

Seventy-four percent of respondents believe that biodiversity on Earth is declining (both levels of agreement). Seventy-three percent believe that by destroying biodiversity, humanity is endangering its means of existence. In addition, 71 percent believe that our lifestyle is contributing to the degradation of biodiversity in other countries (see Figure 56).

In the socio-demographic analysis it becomes clear that among men, 18 to 29-year-olds, and those with a

Figure 56: Problem awareness among the adult population

In your opinion, to what extent are the following statements true?

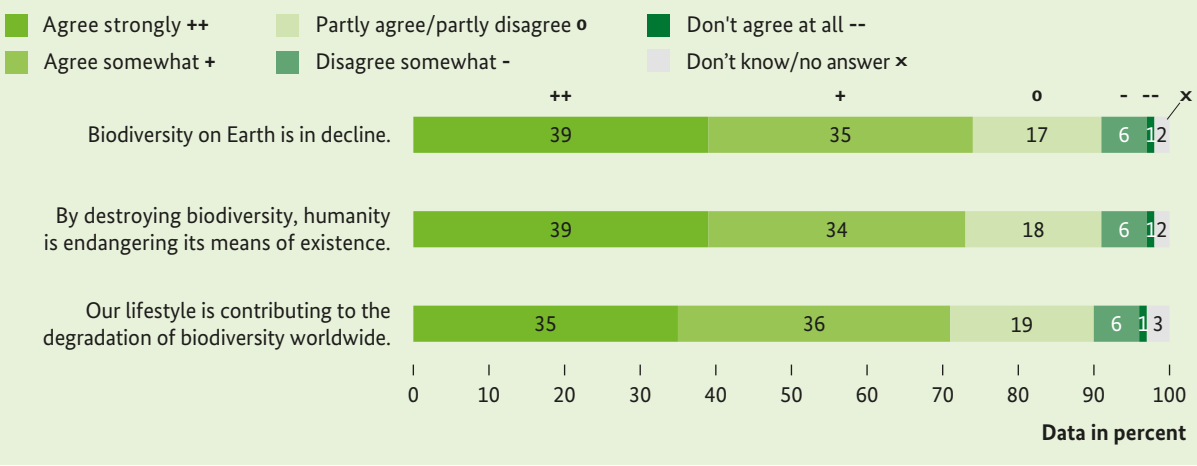


Table 25: Problem awareness among the adult population by gender, age, and education

In your opinion, to what extent are the following statements true?

Response category: "agree strongly/somewhat" Data in percent	Aver-age	Gender		Age (years)				Educational level		
	Ø	M	F	under 29	30 to 49	50 to 65	over 65	Low	Aver-age	High
Biodiversity on Earth is in decline.	74	↓ 70	78 ↑	↓↓64	74	79↑↑	73	↓↓67	79↑↑	76
By destroying biodiversity, humanity is endangering its means of existence.	73	↓↓69	77↑↑	↓↓64	73	78 ↑	73	↓↓67	76	76
Our lifestyle is contributing to the degradation of biodi-versity worldwide.	71	↓↓67	75↑↑	68	73	73	69	↓↓64	74	76↑↑

Heavily over-represented ↑↑ Over-represented ↑ Under-represented ↓ Heavily under-represented ↓↓

low level of formal education, awareness of the problem is less widespread than the population average (see Table 25). The milieu comparison further shows that it is above all Post-Materialists, the Conservative Upscale, and Expeditives who are sensitised to the threat to biodiversity and the consequences associated with it. For example, 90 percent of Post-Materialists and 86 percent each of the Conservative Upscale and Expeditives believe that the destruction of biodiversity is endangering humanity's means of existence. In contrast, in the precarious lifeworld it is 69 percent, in the Adaptive Pragmatic Middle Class 63 percent, and in the fun and experience-oriented lifeworld 31 percent.

Social identity

A third feel connected to groups that are actively working to protect biodiversity.

Thirty-five percent of respondents feel connected to groups that are actively working to protect biodiversity (both levels of agreement). Thirty-three percent say they have a lot in common with people who are actively involved in groups for the sustainable use of nature and resources, and 31 percent say that intensive contact with groups that are actively involved in nature and biodiversity conservation corresponds to their own interests and wishes (see Figure 57).

Figure 57: Connectedness of the adult population with groups working for the protection of biodiversity

In your opinion, to what extent are the following statements true?

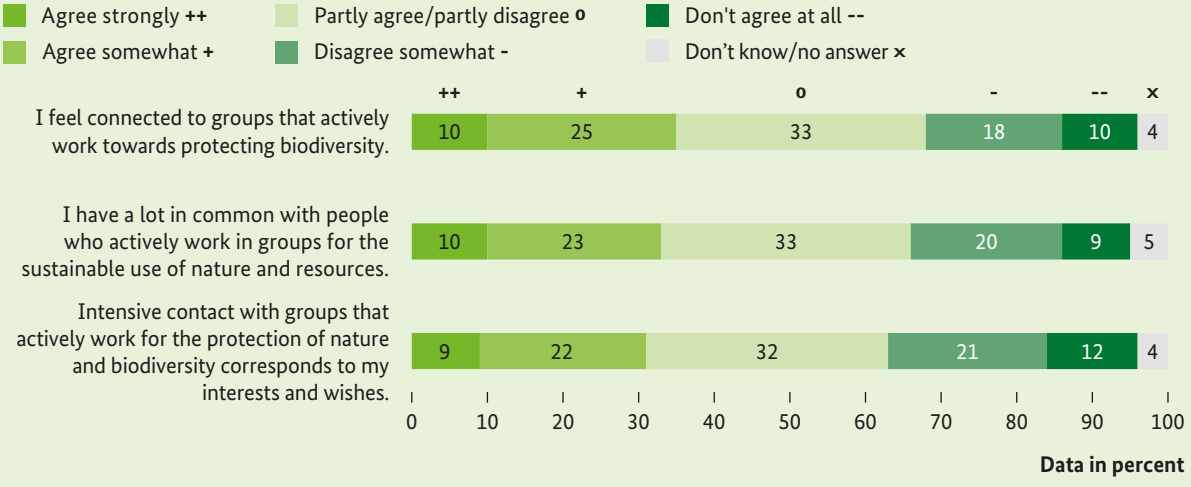


Table 26: Connectedness of the adult population with groups working for the protection of biodiversity by milieu

In your opinion, to what extent are the following statements true?

Ø = Average
CON = Conservative Upscale
PMA = Post-Materialist
PER = Performer
EPE = Expeditive
NEO = Neo-Ecological
ADA = Adaptive Pragmatic Middle Class
HED = Consumer Hedonistic
PRE = Precarious
NOS = Nostalgic Middle Class
TRA = Traditional

Response category: "agree strongly/somewhat" Data in percent	Ø	CON	PMA	PER	EPE	NEO	ADA	HED	PRE	NOS	TRA
I feel connected to groups that actively work towards protecting biodiversity.	35	49↑↑	44↑↑	↓ 28	49↑↑	52↑↑	36	↓↓19	↓↓22	↓↓22	↓↓24
I have a lot in common with people who actively work in groups for the sustainable use of nature and resources.	33	49↑↑	40 ↑	30	52↑↑	51↑↑	39	↓↓13	↓↓20	↓↓19	↓↓21
Intensive contact with groups that actively work for the protection of nature and biodiversity corresponds to my interests and wishes.	31	45↑↑	33	28	47↑↑	45↑↑	36	↓↓18	↓↓19	↓↓19	↓↓20

Heavily over-represented ↑↑ Over-represented ↑ Under-represented ↓ Heavily under-represented ↓↓

For all three statements, it is 18 to 29-year-olds, people with high educational qualifications, and the financially well-off (net household income of 3,500 euros or more) who agree more often than average. For example, 45 percent of 18 to 29-year-olds, 42 percent of those with high educational qualifications, and 41 percent of the financially well-off say they feel connected to groups actively working to protect biodiversity (average: 35 percent).

The milieu analysis shows a divided picture (see Table 26): In the post-modern lifeworlds of the Neo-Ecologicals and Expeditives and among the particularly nature-loving milieus of the Conservative Upscale and Post-Materialists, an above-average number identify with groups that are actively committed to the protection of biodiversity. On the other hand, it is the older, security and order-loving Traditionals, the harmony-oriented Nostalgic Middle Class as well as the lifeworlds of the socially weaker and those focused on consumption and entertainment who claim to have significantly less in common with nature conservation groups.

Figure 58: Descriptive social norm among the adult population

In your opinion, to what extent are the following statements true?

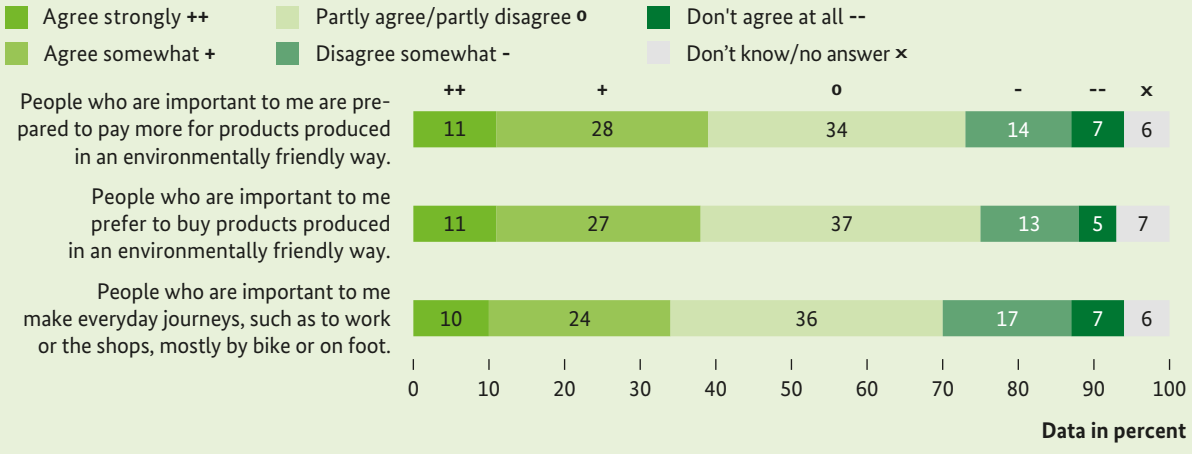


Table 27: Descriptive social norm among the adult population by education and income

In your opinion, to what extent are the following statements true?

