

2021 Youth Nature Awareness Study

In-depth scientific report



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Foreword



Sabine Riewenherm, © Feisel Grombaldi

Dear readers,

We are currently in a period characterised by a multitude of overlapping crises and challenges. This affects all of us, but especially the coming young generation, who will have to deal with these crises in the long term: The correlations between the biodiversity crisis, the climate crisis, and the pandemic are therefore the main topics of this specialist brochure, which is an in-depth report on the current 2021 Nature Awareness Study. In this publication, I am very pleased to be able to present you with detailed analyses on the awareness of teenagers from different socio-demographic groups as well as on social milieus according to the model of the SINUS Institute.

The figures presented to you in this in-depth report make me very hopeful! The vast majority of teenagers in Germany are aware of the pressing problems of our time, as the results clearly show. For example, 70 percent are of the opinion that the conservation of biodiversity is a priority task for society.

Above all, it is extremely promising that teenagers' willingness to act in order to find societal answers to the crises of our time together is also strongly pronounced. Teenagers strongly agree

that a comprehensive change in our lifestyles and economic activities is necessary in Germany in order to stop the global nature, environmental, and climate crisis. The majority of teenagers are prepared to support the necessary change by adopting a sustainable and environmentally-friendly lifestyle, for example by giving up or limiting meat consumption, or by joining a nature conservation association.

When we take a closer look at these overarching statements, we have to keep in mind that we are talking about multi-faceted, sometimes very different youth lifeworlds and everyday realities. The results show once again that nature awareness is several times more pronounced among girls than among boys, that there are pronounced educational effects in many areas, and that teenagers from more difficult social living conditions or with a strong consumer orientation are often less conservation-oriented than adolescents from other lifeworlds. In light of these findings, I am convinced that this brochure contains a multitude of pointers for making future nature conservation policy and nature conservation communication more successful for and with the young generation in order to manage the necessary change.

My conclusion: A largely responsible and committed generation is growing up today, making its voice heard with calls for change. The strong willingness to get involved and to gear everyday behaviour towards greater compatibility with nature and sustainability is a great opportunity to make substantial progress towards protecting nature and biodiversity in the medium and long term. Such a development must not be overlooked by policy makers under any circumstances. It is important for everyone, of all generations, to work together on future-oriented, innovative, and viable solution strategies for nature conservation, climate protection, and sustainable development.

This requires a serious willingness to engage in dialogue with teenagers on an equal footing. For me, this also includes giving them specific opportunities to participate and scope to take action so that they can actively engage in politics and society for nature and climate protection. Tolerance for new and unusual solutions is absolutely essential to ensuring that the creative potential of a committed and young generation can fully unfold.

With warm regards,



Sabine Riewenherm
President of the Federal Agency for Nature Conservation

Summary

This in-depth report presents detailed scientific analyses on youth nature awareness in 2021. They are based on a representative survey on nature awareness among teenagers aged 14 to 17, which was conducted on behalf of the Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV) and the Federal Agency for Nature Conservation (BfN) as part of the 2021 Nature Awareness Study. A direct comparison of the findings on adult awareness has already been published in the context of the basic data brochure (BMUV and BfN 2023). In addition, this brochure presents comparisons between different socio-demographic subgroups (age, gender, level of education, etc.) and youth lifeworlds (according to the SINUS model for youth lifeworlds), as well as some further findings that could not be related to the response behaviour of the adult population.

In the following, central results of these in-depth analyses are first summarised in the form of core statements and recommendations for nature conservation communication and nature conservation practice.

This brochure is available on the internet for download in German and English at www.bfn.de/naturbewusstsein and www.bfn.de/en/nature-awareness.

Appreciation of nature and willingness to get involved

Key statements:

- › For the majority of teenagers, nature was of great personal importance in 2021: 65 percent agree strongly that nature is important for a good life (a further 29 percent “somewhat”). Compared to the first survey in 2020, the level of agreement on this is almost unchanged (2020, 66 percent agree strongly, another 26 percent “somewhat” agree). Girls – in 2021 as well as in 2020 – emphasise more often than boys that nature is part of a good life (highest level of agreement, 2021: 73 percent of girls versus 57 percent of boys; 2020: 74 percent of girls compared to 58 percent of boys).
- › The question of whether nature conservation will also have to make do with less money in times of economic crisis met with approval from less than half of the teenagers in 2021 (43 percent, 12 percent of whom agree strongly, and a further 31 percent “somewhat”). However, agreement with this statement has increased compared to the previous survey (2020: 36 percent, of whom agree strongly: 9 percent, a further 27 percent “somewhat”). In 2021, this opinion was most often held by teenagers with a low level of formal education (both levels of agreement, low educational level: 54 percent, average educational level: 43 percent, high educational level: 40 percent).
- › Willingness to change personal behaviour to protect nature has increased compared to the last youth survey. For example, 61 percent of teenagers in 2021 expressed a willingness to share articles about nature conservation on social media (21 percent

“very”, another 40 percent “somewhat”); in 2020, 55 percent were willing to do so (20 percent “very”, another 35 percent “somewhat”). In 2021, 61 percent were prepared to limit their meat consumption or give it up completely (27 percent “very willing”, another 34 percent “somewhat”), in 2020 it was only 55 percent (30 percent “very willing”, another 25 percent “somewhat”).

Agreement with the statement “Nature is part of a good life.”

Response category “completely agree”



Teenagers, total



Girls



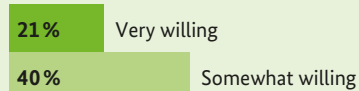
Boys



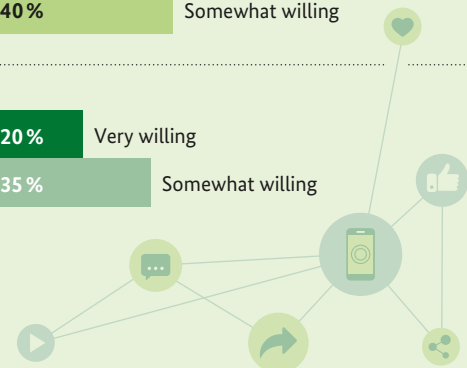
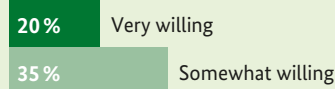
Enquiry about willingness to get personally involved in nature conservation: How willing are you personally to ...

... share articles about nature conservation on social media (for example on the decline of insect populations)?

2021

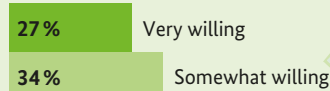


2020



... limit your meat consumption or go without meat?

2021



2020



Recommendations:

Similarly to the previous surveys on adults' awareness of nature, teenagers also show a strong appreciation of nature as a social commodity. In addition, the majority of teenagers continue to believe that nature conservation should have sufficient financial resources even in times of crisis. This result should encourage those responsible in politics and business to (continue to) provide sufficient scope for societal engage-

ment in nature conservation in Germany in order to be able to protect biodiversity in the interest of future generations and to further promote environmentally friendly lifestyles and economic activities.

The strong willingness of teenagers to do something to protect nature represents a good basis for promoting their actual involvement. This can be done, for example, within the framework of school and extracurricular projects or via target group-specific nature conservation communication in social media. Impetus for specific opportunities for action on issues such as species conservation, waste avoidance, food waste, microplastics, and sustainable consumption could be regularly integrated into educational contexts to demonstrate direct opportunities to contribute personally to the protection of nature and the environment. Teenagers in particular, whose range of experience is more limited than that of adults, need easily understandable pointers towards very specific personal actions they can take.

Furthermore, conservation actors should see the strong female involvement as a great opportunity. For example, further training courses and opportunities for a successful career start in “green professions” could be explicitly created for interested teen girls. Taking this further, however, it is also important to adequately address the weaker nature orientation exhibited by boys and to use the framework of education and vocational orientation to create interest and identification with the tasks of nature conservation in a targeted manner.

Awareness of teenagers for the development and importance of biodiversity

Key statements:

- › In 2021, almost three quarters of teenagers (74 percent) were convinced that biodiversity on Earth is declining in 2021 (28 percent of them “very convinced”, another 46 percent “somewhat”). This finding

has remained stable compared to the first Youth Nature Awareness Study (2020: 28 percent “very convinced”, a further 44 percent “somewhat”).

- › Seventy percent of teenagers are convinced that the preservation of biological diversity is a priority task for society (of which 29 percent responded “yes”, another 41 percent “yes, somewhat”). The educational background of the teenagers plays a major role: In the group with a low level of formal education, only 56 percent consider the conservation of biodiversity to be a priority task for society (“yes/yes, somewhat”). In the group with an average level of formal education, the figure is 62 percent and in the group with a high level of formal education, it is 77 percent.
- › Teenagers clearly perceive the decline in insects both worldwide and in Germany (worldwide: 76 percent, of whom agree strongly: 45 percent, somewhat: 31 percent; in Germany: 70 percent, of whom agree strongly: 40 percent, somewhat: 30 percent). Awareness of the decline in insects is expressed more frequently by teenagers with a high level of formal education (both levels of agreement, worldwide: 80 percent; Germany: 75 percent) than by teenagers with a low level of formal education (worldwide: 65 percent; Germany: 58 percent).

Recommendations:

Awareness of the societal importance and necessity of conserving biodiversity is well developed among teenagers. The fact that teenagers are generally of the strong opinion that the protection of biodiversity is a priority task for society opens up a broad field of work for actors in education for sustainable development. The aim should be to work out and communicate in discourse and participation with teenagers how individuals and society can contribute to fulfill-

Agreement with the statements:

“The number and diversity of insects are declining worldwide.”

“The number and diversity of insects are declining in Germany.”

Response category “agree strongly”/“somewhat”

Worldwide



Teenagers, total



76 %



High level of education



80 %



Low level of education



65 %



Response category “agree strongly”/“somewhat”

Germany



Teenagers, total



70 %



High level of education



75 %



Low level of education



58 %



ing this task. Willingness to change behaviour in order to protect biodiversity should be strengthened by communicating behavioural options and providing specific opportunities to practise personally putting them into action. When imparting knowledge in school or extracurricular contexts, it is advisable to aim at raising awareness of the

problem at an early stage and across all education systems by vividly conveying the actual loss of biodiversity and the associated consequences for humans and nature. This is also necessary to tackle the strong educational effect that is visible in this topic area. In addition, it makes sense to use educational offers and career guidance to better

communicate that the “conservationists of tomorrow” can opt for a personal career path that incorporates conserving biodiversity, and that this can be fulfilling – alongside possible ways to contribute individually to a sustainable society that is fit for the future.

The specific political objective of protecting insect diversity received strong support among teenagers in the 2021 Nature Awareness Survey. For such efforts to be successful, it makes sense to inform teenagers at an early stage about what drives and affects insect loss, and to discuss and inform them about personal opportunities for action. In addition to direct measures such as erecting insect hotels or providing food plants and hibernation sites in the garden, in other green spaces, or in the landscape, this should also include opportunities for action that further promote the protection of insect diversity at a higher level. This includes, for example, adjusting one’s own consumption behaviour and giving preference to organically produced food.

Youth and the relationship with nature during the coronavirus crisis

Key statements:

- › In 2021, 44 percent of teenagers said that nature had become more important to them personally compared to the time before the pandemic (“far more important”: 15 percent, “somewhat more important”: another 29 percent). Compared to the first youth survey in 2020, however, this attribution of importance has decreased by 8 percentage points (2020: 52 percent; of which 18 percent “far more important”, 34 percent “somewhat more important”). The socio-demographic analysis does not show any significant differences in this question according to age, gender, education, and size of town (neither in 2021 nor in 2020). In the comparison of lifeworlds, however, it is striking that of all lifestyles, Experimentalists most frequently state that nature

has become far more or at least somewhat more important to them (57 percent).

- › In 2021, 44 percent of teenagers said that they have been in nature more often in recent months than in the period before the coronavirus crisis (16 percent of them “far more often”, another 28 percent “somewhat more often”). Compared to the first youth survey in 2020, this value has also decreased by 8 percentage points (2020: 52 percent; of which 20 percent “far more often”, another 32 percent “somewhat more often”). The socio-demographic analysis also reveals no differences here. In the life-world view, it is again the Experimentalists who claim to have been outdoors far more or at least somewhat more often in recent months than in the period before the coronavirus crisis (58 percent).
- › In 2021, 61 percent of teenagers were convinced that human health depends on the health of our planet (32 percent of them “agree strongly”, another 29 percent “somewhat”). There is a clear correlation with the educational background of respondents: Of the teenagers with a high level of formal education, 71 percent agree strongly or somewhat with this question, compared to 52 percent in the group with an average level of formal education and only 37 percent in the group with a low level of formal education. There is no comparative data available for 2020.

Recommendations:

No other topic occupied and challenged the whole of society more in 2021 than the coronavirus pandemic. It is therefore not surprising that there are hardly any differences between the socio-demographic or lifeworld youth groups with regard to appreciation and use of nature as a place of retreat. As a resource that is in principle freely available to all teenagers in times of crisis, nature can be highlighted as an important protective factor for physical and mental health. However, as the pandemic subsides, there is a noticeable decrease in the appreciation and use of nature as a resource in the context of the coronavirus crisis. It is to be hoped that the increased significance of the relationship with nature, which

is so far still measurable, will remain and continue to have an effect on teenagers even as the pandemic becomes contained.

There is increasing scientific evidence of a connection between the events of the pandemic and the deterioration in the state of nature and the environment (see IPBES 2020). The majority of teenagers are already convinced that human health depends on the health of the planet. Among teenagers with a low level of formal education, however, this connection is far less strongly perceived and should therefore be communicated more clearly in order to promote an awareness of global cause-and-effect relationships regarding the degradation of nature. Information offerings could be developed for this purpose that show how personal everyday behaviour, and social lifestyles and economic activities interact with nature, the environment, and health, and which systemic changes are necessary for positive future development. One 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.

Agreement with the statement:
“Our health depends on the health
of our planet.”

Response category
“Agree strongly”/“somewhat”



Teenagers, total

61 %



Level of education

71 %

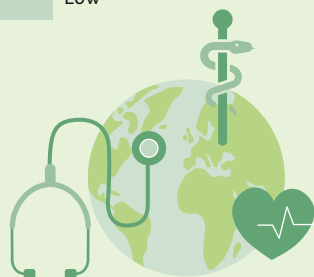
High

52 %

Average

37 %

Low



Understanding of the causes and effects of climate change

Key statements:

- › Fifty-eight percent of teenagers are convinced that climate change is mainly caused by human actions. A further 34 percent of teenagers state that climate change is caused partly by natural processes and partly by human actions. Only a minority of 5 percent think that climate change is caused solely by natural processes. Almost no one expresses the idea that there is no such thing as climate change (rounded 0 percent, absolute 4 out of 1,004 respondents). Opinion on the causes of climate change depends on the level of education: The view that climate change is

mainly caused by human actions is held by 66 percent of teenagers with a high level of formal education, 51 percent with average formal education, and 37 percent with a low level of formal education.

- › Ninety-one percent of teenagers believe that nature conservation is necessary to meet the challenges of climate change (57 percent “agree strongly”, a further 34 percent “somewhat”). This question was also asked in 2020, at which time 87 percent of teenagers were of this opinion (55 percent “agreed strongly”, a further 32 percent “somewhat”).
- › Fifty-nine percent of teenagers are afraid that the climate crisis and the destruction of nature will impact their own lifestyle (25 percent of them “agree strongly”, another 34 percent “somewhat”). The perception of this threat depends on the level of education (both levels of agreement, low formal education: 43 percent, average: 54 percent, high: 65 percent). There are also great differences between the lifeworlds of teenagers: 70 percent of the risk-averse and particularly adaptable Adaptive Pragmatists are concerned, but only 35 percent of the hedonistic Materialistic Escapists.
- › Around half of teenagers believe that they are personally in a position to make an active contribution to protect nature and the climate (54 percent, of whom 18 percent “agree strongly” and another 36 percent “somewhat”). Significantly more teenagers believe that they can be successful collectively (70 percent, of whom 33 percent “agree strongly” and a further 37 percent “somewhat”). The conviction of being able to achieve something together is especially present among girls (75 percent) and teenagers with a high level of formal education (76 percent). It is less pronounced among

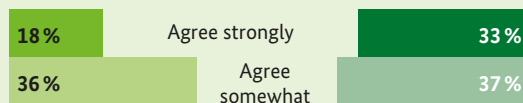
boys (65 percent) and teenagers with a low level of formal education (58 percent). There are no significant differences with regard to confidence in personal effectiveness.

Agreement on personal and collective perceptions of effectiveness for the protection of nature and climate

I am personally
in a position to make
an active contribution
to protect nature
and the climate.

We in Germany
are in a position
to work together
to protect
nature and
the climate.

2021



Agreement with the statement:

“I am afraid that the climate crisis and the destruction of nature will impact my lifestyle.”

Response category “Agree strongly”/“somewhat”

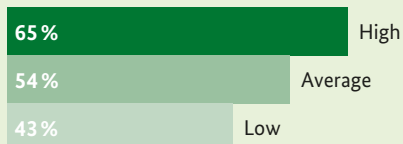


Teenagers, total

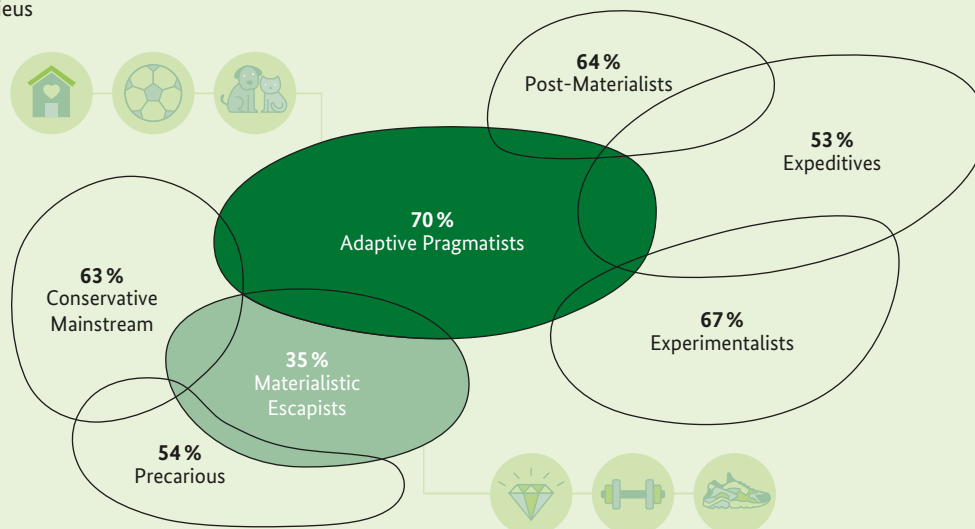
59 %



Level of education



Milieus



Recommendations:

Despite generally high awareness values regarding climate change, clear differences in education can be observed. They reveal that it is especially teenagers with a low level of formal education who see humans as less causal for climate change, who are less concerned about the consequences of climate change, and who see themselves as less able to make an active contribution to protect nature and the climate. As such, low-threshold offers aimed at specific target groups are needed to inform teenagers about the impacts of climate change on biodiversity and the relevance and effectiveness of conservation measures. In addition, teenagers' personal, specific involvement in nature and climate protection must be given further support. The fact that it is generally possible to mobilise this involvement is clearly demonstrated by the widely known youth movement "Fridays for Future". However, as was investigated in the 2020 Youth Nature Awareness Study, the socio-demographic and lifeworld differences shown above are also evident in the willingness to get involved (for example in the context of demonstrations), which means that large parts of the youth population can still be activated.

In communicating with teenagers, attention should also be drawn to the connections between climate change and the loss of biodiversity, as well as to possible courses of action within the framework of natural climate protection: A good nine out of ten teenagers in 2021 believed that nature conservation is necessary to meet the challenges of climate change – youth in Germany can therefore be considered a strong ally in terms of implementing the Federal Ministry for the Environment's Federal Action Plan on Nature-based Solutions for Climate and Biodiversity (see BMUV 2022).

Teenagers' attitudes towards the need for transformative change and assessment of technological developments
Key statements:

- › Sixty-four percent of teenagers believe that a comprehensive change in lifestyles and economic activities in Germany is necessary to stop the global nature, environmental, and climate crisis. Twenty-nine percent are even unreservedly of this opinion. The socio-cultural analysis shows great differences: While 43 percent of the conservation-conscious Post-Materialists and 40 percent of the Adaptive Pragmatists, who are willing to adapt and compromise, agree unreservedly with comprehensive change (both levels of agreement: 80 percent and 76 percent respectively), it is only 16 percent among the non-conformist Experimentalists and just 7 percent among Materialistic Escapists, who are particularly interested in status and possessions (both levels of agreement: 50 percent and 43 percent respectively).
- › Among the teenagers who consider a comprehensive change in lifestyles and economic activities in Germany to be necessary, at least in part, 71 percent declare themselves willing to actively contribute themselves through a sustainable and environmentally friendly lifestyle ("agree strongly": 30 percent, a further 41 percent "somewhat"). The willingness to do this is more pronounced among girls than among boys (78 percent compared to 63 percent) and increases with the level of education (low level of formal education: 54 percent, average: 65 percent, high: 76 percent).
- › Support for the energy transition remains high, with 64 percent of teenagers in favour of it in 2021 (first survey 2020: 66 percent). Full agreement with the energy transition varies with the level of education (low:

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

Response categories “yes” / “yes, somewhat”

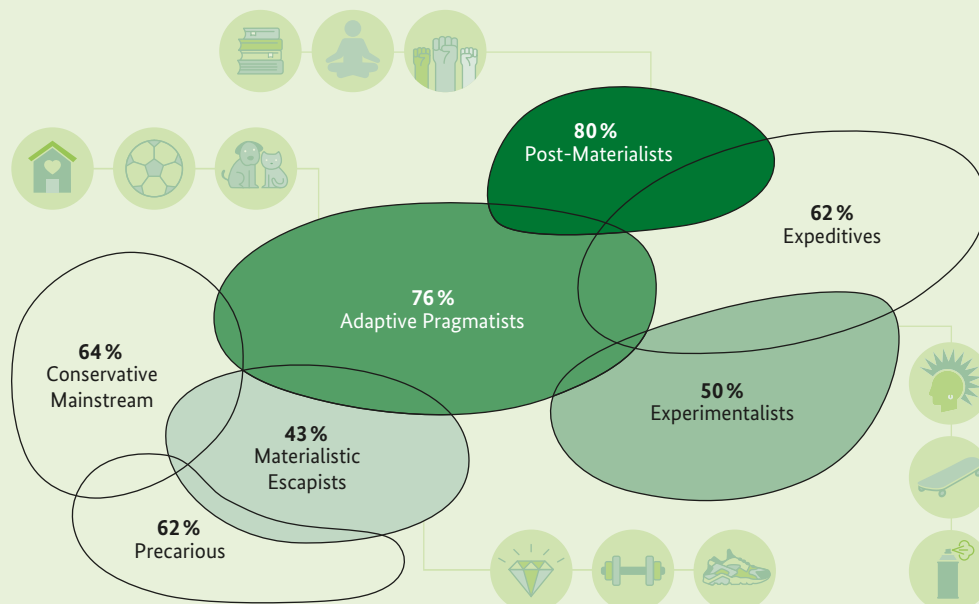


Teenagers, total

64 %



Milieus



57 percent, average: 56 percent, high: 70 percent) and the size of town: Interestingly, approval is highest among teenagers in rural areas (population under 20,000: 74 percent), in large cities (population 100,000 to 500,000: 57 percent) it is lowest.

- › Sixty-one percent of the teenagers surveyed in 2021 were of the opinion that new wind turbines and solar plants should only be built where they do not disturb animals

and plants (35 percent of them “agree strongly”, another 26 percent “some-what”). Girls are clearly more often of this opinion than boys (both levels of agreement: 68 percent compared to 54 percent). Furthermore, agreement increases significantly with the level of education (both levels of agreement, low level of formal education: 38 percent; average level of education: 57 percent; high level of education: 68 percent).

Do you think the energy transition towards predominantly renewable energies is the right way to go?

Response category “yes”

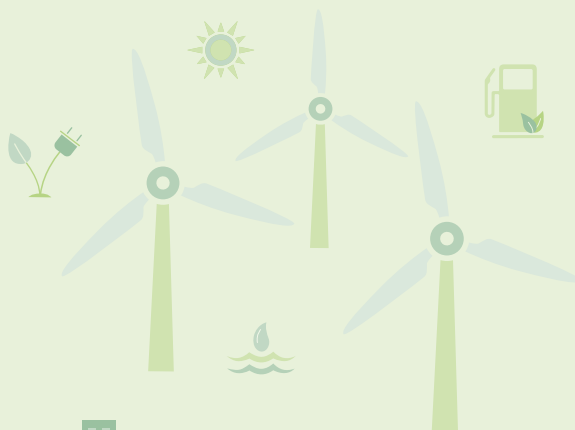


Teenagers, total

64 %



Level of education



Towns



- Concerns about the use of genetic engineering continue to predominate among teenagers. Sixty-eight percent of teenagers are in favour of compulsory labelling of food from animals fed with genetically modified feed (45 percent of them “agree strongly”, another 23 percent “somewhat”). In 2020, this figure was 83 percent (of whom 59 percent “agree strongly” and a further 24 percent “somewhat”). Future studies will investigate whether the lesser concerns expressed in 2021 represent a trend. Clear support for compulsory labelling is found more often among girls than among boys (51 compared to 39 percent, average: 45 percent) and among 14 to 15-year-olds (53 percent) more often than among 16 to 17-year-olds (39 percent). Moreover, unreserved support

increases with the level of education (low: 30 percent, average: 37 percent, high: 52 percent).

- In 2021, 47 percent of teenagers could imagine using an app to find out about the endangerment of nature, successes in nature conservation, or even possible actions that they could personally take (of whom 19 percent were “very willing”, another 28 percent “somewhat willing”). General willingness increases with the level of education (both levels of agreement, low level of formal education: 38 percent; average: 41 percent; high: 53 percent). Compared to the first survey, agreement has decreased (2020: 57 percent, of whom 24 percent “very willing” and a further 33 percent “somewhat”).

In my opinion, commerce should label foods made of animals that have been fed genetically modified feed. To what extent do you agree with this statement?

Response category “completely agree”



Teenagers, total

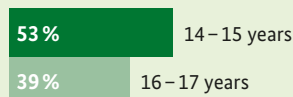
45 %



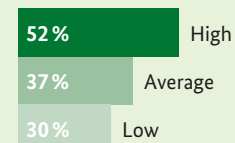
Gender



Age



Level of education



Recommendations:

The call for a comprehensive transformative change in our lifestyles and economic activities is not new, especially from the scientific community (see WBGU 2011, IPBES 2019), but in light of the increasingly evident crises, it is currently of the utmost social relevance. It is encouraging that almost two thirds of teenagers are convinced of the necessity of this change, and almost three quarters of the teenagers who share this conviction also express a personal willingness to help shape this change themselves. The necessary comprehensive change in our lifestyles and economic activities requires broad social cooperation. The in-depth analysis of youth nature awareness in 2021 clearly reveals the subgroups of the youth population in Germany where there is still work to be done on this topic in terms of environmental education and communication work. Thus, more girls than boys and more well-educated

teenagers than teenagers with a low level of formal education are already demanding transformative change and are willing to contribute to it. An examination of teenagers' lifeworlds also shows that it is primarily the sustainability-oriented, educated Post-Materialists, as well as the conformist social middle of youth (the Adaptive Pragmatists), who are demanding change most urgently. This contrasts with some youth lifeworlds that react cautiously or even critically to demands for comprehensive change. These are teenagers from low to average educational backgrounds who place great value on prestige, social status, and short-term consumption goals (the Materialistic Escapists), as well as the unconventional Experimentalists who want to live intensely and “differently” from the mainstream. Also among them are teenagers with mostly low educational backgrounds who are in danger of losing their so-

cial connection at a young age due to precarious living conditions (Precarious lifeworld).

The energy transition, as an essential component of the necessary socio-ecological transformation, has fundamental support among teens. However, it is also worth noting that their approval is heavily linked to their level of education. So, for example, schools must provide better information regarding the importance of the energy transition, so that teenagers from all educational backgrounds can form an opinion on it as part of a “generational project”. In doing so, they should emphasise that the transformation of the energy system is also linked to the creation of new jobs and job profiles. It would also make sense to reflect on the possibilities of shaping the energy transition in a socially and environmentally compatible way. This survey also asked whether teenagers would be willing to use less electricity to protect nature, for example for computers and smartphones. Strong agreement here is at 12 percent, with another 28 percent somewhat agreeing. For communication and education work, these figures are an important indication for expanding the sufficiency discourse and communicating the necessity of energy savings, because technological progress and the efficiency of renewable energies cannot meet the constantly increasing energy demand of our society. It is also interesting to note that teenagers in rural areas in particular are most in favour of the energy transition – that is to say in places where the implementation of the energy transition is actually visible and can be experienced on a daily basis. This finding underlines how important communication and education projects are, especially for teenagers in urban environments, in order to raise awareness about the necessity of the energy transition.

Concerns about genetic engineering are pronounced among teenagers, although somewhat less so in the current survey than in the previous survey. For teenagers too, transparency and freedom of choice, as well as precautions and research into risk, are and remain key terms in the context of genetic engineering. As before, the vast majority of teenagers would like a labelling requirement for animal products produced from livestock fed with genetically modified feed. The majority of teenagers require the potential consequences of genetic engineering on humankind and nature to be adequately explored and thereby highlight the particular importance of research into risks and the precautionary principle in accordance with the existing legal situation.

As such, the promotion of discourse on the topic of genetic engineering among and with the young generation remains of high importance for environmental education, so that teenagers can deepen their independent opinion and actively participate in societal decision-making processes.

Many teenagers exhibit a general interest in digital offers in the context of experiencing nature and nature conservation. As for communication about nature conservation, the goal should be to win over young digital natives by presenting digital offers. This would make work in the field of nature conservation future-proof in the transition between generations. Conservation actors should therefore develop digital formats, where appropriate and possible, to be used in areas such as environmental education and in participation processes. Depending on the intended use, the different interests and lifestyles of the young target groups must be taken into account when designing digital offerings.

1 Introduction

On behalf of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMUV) and the Federal Agency for Nature Conservation (BfN), detailed information on the nature awareness of the German-speaking adult population has been collected every two years since 2009 and published as a Nature Awareness Study. Alongside the main study on nature awareness in the adult population, a separate representative survey of nature awareness among teenagers was carried out for the second time in the 2021 study.

Key results of the youth survey have already been published in the main report (BMUV and BfN 2023). This brochure presents the results of the youth survey differentiated by socio-demographic characteristics (gender, age, education, size of town) and by youth lifeworlds. In addition, we will highlight significant differences found relating to questions asked for the second time (first time in 2020).

In December 2021, over 1,000 German-speaking teenagers aged 14 to 17 were interviewed. The data was collected using a specially created mixed mode design, consisting of an online survey (n = 800) and additional face-to-face interviews (n = 204), in order to also survey teenagers who are hard to reach online.

The conceptual design and reporting for the study were carried out 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 technical support of the BfN. The data was collected by Ipsos GmbH. During development of the survey 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 Fritzsche (Leipzig University), Prof. Dr Ulrich Gebhard (Hamburg University),

Prof. Dr Armin Lude (University of Education Ludwigsburg), Dr Manuel Rivera (Research Institute for Sustainability Helmholtz Centre Potsdam), Prof. Dr Johan Rockström (Potsdam Institute for Climate Impact Research), and Dr Zita Sebesvari (United Nations University).

1.1 Objectives and concept

This study is a representative survey of nature awareness among teenagers in Germany aged between 14 and 17. The aim of this study is to gain valuable insights into the knowledge, attitudes, and willingness of under-18s in Germany to take action with regard to nature, nature conservation, and biodiversity, in order to make this information available to interested members of the public, research institutes, and national nature conservation actors in politics and practice.

In terms of content, the study is based on the Nature Awareness Study carried out among the adult population in autumn 2021. The main questions cover:

Appreciation of nature and willingness to get involved

What is the personal significance of nature for teenagers? What is their opinion on the endangerment of nature? Where do they situate nature conservation in the conflict between politics and economics, and to what extent are they willing to get personally involved in nature conservation?

Awareness of the development and importance of biodiversity

Are teenagers aware of the decline in biodiversity? Do they consider the conservation of biodiversity to be a priority task for society? To what extent are teenagers aware of the reasons for insect decline? What do they see as the main reasons for insect die-off?

The relationship with nature during the coronavirus crisis

What influence has the coronavirus crisis had on the connection between teenagers and nature? Do they spend more time in nature during the pandemic and is nature more valued now? Do teenagers see connections between the coronavirus crisis and the state of nature and the environment?

Understanding of the causes and effects of climate change

What causes do teenagers attribute to climate change? Do they see their lifestyle threatened by the climate crisis? To what extent do they believe they can help protect nature and the climate through their own actions?

Attitudes towards the need for transformative change and assessment of technological progress

In the opinion of teenagers, is a comprehensive change in lifestyles and economic activities in Germany necessary to stop the global nature, environment, and climate crisis? What do teenagers think about renewable energies? What do they think about potential impacts of genetic engineering and to what extent are they interested in digital offerings that can replace or enhance actual experiences of nature?

For the complex topics of energy transition, genetic engineering, digitalisation, and biodiversity, the teenagers were presented with short, neutral introductory texts in advance to make them easier to understand (based on the data collection of the 2020 Youth Nature Awareness Study, see BMUV and BfN 2021).

1.2 Presentation of the youth lifeworlds

Socio-demographic characteristics such as age, education, and gender are not enough on their own to explain individual attitudes, behaviour patterns, and ways of accessing nature. How teenagers experience, use, and value nature is also dependent on their lifestyles and value orientations. That's why, as in the previous survey (2020 Youth Nature Awareness), the SINUS model of youth lifeworlds was integrated in the research design of this study. Through differentiated evaluation of the data according to youth lifeworlds, the socio-demographic analysis (gender, age, education, size of town) is supplemented by the dimension of lifestyle and value orientation.

The SINUS model of teenagers' lifeworlds groups together teenagers who are similar in terms of values, basic attitude to life, and lifestyle, as well as those in a similar social position. In contrast to traditional stratification and lifestyle models, the classification here is socio-cultural: As well as value attitudes, the different facets of daily life (such as leisure, family, school, friendship groups, media use, career orientation) are taken into account in order to provide as comprehensive an image as possible of teenagers' focuses and lifestyles. The SINUS model of teenagers' lifeworlds is not based on partial aspects of everyday reality, but focuses on teenagers and the overall frame of reference of their lifeworlds as a whole. These could also be referred to as social milieus. However, since teenagers' socio-cultural core identity is not yet fully developed and shaped, the lifeworlds term is more appropriate. These are real existing groups with common contexts of meaning and communication in their everyday world, with comparable concepts of what is valuable and important in life that guide actions, as well as similar ideas of quality of life and lifestyle.

By including the SINUS lifeworlds indicators in the questionnaire design of the study, quantitative mapping of the members of the different lifeworlds in the youth population is possible. Figure 1 shows the model of SINUS lifeworlds for teenagers aged 14 to 17 in Germany. It is made up of seven different lifeworlds, which are positioned in

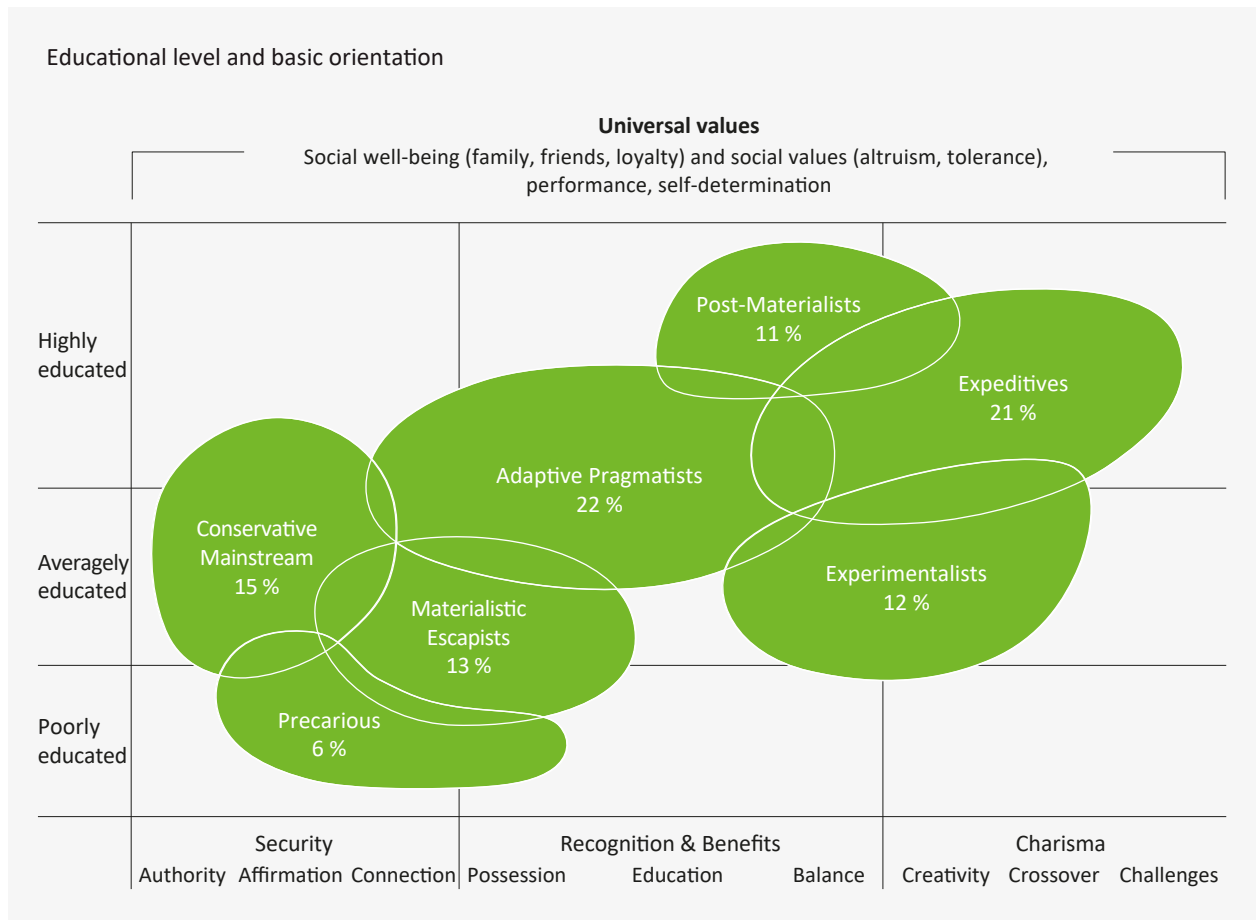


Figure 1: SINUS model for youth lifeworlds in Germany 2021

a two-dimensional axis system. The vertical axis indicates the level of education while the horizontal axis represents the normative basic orientation. The higher the position of the lifeworld in this graphic, the higher the level of education; the further right it is positioned, the more modern the values are from a socio-cultural perspective (for a more detailed explanation, see Calmbach et al. 2020).

The values axis maps both the values shared by all teenagers and the lifeworld-specific values range. The values considered by all teenagers as being fundamentally desirable include in particular: a harmonious family life, reliable and good friendships, and loyalty from a partner. Teenagers also highlight the importance of social values, especially altruism and tolerance, as well as achievement and self-determination. In the SINUS

lifeworlds graphic, these values therefore extend across all lifeworlds. In addition to these universal anchor values, however, there are also values that are lifeworld-specific. These can be classified and described based on three central, normative basic orientations:

- › The “Security” basic orientation maps a set of values that combine alignment with authorities, affirmation of the existing social order, and the desire for social connection. The desire to stay grounded in reality and put down (local) roots is dominant. Getting settled is more important than breaking away.
- › While the “Security” area tends to be lower middle class and traditional, the values of the “Recognition and Benefits” basic orientation range from materialistic to post-materialistic

values, depending on the educational background. Depending on social position, the people in this group seek confirmation through the possession of classic status symbols (materialistic claims of superiority), the capacity for adaptive navigation (claims of superiority through strong willingness to adapt), or through a post-materialist habit (cultural-intellectual claims of superiority). In principle, this basic orientation is characterised by the desire to achieve a good balance between maximising opportunities for prosperity on the one hand, and pursuing leisure and consumer interests as well as maintaining social relationships on the other hand. For teenagers who aspire at least to an intermediate school-leaving certificate, educational values are significantly more important than for teenagers who are aiming for a lower school qualification.

- › The “Charisma” basic orientation is characterised by values and virtues that reflect the desire to look for new horizons (be it mentally, aesthetically, socially, culturally, or geographically), find exciting challenges, question the status quo, try out alternatives, and also take risks. Highlighting creative difference by deliberately crossing the frontiers of style to distance oneself from the “grey mainstream” is typical here. In this individualistic basic orientation, a charismatic interior and exterior play an important role. But it’s not just about exuding a particular charisma, but also “capitalising” on it. Creativity, performing, and networking are key values of this basic orientation.

These normative basic orientations should not be understood as completely separate or divisive categories. The value attitudes of teenagers today follow less of an “either/or” logic than an “as well as” logic. Despite the great importance attributed to post-modern values, teenagers with a dominant “Charisma” basic orientation also follow some of the traditional values of the “Security” basic orientation, for example – although they do this to a much lesser extent than all other teenagers.

The profiles of the teenagers’ lifeworlds are presented below.

Conservative Mainstream

The value profile of these teenagers is characterised by the need for stability, order, and balance. A strong awareness of the proven social order and the wish to adhere to this are characteristic. A modern middle-class lifestyle is also typical, characterised by the desire for social proximity and warmth as well as a balance between work and leisure, personal interests, and family obligations.

The Conservative Mainstream milieu describes itself as unremarkable and reserved, familial, sociable, quiet, and grounded. While these attributes are discredited by many other teenagers as boring, the Conservative Mainstream consider them to be positive characteristics. Their motto is: “Better to err on the side of caution.” This desire for security is also reflected in how they organise their daily life: The Conservative Mainstream shy away from change and stick to habits and certainties. A controlling mentality is typical. They tend to be sceptical of new things and take a wait-and-see approach. They are strongly focused on familiar structures and environments.

For the Conservative Mainstream, self-discipline is more important than self-expression. Accordingly, lifestyle ambitions and consumer trends are at their weakest in this lifeworld. Here, teenagers are economical and controlled with their money. They don’t want to “pour it down the drain”.

The Conservative Mainstream take a primarily community-oriented approach to their leisure time. Many teenagers in this lifeworld take on volunteer work or at least sympathise with it. Direct experiences of nature (such as camping with a camp fire, bicycle tours in the countryside) are popular, with particularly positive mention of moments that create community (whether with family or friends). Nature is a symbol for home, peace, and harmony, and, for Christian believers, is also a part of God’s creation.

Adaptive Pragmatists

Adaptive Pragmatists combine the middle-class basic values and virtues of harmony, family, honesty, respect, trust, punctuality, diligence, willingness to work, and determination with (post-) modern and hedonistic values such as personal fulfilment and flexibility as well as the desire for fun and an intensive life.

Teenagers from this lifeworld perceive that the future will demand a high level of flexibility and self-management. They don't complain about it, but accept it. They name their strengths as adaptiveness and willingness to compromise as well as realism. They take a rather sceptical stance on ideologies. They are not focused on utopia but on the achievable. They do not have plans for making a "better world", but try to find their place in the middle of society. They are rational, grounded, and benefit-oriented instead of risk-oriented. In life, they consider it important to make forward-looking and meaningful decisions. They set themselves achievable goals and are guided by reason and calculating benefits.

Adaptive Pragmatists affirm social order. They consider themselves to be responsible citizens who will pay their taxes on time in future and not be a burden to the state. If ever they do break away from their routines and "do something wild", they don't exaggerate it. However, they are fundamentally open to new things, in particular in relation to media and technologies. They adapt upcoming trends – even though they aren't really trendsetters (like the Expeditives). Intensive media consumption and high levels of activity in social networks are widespread.

They often spend their free time doing hobbies, especially the girls: playing piano, singing, horse-riding, dancing. However, these leisure occupations usually take second place behind school work. Their consumer interest is pronounced, but is usually subject to rational control.