Response category: "agree strongly/somewhat" Data in percent	Average	Educational level			Net household income (euros)			
	Ø	Low	Average	High	up to 999	1,000 to 1,999	2,000 to 3,499	3,500 and more
People who are important to me are prepared to pay more for products produced in an environmentally friendly way.	38	↓ 33	39	42	33	↓ 34	39	45 ↑↑
People who are important to me prefer to buy products produced in an environmentally friendly way.	39	↓ 35	39	43 ↑	32	35	39	46 ↑↑
People who are important to me make everyday journeys, such as to work or the shops, mostly by bike or on foot.	35	↓ 30	35	39 ↑	37	33	34	37

Heavily over-represented ↑↑ Over-represented ↑ Under-represented ↓

Descriptive social norm

Almost 40 percent of Germans are surrounded by people in their personal environment who are willing to pay more for products that are produced in an environmentally friendly way.

Thirty-eight percent of respondents say they are surrounded by people who prefer to buy naturally produced products when they shop. Furthermore, 39 percent say that these people are also willing to pay more for products produced in an environmentally friendly way (both levels of agreement). In addition, 34 percent state that the people important to them do their everyday journeys (for example to work or shopping) mainly on foot or by bike (see Figure 58).

With regard to the three statements on the descriptive social norm, it is noticeable that it is people with a low level of formal education who agree with a below-average frequency. For example, 30 percent of those with a low level of formal education say that people they care about do everyday journeys mainly on foot or by bike. This compares to 39 percent in the group with high educational qualifications. Furthermore, it is mainly the financially well-off who know people in their personal environment who prefer to buy products produced in an environmentally friendly way when shopping and who are also prepared to pay more for such products (see Table 27).

In the milieu perspective, it is above all the particularly nature-loving milieus of the Conservative Upscale and Post-Materialists as well as the post-modern lifeworlds of the Expeditives and Neo-Ecologicals that surround themselves with people who find it important to buy products that are produced in an environmentally-friendly way – even if they cost more. Thus, 54 percent of the Conservative Upscale and Expeditives, 49 percent of Neo-Ecologicals, and 46 percent of Post-Materialists say that people who are important to them would be willing to pay a premium for products that are produced in an environmentally friendly way. This contrasts with 28 percent of the Nostalgic Middle Class, 23 percent of the socially weaker group, and 17 percent of the group with strong consumer-hedonistic values.

Attitudes towards environmentally friendly behaviour

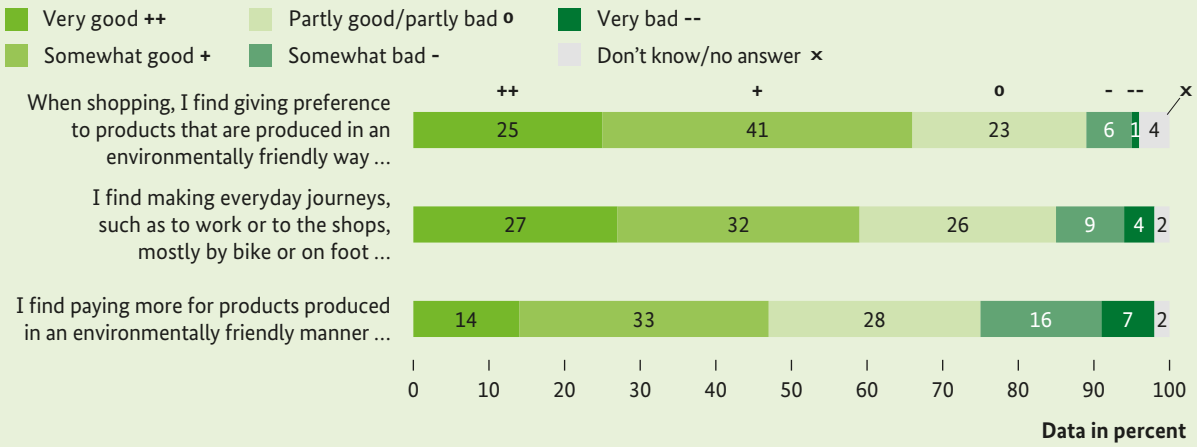
Two-thirds of Germans think it is good to give preference to products produced in an environmentally friendly way when shopping.

Sixty-six percent think it is very good or somewhat good to give preference to products produced in an environmentally friendly way when shopping (see Figure 59). Slightly fewer – but still just under half of the respondents (47 percent) – are in favour of paying more for such products. Fifty-nine percent are in favour of doing everyday journeys mainly on foot or by bike.

Once again, it is people with a low level of formal education who agree with the three statements less frequently than average, and those who are financially well off (net household income of 3,500 euros or more) who are most frequently in favour of paying a surcharge for products produced in an environmentally friendly way (both levels of agreement: 61 percent, average: 47 percent).

Figure 59: Attitudes towards environmentally friendly behaviour among the adult population

What do you think of the following possibilities in general?



The milieu results are also clear (see table 28): Again, it is Post-Materialists, the Conservative Upscale as well as Expeditives and Neo-Ecologicals whose attitudes indicate a strong appreciation of nature and biodiversity. For example, 66 percent of Expeditives, 63 percent of Post-Materialists, 60 percent of the Conservative Upscale, and 57 percent of Neo-Ecologicals think it is very or rather good to pay more for products that are produced in an environmentally friendly way. In contrast, the figure is 36 percent among the Nostalgic Middle Class, 26 percent among people in socially weaker situations, and 20 percent in the fun and experience-oriented lifeworld.

Perceived behavioural control

When shopping, giving preference to products that are produced in an environmentally friendly way is often a question of money.

Forty-seven percent of respondents personally find it very easy or somewhat easy to give preference to products produced in an environmentally friendly way when shopping – but only a good third find it very easy or at least somewhat easy to pay more money for them (see Figure 60). Correspondingly, agreement with the statements queried increases not only with

Table 28: Attitudes towards environmentally friendly behaviour among the adult population by milieu

What do you think of the following possibilities in general?

Ø = Average
CON = Conservative Upscale
PMA = Post-Materialist
PER = Performer
EPE = Expeditive
NEO = Neo-Ecological
ADA = Adaptive Pragmatic Middle Class
HED = Consumer Hedonistic
PRE = Precarious
NOS = Nostalgic Middle Class
TRA = Traditional

Response category: "very/somewhat good" Data in percent	Ø	CON	PMA	PER	EPE	NEO	ADA	HED	PRE	NOS	TRA
When shopping, I find giving preference to products that are produced in an environmentally friendly way ...	66	81↑↑	84↑↑	72	80↑↑	75 ↑	↓↓58	↓↓30	↓↓51	63	67
I find making everyday journeys, such as to work or to the shops, mostly by bike or on foot ...	59	72↑↑	73↑↑	65	66	60	55	↓↓31	↓ 52	55	57
I find paying more for products produced in an environmentally friendly manner ...	47	60↑↑	63↑↑	51	66↑↑	57↑↑	42	↓↓20	↓↓26	↓↓36	47

Heavily over-represented ↑↑ Over-represented ↑ Under-represented ↓ Heavily under-represented ↓↓

Figure 60: Perceived behavioural control in the adult population – possibility to give preference to products that are produced in an environmentally friendly way when making purchases

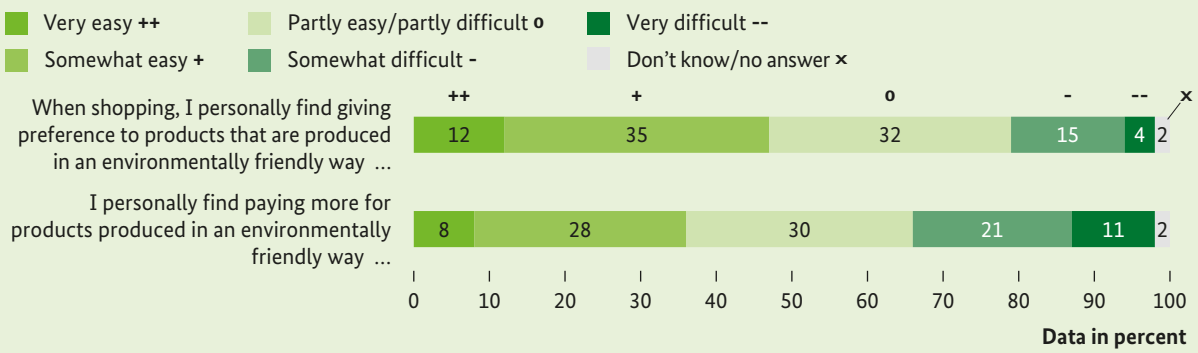


Table 29: Perceived behavioural control in the adult population – possibility to give preference to products that are produced in an environmentally friendly way when making purchases by education and income

How difficult do you find it to implement the following behaviours?

Response category: "very/somewhat easy" Data in percent	Average	Educational level			Net household income (euros)			
	Ø	Low	Average	High	up to 999	1,000 to 1,999	2,000 to 3,499	3,500 and more
When shopping, I personally find giving preference to products that are produced in an environmentally friendly way ...	47	↓↓39	50	53↑↑	↓↓28	↓↓39	49	60↑↑
I personally find paying more for products produced in an environmentally friendly way ...	36	↓↓30	36	43↑↑	↓↓17	↓↓27	37	53↑↑

Heavily over-represented ↑↑ Heavily under-represented ↓↓

education, but even more so with the net household income of respondents (see Table 29).