Precarious teenagers

The French word "précaire" means "precarious," "uncertain," and "revocable" – key terms which can be used to describe the attitude towards life and the living conditions of these teenagers. Their biography reveals initial fractures early on (for example incomplete, problematic family relationships, mental illness, expulsion from school). The everyday life of the Precarious is characterised by the battle for normality and keeping pace, and often marked by experiences of failure.

While there are many indications that most of these teenagers will move permanently into the Precarious lifeworld because they are confronted with a combination of different risk situations (parents with no educational background, unemployed parents, family income at or below the poverty line, poor prospects of graduating from school, problematic peer group), it is also conceivable that some of them are merely going through a phase of crisis, especially if there is a firm intention to "do everything to get out of here".

Precarious teenagers have the most difficult starting conditions. Many are aware of their social disadvantage and try to improve their situation, not allow themselves to become discouraged, and not resign themselves to it. But this lifeworld is dominated by a sense that opportunities are structurally inaccessible – or even that they are rendered inaccessible by the teenagers themselves (such as through taking drugs, criminality, poor performance at school) – and by the resulting fear that there will be few opportunities for participation.

Precarious teenagers have a strong desire to belong and to "achieve something really good as well," but perceive that they will rarely succeed at this in everyday life. Justice and fairness in society are seen as unlikely. Many experience difficulties finding their way in life, resulting in some of them withdrawing (further).

Precarious teenagers oscillate between withdrawal and delinquency in their leisure time. There are some who "go to school, come home, then sleep"

and some who “go out straight away or even go out straight from school.” The latter frequently report experiences of drugs (or dealing drugs), violent disputes, and petty criminal offences. At times they spend their free time at the boundaries of legality or even cross the line.

Materialistic Escapists

Among the Materialistic Escapists, girls and boys alike highly value status and prestige. Their handling of money is often uncontrolled and guided by a spontaneous pleasure principle. Short-term consumption goals are very important – the latest clothing and shoes as well as costume jewellery are extremely important to them. They consider making an impression with outward appearances as a strength. Traditional status symbols and luxury items (big house, fast cars, expensive clothes) are a very important aim in life.

Materialistic Escapists feel at home on big shopping streets, because that’s where “their” shops are. They find it extremely important to get hold of special luxury goods when they can, for example via Ebay or “things that fell off the back of a lorry”. They know where you can find bargains: end-of-line stores, outlets, etc. Expensive brands help to prevent them from getting lost in the mainstream, and instead to set themselves apart from it.

They have a low affinity with education in terms of school learning; they are happy when they’re “out of there” and can quickly stand on their own two feet. Many aim to make up for their educational deficits through diligence at work in the future. In principle, however, the actions of Materialistic Escapists are primarily self-centred and focused on the present. They know that they have to face up to the future, but often put it off.

While family provides a sense of security and safety, their friendship group represents fun and action. Going out with friends and “hanging out” is a fixed part of daily life. Next to going out, Materialistic Escapists consider shopping, money, and holidays to be the “coolest things in the world”. They want to have fun and a “chilled life”.

Experimentalists

Experimentalists want to enjoy life to the full and delay the seriousness of life for as long as possible. They live primarily in the here and now, and don’t like it at all when life is made up of nothing but regulations. They have a strong desire for unhindered self-expression. Self-discipline and self-control are often difficult for Experimentalists. These teenagers want to cross boundaries, are willing to break the rules, “chance it,” and jump in at the deep end – that’s the only way to really live and learn. The fact that these teenagers are sometimes considered to be “rebellious” shows them that they are on the right track. Experimentalists often describe themselves as wilful, individual, and unruly.

They are characterised by a very low focus on routine. They emphasise how boring they find it when things constantly repeat themselves, people always want to play it safe, stick to what they know, and are against change.

In the comparison of teenagers’ lifeworlds, Experimentalists have the least affinity with traditional middle-class values such as groundedness, conscientiousness, obedience, discipline, sense of duty, order, and cleanliness. Of all of the lifeworlds, the Experimentalists most clearly express the desire to “live differently”. The subcultural, the underground, the esoteric impress and attract them. They find excitement in people who are different, who have something fascinating about them because they reject conventions. But they are bored by the bourgeois, normal, career-driven, and conventional. They want to set themselves apart, stand out from the crowd, and keep changing.

For these teenagers, leisure primarily means creative personal fulfilment: learning new skateboard tricks, playing in a band, sewing their own clothes, dancing, photography, drawing, and painting (for example as part of a Manga or graffiti scene).

Post-Materialists

Post-Materialist teenagers can clearly formulate the extremely humanistic catalogue of values they find relevant. Democracy, freedom, pacifism, tolerance, justice, equality, and care for people, animals, and the environment are maxims according to which they wish to live their lives. Some also have a comparatively strong sense of mission – they find it important to convince others of their opinions. They combine these virtues with values of self-expression and commitment.

They distance themselves from ostentatious luxury and material excess, but don't reject material values per se. They like "nice things" and want to enjoy life. Yet Post-Materialists are more cautious in this regard than teenagers from other lifeworlds. Sustainability is not an empty formula for them, but a credible guideline in life. They are focused on the common good, believe that everyone is equal, and want this to have meaning not only on paper, but in reality too.

Intellectuality, education, and literacy are of relatively high importance for Post-Materialists. At the same time, they come across as cool and relaxed. They don't really give off the impression that they are bothered by pressure to perform. They look on challenges as the "spice of life" – happy to face them and generally well-equipped to handle them. This is primarily due to the fact that Post-Materialists are very keen to educate themselves. They enjoy expanding their knowledge, their own horizons, and their personal skills, and find this important.

Post-Materialists seek out a variety of intellectual, artistic, or creative experiences in their free time. They like dealing with social and political issues. They are mainly interested in nature, environmental and sustainability issues, and (especially girls) gender and sexuality issues. They like to discuss these subjects a lot in their friendship groups.

Expeditives

A colourful patchwork of values is typical of Expeditives. They highly value a balance between personal fulfilment, self-expression, independence, and creativity on the one hand, and performance ideals, such as career aspirations and success, ambition, and diligence on the other hand. Of all teenagers, they are the most flexible, mobile, and innovative. Many of them are also often competitive and accepting of the market society. Continuously expanding their own range of experiences is a fundamental tenet for them. Despite their enthusiasm for fun in their free time, they also want to achieve something in their work life ("Movers & Shakers"). Their everyday life is often jam-packed because they don't want to miss out on anything.

Expeditives distance themselves from the characteristics of the established middle-class: unchallenged pursuit of conventions, subordination of fun and personal fulfilment in favour of security, fear of attracting attention, and change. They also don't want to be forced into ideological corsets and are not control or authority-oriented. They are just as distanced from values of submission as they are from ascetic values and conservative ideas of morality.

In this lifeworld, diversity and difference are celebrated. Expeditives go to great efforts to distance themselves from the mainstream. Yet they are less "dogged" and rigorous than Experimentalists. Their efforts for distinction appear less like rebellious fighting than as a natural result of their "obvious" intellectual and stylistic superiority (in particular compared against others of the same age).

Expeditives travel a lot in their free time. They flock outside to public spaces and hot locations, wherever music is playing and the people are exciting and different. Expeditives dream of a lively cultural life and the freedom of global metropolises. In Germany, they just love Berlin.

Last but not least, Expeditives are very keen to educate themselves. In this lifeworld, education occurs both deliberately – in school and during

free time – and en passant. If they are interested in a particular issue, they take it as a matter of course to find out lots of information about it, by reading a specialised book, doing research on the Internet, or visiting an exhibition.

1.3 Explanatory notes on the brochure

The survey results of the 2021 Youth 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, four-point or five-point scales are predominantly used: The first two categories indicate the degree of agreement (for example “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. The “don’t know/no answer” category was selected when the respondent was unable or unwilling to assess a question or statement.

To ensure legibility and comprehensibility, decimal places have been omitted from the specified percentage values and the figures rounded up to the nearest whole number. If the sum of the 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 characteristics groups. The following socio-demographic characteristics of the teenagers surveyed were considered here: gender, age (14 and 15 years old, 16 and 17 years old), level of formal education (low, average, high)¹, and size of town (number of inhabitants less than 20,000, 20,000 to 100,000, 100,000 to 500,000, 500,000 and above). The Sinus-Milieu indicator for teenagers’ lifeworlds was integrated into the questionnaire in order to allow an evaluation according to the lifeworlds of teenagers, as described in Chapter 1.2. Significant differences are explained in the text. In addition, particularly interesting findings are graphically presented in figures or tables.

Established test methods of empirical social research were used to check the statistical significance of the survey data. Differences in the response behaviour of different characteristics groups were examined using the chi-squared test (see Eid 2013, Janssen and Laatz 2010, or Sedlmeier 2013). 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 (significance level of $p < .05$). Traits are interpreted as significantly over-represented or significantly under-represented if a probability of 99 percent (significance level of $p < .01$) can be assumed.

1 Low - School type: Lower secondary school/vocational secondary school or highest level of education: Lower secondary school leaving certificate/vocational secondary school leaving certificate/left school without leaving certificate or intended school leaving certificate of the community school pupils: Lower secondary school leaving certificate/vocational secondary school leaving certificate. Average - School type: Secondary school or highest level of education: Secondary school leaving certificate or intended school leaving certificate of community school pupils: Secondary school leaving certificate. High - School type: Grammar school or highest level of education: University of applied sciences entrance qualification/general university entrance qualification/specialised university entrance qualification or intended school-leaving certificate of community school pupils: University of applied sciences entrance qualification/general university entrance qualification/specialised university entrance qualification.

Over-representation and under-representation are colour-coded in the figures and tables and explained 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 boys or girls), 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.

The degree of agreement with a question as well as the frequency with which a characteristic occurs in the group being studied were colour-coded – as described above – and explained in the legend. The numbers are also colour-coded: In the case of over-represented values and agreements (for example “agree strongly”/“agree somewhat”), the numbers are presented in black; for under-represented values and disagreements (“disagree somewhat”/“don’t agree at all”), the numbers are presented in white. Thus, even with a black and white printout, all colour codings are distinguishable from each other. In the case of the diagrams of the teenagers’ lifeworlds, the overlapping areas between two lifeworlds are marked in the colour of the lifeworld that has the higher percentage value of the response category that is to be represented.

For an overview of the responses by all respondents, see the base count in the Annex. This illustrates all of the survey topics in table form in the order in which they appeared in the questionnaire.

This brochure is available at www.bfn.de/en/nature-awareness where you will also find studies from previous years.

2 Appreciation of nature and willingness to get involved

For years, teenagers have been considered a target group that is rather difficult to reach when it comes to involvement in nature conservation. Some authors blame this on a mixture of increasing media consumption and expanding hedonism in our society (see, for example, Brämer 2006), others emphasise that the phase of adolescence is accompanied by a temporary loss of meaning for nature (see Gebhard 2019, Stopka and Molitor 2016). However, there are also studies that describe the theory of teenagers' alienation from nature as a misdiagnosis (see Deutscher Jagdverband et al. 2017).

This study addresses this issue by first examining the extent to which teenagers appreciate nature, how they think about the endangerment and protection of nature, and whether they think nature conservation should take a back seat in times of economic crisis. The study then looks at how effective teenagers consider their own actions to be in protecting nature. An explicit distinction

is made between individual effectiveness and collective effectiveness (through joint efforts). Finally, the last part of this chapter examines the extent to which teenagers are willing to become personally involved in nature conservation. To this end, the participants in the study were asked about eight behaviours, which include consumer habits, media, and politics.

2.1 Importance of nature for teenagers

Being in nature makes teenagers happy.

For the young generation, nature is an important part of life: 94 percent think nature is part of a good life (both levels of agreement), and 87 percent say it makes them happy to be in nature. Conversely, only a small number of teenagers feel (somewhat) uncomfortable in nature (16 percent). Compared to the survey in 2020, no significant differences can be seen (see Figure 2).

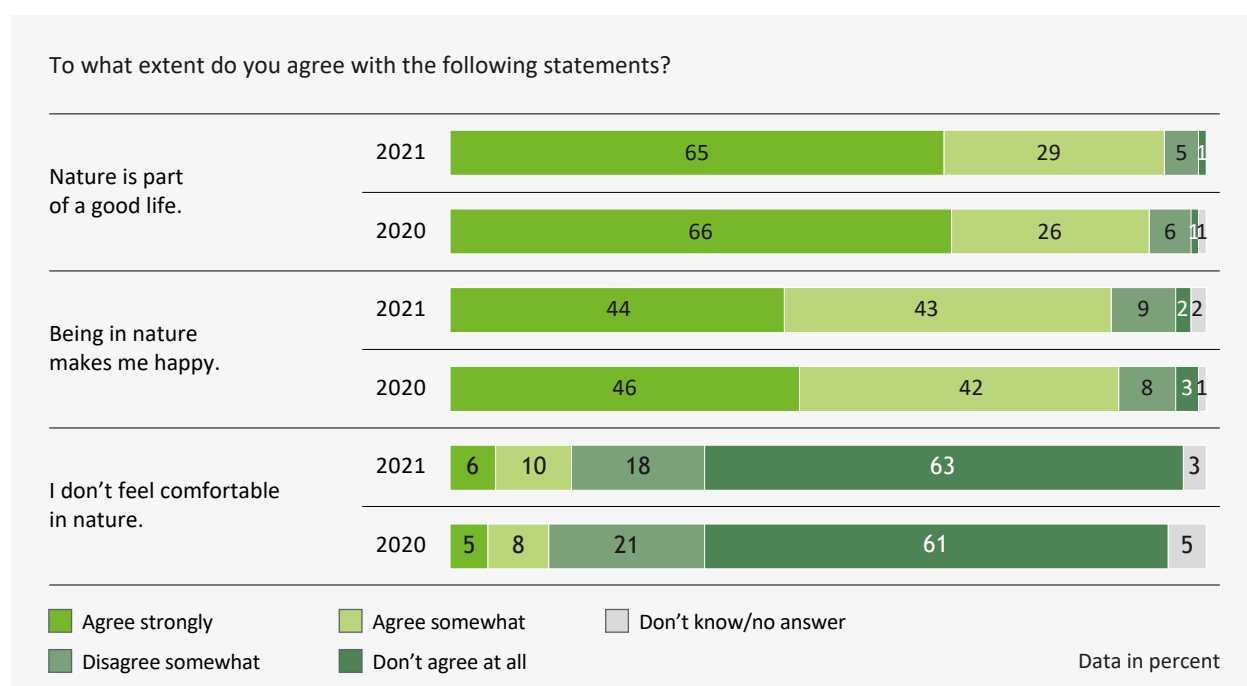


Figure 2: Personal importance of nature compared over time

Girls state slightly more often than boys that nature is part of a good life (both levels of agreement: 73 percent compared to 57 percent). Furthermore, the educational comparison shows that teenagers with a low level of formal education see nature as an important part of life with below-average frequency (highest levels of agreement: 55 percent, average: 65 percent).

Post-Materialists, Adaptive Pragmatists, and Conservative Mainstream have the greatest emotional attachment to nature.

In the lifeworld of the sustainability-oriented Post-Materialists and in the social centre of the youth population – among the Adaptive Pragmatists – the appreciation for nature is highest. Hence, 83 percent of Post-Materialists and 79 percent of Adaptive Pragmatists stress that nature is part of a good life (highest approval level, average: 65 percent). Less conviction comes from the strongly hedonistic lifestyles of the Experimentalists (50 percent) and the Materialistic Escapists (38 percent). What is more, in addition to the Post-Materialists and Adaptive Pragmatists, the Conservative Mainstream with particularly strong local roots emphasise more often than average that it makes them happy to be in nature. In the lifeworld of the urban, cosmopolitan “hipsters” (Expeditives) and among the Materialistic Escapists, the number is much lower (see Table 1).

2.2 Endangerment and protection of nature

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

Ninety-three percent of 14 to 17-year-olds believe that it is man’s duty to protect nature (both levels of agreement). Ninety percent think that nature may only be used in such a way that affords coming generations the same opportunity. Furthermore, 85 percent say it makes them angry that so many people treat nature so recklessly. No clear differences can be seen in the time comparison (see Figure 3).

Differences in the response behaviour of the teenagers become apparent in the comparison of the genders: More girls than boys stress their anger at others’ reckless treatment of nature (highest level of agreement: 58 percent compared to 42 percent) and see it as man’s duty to protect nature (69 percent compared to 57 percent).

In the comparison of lifeworlds, it is striking that the greatest awareness of the endangerment and protection of nature is present in the groups of the Post-Materialists, who are critical of consumption, and the Adaptive Pragmatists, who are particularly willing to adapt. The conscientious Conservative Mainstream are also more aware of this issue than average. For example, 77 percent of Post-Materialists, 75 percent of Adaptive Pragmatists, and 69 percent of the Conservative

Table 1: Emotional attachment to nature by lifeworld

To what extent do you agree with the following statements?								
Response category: “agree strongly”	Average	Conservative Mainstream	Post-Materialists	Adaptive Pragmatists	Expeditives	Experimentalists	Materialistic Escapists	Precarious
Data in percent								
Nature is part of a good life.	65	71	83	79	60	50	38	65
Being in nature makes me happy.	44	55	60	55	30	35	27	43
I don’t feel comfortable in nature.	6	9	4	4	5	7	5	3
<div> <div></div> Heavily over-represented <div></div> Heavily under-represented </div>								

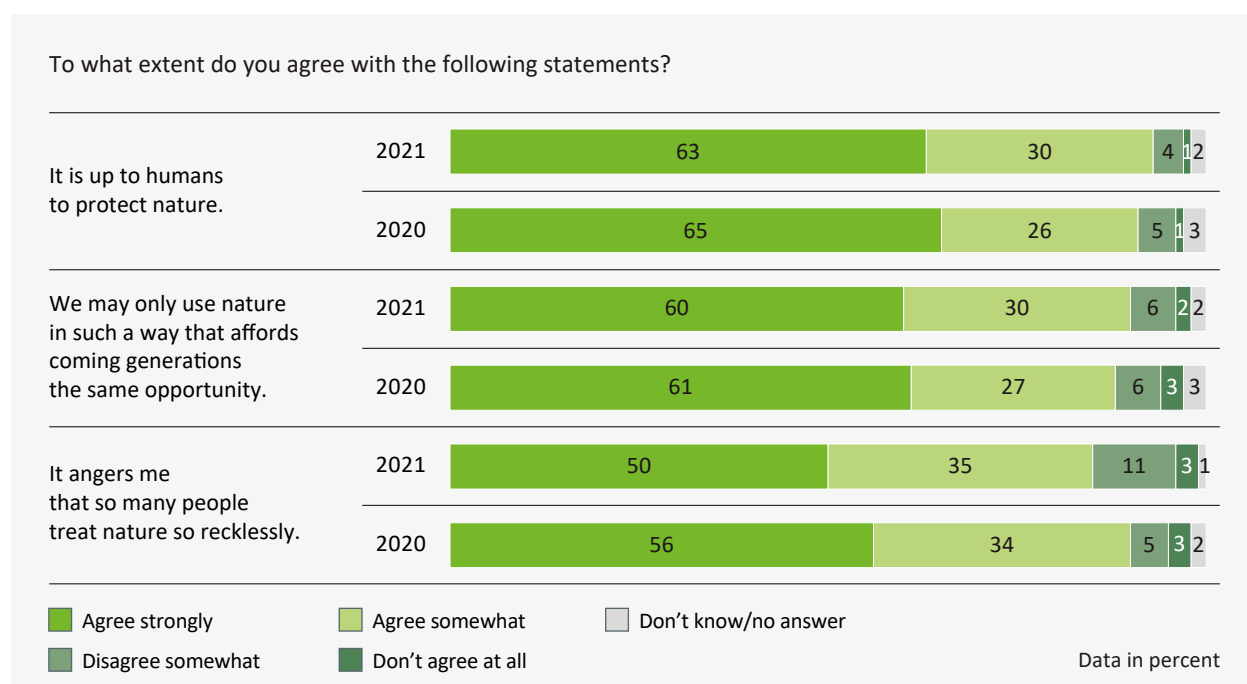


Figure 3: Attitudes towards the endangerment and protection of nature compared over time

Mainstream are convinced that nature should only be used in such a way that it can be enjoyed to the same extent by future generations (highest level of agreement, average: 60 percent). Awareness is lower among Experimentalists and particularly Materialistic Escapists. In these lifeworlds, 40 percent and 29 percent respectively are explicitly in favour of sustainable use of nature.

2.3 Nature conservation caught between politics and economics

The majority of respondents reject the call for less money for nature conservation in times of economic crisis.

The question of whether nature conservation should also have to make do with less money in times of economic crisis meets with agreement in 44 percent of teenagers (both levels of agreement) while 50 percent reject this position ("somewhat disagree" or "strongly disagree"). The statement that nature must not stand in the way of economic development is also rejected by a majority – 64 percent – while 29 percent agree

(both levels of agreement). However, the comparison with the survey in 2020 shows that the proportion of those who agree with the statements has increased in both cases (see Figure 4).

Even though the shifts between 2020 and 2021 are relatively small, they should not be ignored, especially since the symptoms of crisis have once again increased significantly as the Ukraine war has escalated, but are not yet reflected in the present survey.

The socio-demographic analysis reveals differences based on the level of education. In each case, it is teenagers with a low level of formal education who most frequently express the opinion that in times of economic crisis, nature conservation must also make do with less money (both levels of agreement: 54 percent, average educational level: 43 percent, high educational level: 40 percent) and that nature must not stand in the way of economic development (40 percent, average educational level: 30 percent, high educational level: 26 percent).

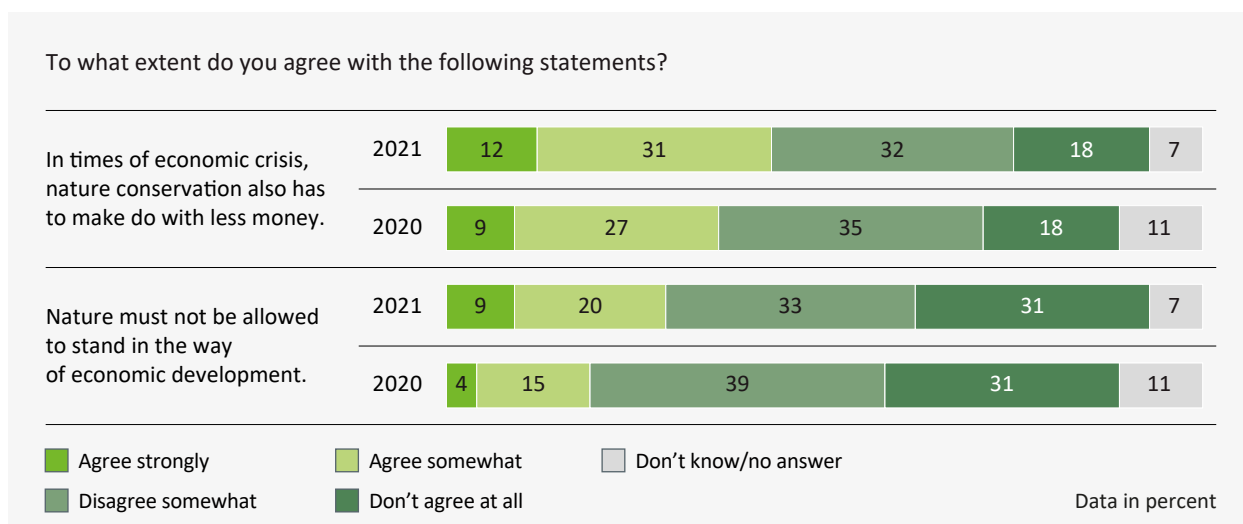


Figure 4: Nature conservation caught between politics and economics compared over time

In a comparison of lifeworlds, it is the Experimentalists who are most likely to give priority to economic development over nature conservation in times of crisis. These teenagers are particularly keen to enjoy life to the fullest in the here and now. The question of whether nature conservation should have to make do with less money in times of economic crisis meets with the approval of 55 percent of this group (both levels of agreement, average: 43 percent).

2.4 Collective and personal perceptions of effectiveness

Before the teenagers were asked about how willing they were to get personally involved in nature conservation, they were asked how effective they consider their own actions for the protection of nature to be. And since it is possible to act individually but also collectively (through joint efforts), a distinction was also made between individual (personal) and collective effectiveness.

Perceptions of personal effectiveness have increased over time.

Eighty-two percent of the teenagers surveyed believe that people can work together to achieve something to protect nature on Earth (both levels

of agreement) – just under half even “strongly agree” with this. Sixty-one percent believe that their own personal contribution also helps to protect nature, with a good quarter agreeing “strongly”.

The comparison over time reveals that belief in collective effectiveness has decreased. However, this only concerns the highest approval level (see Figure 5): in 2020, 59 percent “agreed strongly” that we as humankind can work together to achieve something to protect nature on Earth. In the current survey, the figure is 49 percent. However, if we compare both levels of agreement, the difference is not significant (2020: 84 percent, 2021: 82 percent). The situation is different regarding the perception of personal effectiveness. Compared to 2020, this has increased – by four percentage points at the highest level of agreement (2020: 22 percent, 2021: 26 percent) and by eight percentage points overall at both approval levels (2020: 53 percent, 2021: 61 percent).

This opposing trend in agreement with collective versus individual effectiveness is interesting, but also not easy to interpret. One hypothesis that could explain why collective effectiveness is regarded as less successful is that in the wake of the coronavirus crisis – as the defining event of 2020 and 2021 – more and more doubts arose

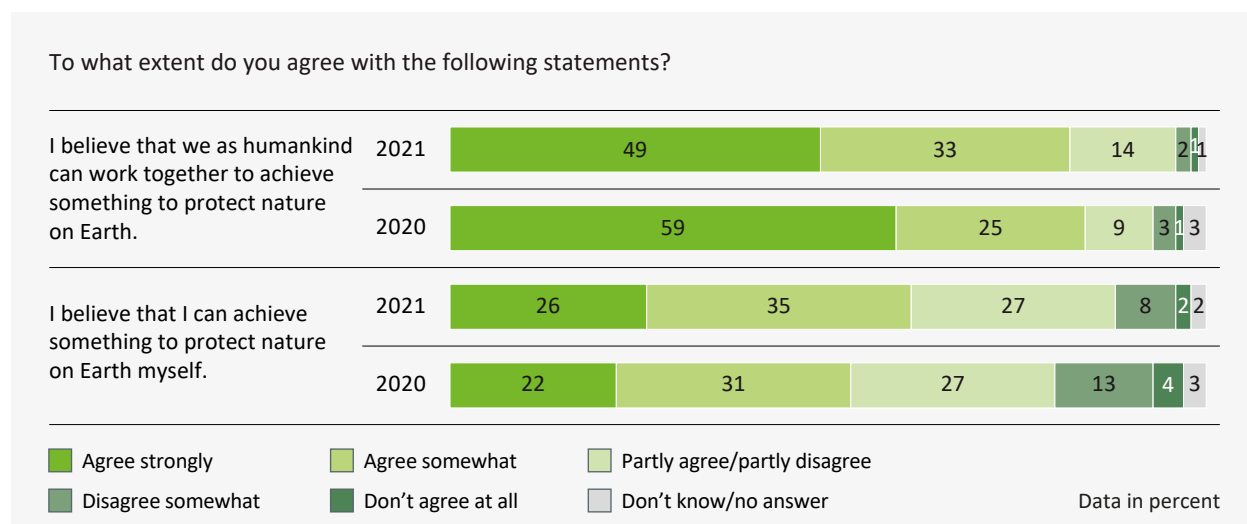


Figure 5: Collective and personal effectiveness compared over time

as to whether major (international) crises can be solved collectively and amicably. The uncertainties regarding the control measures, the very different reactions internationally, the clear deficiencies in supplying developing countries, the emerging scepticism concerning COVID or vaccination in parts of the population – all this may have gnawed at the conviction that “we as humankind” are able to face up to major problems quickly and, above all, unitedly (otherwise it is not collective action). Left to fend for themselves, many are likely to have felt an obligation to take personal initiative.

Collective and personal perceptions of effectiveness are related to teenagers' educational level.

Teenagers with a low level of formal education are least convinced that they can effectively advocate for the protection of nature on Earth both personally (both levels of agreement: 48 percent) as well as collectively (74 percent) (see Table 2, average: 61 percent and 82 percent respectively). Furthermore, the age comparison shows that 14 to 15-year-olds are more likely than 16 to 17-year-olds to think they can do something themselves to protect nature on Earth (both levels of agreement: 68 percent compared to 56 percent).

Table 2: Collective and personal effectiveness by age and level of education

To what extent do you agree with the following statements?						
Response category: “Agree strongly/somewhat”	Average	Age (years)		Educational level		
Data in percent		14 to 15	16 to 17	Low	Average	High
I believe that we as humankind can work together to achieve something to protect nature on Earth.	82	84	81	74	79	86
I believe that I can achieve something to protect nature on Earth myself.	61	68	56	48	58	66
<div>Heavily over-represented</div> <div>Under-represented</div> <div>Heavily under-represented</div>						

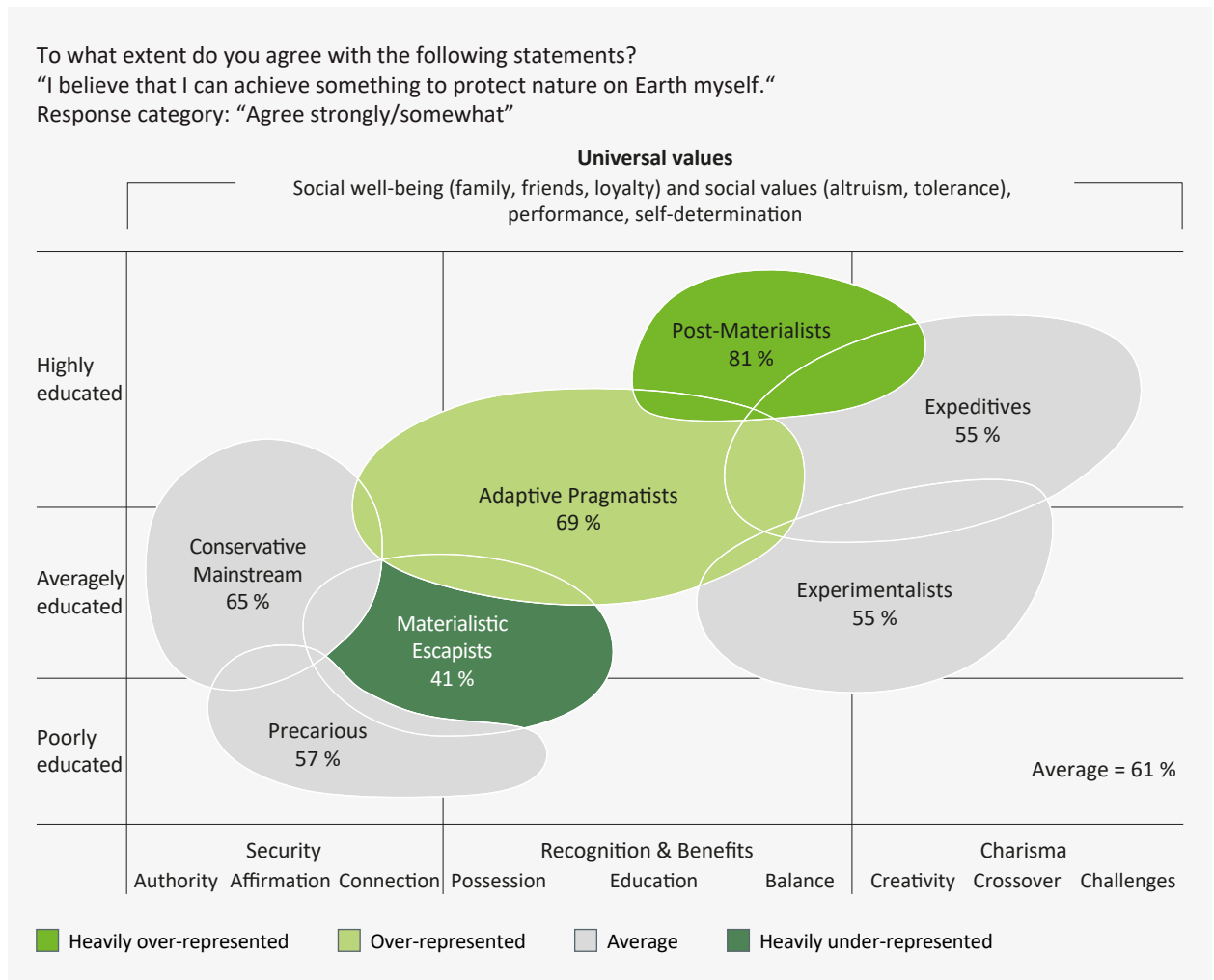


Figure 6: Personal effectiveness by lifeworld

Post-Materialists and Adaptive Pragmatists are most often convinced that they can contribute to nature conservation.

Ninety-three percent of Post-Materialists and 92 percent of Adaptive Pragmatists agree that humankind can work together to achieve something for the protection of nature on Earth (average: 82 percent). At the same time, 81 percent of Post-Materialists and 69 percent of Adaptive Pragmatists believe that their own, very personal contribution also helps to protect nature on Earth (average: 61 percent). In contrast, Materialistic Escapists are much less convinced. In this lifeworld, the level of agreement with collective effectiveness is 41 percent. Moreover, they are the

only group in which less than half of the respondents believe that they can also make a difference themselves for the protection of nature on Earth (see Figure 6).

The socio-cultural analysis here makes it clear how important it is to look at things from a lifeworld perspective as well as from a socio-demographic one. Post-Materials and Expeditives both belong to the groups of teenagers with a high level of formal education. But while 81 percent of Post-Materialists are convinced of their individual effectiveness, only 55 percent of Expeditives are – a value that is still below the average of 61 percent.

2.5 Teenagers' willingness to get personally involved in nature conservation

In order to investigate the extent to which teenagers are prepared to get personally involved in nature conservation, they were asked about eight different types of behaviour.

General willingness to get involved has increased.

Ninety-two percent of the teenagers surveyed are very or somewhat willing to take care of nature

and treat it well when they are in it (see Figure 7). Eighty-eight percent declare their willingness to deliberately organise sports and leisure activities in nature with consideration for animals and plants. Switching brands of cosmetics or toiletries if manufactured in a way that is harmful to nature, and making friends and acquaintances aware of nature conservation are both steps 80 percent of respondents may consider taking. Around three quarters express willingness to learn about current developments in the area of biodiversity. Eating less meat or no meat at all, and sharing articles about nature conservation

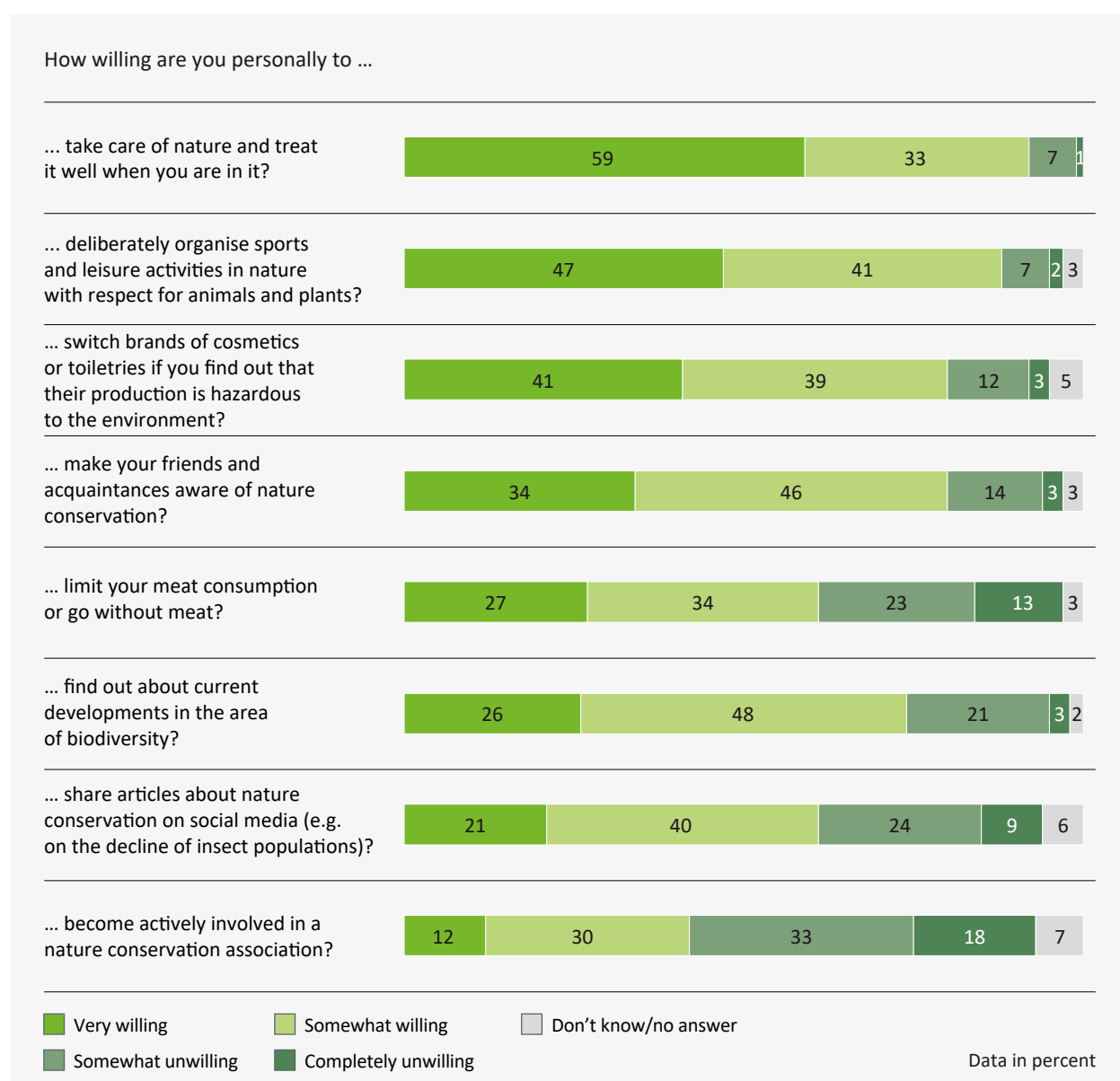


Figure 7: Willingness to get personally involved in nature conservation

on social media are both things that 61 percent of respondents can imagine doing. Willingness to actively work for a nature conservation association is at 42 percent.

On the whole, it should be noted that the overall willingness to get involved in nature conservation is high among teenagers. Furthermore, the comparison over time shows that general willingness to get involved has increased. For example, in 2020, two-thirds of respondents expressed their willingness to find out about current developments in the area of biodiversity. In the current survey, it is around three quarters. However, it must also be taken into account that unreserved willingness ("very willing") to get actively involved in nature conservation is significantly below 50 percent for most behaviours included in the survey – as it was in the previous study. The least willingness is shown for active involvement in a nature conservation association ("very willing": 2020: 10 percent, 2021: 12 percent).

In the socio-demographic analysis, differences in education and gender are apparent (see Table 3): Unreserved willingness to take care of nature and to treat it well increases with teenagers' level of formal education and is more pronounced among girls than among boys. The same applies to the unrestricted willingness to deliberately organise sports and leisure activities in nature with consideration for animals and plants. In addition, more girls than boys express their unreserved willingness to make friends and acquaintances aware of the protection of nature ("very willing": 40 percent compared to 28 percent) and to limit meat consumption or eat no meat at all ("very willing": 35 percent compared to 20 percent).

Willingness to get involved in nature conservation is weakest in the lifeworld of Materialistic Escapists.

An examination of teenagers' lifeworlds makes it clear that willingness to get personally involved in nature conservation is strongest among Post-Ma-

Table 3: Willingness to get personally involved in nature conservation by gender and educational level

How willing are you personally to ...						
Response category: "Very willing"	Average	Gender		Educational level		
		M	F	Low	Average	High
... take care of nature and treat it well when you are in it?	59	50	68	42	54	65
... deliberately organise sports and leisure activities in nature with respect for animals and plants?	47	38	57	35	44	51
... switch brands of cosmetics or toiletries if you find out that their production is hazardous to the environment?	41	37	44	35	38	43
... make your friends and acquaintances aware of nature conservation?	34	28	40	26	33	36
... limit your meat consumption or go without meat?	27	20	35	20	24	31
... find out about current developments in the area of biodiversity?	26	26	25	25	24	27
... share articles about nature conservation on social media (for example on the decline of insect populations)?	21	17	26	14	22	22
... become actively involved in a nature conservation association?	12	13	12	11	13	12
<div> Heavily over-represented Over-represented Under-represented Heavily under-represented </div>						

Table 4: Willingness to get personally involved in nature conservation by lifeworld

How willing are you personally to ...								
Response category: "Very willing"	Average	Conservative Mainstream	Post-Materi- alists	Adaptive Prag- matists	Expeditives	Experimental- ists	Materialistic Escapists	Precarious
Data in percent								
... take care of nature and treat it well when you are in it?	59	66	84	77	56	37	22	53
... deliberately organise sports and leisure activities in nature with respect for animals and plants?	47	51	66	63	44	31	16	47
... switch brands of cosmetics or toiletries if you find out that their production is hazardous to the environment?	41	45	59	51	38	30	17	37
... make your friends and acquaintances aware of nature conservation?	34	33	48	47	26	28	16	31
... limit your meat consumption or go without meat?	27	31	35	35	20	25	15	32
... find out about current developments in the area of biodiversity?	26	22	31	38	24	23	11	22
... share articles about nature conservation on social media (for example on the decline of insect populations)?	21	20	27	34	17	14	8	22
... become actively involved in a nature conservation association?	12	8	11	21	11	11	6	10
<div> <div></div> Heavily over-represented <div></div> Over-represented <div></div> Under-represented <div></div> Heavily under-represented </div>								

terialists and Adaptive Pragmatists. By contrast, Materialistic Escapists, who are focused on status and prestige, were least willing (see Table 4). For example, 59 percent of Post-Materialists and 51 percent of Adaptive Pragmatists were "very willing" to switch brands of cosmetics or toiletries if manufactured in a way that is harmful to nature. The corresponding figure for Materialistic Escapists was just 17 percent. Furthermore, it is noticeable that in addition to the Materialistic Escapists, the creative and more performance-driven and networking-oriented lifeworlds of the Experimentalists and Expeditives also show below-average willingness to engage in some behaviours. For example, Experimentalists are less often than average "very willing" to organise sports and leisure activities in nature with consideration for animals and plants (31 percent, average: 47 percent). Unrestricted willingness to make friends and acquaintances aware of the protection of

nature is below average among Expeditives. The same applies to unrestricted willingness to eat less meat.

One important result that can be highlighted in this chapter is that teenagers have a largely positive image of nature. For the large majority of them in Germany, nature is part of a good life. It makes them happy to be in nature, they see it as humankind's duty to protect nature, and many are generally willing to get involved in nature conservation. With this in mind, there is no trend of youth as such becoming alienated from nature. However, a closer look at teenagers' lifeworlds shows that consumer hedonistic values and an orientation towards living life to the fullest, here and now, could certainly lead to alienation from nature.

3 Awareness of teenagers for the development and importance of biodiversity

While the dramatic consequences of climate change are still ahead of us, the loss of biodiversity is already a reality. It is taking place before our eyes. But can we even see it? The worldwide climate movement “Fridays for Future” is strongly supported by children and teens. But what about protests against the loss of biodiversity?

For years, experts have been warning that children and teenagers are growing increasingly distant from nature. Among the causes cited are increasing urbanisation and an increase in media consumption (see also Chapter 2). Other contributing factors are an insufficient awareness of the term biodiversity and the decline in knowledge about species (see Gerl et al. 2018, Graf and Zubke 2021).

On the other hand, studies show that it is quite possible to sensitise teenagers to the importance of biodiversity for their own lives and motivate them to act accordingly through positive, self-determined, participatory, and reflective experiences of nature. The approaches developed go far beyond merely teaching about species, but often focus on species that occur in the everyday living environment of teenagers (for example insects, especially bees) (see Gebhard et al. 2021).

In light of this, the question arises as to whether and to what extent teenagers in Germany perceive the loss of biodiversity, and if so, to what extent they see the protection of biodiversity as an important societal task. To find out what teenagers think is causing the decline in biodiversity, they were asked about the reasons for insect die-off.