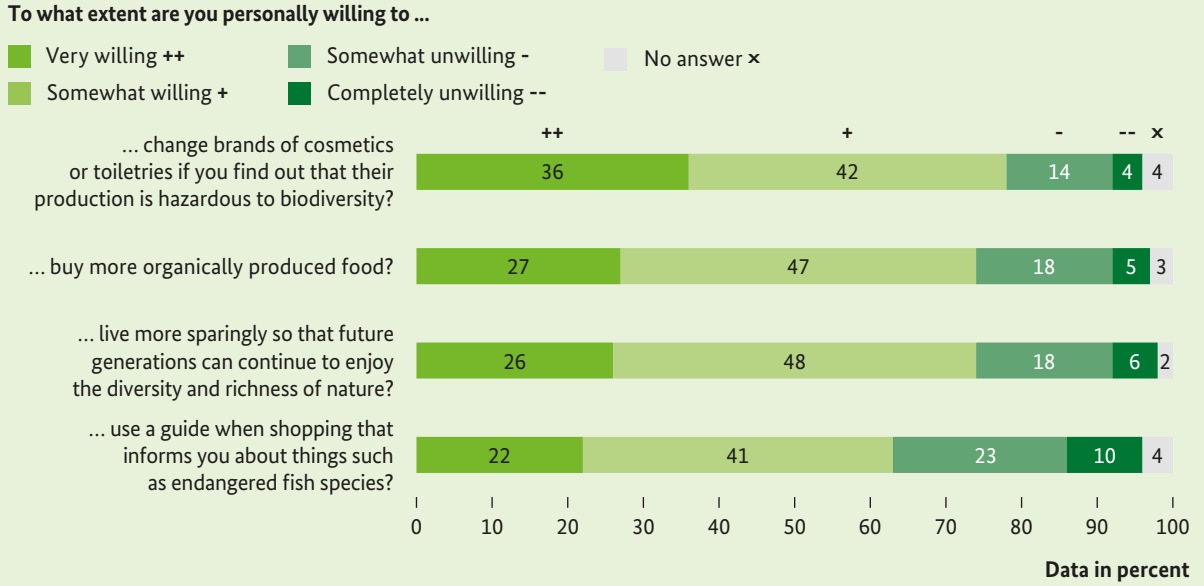
The milieu analysis shows that above-average approval ratings are found in the socially upscale milieus (Conservative Upscale, Post-Materialists, Performers, Expeditives) and in the milieu of non-conformist, progressive realists (Neo-Ecologicals). Thus, 70 percent of Expeditives, 65 percent of the Conservative Upscale, 58 percent of Neo-Ecologicals, and 55 percent each of Performers and Post-Materialists find it very or somewhat easy to give preference to products produced in an environmentally friendly way when shopping. Among the Nostalgic Middle Class, the figure is 32 percent, among the socially weaker milieu 26 percent, and among members of the milieu with a strong consumer-hedonist value orientation 19 percent.

Willingness to make lifestyle changes

In large parts of the population, there is a fundamental willingness to make behavioural changes aimed at a change in lifestyle.

Seventy-eight percent of respondents are very or somewhat willing to change brands of cosmetics or toiletries if they find out that their production is hazardous to biodiversity. In each case, around three quarters declare their willingness to buy more organically produced food and to live more sparingly so that future generations can continue to enjoy the diversity and richness of nature. In view of the fact that organic products currently account for 6.8 percent of the total food market – and the trend is growing – this answer certainly reveals considerable potential (see BMEL 2022). When shopping, 63 percent can imagine using a guide that provides information about endangered fish species, for example (see Figure 61).

Figure 61: Willingness to make lifestyle changes among the adult population



Willingness to change one's lifestyle in order to protect biodiversity is above average among women, people with a high level of formal education, and high net household income. For example, 30 percent of the women surveyed, 32 percent of those with a high level of formal education, and 34 percent of the financially well-off are unreservedly willing to buy more organically produced food (average: 27 percent).

Figure 62: Willingness to make lifestyle changes among the adult population by milieu

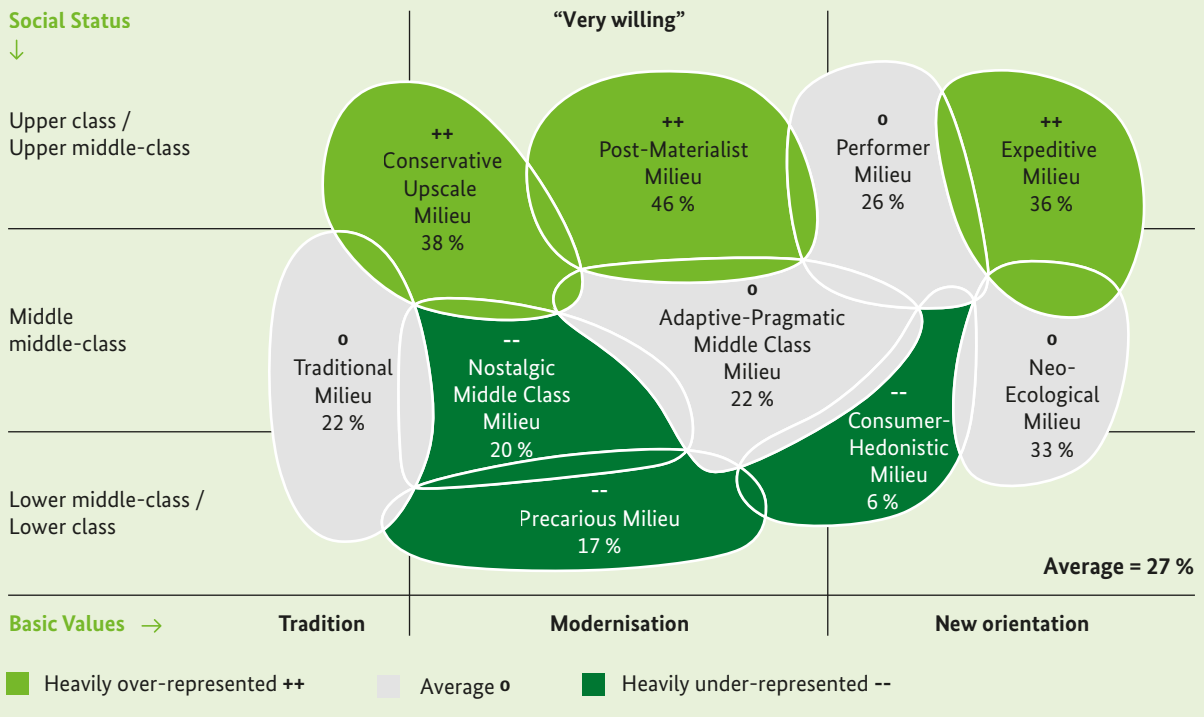
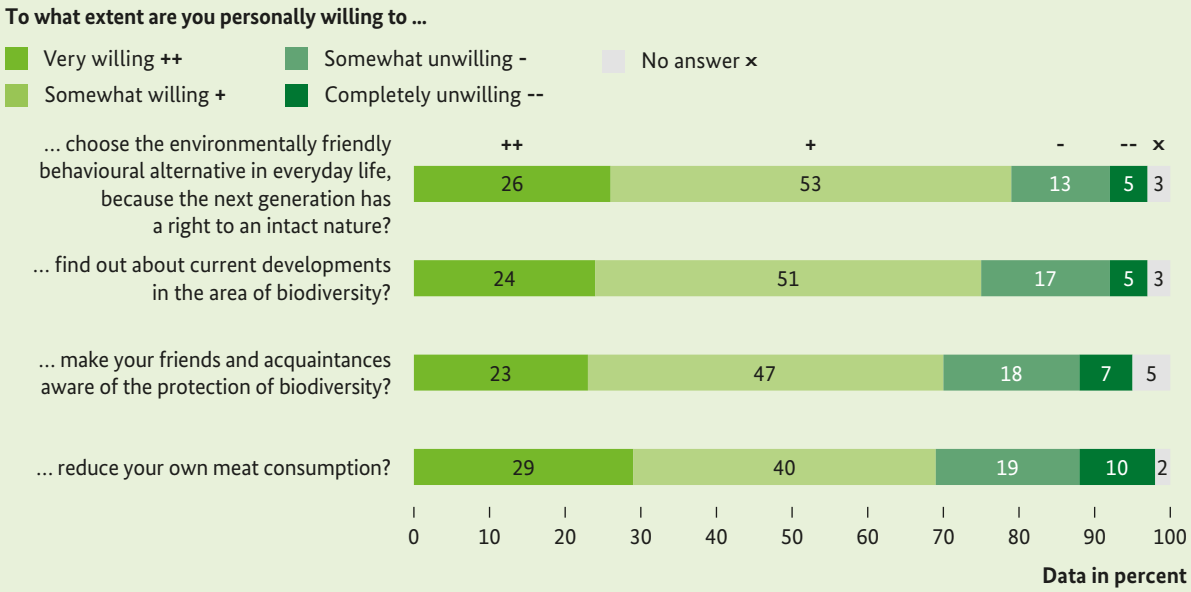


Figure 63: Willingness to make private behavioural changes among the adult population



In a milieu comparison, it is Post-Materialists, the Conservative Upscale, and Expeditives who express the greatest willingness to change their lifestyle. Thus, almost 50 percent of Post-Materialists declare themselves "very willing" to buy more organically produced food. The figure is 38 percent for the Conservative Upscale and 36 percent for Expeditives. In contrast, willingness to change one's own lifestyle – for example to prefer organically produced food when shopping – is much lower in the Nostalgic Middle Class milieu, the socially weaker lifeworld, and the fun and experience-oriented milieu (see Figure 62).

Willingness to change private behaviour

Around 70 percent are willing to reduce their own meat consumption.

Almost 80 percent of respondents can imagine choosing the environmentally friendly behavioural alternative in everyday life, because the next generation has a right to an intact nature. Three quarters are very or somewhat willing to learn about current developments in the field of biodiversity. Furthermore, 70 percent express their general willingness to make friends and acquaintances aware of the protection of biodiversity. Almost as many can imagine reducing their own meat consumption (see Figure 63).

Table 30: Willingness to make private behavioural changes among the adult population by gender and education

To what extent are you personally willing to ...

Response category: "very willing"	Average	Gender		Educational level		
Data in percent	Ø	M	F	Low	Average	High
... choose the environmentally friendly behavioural alternative in everyday life, because the next generation has a right to an intact nature?	26	24	29	23	26	30
... find out about current developments in the area of biodiversity?	24	22	27	↓↓18	26	29↑↑
... make your friends and acquaintances aware of the protection of biodiversity?	23	↓ 20	26 ↑	↓↓18	24	28 ↑
... reduce your own meat consumption?	29	↓↓22	36↑↑	↓↓23	30	34 ↑

Heavily over-represented ↑↑ Over-represented ↑ Under-represented ↓ Heavily under-represented ↓↓

These figures refer to stated willingness to make behavioural changes, they do not measure actual behaviour. The fact that there are sometimes considerable discrepancies between awareness and behaviour has been highlighted by social science environmental research for decades. The topic of meat consumption is a good example. Despite health and environmental reasons for reduced meat consumption, many consumers feel that perceived costs, convenience, availability and, for some, status reasons stand in the way of an actual change in behaviour. Nevertheless, the range of vegetarian and vegan dietary alternatives has grown considerably in recent years, and a certain trend can be said to exist especially in social milieus with a high status (see Friedrichsen and Gärtner 2020).

Willingness to change behaviour in the private sphere in order to protect biodiversity is generally stronger among women than among men. It also increases with the respondents' level of education (see Table 30). In a comparison of milieus, it is once again Post-Materialists, the Conservative Upscale, and Expeditives who express the strongest willingness to change their behaviour. For example, 52 percent of Post-Materialists, 41 percent of Expeditives, and 35 percent of the Conservative Upscale are "very willing" to reduce their own meat consumption. This compares with 22 percent each among the progress-driven Performers and down-to-earth Nostalgic Middle Class, 21 percent each among people in precarious situations and Adaptive Pragmatists, and only seven percent in the group with strongly consumer-hedonistic values.