3.1 Perceived decline in biodiversity

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

Seventy-four percent of the teenagers surveyed are convinced that biodiversity on Earth is in decline (both levels of agreement), while just four percent state that they are (somewhat) unconvinced of this. A further 18 percent are undecided and four percent are unable to give an answer. Compared to the 2020 survey, the answers to this question are not significantly different (see Figure 8).

In light of the research literature mentioned in the introduction, one could suggest that the large proportion of respondents who answered “somewhat convinced” in particular (46 percent compared to 28 percent “very convinced”) includes

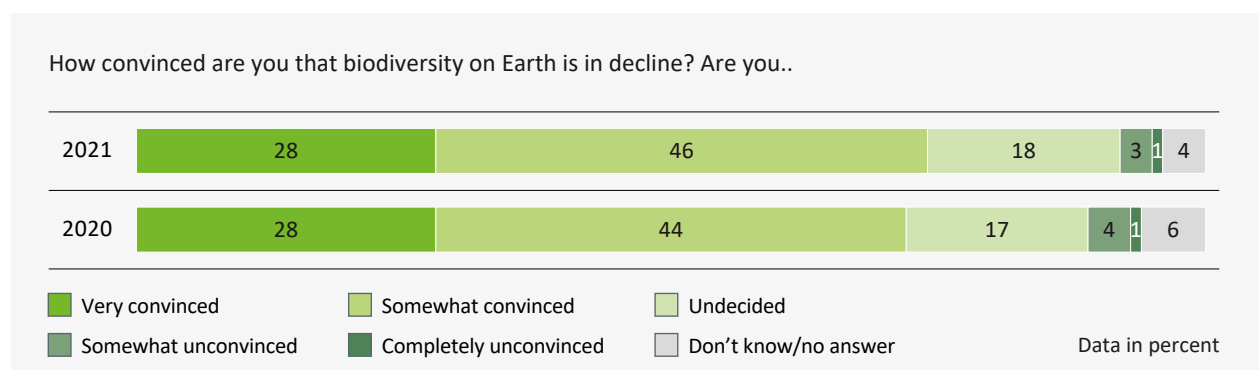


Figure 8: Perceived decline in biodiversity compared over time

teenagers who, as a result of their own knowledge and experience, have not really noticed the loss of biodiversity, but have heard about it in the mass media or on social media. However, this assumption cannot be verified on the basis of the data presented here, but would require a separate investigation.

In the socio-demographic analysis, it is apparent that the perceived decline in biodiversity increases with teenagers' level of education: In the group with a low level of formal education, 64 percent are strongly or at least somewhat convinced of the decline in biodiversity. In the group with an average level of formal education, the figure is 68 percent and in the group with a high level of formal education, it is 80 percent.

The response behaviour of the youth lifeworlds shows that the conservation-oriented Post-Materialists and the determined, well-informed middle of the youth population (Adaptive Pragmatists) are most sensitised to the threat to biodiversity (both levels of agreement: 88 percent and 85 percent respectively). By contrast, the problem of declining biodiversity is least present in the lifeworld of Materialistic Escapists, who are particularly interested in status and possession (50 percent).

3.2 Considering biodiversity as a priority societal task

Seventy percent of teenagers consider the protection of biodiversity to be a priority task for society.

In addition to being questioned about the perceived decline in biodiversity, the teenagers were asked for the first time whether they thought the conservation of biodiversity was a priority task for society. Twenty-nine percent answered "yes" without reservation, another 41 percent "yes, somewhat". In contrast, only four percent answered "no" or "not really". A further 22 percent are undecided ("partly yes/partly no") and four percent do not trust themselves to give an answer (see Figure 9).

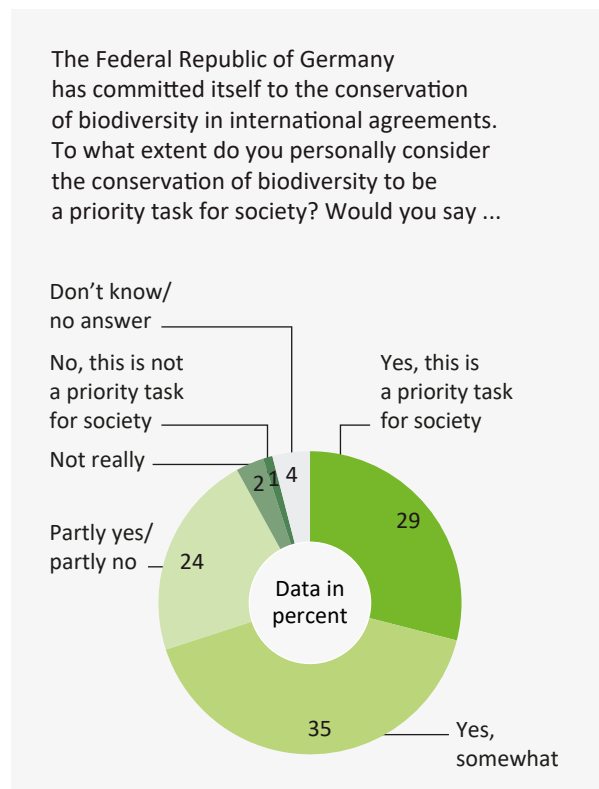


Figure 9: Social significance of the conservation of biodiversity

Once again, the educational background of the teenagers plays a major role: In the group with a low level of formal education, 56 percent consider the conservation of biodiversity to be a priority task for society ("yes/yes, somewhat"). In the group with an average level of formal education, the figure is 62 percent and in the group with a high level of formal education, it is 77 percent.

The socio-cultural analysis reveals that Post-Materialists, who are critical of consumerism and are keen to educate themselves, most frequently claim the protection of biodiversity to be a central societal task. This is made clear by the highest response level: 42 percent of Post-Materialists unreservedly consider the conservation of biodiversity to be a priority task for society. The average of all those surveyed is 29 percent, among Materialistic Escapists the figure is only 13 percent.

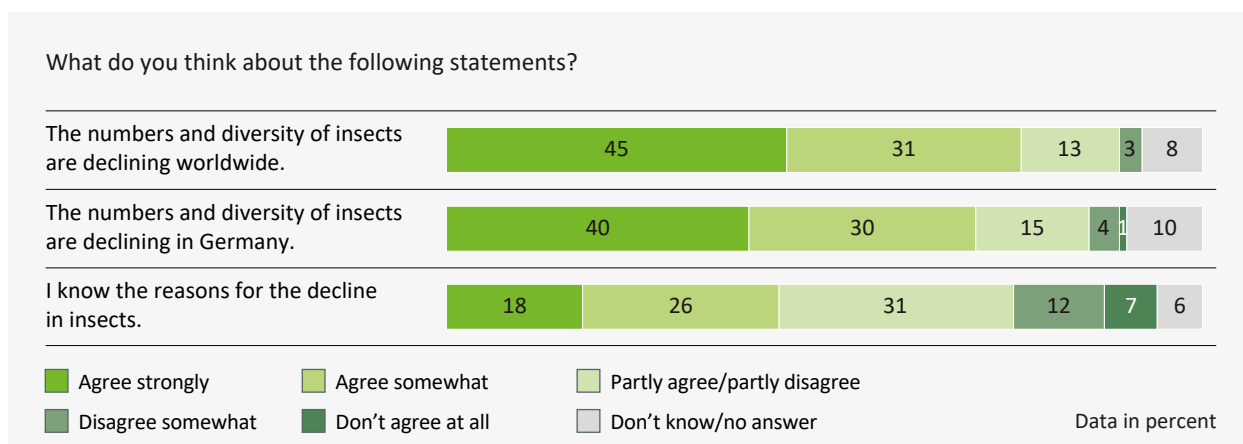


Figure 10: Perceived decline in insect diversity and level of knowledge on causes

3.3 Awareness of insect die-off

Three out of four teenagers are aware of the global decline in insect diversity.

Seventy-six percent of the teenagers surveyed believe that the number and diversity of insects is decreasing worldwide (both levels of agreement). Only three percent disagree with this view. Another 13 percent are undecided ("partly agree, partly disagree"), eight percent do not trust themselves to give an opinion (see Figure 10). When respondents were asked about the reference area of Germany, similar results emerged: 70 percent (also) perceive a decline in insect diversity in Germany, five percent disagree. A further 15 percent are undecided and ten percent are unable to give an answer. This is remarkable

because with many other nature and environmental problems, people tend to think that it is particularly bad elsewhere, but less so in Germany. Obviously, the strongly national character of the public debate on bee and insect die-off has somewhat shifted the coordinates of perception here.

Regardless of reference area (worldwide or Germany), it is mainly teenagers with a high level of formal education who are aware of the decline in insect diversity (see Table 5). For example, 80 percent of these teenagers believe that the number and diversity of insects is decreasing worldwide (both levels of agreement). This compares to 65 percent in the group with low educational qualifications.

Table 5: Perceived decline in insect diversity and level of knowledge on causes by educational level

What do you think about the following statements?				
Response category: "Agree strongly/somewhat"	Average	Educational level		
		Low	Average	High
Data in percent				
The numbers and diversity of insects are declining worldwide.	75	65	71	80
The numbers and diversity of insects are declining in Germany.	70	58	66	75
I know about the reasons for insect die-off.	44	33	36	50

Over-represented (light green) Under-represented (medium green) Heavily under-represented (dark green)

The socio-cultural analysis reveals that belief that the number and diversity of insects is decreasing is strongest among Post-Materialists, who are keen to educate themselves (both levels of agreement, decrease worldwide: 87 percent, decrease in Germany: 79 percent), the Conservative Mainstream (decrease worldwide: 83 percent, decrease in Germany: 83 percent), and the level-headed and rational Adaptive Pragmatists (decrease worldwide: 83 percent, decrease in Germany: 75 percent). Less conviction is demonstrated by the fun and leisure-oriented lifeworlds of the Experimentalists (decrease worldwide: 66 percent, decrease in Germany: 61 percent) and Materialistic Escapists (decrease worldwide: 54 percent, decrease in Germany: 50 percent).

Few teenagers are sure they know the reasons for the decline in insects.

Forty-four percent of the teens surveyed say they know the reasons for the decline in insects (both levels of agreement, see Figure 10). However, only 18 percent are really sure ("agree strongly"). In the group with a low level of formal education

especially, there are few teenagers who know the reasons for the decline in insect diversity. In this group, only 33 percent profess to be informed about the causes (both levels of agreement, see Table 5).

In a comparison of lifeworlds, the Conservative Mainstream, who are concerned with stability, order, and balance, most frequently state that they are aware of the causes of the decline in insects (both levels of agreement: 52 percent). Much less informed are the Materialistic Escapists. In this lifeworld, it is only 28 percent who say they know the reasons for the decline in insects.

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

In order to find out which causes the teenagers suspected as instrumental in insect die-off, those who stated that they had observed a decline were asked to select what they thought were the two most important causes from a given list.

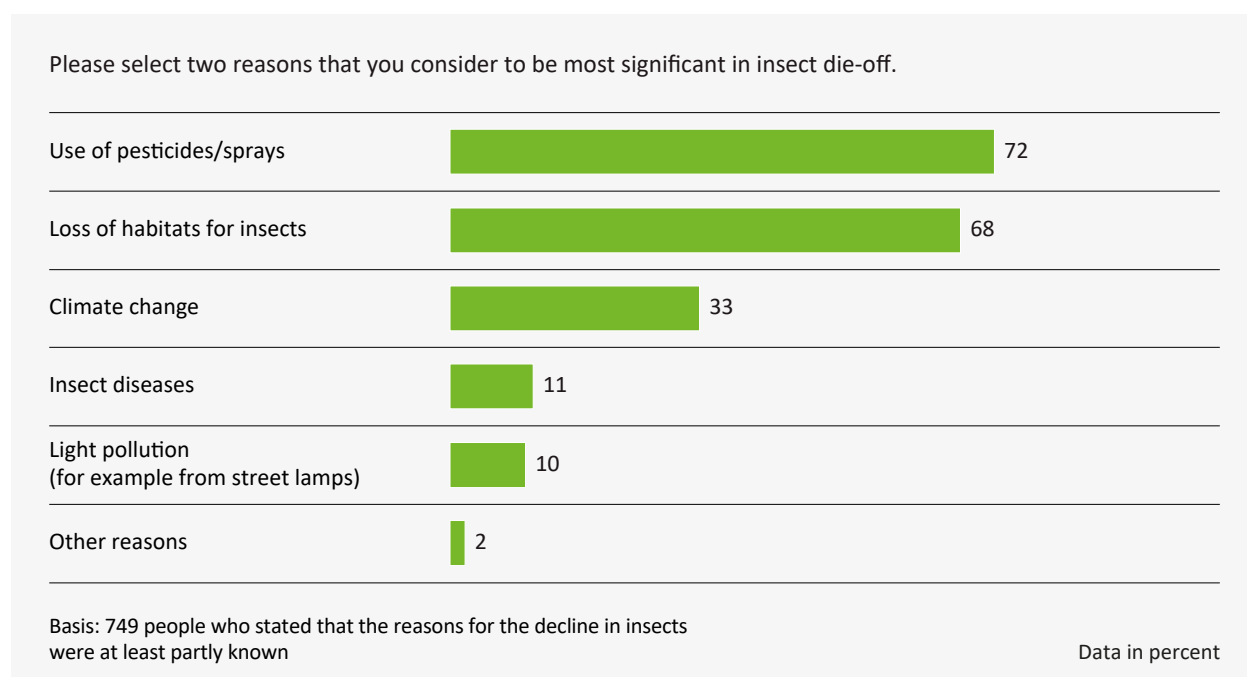


Figure 11: Reasons for insect die-off

Table 6: Reasons for insect die-off by age and educational level

Please select two reasons that you consider to be most significant in insect die-off.						
Data in percent	Average	Age (years)		Educational level		
		14 to 15	16 to 17	Low	Average	High
Use of pesticides/sprays	72	79	67	68	74	72
Loss of habitats for insects	68	68	68	54	63	74
Climate change	33	26	38	33	30	34
Insect diseases	11	9	12	21	14	7
Light pollution (for example from street lamps)	10	11	9	18	13	7
Other reasons	2	2	2	2	2	2
 Heavily over-represented Over-represented Under-represented Heavily under-represented						
Basis: 749 people who stated that the reasons for the decline in insects were at least partly known						

Pesticide use (72 percent) and habitat loss (68 percent) are mentioned most frequently. Climate change is in third place with 33 percent of mentions. Insect diseases (eleven percent) and light pollution (ten percent) play a minor role according to respondents. Two percent chose the answer option "Other reasons" (see Figure 11).

The socio-demographic analysis reveals age differences (see Table 6): In the 14-15 age group, pesticides or sprays play a greater role, while climate change plays a lesser role; in the 16-17 age group, the reverse is true. Furthermore, educational differences are evident. With increasing levels of education, habitat loss is more frequently seen as a cause of insect die-off, whereas insect diseases and light pollution are mentioned less frequently.

In the comparison of lifeworlds, it is striking that the loss of habitats is highlighted above all by the Conservative Mainstream as the cause of insect mortality (77 percent, average: 68 percent). In the Experimentalist lifeworld, the loss of habitats (51 percent) as well as the use of pesticides (55 percent, average: 72 percent) are less often seen as causal. Instead, these teenagers refer more to possible insect diseases (18 percent, average: eleven percent) and to light pollution (17 percent, average: ten percent). Consumer Hedonists,

who are particularly oriented to the present, also attribute the decline in insect diversity to possible insect diseases with above-average frequency (20 percent).

Overall, it can be stated that the vast majority of teenagers surveyed are (somewhat) convinced of the decline in biodiversity and perceive the protection of biodiversity as an urgent societal task. This shows that both educational differences and the differences in teenagers' lifeworlds are decisive: Teens with higher educational qualifications and more modern, especially post-materialistic value orientations turn out to be more informed and sensitised than those with a low level of education and more traditional, but above all more materialistic basic orientations. This also highlights important tasks for nature education. It is not only classical biology lessons that are called for, but also alternative nature education settings both in schools and in out-of-school settings (see Goudarzi et al. 2021).

4 Youth and the relationship with nature during the coronavirus crisis

Children and teenagers have suffered particularly during the coronavirus pandemic: Daycare and school closures, mandatory distancing from the peer group, restrictions on many sport and leisure activities, and long phases of a more family-centred daily routine with home schooling have often led to stress situations within families. Social differences have worsened, and children and teenagers from educationally disadvantaged backgrounds especially have been less able to keep up. Anxiety disorders and depression have increased significantly in this age group in particular (see Oommen-Halbach et al. 2022, Pundt and Scherenberg 2022, Spitzer 2022).

In this context, the “great outdoors” can be considered an important refuge for children and teenagers. This suggests that spending time in nature has become more important for teens in the last two years. The Youth Nature Awareness Study explores this theory for the second time. In addition, it was investigated whether the teenagers see a connection between the coronavirus crisis and the state of nature: Is the pandemic “only” a health issue and has nothing to do with

the state of nature, or is the coronavirus crisis related to our treatment of nature, such as habitat destruction? Indeed, there is evidence that the climate crisis, biodiversity crisis, and pandemic are closely causally linked (see Gibb et al. 2020, Rulli et al. 2021, Settele 2020, among others). But whether teenagers recognise such a connection or whether they view the coronavirus as completely detached from the state of nature and the environment is a question that is still completely open.

4.1 Awareness of connections between the coronavirus crisis and the state of nature and the environment

Teenagers are split concerning the question of whether the coronavirus crisis is connected with the condition of nature and the environment.

Sixty-one percent of respondents believe that our health depends on the health of our planet. Twenty percent disagree with this view. The remaining 19 percent are undecided on this

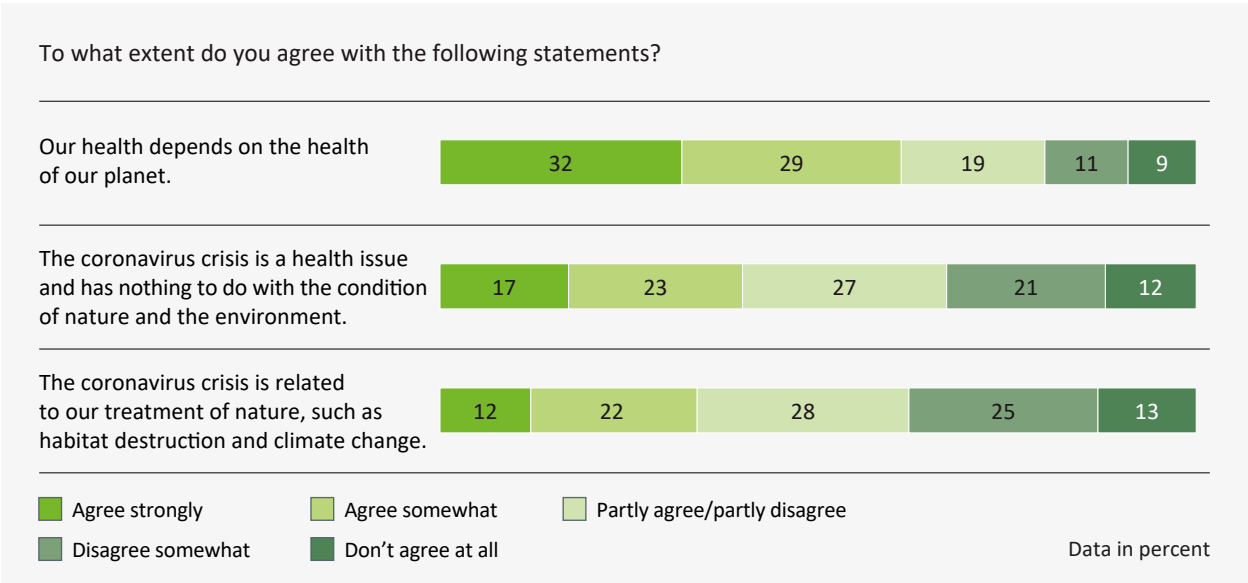


Figure 12: Connections between the coronavirus crisis and the state of nature and the environment

Table 7: Connections between the coronavirus crisis and the state of nature and the environment by educational level

To what extent do you agree with the following statements?				
Response category: "Agree strongly/agree somewhat"	Average	Educational level		
Data in percent		Low	Average	High
Our health depends on the health of our planet.	61	37	52	71
The coronavirus crisis is a health issue and has nothing to do with the condition of nature and the environment.	39	32	36	42
The coronavirus crisis is related to our treatment of nature, such as habitat destruction and climate change.	34	40	36	32

■ Heavily over-represented ■ Heavily under-represented

question ("partly agree/partly disagree"). However, a connection between the coronavirus crisis and the state of nature and the environment is less frequently recognised (see Figure 12). For example, 40 percent say that the coronavirus crisis is a health issue and has nothing to do with the state of nature and the environment. Twenty-seven percent answer with "partly agree/partly disagree", while a third disagree with this view. This question was already asked once in the previous survey (in the 2020 study). At that time, 33 percent said they did not see any connection between the coronavirus crisis and the state of nature and the environment.

Furthermore, 34 percent think the coronavirus crisis is related to our treatment of nature, such as habitat destruction and climate change. This is disputed by 38 percent, 28 percent are undecided.

It is primarily teenagers with a high level of formal education who state that our health is dependent on the health of our planet (see Table 7). In this group, 71 percent agree with this opinion strongly or at least somewhat. This compares to 52 percent in the group with an average level of formal education and only 37 percent in the group with a low level of formal education.

When asked about the connection between the coronavirus crisis and the state of nature and the

environment, the socio-demographic analysis does not indicate any significant differences. Examining the teenagers' lifeworlds shows that it is above all the Expeditives who suspect a connection between the coronavirus crisis and the state of nature and the environment. In this travel-oriented, cosmopolitan lifeworld, 32 percent say that the coronavirus crisis has nothing to do with the state of nature and the environment (average: 39 percent), while as many as 39 percent disagree with this view (average: 32 percent).

4.2 Altered appreciation of nature in times of pandemic

During the pandemic, the personal importance of nature has increased for about half of teenagers.

Regardless of age, gender, education, and size of town, 44 percent of teens say that nature has become more important to them personally compared to before the coronavirus crisis (15 percent "far more important", another 29 percent "somewhat more important"). Fifty-four percent claim that the personal importance of nature for them has not changed. Only a fraction of two percent consider nature slightly less important now compared to the time before the pandemic (see Figure 13).

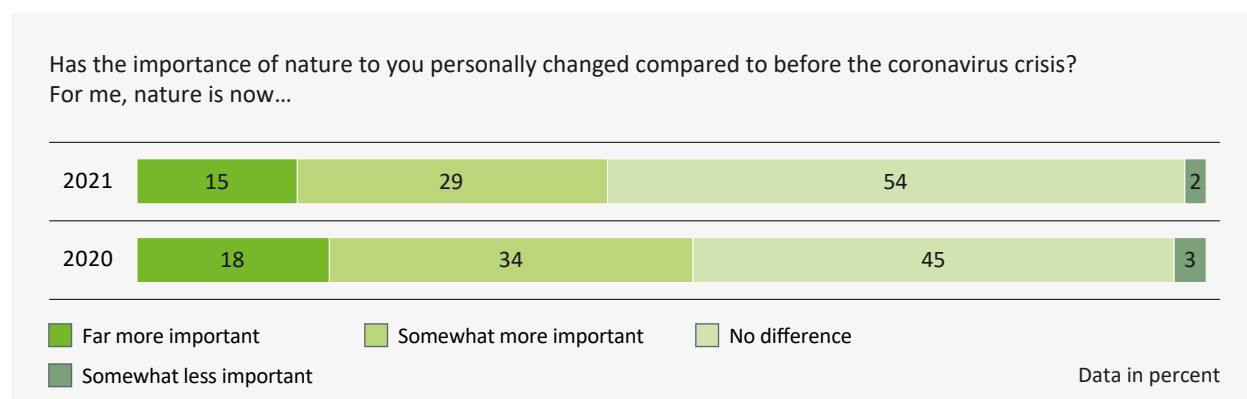


Figure 13: Altered appreciation of nature compared over time

Compared to the previous survey, the proportion of those for whom nature has become more important during the pandemic has decreased by eight percentage points (2020: 52 percent, 2021: 44 percent). This decline could be related to the fact that nature was sought out as a place of compensation or refuge, especially in phases of harsher lockdowns such as at the beginning of the pandemic, while loosened restrictions allow for more alternatives and thus create less of a need to spend time in nature.

In the comparison of lifeworlds, it is striking that Experimentalists are the most likely of all lifeworlds to say that their appreciation of nature has increased. For 57 percent of this fun and scene-oriented group, nature has become far more or at least somewhat more important compared to the time before the coronavirus crisis (average: 44 percent). In view of the pandemic, which has now lasted for two years, it seems reasonable to assume that these teenagers, who are particularly fond of freedom, have suffered especially from the restrictions of the pandemic and, especially during the lockdown phases, have appreciated the freedoms of nature.

4.3 Spending time in nature during the pandemic

In the second year of the coronavirus crisis, 44 percent of teenagers spent more time in nature than before the pandemic.

Forty-four percent of teenagers said that they have been in nature more often in recent months than in the period before the coronavirus crisis (16 percent “far more often”, another 28 percent “somewhat more often”). This is compared to 16 percent who claimed to have spent less time in nature over the past months. Forty percent had been in nature just as often as before the pandemic (see Figure 14).

The comparison over time makes it clear that the proportion of those who say they have been in nature more often in recent months than before the pandemic has also decreased by eight percentage points (2020: 52 percent, 2021: 44 percent). The question remains open as to whether the slight decline in the frequency of trips into nature is a cause or a consequence of the decline in appreciation.

The socio-demographic analysis also reveals no differences here. In the lifeworld view, it is mainly the Experimentalists who state that they have been in nature more often in recent months than in the period before the coronavirus crisis (“far more often” or “somewhat more often”: 58 percent, average: 44 percent). This finding reinforces the assumption that for these teens in particular, spending time in nature is an important way to enjoy certain freedoms despite restrictions.

In summary, it can be said that the coronavirus contributed to an increase in time spent in nature as well as the appreciation of it, although this ef-

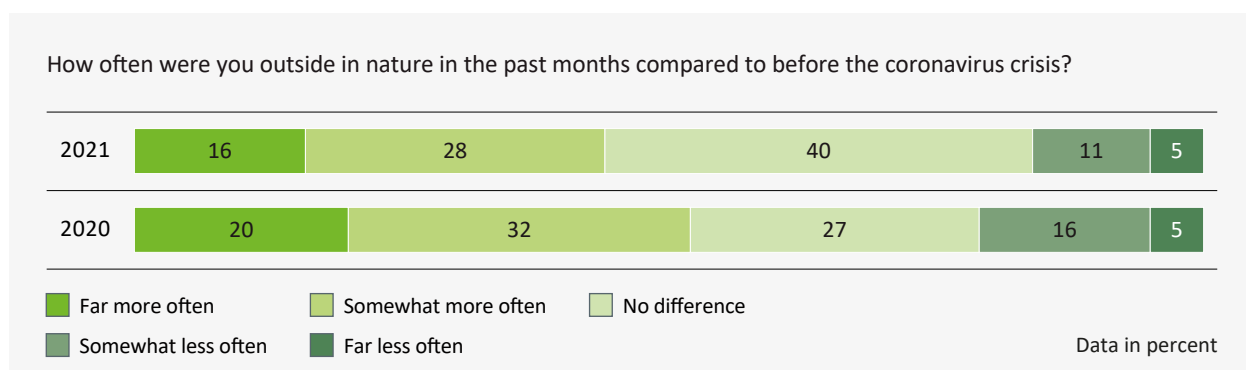


Figure 14: Spending time in nature during the pandemic compared over time

fect was somewhat weaker in the second year of the pandemic. It should be emphasised that with more than 60 percent agreement, a clear majority of respondents recognise the general connection between a healthy planet and the health of us humans. This is an encouraging finding for the growing efforts to anchor the concept of plane-

tary health in the awareness of the population. As this connection is clearly dependent on education (the higher the level of formal education, the stronger the connection), however, there must be more enlightenment here, especially for the educationally disadvantaged classes, adapted to their abilities and needs.

5 Understanding of the causes and effects of climate change

The fact that the young generation feels threatened by climate change was impressively underlined by the Fridays for Future movement from 2019 (Haunss and Sommer 2020). In this context, the topic of climate change primarily attracts teenagers from post-material, self-fulfilment-seeking, and freedom-loving lifeworlds, while teenagers living precariously, for example, give the topic a lower priority (see Calmbach et al. 2020). Nevertheless, studies show that fear of the consequences of climate change is very pronounced, especially among children and teens. Alongside the coronavirus, this climate anxiety also contributes strongly to depression and other mental health issues, which are becoming increasingly common in this age group (Raile and Rieken 2021, Spitzer 2022). All over the world, teenagers feel depressed, powerless, and even guilty about climate change (Lynas et al. 2021).

This raises the question of what teenagers in Germany think about climate change. Do they think

it is man-made or caused by natural processes? To what extent does the climate crisis trigger fear and concern? Can anything still be done about it, and what role do teenagers themselves play in this? And finally: Is nature conservation seen as a contribution to climate protection and climate adaptation? The following chapter provides answers to these questions.

5.1 Knowledge of the causes of climate change

Teenagers have no doubts that climate change is a fact.

Out of 1,004 respondents, only four teenagers think there is no such thing as climate change (0.4 percent). For everyone else, climate change is a reality (see Figure 15). Yet only five percent believe that climate change is caused by natural processes. Fifty-eight percent say climate change is mainly caused by human activity. A further 34

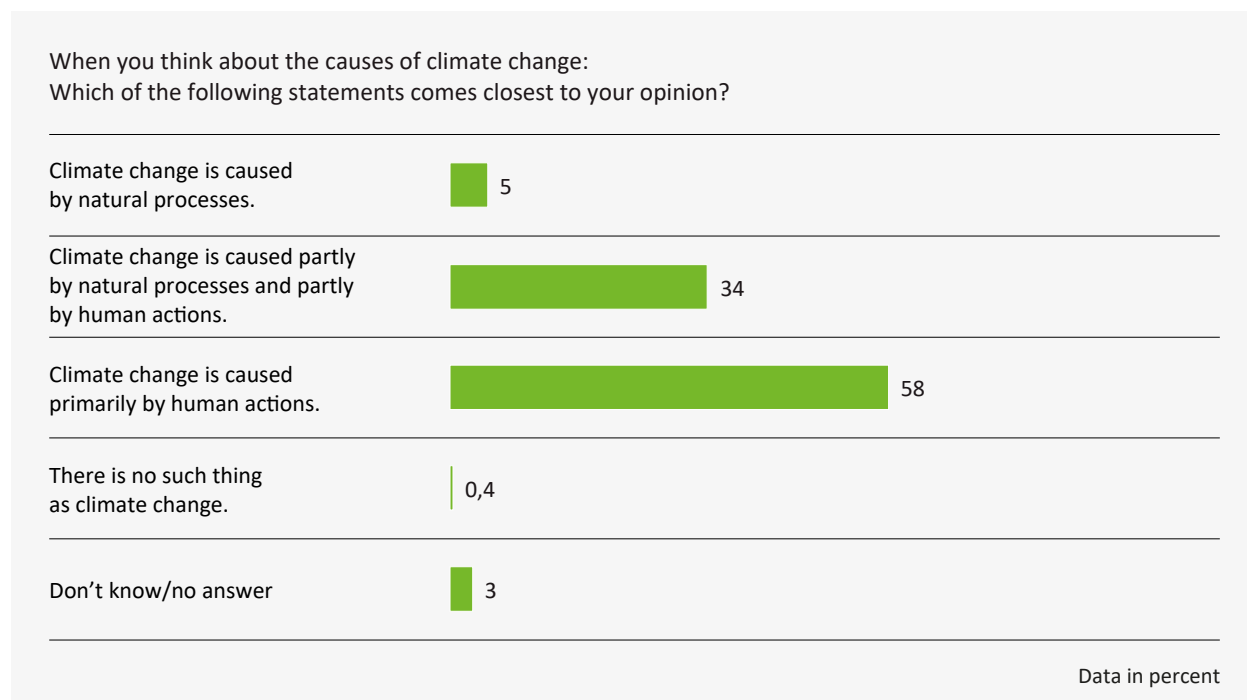


Figure 15: Causes of climate change

Table 8: Causes of climate change by educational level

When you think about the causes of climate change: Which of the following statements comes closest to your opinion?				
Data in percent	Average	Educational level		
		Low	Average	High
Climate change is caused by natural processes.	5	8	6	3
Climate change is caused partly by natural processes, partly by human actions.	34	47	38	29
Climate change is caused primarily by human actions.	58	37	51	66
There is no such thing as climate change.	0.4	1	1	0.2
Don't know/no answer	3	7	4	1

■ Heavily over-represented
 ■ Under-represented
 ■ Heavily under-represented

percent think that climate change is partly due to natural processes and partly due to human activity.

Opinions on the causes of climate change depend on the educational background of teenagers (see Table 8). In the group with a low level of formal education, for example, 37 percent believe that climate change is mainly caused by human activity. In the group with an average level of formal education, the figure is 51 percent and in the group with a high level of formal education, it is 66 percent. This finding highlights the importance of creating solid knowledge of climate change and its causes in education as early as possible (starting in primary school).

The socio-cultural analysis also shows that the opinion that climate change is predominantly caused by human action is under-represented in the group of experience-oriented Experimentalists (45 percent, average: 58 percent). The same applies to the educationally disadvantaged life-worlds of the Precarious (42 percent) and Materialistic Escapists (39 percent).

5.2 Awareness of the impacts of climate change

Nine out of ten teenagers see nature conservation as a necessity to meet the challenges of climate change.

Ninety-one percent of respondents believe that nature conservation is necessary to meet the challenges of climate change (see Figure 16). Fifty-seven percent are even “strongly” of this opinion, another 34 percent “somewhat”. This question was already asked in the previous survey. In 2020, 87 percent of teenagers were of this opinion (55 percent of them “strongly”, another 32 percent “somewhat”). Furthermore, in 2021, 59 percent say they are afraid that climate change and the destruction of nature will negatively impact their own lifestyle (both levels of agreement).

From a nature conservation perspective, the high approval ratings for the first of the two statements are encouraging, as they demonstrate that a clear connection is seen between nature conservation, climate protection, and climate adaptation.

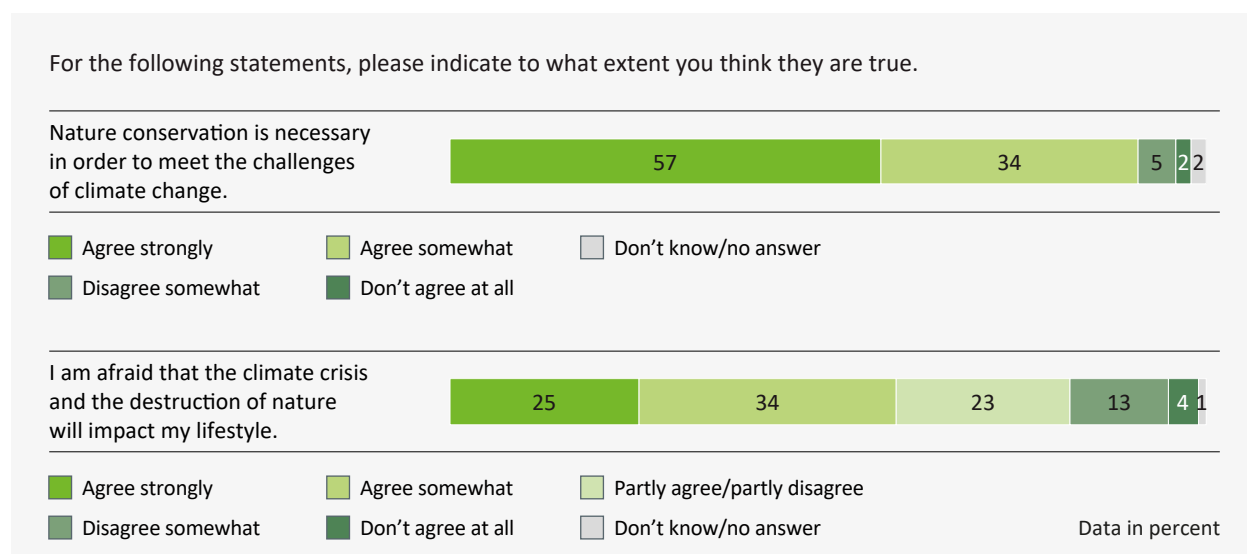


Figure 16: Perception of threats

Threats caused by climate change are mainly feared by teenagers with a high level of formal education. In this group, 65 percent say they are afraid that climate change and the destruction of nature will negatively impact their own lifestyle (both levels of agreement, see Table 9). The consequences of climate change are feared somewhat more frequently in the Adaptive Pragmatists group. In this down-to-earth and risk-averse lifeworld, 70 percent assume negative effects for their own lives (both levels of agreement). In contrast, the strongly hedonistic Materialistic Escapists worry comparatively little. "Only" 35 percent

of these teenagers say they are afraid that climate change and the destruction of nature will negatively affect their own lifestyle.

Among the younger generation, every second person sees themselves in a position to make an active contribution to protect nature and the climate.

Seventy percent of 14 to 17-year-olds share the opinion that we in Germany are in a position to work together to protect nature and the climate (see Figure 17). One third of respondents agree

Table 9: Perception of threats by educational level

For the following statements, please indicate to what extent you think they are true.				
Response category: "Agree strongly/somewhat"	Average	Educational level		
		Low	Average	High
Nature conservation is necessary in order to meet the challenges of climate change.	91	85	90	93
I am afraid that the climate crisis and the destruction of nature will impact my lifestyle.	59	43	54	65
Heavily over-represented (dark green), Under-represented (medium green), Heavily under-represented (dark green)				

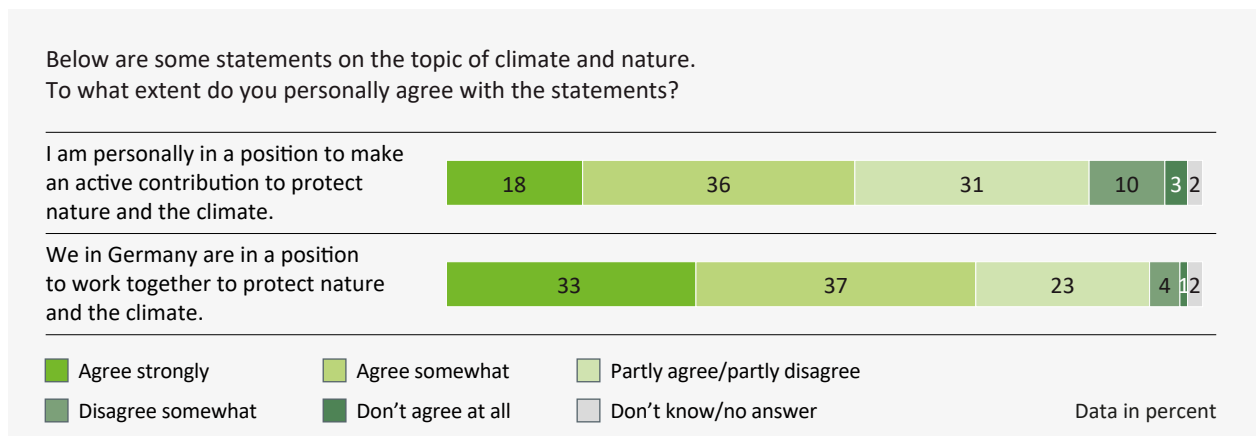


Figure 17: Individual and collective perceptions of effectiveness

unreservedly with this statement. Furthermore, more than half of teenagers think that they are also personally in a position to make an active contribution to protect nature and the climate. Some 18 percent are “strongly” convinced of this.

Obviously, the teenagers surveyed have a realistic assessment of their own possibilities in climate protection, as they agree more often with collective effectiveness than with individual effectiveness. We can conclude from this that offers for teenagers on climate protection should not only address their personal lifestyle, but above all their role in the societal and political collective.

Girls, and teenagers with a high level of formal education especially believe that they can work together with others to protect nature and the climate: 75 percent of female respondents and 76 percent of teenagers with a high level of formal education think that we in Germany are in a position to work together to protect nature and the climate (both levels of agreement). Among male respondents, it is 65 percent and in the group with a low level of formal education 58 percent. Girls, and teenagers with a high level of formal education also tend to be more convinced that their own individual actions can have an effect. However, these results are not statistically significant.

Post-Materialists and Adaptive Pragmatists have the greatest confidence that they can personally and collectively achieve something to protect nature and the climate.

In a comparison of lifeworlds, the Post-Materialists, who are critical of consumerism, and the performance-driven teenagers of the modern middle (Adaptive Pragmatists) are most often of the opinion that we in Germany are in a position to work together to protect nature and the climate (both levels of agreement: 87 percent and 85 percent respectively, average: 70 percent). There are far fewer Materialistic Escapists, who prefer to spend their free time shopping, gaming, and watching series, who hold this opinion (42 percent). The situation is similar when it comes to the question of the individual perception of effectiveness (see Figure 18). While 69 percent of Post-Materialists and 63 percent of Adaptive Pragmatists say they are also personally in a position to protect nature and the climate, this figure is only 35 percent for Materialistic Escapists.

Overall, it is clear that a majority of teenagers consider climate change a major threat, even a personal one, which triggers fear. Despite (or precisely because of) perceiving climate change as a threat, a majority of teenagers are convinced that they are in a position to do something themselves to combat it. However, it should also be noted

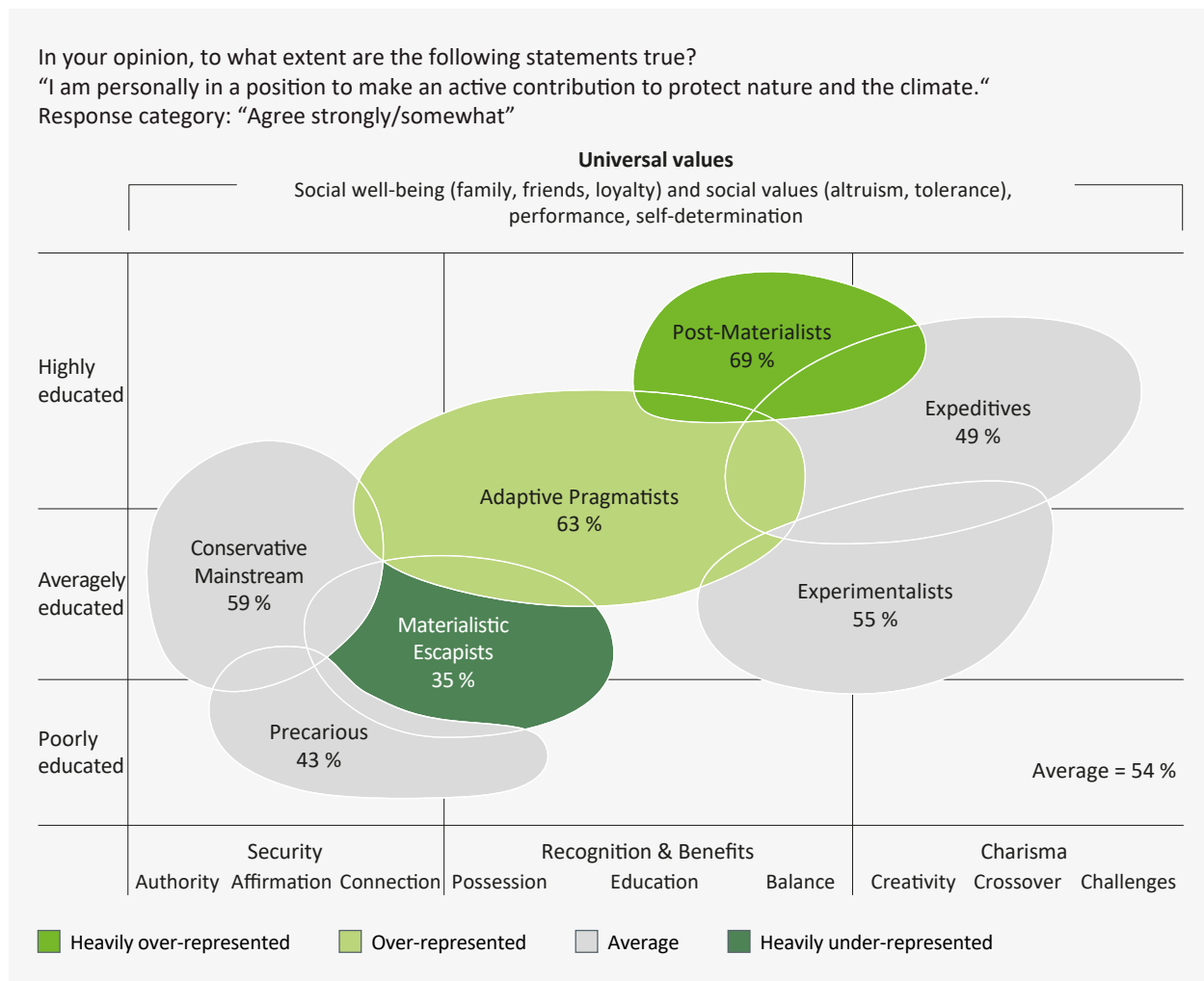


Figure 18: Individual perceptions of effectiveness by lifeworld

that it is mainly teenagers with a low level of formal education and those with Consumer Hedonistic value orientations who have less confidence in being able to make an active contribution to protect nature and the climate.