Willingness to take collective action

Every second person can imagine helping to maintain a nature reserve together with other people.

Compared to willingness to change one's behaviour in the personal and private sphere, willingness to act collectively is lower overall: 58 percent declare themselves very or somewhat willing to create habitats for animals and plants, such as flower meadows or ponds, together with other people. Around 50 percent each can imagine helping to maintain a nature reserve together with other people, and publicly campaigning (for example through petitions, demonstrations) for politicians to take greater care to protect nature for all people living today and for future generations. Furthermore, 42 percent of respondents declare their general willingness to actively participate in a nature conservation association in order to protect biodiversity (see Figure 64).

Figure 64: Willingness to take collective action among the adult population

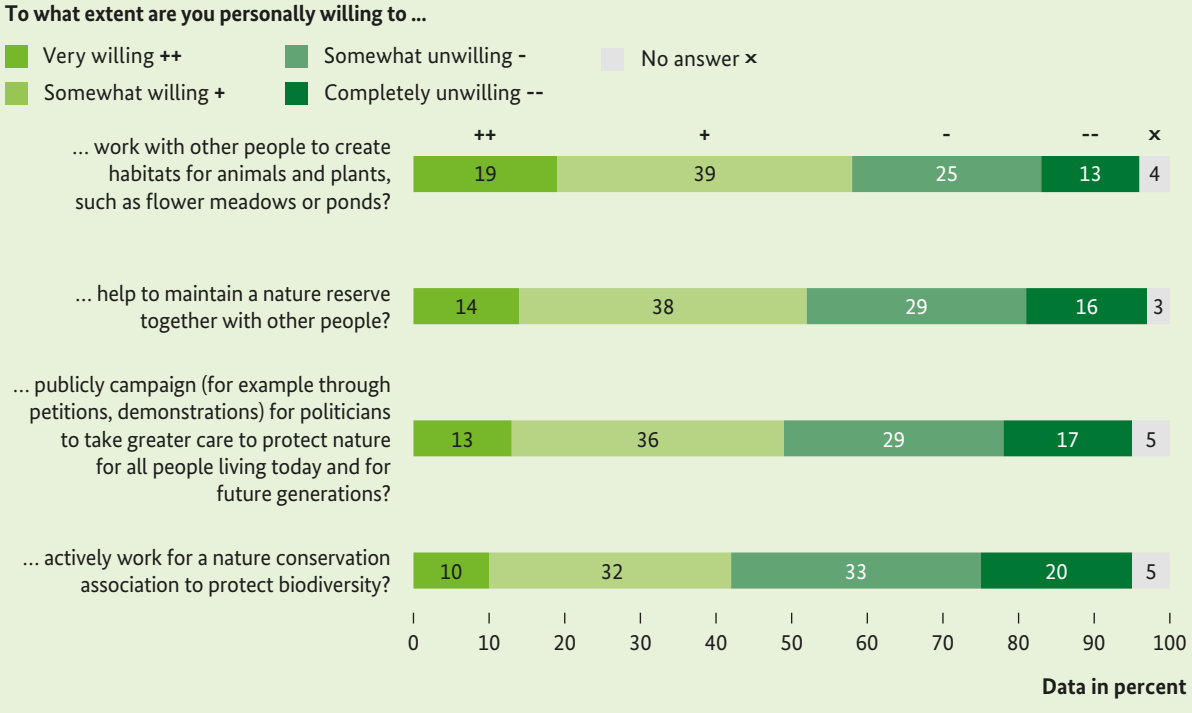
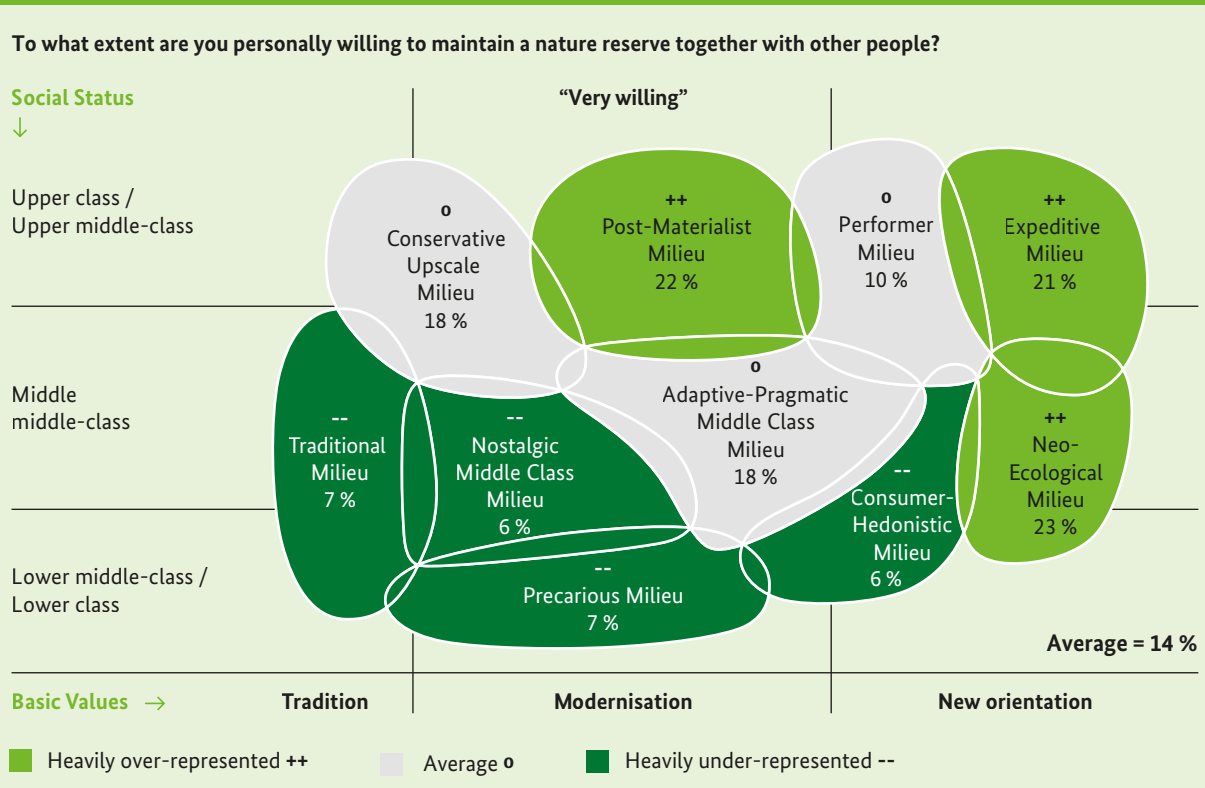


Figure 65: Willingness to take collective action among the adult population by milieu



The over-65s and those with low levels of formal education find it harder to imagine working together with others to protect biodiversity. This becomes particularly clear when looking at the highest level of agreement. For example, only twelve percent of the over-65s and 14 percent of those with a low level of formal education are fully prepared to help maintain a nature reserve together with other people. The average of those surveyed is 19 percent.

The milieu analysis shows that it is above all Post-Materialists, who are particularly oriented towards nature conservation, as well as the post-modern milieus of the Expeditives and Neo-Ecologicals, who are prepared to work together with others to protect biodiversity. For example, 23 percent of Neo-Ecologicals, 22 percent of Post-Materialists, and 21 percent of Expeditives are "very willing" to help maintain a nature reserve together with other people. There are significantly fewer in the older generation, which loves security and order (Traditional milieu), the Nostalgic Middle Class milieu, which is concerned with orientation and participation, and the (lower) middle class, which is focused on consumption and entertainment, (see Figure 65).

Willingness to pay more

More than half of the population can imagine paying higher prices for food produced in a sustainable and environmentally friendly way in principle – but unreserved willingness to do so is significantly lower.

Generally, 61 percent can imagine paying more for products that are produced in an environmentally friendly way if this means supporting economically weaker regions in Germany. Furthermore, 57 percent are very or somewhat willing to pay higher prices for food produced in a sustainable and environmentally friendly way, to pay more for products from economically weaker countries produced in an environmentally friendly way so that international trade becomes fairer, and to donate to the upkeep and conservation of a nature reserve. For all four behaviours surveyed, unreserved willingness to pay more is a maximum of 16 percent (see Figure 66).

Willingness to pay more increases with the respondents' level of education and is strongest in the group with high net household income (see Table 31). The milieu analysis again reveals clear differences: Post-Materialists, Expeditives, and the Conser-

Figure 66: Problem awareness among the adult population

To what extent are you personally willing to ...

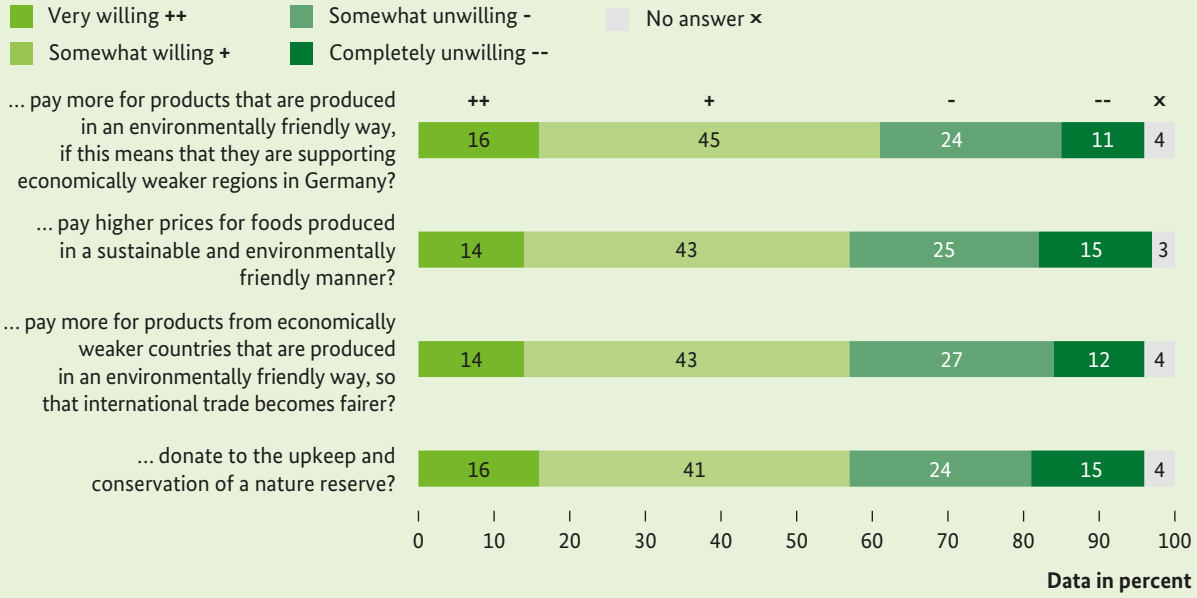


Table 31: Willingness to pay among the adult population by education and income

To what extent are you personally willing to ...

Response category: "very willing" Data in percent	Average Ø	Educational level: Low	Educational level: Average	Educational level: High	Net household income (euros): up to 999	Net household income (euros): 1,000 to 1,999	Net household income (euros): 2,000 to 3,499	Net household income (euros): 3,500 and more
... pay more for products that are produced in an environmentally friendly way, if this means that they are supporting economically weaker regions in Germany?	16	↓↓11	16	21↑↑	16	↓↓10	15	25↑↑
... pay higher prices for foods produced in a sustainable and environmentally friendly manner?	14	↓↓11	13	20↑↑	12	↓↓ 9	14	23↑↑
... pay more for products from economically weaker countries that are produced in an environmentally friendly way, so that international trade becomes fairer?	14	↓ 11	14	16	14	↓ 10	13	19↑↑
... donate to the upkeep and conservation of a nature reserve?	16	↓↓11	15	21↑↑	11	13	17	19

Heavily over-represented ↑↑ Under-represented ↓ Heavily under-represented ↓↓

vative Upscale are most willing to pay more, while the Nostalgic Middle Class, members of the socially disadvantaged lifeworld, and the group with strongly consumer-hedonistic values are least willing. As such, 26 percent of Post-Materialists, 23 percent of Expeditives, and 19 percent of the Conservative Upscale are unreservedly prepared to accept higher prices for food produced in a sustainable and environmentally friendly manner. On the other hand, it is six percent in the Consumer Hedonistic lifeworld and five percent each among the Nostalgic Middle Class and the socially disadvantaged milieus.

Overall, it is clear that willingness to pay more – as well as all other factors used to measure the new societal indicator – varies according to socio-demographic as well as socio-cultural characteristics. Future Nature Awareness Studies will need to examine how the willingness to change behaviour to protect nature and the factors that influence it change over time.

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Abbreviations

BfN	Bundesamt für Naturschutz – Federal Agency for Nature Conservation
BMEL	Bundesministerium für Ernährung und Landwirtschaft – Federal Ministry of Food and Agriculture
BMUV	Bundesministerium für Umwelt, Naturschutz, nukleare Sicherheit und Verbracherschutz – Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection
BMWK	Bundesministerium für Wirtschaft und Klimaschutz – Federal Ministry for Economic Affairs and Climate Action
CAP	Common Agricultural Policy
CAPI	Computer-assisted personal interviews
CAWI	Computer-assisted web interviews
CBD	Convention on Biological Diversity
DAS	Deutsche Anpassungsstrategie an den Klimawandel – German Strategy for Adaptation to Climate Change
DOI	Digital Object Identifier
Ed.	Editor
EEA	European Environment Agency
et al.	et alii/et aliae/et alia (and others)
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FDP	Freie Demokratische Partei – Free Democratic Party
GCP	Global Carbon Project (organisation working to quantify global greenhouse gas emissions and their causes)
GmbH	Gesellschaft mit beschränkter Haftung – Limited liability company
GMO	Genetically modified organism
IOE	The International Organisation of Employers
IPBES	Intergovernmental Platform on Biodiversity and Ecosystem Services
IPCC	Intergovernmental Panel on Climate Change
KWRA	Klimawirkungs- und Risikoanalyse – Climate Impact and Risk Assessment

NBS	National Strategy on Biological Diversity
OHHLEP	One Health High Level Expert Panel
PIK	Potsdam-Institut für Klimafolgenforschung e.V. – Potsdam Institute for Climate Impact Research
SPD	Sozialdemokratische Partei Deutschlands – Social Democratic Party of Germany
SPSS	Statistical and analytic software from IBM (Statistical Package for the Social Sciences)
UBA	Umweltbundesamt – German Environment Agency
UN	United Nations
UNEP	United Nations Environment Programme
US	United States of America
WBGU	Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen – German Advisory Council on Global Change
WHO	World Health Organisation
WSL	Eidgenössische Forschungsanstalt für Wald, Schnee und Landschaft – Swiss Federal Institute for Forest, Snow and Landscape Research

Abbreviations for the Sinus milieus

ADA	Adaptive Pragmatic Middle Class milieu
CON	Conservative Upper Class milieu
EPE	Expeditive milieu
HED	Materialistic Hedonist milieu
NEO	Neo-Ecological milieu
NOS	Nostalgic Mainstream milieu
PER	Performer milieu
PMA	Post-Materialist milieu
PRE	Precarious milieu
TRA	Traditional milieu

Basic count: 2021 Nature Awareness Study – Adults

Chapter 2: At the limit – Perception of the Earth's stress limits and changes in nature and landscape

A2.1 The Earth offers many resources and means of existence that must be available reliably and in sufficient quantity for human well-being. The stability of these means of existence is also necessary in order to be able to compensate for human pressures on nature. Please rate whether the global situation in the following areas is very alarming and unstable, somewhat alarming, partly alarming/partly not, somewhat not alarming, or not at all alarming and stable. (Figure 2)

Data in percent	Very alarming and unstable	Somewhat alarming	Partly alarming/ partly not	Somewhat not alarming	Not at all alarming and stable	Don't know/ no answer
State of the seas	36	35	19	7	2	1
Climate	33	34	21	8	3	1
Habitats and species diversity	26	39	24	7	2	2
Earth's ability to compensate for human pressures, for example from chemicals and man-made substances	24	35	25	9	3	4
Ozone layer	23	35	24	10	4	4
Land use and land consumption, for example through agriculture and the timber industry, settlements, and transport	16	36	31	10	3	4
Cycles in nature, for example the exchange of natural substances between air, water, and soil	13	34	32	13	3	5
Air quality	13	33	33	14	4	3
Access to drinking water	12	31	32	15	6	4

A2.2 Would you say that the state of nature and landscape in your environment has generally improved, remained the same, or deteriorated over the last 20 years? (Figure 3)

Data in percent	
It has mostly improved.	7
It has remained the same.	37
It has mostly deteriorated.	50
Don't know/no answer	6

A2.3a What exactly has improved? (Open question, multiple answers possible; only people who had said that the state had improved)

Data in percent		Data in percent	
Bodies of water/lakes	5	Animals/living beings	1
Air/air quality	4	Seas/oceans	1
Landscape/nature and landscape objects	3	Meadows/fields	1
Agriculture	3	Climate/weather	1
Environment/nature	3	Other associations	12
Plants/trees/forests	1		

Bodies of water/lakes – subcategories (5 %)

Data in percent		Data in percent	
Better water quality/clean/clear water	3	Bodies of water have improved	1
Clean rivers	2		

Air/air quality – subcategories (4 %)

Data in percent		Data in percent	
Air/better air quality	4	Other	1

Landscape/nature & landscape objects – subcategories (3 %)

Data in percent		Data in percent	
Lots is being done for nature/the environment	1	Nature/environment	1
Green spaces/more green spaces/planting	1	Other	1

Agriculture – subcategories (3 %)

Data in percent	
Other	3

Environment/nature – subcategories (3 %)

Data in percent		Data in percent	
Environmental/nature conservation	1	Other	2
More/many nature reserves	1		

Plants/trees/forests – subcategories (1 %)

Data in percent		Data in percent	
Healthy forests	1	Other	1

Animals/living beings – subcategories (1 %)

Data in percent	
Other	1

Seas/oceans – subcategories (1 %)

Data in percent	
Other	1

Meadows/fields – subcategories (1 %)

Data in percent	
Other	1

Climate/weather– subcategories (1 %)

Data in percent	
Other	1

Other associations – subcategories (12 %)

Data in percent		Data in percent	
Everything/everything has improved	6	Cleanliness/clean generally	1
More is being done (generally)	1	Other	4
Species diversity/diversity/very diverse	1		

A2.3b What exactly has deteriorated? (Open question, multiple answers possible; only people who had said that the state had deteriorated) (Figure 4)

Data in percent		Data in percent	
Climate/weather	30	Seas/oceans	10
Plants/trees/forests	23	Environment/nature	8
Landscape/nature and landscape objects	22	Agriculture	7
Natural and environmental catastrophes	17	Water/water quality	4
Animals/living beings	16	Bodies of water/lakes	2
Air/air quality	14	Other associations	18

Climate/weather– subcategories (30 %)

Data in percent		Data in percent	
Climate	10	Hole in the ozone layer/increase in the hole in the ozone layer	3
Heat/high temperatures/aridity	7	Weather	2
Storms/more storms/torrential rain	5	Wind/tornadoes	2
Climate change	4	The seasons have changed	1
Climate/global warming	4	Other	1

Plants/trees/forests – subcategories (23 %)

Data in percent		Data in percent	
Plants in general	1	Destruction of the rainforests	1
Deforestation of forests	6	Pollution of the forests/litter in the forests	1
Tree/forest dieback	5	Plant dieback/plant extinction	1
Forests in a poor state/sick	4	Forest fires/more forest fires	1
Woods/forest	3	Damage to forests by beetles/pests	0.4
Tree/forest cover reduced	2	Other	1

Landscape/nature and landscape objects – subcategories (22 %)

Data in percent		Data in percent	
Too many built-up areas/landscapes	10	Destruction of habitats	1
Fewer green spaces/grass verges/meadows	7	More factories/industry	1
Traffic density/more cars	3	More energy production/waste/electric bikes and vehicles	1
Melting of the glaciers/icebergs	2	Aeroplanes/aircraft noise	0.3
Poorer soils/poor soil quality	2	Too few natural areas	0.1
More and more rock gardens	1	Other	1

Natural and environmental catastrophes – subcategories (17 %)

Data in percent		Data in percent	
Species extinction/less species diversity	8	Littering of nature	3
More environmental/natural catastrophes	3	Flood catastrophes	1
Floods/there are more/frequent floods/flooding	3	Other	0.4

Animals/living beings – subcategories (16 %)

Data in percent		Data in percent	
Animals in general	1	Fewer butterflies	2
Insect decline/fewer insects	7	Habitat for animals is disappearing/shrinking	2
Bee decline/fewer bees	4	Too little animal conservation	0.3
Animal diversity has declined/extinction of species	4	Other	1
Fewer bird species/bird species are disappearing	3		

Air/air quality – subcategories (14 %)