6 Teenagers' attitudes towards the need for transformative change and assessment of technological developments

For some years now, there has been talk of transformation in environmental and sustainability-related research. Without a more or less major transformation in technology, economics, and lifestyle, it will no longer be possible to avoid overstepping planetary boundaries. According to the WBGU (German Advisory Council on Global Change) in its 2011 annual report, which has played an important role in the German debate, a new social contract is needed for a major transformation (WBGU 2011). The narrative of major transformation has subsequently been spelled out differently by different disciplines and branches of research, sometimes more, sometimes less radically (see Witt-Mayer et al. 2017). What all these approaches have in common is that they consider a purely incremental approach to nature and environmental problems to be insufficient: A simple “business as usual” or cosmetic improvements here and there will not solve the problems.

How do teenagers in Germany see it? For a long time, many observers were of the opinion that teenagers were not interested and engaged enough in political issues. Of late though, young people as such are considered very likely to become politically involved; a whole generation now seems to be driven by climate and environment issues. A closer look shows that such generalised findings fail to capture the reality of youth today. Instead, what can be observed are simultaneous de-politicisation and re-politicisation processes (see Vodafone Foundation Germany 2022). The question arises as to how teenagers see the topic of transformation and whether they want to take an active role in this themselves.

The second part of this chapter consists of questions on the evaluation of technological developments, illustrated by the topics of energy transition, genetic engineering, and digitalisation. Undoubtedly, there are significant differences between these three fields of technology. Nevertheless, all of these technology areas have significant impacts in terms of nature conservation. In this

respect, it is interesting to find out how teenagers position themselves on this.

6.1 Willingness to change lifestyles and economic activities

Around two thirds of teenagers believe that a change in the way we live and do business in Germany is necessary.

Sixty-four percent of 14 to 17-year-olds share the opinion that a comprehensive change in lifestyles and economic activities in Germany is necessary to stop the global nature, environmental, and climate crisis. Of this group, 29 percent are unreservedly of this opinion. Twenty-four percent are undecided on this question (“partly yes/partly no”), only seven percent answer “no” or “not really”, and one percent say there is no nature, environmental, and climate crisis. The remaining four percent do not trust themselves to make an assessment (see Figure 19).

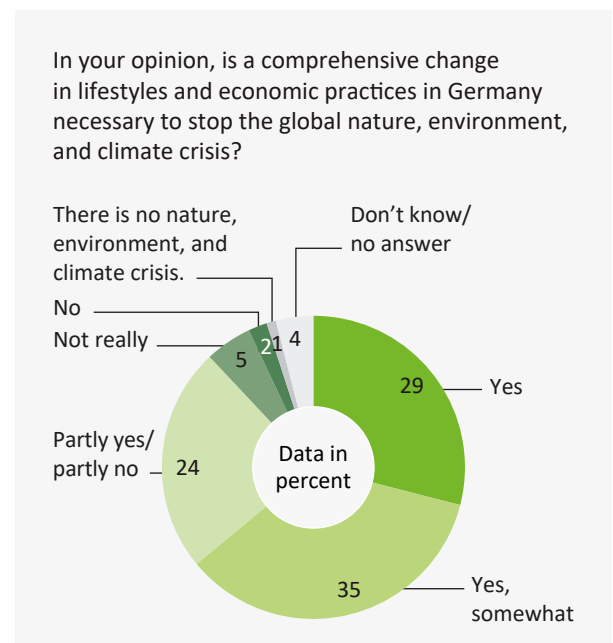


Figure 19: Attitude towards the need for change

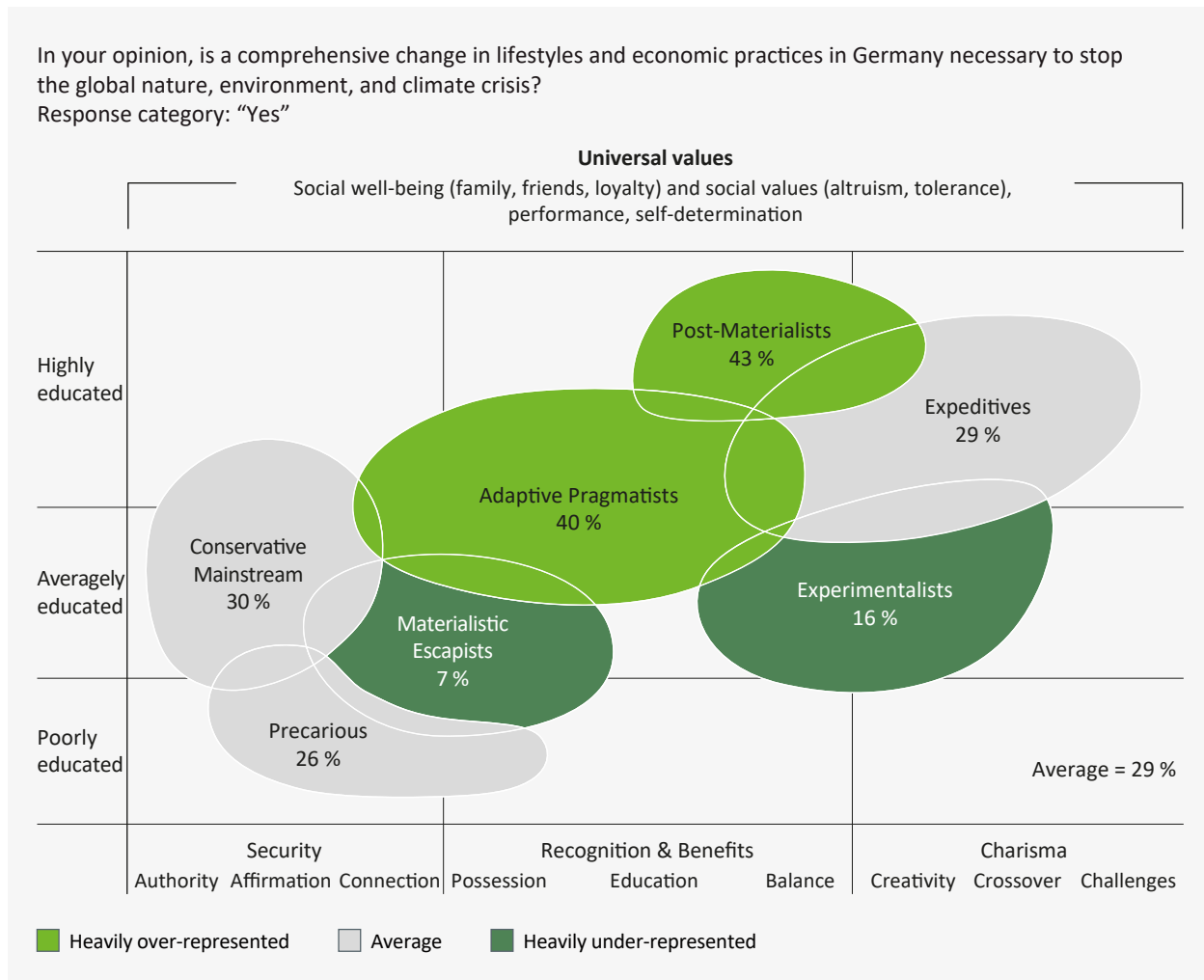


Figure 20: Attitude towards the need for change by youth lifeworld

Teens with a high level of formal education (both levels of agreement: 70 percent) and teenagers living in rural areas (population under 20,000: 74 percent) are more likely than average to believe that a comprehensive change in lifestyles and economic activities is necessary. Somewhat less frequently, teenagers with an average and low level of formal education are convinced of the need for comprehensive change (56 percent and 52 percent respectively).

Post-Materialists and Adaptive Pragmatists most often emphasise the need for a comprehensive change in lifestyles and economic activities in Germany.

The differences are greater when looking at the lifeworlds. It is particularly evident with regard to the highest level of agreement (see Figure 20): While 43 percent of the conservation-conscious Post-Materialists and 40 percent of the Adaptive Pragmatists, who are willing to adapt and compromise, unreservedly consider a comprehensive change in lifestyles and economic activities to be necessary (both levels of agreement: 80 percent and 76 percent respectively), it is 16 percent among the non-conformist Experimentalists and seven percent among Materialistic Escapists, who are particularly interested in status and possessions (both levels of agreement: 50 percent and 43 percent respectively).

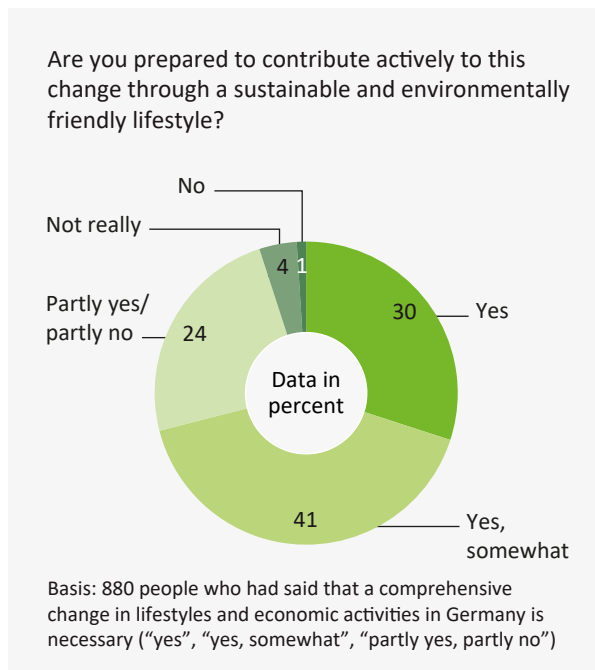


Figure 21: Social significance of the conservation of biodiversity

In addition to attitudes towards a change in lifestyles and economic activities, the survey also asked about willingness to support this change by adopting a sustainable and environmentally friendly lifestyle. Those who had stated that comprehensive change was not necessary ("not really", "no") were excluded from this question.

Over 70 percent declare their willingness to actively contribute to a change in lifestyles and economic activities.

Of those respondents who consider a comprehensive change in lifestyles and economic activities to be necessary in Germany (at least in part), 71 percent declare themselves willing to actively contribute to this through a sustainable and environmentally friendly lifestyle – 30 percent even agree unreservedly (see Figure 21). Only five percent claim to be not prepared or somewhat unprepared to do this. A further 24 percent are undecided on this question ("partly yes/partly no").

The socio-demographic analysis reveals gender and educational differences (see Table 10): More girls than boys can imagine themselves actively contributing to a change in lifestyles and economic activities (both levels of agreement: 78 percent compared to 63 percent). Furthermore, willingness to support this change through a sustainable and environmentally friendly lifestyle increases with teenagers' level of formal education (low: 54 percent, average: 65 percent, high: 76 percent).

In a comparison of lifeworlds, the Post-Materialists and Adaptive Pragmatists once again stand out with their response behaviour: 80 percent of Post-Materialists and 79 percent of Adaptive Pragmatists want to actively contribute to the change in lifestyles and economic activities (both levels of agreement). The lowest levels of agreement are again found in the lifeworld of Materialistic Escapists (43 percent).

Table 10: Willingness to change lifestyles and economic activities by gender and educational level

Are you prepared to contribute actively to this change through a sustainable and environmentally friendly lifestyle?						
Data in percent	Average	Gender		Educational level		
		M	F	Low	Average	High
Yes/yes, somewhat	71	63	78	54	65	76
<div> Heavily over-represented Over-represented Heavily under-represented </div>						
Basis: 880 people who had said that a comprehensive change in lifestyles and economic activities in Germany is necessary ("yes", "yes, somewhat", "partly yes, partly no")						

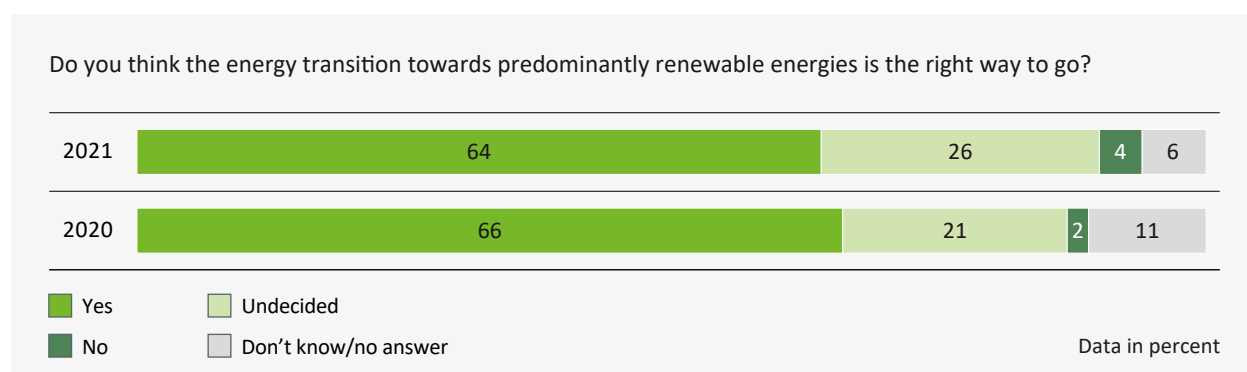


Figure 22: Approval and rejection of the energy transition compared over time

6.2 Agreement with the energy transition

Agreement with the energy transition remains high.

Following the survey in 2020, the question about teenagers' attitudes to the energy transition was asked for the second time in the Youth Nature Awareness Study. Once again, the level of agreement is high (see Figure 22): 64 percent of teenagers surveyed consider the energy transition to be the right way to go, 26 percent are undecided, four percent do not agree with it, and six percent said they didn't know or had no answer. This confirms the result of the 2020 survey: With two thirds of respondents, a significant majority of teenagers is in favour of the energy transition.

The proportion of those who reject the energy transition is again extremely low at four percent.

The educational comparison shows that agreement with the energy transition is most widespread among teenagers with a high level of formal education. In this group, 70 percent are in favour of the energy transition. In the groups with a low and average level of formal education, the figures are 57 percent and 56 percent respectively. It is worth noting that teenagers with a low and average level of formal education are somewhat more often undecided about the energy transition, but do not reject it more often (see Table 11). This indicates a certain uncertainty, which could be related to the fact that teenagers from low and average educational backgrounds do not

Table 11: Approval and rejection of the energy transition by educational level and size of town

Do you think the energy transition towards predominantly renewable energies is the right way to go?								
Data in percent	Average	Educational level			Town size (population)			
		Low	Average	High	<20,000	20,000 to <100,000	100,000 to <500,000	500,000+
Yes	64	57	56	70	74	62	57	67
Undecided	26	35	32	22	22	31	30	22
No	4	4	5	4	1	2	6	5
Don't know/no answer	6	5	7	5	3	5	7	7

Over-represented (Light Green), Under-represented (Dark Green)

Table 12: Approval and rejection of the energy transition by lifeworld

Do you think the energy transition towards predominantly renewable energies is the right way to go?								
Data in percent	Average	Conservative Mainstream	Post-Materialists	Adaptive Pragmatists	Expeditives	Experimentalists	Materialistic Escapists	Precarious
Yes	64	63	77	78	66	51	43	52
Undecided	26	26	15	18	25	38	39	32
No	4	6	2	2	4	4	9	4
Don't know/no answer	6	5	6	2	5	7	9	12

■ Heavily over-represented
■ Over-represented
■ Under-represented
■ Heavily under-represented

have enough information about the energy transition – either because this is missing from the educational offering at school, or because they do not actively seek information themselves.

Furthermore, the comparison of town sizes reveals that teenagers who live in villages and small towns are the most likely to support the energy transition (population under 20,000: 74 percent, average: 64 percent). In large cities with a population of between 100,000 and 500,000, approval

is lowest (57 percent). This finding is remarkable insofar as the energy transition is mainly taking place in rural areas (for example wind power, photovoltaics in open spaces, transmission grids) and thus teenagers from smaller towns are objectively more affected by it. Yet it is precisely in the smallest towns that rejection is lowest, while approval is highest. Attitudes towards the energy transition are therefore influenced by other factors than merely the distance from renewable energy plants (see also Hübner et al. 2020).

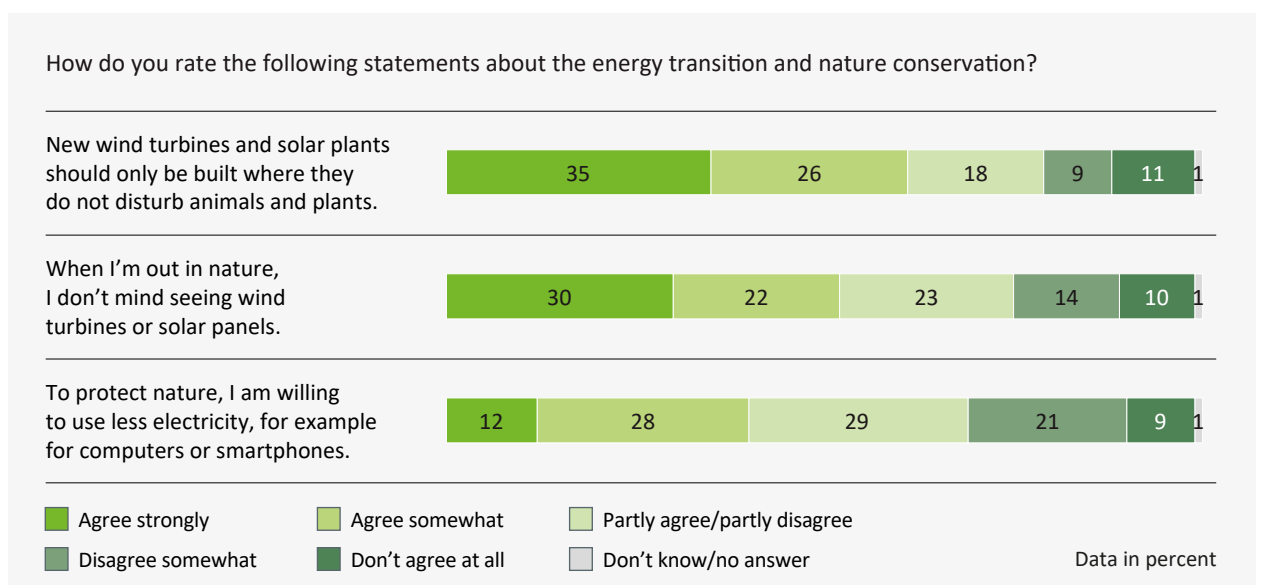


Figure 23: Attitudes towards the expansion of wind turbines and solar installations

Experimentalists and Consumer Hedonists are most often undecided in their attitude to the energy transition.

In the lifeworlds of the Adaptive Pragmatists and Post-Materialists, who are particularly interested in information, more than three quarters think the energy transition is right (78 percent and 77 percent respectively). Among the cosmopolitan Expeditives (66 percent) and the Conservative Mainstream, who have strong local roots (63 percent), the figure is around two thirds each. In the lifeworlds of Precarious teenagers (52 percent) and fun-oriented Experimentalists (51 percent), every second person is still in favour of the energy transition. With 43 percent “yes” votes, approval is lowest among Consumer Hedonists, whose gaze does not extend as far into the future and who prefer to concentrate on life in the here and now. Furthermore, it is striking that Experimentalists and Consumer Hedonists are most often undecided in their attitude towards the energy transition. In each of these groups, almost 40 percent position themselves neither for nor against the energy transition (see Table 12).

Overwhelmingly, teenagers share the opinion that new wind turbines and solar plants should only be built where they do not disturb animals and plants.

Sixty-one percent of the teenagers surveyed were of the opinion that new wind turbines and solar plants should only be built where they do not disturb animals and plants (both levels of agreement). Yet 52 percent say that when they are out in nature, it does not bother them to see wind turbines or solar panels. Furthermore, 40 percent state that they would be willing to use less electricity (for computers or smartphones, for example) in order to protect nature. It is striking that the proportion of respondents who are undecided on these questions (“partly agree, partly disagree”) is relatively high in each case (between 18 and 29 percent, see Figure 23). This could indicate that the teenagers feel they are obtaining sufficient information, but that they have not decided on their own preferences yet. The “closer” the question comes to how a person is affected (for example the question about personal energy use), the more teenagers are torn between nature conservation and their own wishes.

The socio-demographic analysis reveals large educational differences (see Table 13). For example, 37 percent of teenagers with a low level of formal education say that it does not bother them to see wind turbines or solar panels when they are out in nature. In the group with an average level of formal education, the figure is 45 percent and in the group with a high level of formal education, it is 58 percent. A gender comparison further shows that girls are more likely than boys to think that

Table 13: Attitudes towards the expansion of wind turbines and solar installations by gender and educational level

How do you rate the following statements about the energy transition and nature conservation?						
Response category: “Agree strongly/agree somewhat”	Average	Gender		Educational level		
Data in percent		M	F	Low	Average	High
New wind turbines and solar plants should only be built where they do not disturb animals and plants.	61	54	68	38	57	68
When I’m out in nature, I don’t mind seeing wind turbines or solar panels.	52	51	52	37	45	58
To protect nature, I am willing to use less electricity, for example for computers or smartphones.	40	40	39	29	33	46
<div> <div></div> Heavily over-represented <div></div> Over-represented <div></div> Under-represented <div></div> Heavily under-represented </div>						

Table 14: Attitudes towards the expansion of wind turbines and solar installations by lifeworld

How do you rate the following statements about the energy transition and nature conservation?								
Response category: “Agree strongly/agree somewhat”	Average	Conservative Mainstream	Post-Materialists	Adaptive Pragmatists	Expeditives	Experimentalists	Materialistic Escapists	Precarious
Data in percent								
New wind turbines and solar plants should only be built where they do not disturb animals and plants.	61	70	74	60	49	64	49	75
When I’m out in nature, I don’t mind seeing wind turbines or solar panels.	52	52	53	58	50	56	36	52
To protect nature, I am willing to use less electricity, for example for computers or smartphones.	40	51	52	37	30	42	33	42

Heavily over-represented
 Over-represented
 Under-represented
 Heavily under-represented

new wind turbines and solar plants should only be built where they do not disturb animals and plants (68 percent compared to 54 percent).