Data in percent		Data in percent	
Air/poor air quality/air pollution	11	Fine particulate pollution/more fine particulate pollution	1
Too much CO_2/CO_2 emissions	2	Other	1

Seas/oceans – subcategories (10 %)

Data in percent		Data in percent	
Pollution of the seas/plastic waste in the seas	7	Rising sea levels	0.3
Seas/oceans/state of the seas	2	Coral die-off/extinction of coral reefs	0.3
Fish die-off/fish stocks are declining	1	Other	1

Environment/nature – subcategories (8 %)

Data in percent		Data in percent	
Environmental pollution	4	Environmental destruction/destruction/ in danger/threatened	0.3
Nature/environment	3	Other	1

Agriculture – subcategories (7 %)

Data in percent		Data in percent	
Soil compaction	2	More agricultural areas/farmland	1
Use of pesticides/fertiliser in agriculture	2	Crop failures/harvest yields in decline	0.4
Monoculture/too much monoculture	2	Other	1
Factory farming	1		

Water/water quality – subcategories (4 %)

Data in percent		Data in percent	
Water has deteriorated/poor water quality	3	Access to drinking water not ensured for all	0.4
Water scarcity/water shortage	1	Other	0.4

Bodies of water/lakes – subcategories (2 %)

Data in percent		Data in percent	
Polluted water/lakes	1	Other	0.4
Rivers	0.3		

Other associations – subcategories (4 %)

Data in percent		Data in percent	
Everything has deteriorated	6	Consumption of resources/everything is being exploited	2
Human interaction with nature	3	Too much consumption	1
Waste consumption/too much waste	3	Too many people/overpopulation	1
Too much plastic/plastic pollution/microplastic	3	Other	3

A2.4 How do you think the following features of agricultural areas have developed in the last ten years? Please indicate in each case whether you think the feature has tended to increase, remained about the same, or tended to decrease. (Figure 5).

Data in percent	The feature has tended to decrease.	The feature has remained about the same.	The feature has tended to increase.	Don't know/ no answer
Bees	70	20	5	5
Butterflies	63	26	4	7
Green space, such as meadows and pastures	49	38	7	6
Margins and wildflower strips, that means areas between fields or between fields and paths	44	36	13	7

A2.5 How true do you find the following statements? (Figure 6)

Data in percent	Agree strongly	Agree somewhat	Partly agree/ partly disagree	Disagree somewhat	Don't agree at all	Don't know/ no answer
The numbers and diversity of insects are declining worldwide.	35	36	18	5	1	5
The numbers and diversity of insects are declining in Germany.	36	35	17	7	1	4
I know about the reasons for insect decline.	19	26	34	11	5	5

A2.6 Please select two reasons that you consider to be most significant in insect die-off. (Multiple answers possible; only people who had said they at least partly knew the reasons for insect die-off) (Figure 7)

Data in percent	
Use of pesticides/sprays	69
Loss of habitats for insects	68
Climate change	32
Insect diseases	17
Light pollution (for example from street lights)	9
Other reasons	1

A2.7 What do you think about the spread of the following animals in Germany? (Figure 8)

Data in percent	I think it's good	I don't care	I don't think it's good	I don't know
Common otter	58	17	18	7
Beaver	56	16	22	6
Lynx	55	15	23	7
Wild cat	54	14	25	7
Wolf	40	13	40	7
Raccoon	34	15	43	8

Chapter 3: The pandemic – the population's understanding of its causes and its influence on our relationship with nature

A3.1 To what extent do you agree with the following statements? (Figure 9)

Data in percent	Agree strongly	Agree somewhat	Partly agree/ partly disagree	Disagree somewhat	Completely disagree
Our health depends on the health of our planet.	30	32	30	6	2
The coronavirus crisis is a health issue and has nothing to do with the condition of nature and the environment.	26	32	26	13	3
The coronavirus crisis is related to our treatment of nature, such as habitat destruction and climate change.	10	21	29	29	11

A3.2 Please state whether you agree strongly, agree somewhat, disagree somewhat, or do not agree at all with the following statements. (Figure 10)

Data in percent	Agree strongly	Agree somewhat	Disagree somewhat	Don't agree at all	Don't know/ no answer
Being in nature makes me happy.	46	44	8	1	1
Nature is part of a good life.	50	39	9	1	1
I don't feel comfortable in nature.	8	10	16	64	2

A3.3 Has the importance of nature to you changed compared to before the coronavirus crisis? For me, nature is now... (Figure 12)

Data in percent	
Far more important	13
Somewhat more important	25
Just as important	60
Somewhat less important	1
Far less important	1

A3.4 How often were you outside in nature in the past months compared to before the coronavirus crisis? (Figure 14)

Data in percent	
Far more often	11
Somewhat more often	27
No difference	54
Somewhat less often	6
Far less often	2

Chapter 4: Climate change and loss of biodiversity – perception of risk and awareness of the influence on nature and society

A4.1 When you think about the causes of climate change: Which of the following statements comes closest to your opinion? (Figure 15)

Data in percent	
Climate change is caused by natural processes.	6
Climate change is caused partly by natural processes and partly by human actions.	44
Climate change is caused primarily by human actions.	45
There is no such thing as climate change.	3
Don't know/no answer	2

A4.2 How convinced are you that climate change is affecting the following areas? (Only people who did not respond "There is no such thing as climate change.") (Figure 17)

Data in percent	Very convinced	Somewhat convinced	Partly convinced/ partly un-convinced	Somewhat un-convinced	Completely un-convinced	Don't know/no answer
Extreme weather events	46	30	16	5	1	2
Wild species and biodiversity	39	35	18	5	1	2
Lifestyle and quality of life of future generations	33	39	20	4	1	3
Agriculture	33	38	21	6	1	1
Forestry sector	33	36	22	6	1	2
Industry and the economy	23	35	27	9	3	3
Personal lifestyle and quality of life	20	38	29	9	2	2
Migration, refugees, and immigration	18	26	26	17	10	3
Peace and stable foreign relations	15	26	31	17	6	5

A4.3 How true do you find the following statements? (Figure 18)

Data in percent	Agree strongly	Agree somewhat	Disagree somewhat	Don't agree at all	Don't know/ no answer
Nature conservation is necessary in order to meet the challenges of climate change.	48	40	9	1	2
Climate change is affecting biodiversity.	46	40	9	1	4

A4.4 Below are several statements about climate and nature. To what extent do you personally agree with the statements? (Figure 19)

Data in percent	Agree strongly	Agree somewhat	Partly agree/ partly disagree	Disagree somewhat	Don't agree at all	Don't know/no answer
I believe that we in Germany can work together to achieve something to protect nature and the climate.	25	35	26	8	4	2
We in Germany are in a position to work together to protect nature and the climate.	22	37	27	8	3	3
I believe that I can personally achieve something to protect nature and the climate myself.	16	32	29	14	6	3
I am personally in a position to make an active contribution to protect nature and the climate.	14	30	31	16	6	3
I am afraid that the climate crisis and the destruction of nature will impact my lifestyle.	14	33	30	16	6	1

Chapter 5: Change – responsibility, transformative change, and technological progress

A5.1 Which of the policy areas named below are currently most important in your opinion? Please name the three most important policy areas for you. (Multiple answers possible) (Figure 20)

Data in percent	
Protection of nature, the environment, and the climate	57
Poverty and social equality	43
Health	37
Pension	30
Immigration, migration, and xenophobia	29
Education	25
Criminality, domestic security	24
Economy, finances, and the labour market	23
Peace policy and stable foreign relations	17
Gender equality	7

A5.2 Protection of the environment is a task that many people can contribute to. Please specify in each case how you rate the involvement of the bodies named below: excessive, just right, or too little. (Figure 21)

Data in percent	Involvement is too little.	Involvement is just right.	Involvement is excessive.	Don't know/ no answer
Business and industry	65	25	4	6
Federal government	61	25	9	5
Your state government	56	29	7	8
Citizens	50	36	7	7
Your city and municipal council	49	36	6	9
Agriculture	46	42	4	8
Forestry sector	38	48	4	10
Environmental and nature conservation organisations (for example Greenpeace, NABU, BUND)	21	54	18	7

A5.3 How true do you find the following statements? (Figure 23)

Data in percent	Agree strongly	Agree somewhat	Disagree somewhat	Don't agree at all	Don't know/ no answer
It is up to humans to protect nature.	55	35	7	1	2
We may only use nature in such a way that affords coming generations the same opportunity.	55	35	8	1	1
It angers me that so many people treat nature so recklessly.	45	38	14	2	1

A5.4 How true do you find the following statements? (Figure 25)

Data in percent	Agree strongly	Agree somewhat	Disagree somewhat	Don't agree at all	Don't know/ no answer
In times of economic crisis, nature conservation also has to make do with less money.	10	38	30	16	6
Nature must not be allowed to stand in the way of economic development.	7	26	35	26	6

A5.5 How important do you think it is that the following nature conservation measure is prioritised? (Figure 27)

Data in percent	Very important	Somewhat important	Somewhat unimportant	Not at all important	Don't know/ no answer
The state provides more money to promote nature conservation and to preserve rare animal and plant species.	37	47	9	2	5

A5.6 In your opinion, is a comprehensive change in lifestyles and economic practices in Germany necessary to stop the global nature, environment, and climate crisis? (Figure 29)

Data in percent	
Yes	27
Yes, somewhat	33
Partly yes/partly no	26
Not really	7
No	3
There is no nature, environment, and climate crisis.	1
Don't know/no answer	3

A5.7 Are you prepared to contribute actively to this change through a sustainable and environmentally friendly lifestyle? (Only people who had said that a comprehensive change in lifestyles and economic practices in Germany is necessary ["yes", "yes, somewhat", "partly yes, partly no"]) (Figure 31)

Data in percent	
Yes	28
Yes, somewhat	40
Partly yes/partly no	29
Not really	2
No	1
Don't know/no answer	0

A5.8 Do you think the energy transition towards predominantly renewable energies is the right way to go? (Figure 32)

Data in percent	
Yes	48
Undecided	35
No	13
Don't know/no answer	4

A5.9 A predominantly renewable energy supply to address the climate crisis can also have negative impacts on nature, landscape, and biodiversity. For example, wind turbines can affect the landscape and the habitat of birds. How important is it to you that the energy transition is implemented anyway? (Figure 35)

Data in percent	
Very important	19
Somewhat important	33
Partly important/partly unimportant	33
Somewhat unimportant	7
Completely unimportant	4
Don't know/no answer	4

A5.10 Please rate the following statement about genetic engineering in agriculture: "In my opinion, commerce should label foods made of animals that have been fed genetically modified feed." (Figure 36)

Data in percent	
Agree strongly	55
Agree somewhat	29
Disagree somewhat	8
Completely disagree	3
Don't know/no answer	5

A5.11 We would now like to ask you some general questions about new procedures in genetic engineering. These new methods make it possible, for example, to switch genes in the genome on and off or rewrite them in a more targeted way, and to specifically recombine the genome according to a modular principle. In the press, these procedures are also referred to as genome editing, CRISPR/Cas, or gene scissors. To what extent do you agree with the following statements? (Figure 38)

Data in percent	Agree strongly	Agree somewhat	Disagree somewhat	Don't agree at all	Don't know/ no answer
When plants are genetically engineered using new methods, the potential effects on nature should always be explored.	57	32	7	1	3
We are not yet able to predict the long-term effects of new genetic engineering processes.	49	30	14	2	5
I don't think humans have the right to genetically modify plants and animals.	40	30	17	5	8

A5.12 The lifeworld of many people is becoming increasingly digital. With this in mind, what do you think about the following statements about virtual and digital experiences of nature? (Figure 39)

Data in percent	Agree strongly	Agree somewhat	Partly agree/ partly disagree	Disagree somewhat	Don't agree at all	Don't know/ no answer
Digital offerings for a natural experience, such as a virtual walk in the woods or a virtual safari, are of interest to me.	6	17	23	19	31	4
It reassures me that animal and plant species that are dying out in their real habitats can still be experienced digitally.	7	16	23	18	31	5
Digital nature offerings such as virtual natural experiences or information sites on the internet have already motivated me to experience nature outdoors.	6	14	23	21	32	4

A5.13 To what extent do you agree with the following statements? "I can imagine myself using an app to find out about natural hazards, successes in nature conservation, or even possible actions that I could personally take." (Figure 40)

Data in percent	
Agree strongly	15
Agree somewhat	28
Partly agree/partly disagree	22
Disagree somewhat	12
Completely disagree	18
Don't know/no answer	5

Chapter 6: Awareness of biodiversity – the previous societal indicator and results of the new measurement model

A6.1 Are you familiar with the term "biodiversity"? (Figure 45)

Data in percent	
I've heard of it and I know what the term means.	47
I've heard of it but I don't know what the term means.	39
I've never heard of it.	11

A6.2 What does the term "biodiversity" mean to you? (Multiple answers possible; only people who had claimed to know what "biodiversity" means) (Figure 47)

Data in percent	
Diversity of species (animals and/or plants)	87
Diversity of ecosystems, habitats	67
Diversity of genes, genetic information, genetic makeup	32
Other	2

A6.3 How convinced are you that biodiversity on Earth is in decline? Are you ... (Figure 49)

Data in percent	
Very convinced	29
Somewhat convinced	45
Undecided	17
Somewhat unconvinced	5
Completely unconvinced	1
Don't know/no answer	3

A6.4 The Federal Republic of Germany has committed itself to the conservation of biodiversity in international agreements. To what extent do you personally consider the conservation of biodiversity to be a priority task for society? Would you say ... (Figure 50)

Data in percent	
Yes, this is a priority task for society.	30
Yes, somewhat	37
Partly yes/partly no	22
Not really	5
No, this is not a priority task for society.	2
Don't know/no answer	4

A6.5 How true do you find the following statements? (Figure 51)

Data in percent	Agree strongly	Agree somewhat	Disagree somewhat	Don't agree at all	Don't know/ no answer
Biodiversity in nature promotes my well-being and quality of life.	35	44	14	3	4
In order to preserve biodiversity, the consumption of land for settlements, industry, and transport routes should be reduced.	29	47	15	3	6
If biodiversity diminishes, it affects me personally.	25	44	20	5	6
Poorer states should be financially supported by richer states to protect their biodiversity.	24	44	18	6	8
I feel personally responsible for the conservation of biodiversity.	19	42	26	7	6

A6.6 To what extent are you personally willing to ...? (Figure 53)

Data in percent	Very willing	Somewhat willing	Somewhat unwilling	Completely unwilling	No answer
... switch brands of cosmetics or toiletries if you find out that their production is hazardous to biodiversity?	36	42	14	4	4
... find out about current developments in the area of biodiversity?	24	51	17	5	3
... make your friends and acquaintances aware of the protection of biodiversity?	23	47	18	7	5
... use a guide when shopping that informs you about things such as endangered fish species?	22	41	23	10	4
... donate to the upkeep and conservation of a nature reserve?	16	41	24	15	4
... actively work for a nature conservation association to protect biodiversity?	10	32	33	20	5

A6.7 To what extent do you agree with the following statements? (Figure 54)

Data in percent	Agree strongly	Agree somewhat	Partly agree/ partly disagree	Disagree somewhat	Don't agree at all	Don't know/ no answer
I feel connected to nature.	31	38	23	5	1	2
I am not separate from nature but a part of nature.	27	35	25	8	2	3
In nature, I feel connected to something greater.	16	24	26	20	10	4

A6.8 To what extent do you agree with the following statements? (Figure 56)

Data in percent	Agree strongly	Agree somewhat	Partly agree/ partly disagree	Disagree somewhat	Don't agree at all	Don't know/ no answer
Biodiversity on Earth is in decline.	39	35	17	6	1	2
By destroying biodiversity, humanity is endangering its means of existence.	39	34	18	6	1	2
Our lifestyle is contributing to the degradation of biodiversity worldwide.	35	36	19	6	1	3

A6.9 To what extent do you agree with the following statements? (Figure 57)

Data in percent	Agree strongly	Agree somewhat	Partly agree/ partly disagree	Disagree somewhat	Don't agree at all	Don't know/ no answer
I feel connected to groups that actively work towards protecting biodiversity.	10	25	33	18	10	4
I have a lot in common with people who actively work in groups for the sustainable use of nature and resources.	10	23	33	20	9	5
Intensive contact with groups that actively work for the protection of nature and biodiversity corresponds to my interests and wishes.	9	22	32	21	12	4

A6.10 To what extent do you agree with the following statements? (Figure 58)

Data in percent	Agree strongly	Agree somewhat	Partly agree/ partly disagree	Disagree somewhat	Don't agree at all	Don't know/ no answer
People who are important to me are prepared to pay more for products produced in an environmentally friendly way.	11	28	34	14	7	6
People who are important to me prefer to buy products produced in an environmentally friendly way.	11	27	37	13	5	7
People who are important to me make everyday journeys, such as to work or the shops, mostly by bike or on foot.	10	24	36	17	7	6

A6.11 What do you think of the following possibilities in general? (Figure 59)

Data in percent	Very good	Somewhat good	Partly good/ partly bad	Somewhat bad	Very bad	Don't know/ no answer
When shopping, I find giving preference to products that are produced in an environmentally friendly way ...	25	41	23	6	1	4
I find making everyday journeys, such as to work or to the shops, mostly by bike or on foot ...	27	32	26	9	4	2
I find paying more for products produced in an environmentally friendly manner ...	14	33	28	16	7	2

A6.12 How difficult do you find it to implement the following behaviours? (Figure 60)

Data in percent	Very easy	Somewhat easy	Partly easy/ partly difficult	Somewhat difficult	Very difficult	Don't know/ no answer
When shopping, I personally find giving preference to products that are produced in an environmentally friendly way ...	12	35	32	15	4	2
I personally find paying more for products produced in an environmentally friendly way ...	8	28	30	21	11	2

A6.13 To what extent are you personally willing to ...? (Figure 61)

Data in percent	Very willing	Somewhat willing	Somewhat unwilling	Completely unwilling	No answer
... switch brands of cosmetics or toiletries if you find out that their production is hazardous to biodiversity?	36	42	14	4	4
... buy more organically produced food?	27	47	18	5	3
... live more sparingly so that future generations can continue to enjoy the diversity and richness of nature?	26	48	18	6	2
... use a guide when shopping that informs you about things such as endangered fish species?	22	41	23	10	4

A6.14 To what extent are you personally willing to ...? (Figure 63)

Data in percent	Very willing	Somewhat willing	Somewhat unwilling	Completely unwilling	No answer
... choose the environmentally friendly behavioural alternative in everyday life, because the next generation has a right to an intact nature?	26	53	13	5	3
... find out about current developments in the area of biodiversity?	24	51	17	5	3
... make your friends and acquaintances aware of the protection of biodiversity?	23	47	18	7	5
... reduce your own meat consumption?	29	40	19	10	2

A6.15 To what extent are you personally willing to ...? (Figure 64)

Data in percent	Very willing	Somewhat willing	Somewhat unwilling	Completely unwilling	No answer
... work with other people to create habitats for animals and plants, such as flower meadows or ponds?	19	39	25	13	4
... help to maintain a nature reserve together with other people?	14	38	29	16	3
... publicly campaign (for example through petitions, demonstrations) for politicians to take greater care to protect nature for all people living today and for future generations?	13	36	29	17	5
... actively work for a nature conservation association to protect biodiversity?	10	32	33	20	5

A6.16 To what extent are you personally willing to ...? (Figure 66)

Data in percent	Very willing	Somewhat willing	Somewhat unwilling	Completely unwilling	No answer
... pay more for products that are produced in an environmentally friendly way, if this means that they are supporting economically weaker regions in Germany?	16	45	24	11	4
... pay higher prices for foods produced in a sustainable and environmentally friendly manner?	14	43	25	15	3
... pay more for products from economically weaker countries that are produced in an environmentally friendly way, so that international trade becomes fairer?	14	43	27	12	4
... donate to the upkeep and conservation of a nature reserve?	16	41	24	15	4

Basic count: 2021 Youth Nature Awareness Study – 14 to 17-year-olds

Chapter 2: At the limit – perception of the Earth's stress limits and changes in nature and landscape

A2.1 What do you think about the following statements? (Figure 6)

Data in percent	Agree strongly	Agree somewhat	Partly agree/ partly disagree	Disagree somewhat	Don't agree at all	Don't know/ no answer
The numbers and diversity of insects are declining worldwide.	45	31	13	3	0	8
The numbers and diversity of insects are declining in Germany.	40	30	15	4	1	10
I know about the reasons for insect decline.	18	26	31	12	7	6

A2.2 Please select two reasons that you consider to be most significant in insect die-off. (Multiple answers possible; only people who had said they at least partly knew the reasons for insect die-off) (Figure 7)

Data in percent	
Use of pesticides or sprays	72
Loss of habitats for insects	68
Climate change	33
Insect diseases	11
Light pollution (for example from street lights)	10
Other reasons	2

Chapter 3: The pandemic – the population's understanding of its causes and its influence on our relationship with nature

A3.1 To what extent do you agree with the following statements? (Figure 9)

Data in percent	Agree strongly	Agree somewhat	Partly agree/ partly disagree	Disagree somewhat	Don't agree at all
Our health depends on the health of our planet.	32	29	19	11	9
The coronavirus crisis is a health issue and has nothing to do with the condition of nature and the environment.	17	23	27	21	12
The coronavirus crisis is related to our treatment of nature, such as habitat destruction and climate change.	12	22	28	25	13

A3.2 Please state whether you agree strongly, agree somewhat, disagree somewhat, or do not agree at all with the following statements. (Figure 10)

Data in percent	Agree strongly	Agree somewhat	Disagree somewhat	Don't agree at all	Don't know/ no answer
Being in nature makes me happy.	44	43	9	2	2
Nature is part of a good life.	65	29	5	1	0
I don't feel comfortable in nature.	6	10	18	63	3

A3.3 Has the importance of nature to you changed compared to before the coronavirus crisis? For me, nature is now... (Figure 12)

Data in percent	
Far more important	15
Somewhat more important	29
Just as important	54
Somewhat less important	2
Far less important	0

A3.4 How often were you outside in nature in the past months compared to before the coronavirus crisis? (Figure 14)

Data in percent	
Far more often	16
Somewhat more often	28
No difference	40
Somewhat less often	11
Far less often	5

Chapter 4: Climate change and loss of biodiversity – perception of risk and awareness of the influence on nature and society

A4.1 When you think about the causes of climate change: Which of the following statements comes closest to your opinion? (Multiple answers possible) (Figure 15)

Data in percent	
Climate change is caused by natural processes.	5
Climate change is caused partly by natural processes and partly by human actions.	34
Climate change is caused primarily by human actions.	58
There is no such thing as climate change.	0
Don't know/no answer	3

A4.2 Below are several statements about climate and nature. To what extent do you personally agree with the statements? (Figure 19)

Data in percent	Agree strongly	Agree somewhat	Partly agree/ partly disagree	Disagree somewhat	Don't agree at all	Don't know/ no answer
We in Germany are in a position to work together to protect nature and the climate.	33	37	23	4	1	2
I am personally in a position to work to protect nature and the climate.	18	36	31	10	3	2
I am scared that the climate crisis and the destruction of nature will impact my lifestyle.	25	34	23	13	4	1

Chapter 5: Change – responsibility, transformative change, and technological progress

A5.1 What do you think about the following statements? (Figure 23)

Data in percent	Agree strongly	Agree somewhat	Disagree somewhat	Don't agree at all	Don't know/ no answer
It is up to humans to protect nature.	63	30	4	1	2
We may only use nature in such a way that affords coming generations the same opportunity.	60	30	6	2	2
It angers me that so many people treat nature so recklessly.	50	35	11	3	1

A5.2 What do you think about the following statements? (Figure 25)

Data in percent	Agree strongly	Agree somewhat	Disagree somewhat	Don't agree at all	Don't know/ no answer
In times of economic crisis, nature conservation also has to make do with less money.	12	31	32	18	7
Nature must not be allowed to stand in the way of economic development.	9	20	33	31	7

A5.3 In your opinion, is a comprehensive change in lifestyles and economic practices in Germany necessary to stop the global nature, environment, and climate crisis? (Figure 29)

Data in percent	
Yes	29
Yes, somewhat	35
Partly yes/partly no	24
Not really	5
No	2
There is no nature, environment, and climate crisis.	1
Don't know/no answer	4

A5.4 Are you prepared to contribute actively to this change through a sustainable and environmentally friendly lifestyle? (Only people who had said that a comprehensive change in lifestyles and economic practices in Germany is necessary ["yes", "yes, somewhat", "partly yes, partly no"]) (Figure 31)

Data in percent	
Yes	30
Yes, somewhat	41
Partly yes/partly no	24
Not really	4
No	1
Don't know/no answer	0

A5.5 Do you think the energy transition towards predominantly renewable energies is the right way to go? (Figure 33)

Data in percent	
Yes	64
Undecided	26
No	4
Don't know/no answer	6

A5.6 Please rate the following statement about genetic engineering in agriculture: "In my opinion, commerce should label foods made of animals that have been fed genetically modified feed." (Figure 37)

Data in percent	
Agree strongly	45
Agree somewhat	23
Disagree somewhat	13
Completely disagree	16
Don't know/no answer	3

A5.7 The lifeworld of many people is becoming increasingly digital. With this in mind, what do you think about the following statements about virtual and digital experiences of nature? (Figure 39)

Data in percent	Agree strongly	Agree somewhat	Partly agree/ partly disagree	Disagree somewhat	Don't agree at all	Don't know/no answer
Digital offerings for a natural experience, such as a virtual walk in the woods or a virtual safari are of interest to me.	10	17	24	22	25	2
It reassures me that animal and plant species that are dying out in their real habitats can still be experienced digitally.	10	15	23	20	27	5
Digital nature offerings such as virtual natural experiences or information sites on the internet have already motivated me to experience nature outdoors.	14	20	24	20	16	6

A5.8 To what extent do you agree with the following statements? "I can imagine myself using an app to find out about natural hazards, successes in nature conservation, or even possible actions that I could personally take." (Figure 41)	
Data in percent	
Agree strongly	19
Agree somewhat	28
Partly agree/partly disagree	25
Disagree somewhat	13
Completely disagree	11
Don't know/no answer	4

Chapter 6: Awareness of biodiversity – the previous societal indicator and results of the new measurement model

A6.1 How convinced are you that biodiversity on Earth is in decline? Are you ... (Figure 49)	
Data in percent	
Very convinced	28
Somewhat convinced	46
Undecided	18
Somewhat unconvinced	3
Completely unconvinced	1
Don't know/no answer	4

A6.2 The Federal Republic of Germany has committed itself to the conservation of biodiversity in international agreements. To what extent do you personally consider the conservation of biodiversity to be a priority task for society? Would you say ... (Figure 50)	
Data in percent	
Yes, this is a priority task for society.	29
Yes, somewhat	41
Partly yes/partly no	22
Not really	3
No, this is not a priority task for society.	1
Don't know/no answer	4

List of footnotes

17 The milieu indicator contains statements that represent the typical values of the individual lifestyles and thus also make it possible to reconstruct the boundaries between the groups. Statements that capture the respondents' basic beliefs or diagnose motives that are effective in everyday life have proven to be the most effective. The criterion for the selection of such statements is their differentiating power, that means their suitability for optimally separating the different groups. On this basis, the respondents are assigned to the lifeworlds on the basis of a probability model using a specially adapted form of cluster analysis. This is done by determining a specific distribution of response probabilities across all indicator items for each group (norm profiles). Lifestyle classification is then done according to similarity of individual response patterns with the probability model, according to the logic of profile matching. 20

18 How the members of the youth lifeworlds can be mapped quantitatively onto the youth population will be shown in a separate report by the BfN. 20

19 Social class describes the position in society associated with education, income and occupational prestige. It is linked to the existence of economic, cultural, social, and symbolic capital. 20

20 Low: Without lower secondary/primary school leaving certificate or with lower secondary/primary school leaving certificate or polytechnic secondary school with 8th or 9th grade leaving certificate. Medium: Secondary school leaving certificate or leaving certificate from the 10th grade of a polytechnic secondary school or vocational school qualification. High: General or subject-linked higher education entrance qualification / Abitur or degree from a university, college, or university of applied sciences. 25

21 It was translated into twelve languages in the year of publication (see Uekötter 2011, page 86). 27

22 The Holocene refers to the climatically relatively stable geological epoch since the end of the last ice age about 11,000 years ago. During this time, humanity has developed up to the modern age. In the shadow of climate change, we are about to leave this safe operating space – if the global community does not succeed in keeping to the goals of the Paris Climate Agreement (a maximum of 1.5-2 degrees Celsius warming compared to the pre-industrial epoch). 27

23 The scientific approach of planetary boundaries assesses ocean acidification. To avoid difficulties in understanding, the Nature Awareness Study asked more generally about the state of the oceans. 28

24 The EU defines invasive species as animal and plant species that can affect habitats, species, or ecosystems through their spread and thus harm biodiversity. 38

25 The One Health High Level Expert Panel (OHHLEP) convened by WHO, FAO, IOE, and UNEP defines One Health as follows: One Health is an integrated, unifying approach that aims to sustainably balance and optimise human, animal, and ecosystem health. It recognises that the health of people, domestic and wild animals, plants, and the wider environment (including ecosystems) are closely interconnected and interdependent. The approach mobilises different sectors, disciplines, and communities at different levels of society to work together to promote well-being and address threats to health and ecosystems, while meeting collective needs for clean water, energy, and air, and safe and nutritious food, taking action on climate change, and contributing to sustainable development. See: www.who.int/news/item/01-12-2021-tripartite-and-unep-support-ohhlep-s-definition-of-one-health 40

26 It should be noted that only the effect of climate change on biodiversity is considered here, not the state of biodiversity itself. As an examination of the planetary boundaries (see Chapter 2) has shown, this state is already in the "red zone" today, and is therefore to be classified as dangerous. If no adaptive measures are taken, climate change will exacerbate the risk in the coming years. 49

27 In years with particularly hot summers, it was considerably more (for example around 10,000 in 2003), in years with cooler summers it was considerably less (for example 2011: 200 heat deaths). Watts et al. (2020) employ a different calculation method and count around 20,000 heat deaths in Germany for 2018. 50

28 There is no indication that this result is influenced by the fact that the survey was conducted within the scope of the Nature Awareness Study: The question about the policy areas perceived as most important was deliberately asked at the beginning of the survey in order to exclude any influence by further engagement with nature conservation issues. For reasons of survey ethics, the respondents are informed about who commissioned the study (BMUV and BfN) at the beginning, but the analyses of an experimental preliminary study for the 2017 Nature Awareness Study show that no fundamentally positive influence can be derived from this (see Trautwein et al. 2019). 59

29 The development, operationalisation, and exact calculation of the societal indicator can be found in Kuckartz and Rädiker (2009). An explanation of the procedure and a comprehensive discussion of the findings are presented in the in-depth report on the societal indicator. 78

30 The following definition was read out to the respondents: In science, biodiversity is understood to mean firstly the diversity of genetic information and genes, secondly the diversity of animal and plant species, and thirdly the diversity of habitats and ecosystems. 82

31 The stronger the connection between a factor (for example “problem awareness”) and the nature-protecting behavioural intentions, the greater the weighting for this factor. The development, operationalisation, and exact calculation of the societal indicator can be found in Kuckartz and Rädiker (2023). 88

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