Large differences can also be seen in the socio-cultural view (see Table 14). It is worth noting that the opinion that new wind turbines and solar plants should only be built where they do not disturb animals and plants is held not only by the nature-loving Post-Materialists (both levels of agreement: 74 percent) and the Conservative Mainstream with their strong local roots (70 percent), but also by Precarious teenagers (75 percent, see Table 14). In the case of this last group, it must be noted that at 52 percent, their agreement with the energy transition is generally lower than the average (64 percent). Their approval of the nature conservation caveat for the expansion of wind turbines and solar plants is likely to be influenced at least as much by this fact as by concerns about possibly disturbing animals and plants.

Significantly less approval comes from the success and lifestyle-oriented Expeditives and the Materialistic Escapists (49 percent each). Another finding is that Materialistic Escapists are less likely than average to say that they don’t mind seeing

wind turbines or solar panels when they are out in nature (36 percent, average: 52 percent), while the willingness to consume less electricity is lowest among Expeditives (30 percent, average: 40 percent). The greatest willingness to save electricity comes from the ranks of the Post-Materialists (52 percent) and the Conservative Mainstream (51 percent).

6.3 Attitude towards agro-genetic engineering

Concerns about genetic engineering prevail.

In 2021, 69 percent of teenagers are of the opinion that potential effects on nature should always be explored when plants are specifically genetically engineered. Almost every second young person is “strongly” of this opinion (see Figure 24). Sixty-eight percent would like commerce to label foods made of animals that have been fed genetically modified feed (both levels of agreement). In addition, more than half of the respondents express ethical concerns: 56 percent think that humans have no right to deliberately genetically modify plants and animals (both levels of agreement).

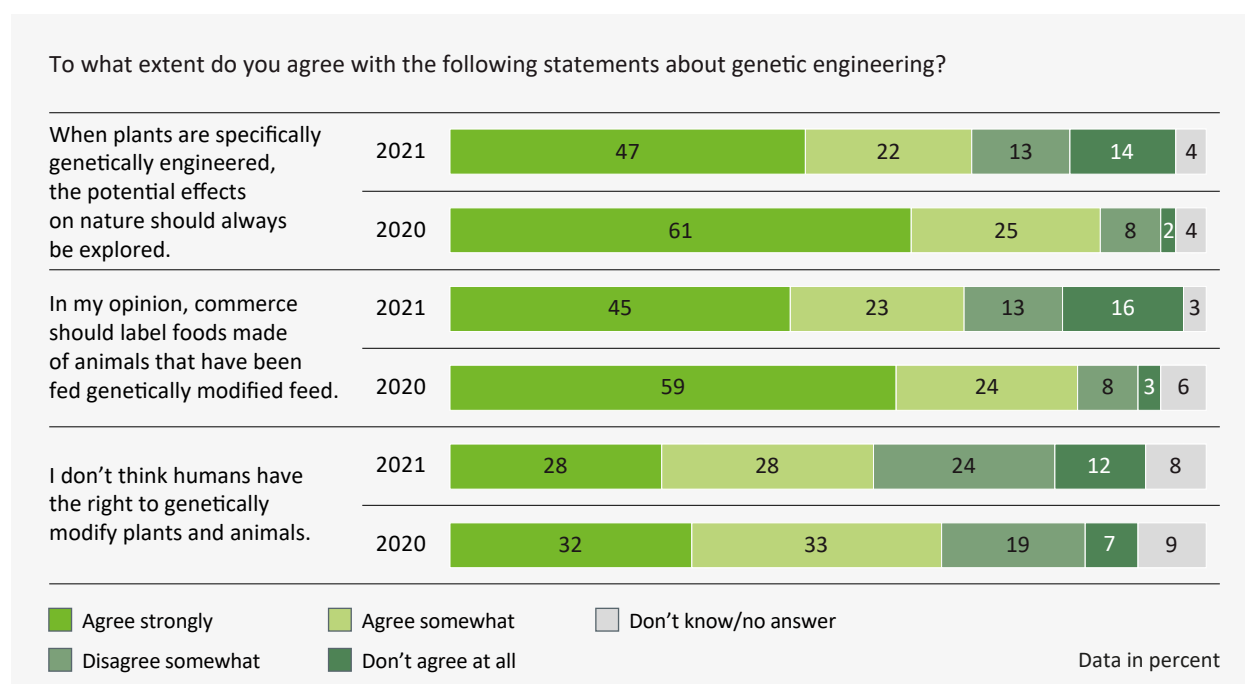


Figure 24: Attitudes towards the deployment of genetic engineering in agriculture compared over time

Overall, the findings prove that scepticism towards genetic engineering is widespread among teenagers. However, compared to the first Youth Nature Awareness Study from 2020, the numbers are lower (see Figure 24). Future surveys will clarify whether this is a trend.

Ethical reservations are expressed above all by girls and 14 to 15-year-olds.

The insistence that potential effects on nature should always be explored when plants are specifically genetically engineered increases with teenagers' formal education (highest level of agreement: low educational level: 20 percent, average educational level: 38 percent, high educational level: 58 percent). The same applies to the demand for mandatory labelling: In the group with a low level of formal education, 30 percent "strongly" demand that commerce should label foods made of animals that have been fed genetically modified feed. In the group with an average level of formal education, the figure is 37 percent and in the group with a high level of formal education, it is even 52 percent.

The differences between the genders and ages are also striking (see Table 15). A labelling requirement is supported by girls (highest level of agreement: 51 percent) more often than by boys (39 percent) and by 14 to 15-year-olds (53 percent) more often than by 16 to 17-year-olds (39 percent). Moreover, it is mainly girls and 14 to 15-year-olds who emphasise ethical reservations. For example, 35 percent of female respondents (compared to 21 percent of male respondents) and 41 percent of 14 to 15-year-olds (compared to 20 percent of 16 to 17-year-olds) emphasise that humans have no right to deliberately genetically modify plants and animals.

Scepticism towards genetic engineering in agriculture is found above all among Post-Materialists, the Conservative Mainstream, and Adaptive Pragmatists.

The educated Post-Materialists, the down-to-earth Conservative Mainstream, and the social middle of the youth population (Adaptive Pragmatists) express the most doubts overall about the use of genetic engineering in agriculture (see

Table 15: Attitudes towards the deployment of genetic engineering in agriculture by gender, age, and educational level

To what extent do you agree with the following statements about genetic engineering?								
Response category: "agree strongly"	Average	Gender		Age (years)		Educational level		
Data in percent		M	F	14 to 15	16 to 17	Low	Average	High
When plants are specifically genetically engineered, the potential effects on nature should always be explored.	47	42	52	55	42	20	38	58
In my opinion, commerce should label foods made of animals that have been fed genetically modified feed.	45	39	51	53	39	30	37	52
I don't think humans have the right to genetically modify plants and animals.	28	21	35	41	20	27	29	28

■ Heavily over-represented
■ Over-represented
■ Under-represented
■ Heavily under-represented

Table 16). Thus, 64 percent of Post-Materialists, 60 percent of the Conservative Mainstream, and 56 percent of Adaptive Pragmatists unreservedly agree that possible effects on nature should always be investigated when plants are deliberately genetically modified (highest level of agreement,

average: 47 percent). In contrast, the figures for the strongly hedonistic lifeworlds of the Experimentalists and Materialistic Escapists are 34 percent and 18 percent respectively. Calls for compulsory labelling also come most frequently from the ranks of the Post-Materialists (highest

Table 16: Attitudes towards the deployment of genetic engineering in agriculture by lifeworld

To what extent do you agree with the following statements about genetic engineering?								
Response category: "agree strongly"	Average	Conservative Mainstream	Post-Materialists	Adaptive Pragmatists	Expeditives	Experimentalists	Materialistic Escapists	Precarious
Data in percent								
When plants are specifically genetically engineered, the potential effects on nature should always be explored.	47	60	64	56	42	34	18	54
In my opinion, commerce should label foods made of animals that have been fed genetically modified feed.	45	54	61	53	38	36	19	57
I don't think humans have the right to genetically modify plants and animals.	28	37	37	31	15	26	16	52

■ Heavily over-represented
■ Over-represented
■ Under-represented
■ Heavily under-represented

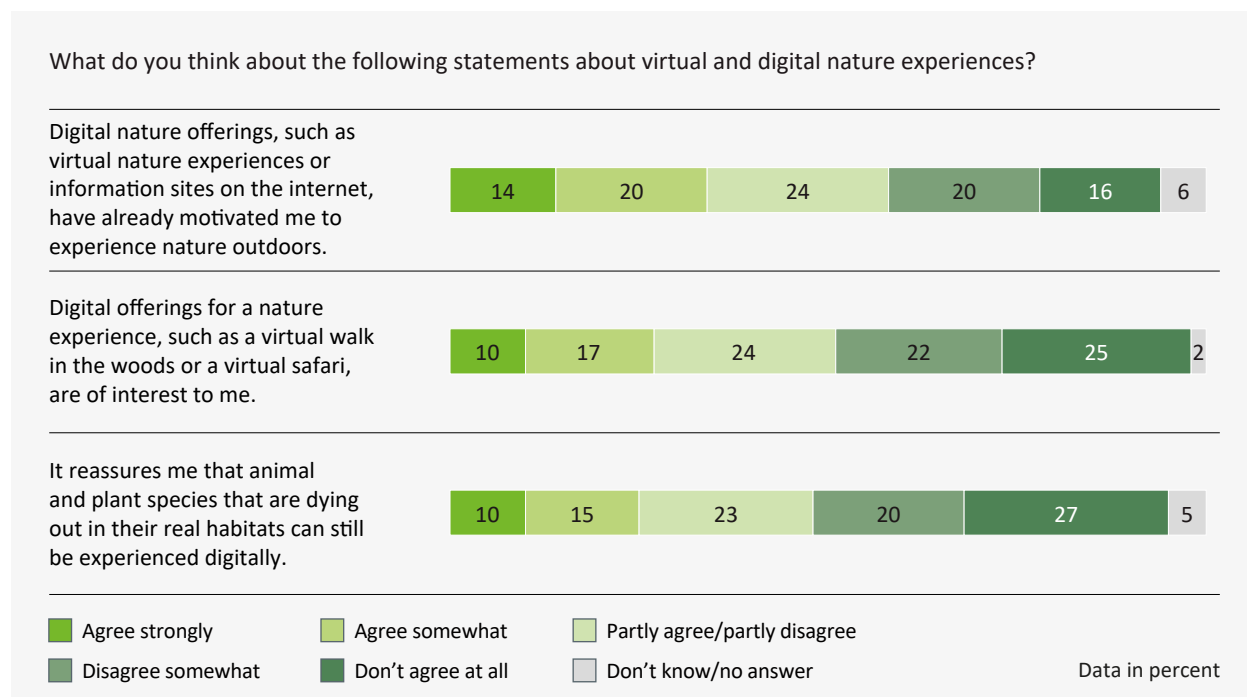


Figure 25: Interest in digital nature offerings

level of agreement: 61 percent), the Conservative Mainstream (54 percent), and Adaptive Pragmatists (53 percent), while it is expressed with less vehemence by Experimentalists (36 percent) and Materialistic Escapists (19 percent) (average: 45 percent).²

In no other lifeworld than among teenagers from precarious, socially weaker situations is it emphasised more often that humans have no right to deliberately genetically modify plants and animals

(highest level of agreement: 52 percent, average: 28 percent). In contrast, ethical concerns are less frequently highlighted in the lifeworld of Materialistic Escapists (16 percent) and among the experimental Expeditives (15 percent).

6.4 Teenagers' affinity for digital nature offerings

Digital nature offerings meet with divided interest among teenagers.

Twenty-seven percent of the teenagers surveyed 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 47 percent who do not really find such offerings interesting or not at all. Twenty-four percent are undecided ("partly agree/partly disagree"), two 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 25): 25 percent

² As for the question on food labelling, line 2 in Table 16 shows that, at 57 percent, teenagers from the Precarious milieu are also clearly above the population average of 45 percent. Although the statistically significant measured values for the youth milieus of the Conservative Mainstream (54 percent) and Adaptive Pragmatists (53 percent) are thus exceeded by the numerical value, the measured value for youth from precarious situations cannot be reported as significant here. Since the significance test is carried out using chi-squared tests, in which each subgroup is tested against the total, the sample size plays an important role. Since the milieu of teenagers from a precarious social situation is by far the smallest milieu, the percentage value differences here must be considerably larger to count as significant than is the case with the other milieus.

agree strongly or somewhat with this question, while 47 percent somewhat disagree or don't agree at all. Twenty-three percent are undecided and five percent do not know. For the third statement, the levels of agreement are somewhat higher: 34 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). Almost the same number (36 percent) somewhat disagree or don't agree at all with this statement. A further 24 percent are undecided and six percent are unable to give an answer.

**The interest in digital nature offerings is great-
est among teenagers with a low level of formal
education.**

It is mainly teenagers with a low level of formal education who are enthusiastic about digital nature offerings (see Table 17): In this group, 38 percent find digital offerings, such as a virtual forest walk, interesting (both levels of agreement, average: 27 percent). What is more, 49 percent say that digital offerings, such as virtual nature experiences or information sites on the internet, have already motivated them to experience nature outdoors (average: 34 percent). This last finding speaks against the obvious fear that digital

offerings would be used as a substitute for real nature experiences. Especially for teenagers with a low level of formal education, who have lower nature awareness values in many areas, digital nature offerings could take on a bridging function leading on to "real" nature experiences. Experiences with digital location-based games (so-called geo games, see Lude 2020) show that good, age-group-specific digital offerings can contribute to increased interest in real nature experiences and to sustainable behavioural changes. In light of the findings presented here, more thought should be given to a special focus on teenagers with a low level of formal education.

In a comparison of lifeworlds, Experimentalists are by far the most interested in digital nature offerings. In this lifeworld, which is particularly interested in new and unconventional ideas, 42 percent of respondents find such offerings interesting (both levels of agreement, average: 27 percent). Furthermore, 43 percent of Experimentalists state that digital offerings have already motivated them to experience nature outdoors (average: 33 percent). In addition, in this group, 41 percent say it reassures them that animal and plant species that are dying out in their real habitats can still be experienced digitally (average: 26 percent).

Table 17: Interest in digital nature offerings by educational level

What do you think about the following statements about virtual and digital nature experiences?				
Response category: "Agree strongly/agree somewhat"	Average	Educational level		
Data in percent		Low	Average	High
Digital nature offerings such as virtual nature experiences or information sites on the internet have already motivated me to experience nature outdoors.	34	49	32	31
Digital offerings for a nature experience, such as a virtual walk in the woods or a virtual safari, are of interest to me.	27	38	24	26
It reassures me that animal and plant species that are dying out in their real habitats can still be experienced digitally.	25	30	28	23
<div></div> Heavily over-represented				

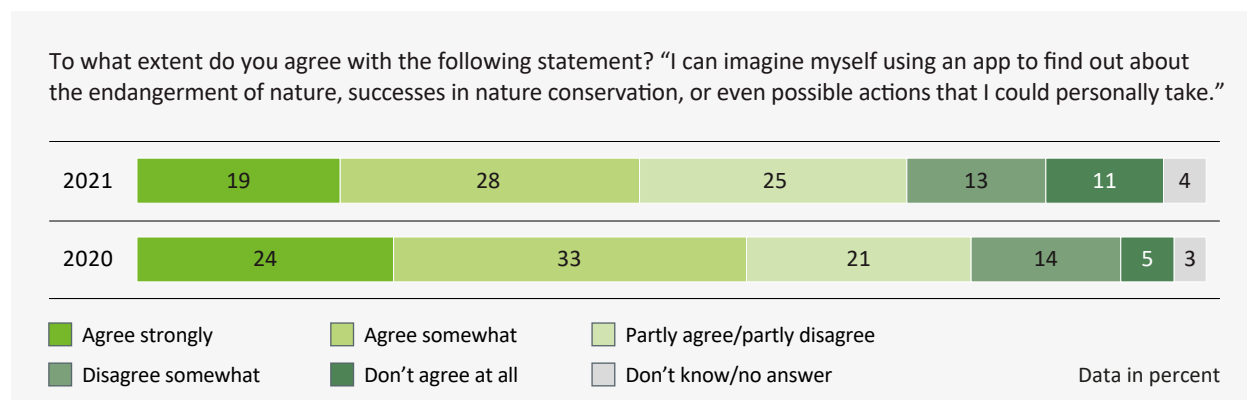


Figure 26: Willingness to use a nature conservation app compared over time

Willingness to use a nature conservation app has decreased.

Forty-seven percent of the teenagers 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), 24 percent are (somewhat) unlikely to use such an app, 25 percent are undecided, and four percent do not have an opinion. This means that willingness to use a nature conservation app has decreased by ten percentage points compared to the previous survey (see Figure 26).

Willingness to use a nature conservation app depends on the educational background of the respondents: In the group with a low level of formal education, willingness to use such an app is 38 percent (“very/somewhat willing”). In the group with an average level of formal education, the figure is 41 percent and in the group with a high level of formal education, it is 53 percent.

Younger teens aged 14 and 15 express this willingness more emphatically (“very willing”: 24 percent) than 16 to 17-year-olds (“very willing”: 16 percent, population average: 19 percent). When looking at both levels of agreement, no significant differences are evident. In the previous survey, no differences were discernible in this question (2020, “very willing”: 14 to 15-year-olds: 24 percent; 16 to 17-year-olds: 23 percent; population average: 24 percent).

Furthermore, the comparison of lifeworlds shows that in 2021, Post-Materialist teenagers showed the greatest willingness to use an app to find out about the endangerment of nature, successes in nature conservation, or even possible actions that they could personally take for nature (“very/somewhat likely”: 57 percent, population average: 47 percent). In this lifeworld, sustainability is not an empty word, but a solid principle in life. In contrast, ecological values play a less prominent role in the lifeworld of Materialistic Escapists. Accordingly, their willingness to use digital nature offerings is lower (33 percent). The comparison over time is interesting: In 2020, although the greatest willingness was also found among Post-Materialist teenagers, the agreement scores were significantly higher (2020, “very willing/somewhat willing”: 71 percent; population average: 57 percent). The Adaptive Pragmatists are also noteworthy. While this group was significantly above the population average in 2020 (2020, “very willing/somewhat willing”: 65 percent, population average: 57 percent), this difference has dissipated in the current survey (2021, “very/somewhat willing”: 49 percent, population average: 47 percent).

In view of the findings in this chapter, it is clear that the intensity and manner in which teenagers use digital offerings differ, in some cases considerably, depending on their level of education and lifeworld. Better educated and post-materialistically oriented teenagers tend to view virtual nature experiences with reserve, whereas these

are attractive to less educated and more materialistically oriented groups and can convey real nature experiences. Apps that report critically and thus also politically on the destruction of nature are evaluated by both groups in exactly the opposite way: the educated Post-Materialists

find them good, the educationally disadvantaged Materialistic Escapists reject them by a majority. Communication about nature conservation in the digital age must therefore be as diverse and target group-specific as the digital world itself is.

Basic count:**2021 Youth Nature Awareness Study – 14 to 17-year-olds****Chapter 2: Appreciation of nature and willingness to get involved**

A2.1 Please state whether you agree strongly, agree somewhat, disagree somewhat, or do not agree at all with the following statements. (Figure 2)

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

A2.2 What do you think about the following statements? (Figure 3)

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

A2.3 What do you think about the following statements? (Figure 4)

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

A2.4 To what extent do you agree with the following statements? (Figure 5)

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 as humankind can work together to achieve something to protect nature on Earth.	49	33	14	2	1	1
I believe that I can achieve something to protect nature on Earth myself.	26	35	27	8	2	2

A2.5 How willing are you personally to ... (Figure 7)

Data in percent	Very willing	Somewhat willing	Somewhat unwilling	Completely unwilling	No answer
... take care of nature and treat it well when you are in it?	59	33	7	1	0
... deliberately organise sports and leisure activities in nature with respect for animals and plants?	47	41	7	2	3
... switch brands of cosmetics or toiletries if you find out that their production is hazardous to the environment?	41	39	12	3	5
... make your friends and acquaintances aware of nature conservation?	34	46	14	3	3
... limit your meat consumption or go without meat?	27	34	23	13	3
... find out about current developments in the area of biodiversity?	26	48	21	3	2
... share articles about nature conservation on social media (for example on the decline of insect populations)?	21	40	24	9	6
... become actively involved in a nature conservation association?	12	30	33	18	7

Chapter 3: Awareness of teenagers for the development and importance of biodiversity

A3.1 How convinced are you that biodiversity on Earth is in decline? Are you ... (Figure 8)

Data in percent	
Very convinced	28
Somewhat convinced	46
Undecided	18
Somewhat unconvinced	3
Completely unconvinced	1
Don't know/no answer	4

A3.2 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 9)

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

A3.3 What do you think about the following statements? (Figure 10)

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 die-off.	18	26	31	12	7	6

A3.4 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 11)

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

Chapter 4: Youth and the relationship with nature during the coronavirus crisis

A4.1 To what extent do you agree with the following statements? (Figure 12)

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

A4.2 Has the importance of nature to you changed compared to before the coronavirus crisis? For me, nature is now... (Figure 13)

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

A4.3 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 5: Understanding of the causes and effects of climate change

A5.1 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.	0.4
Don't know / no answer	3

A5.2 For the following statements, please indicate to what extent you think they are true. (Figure 16)

Data in percent	Agree strongly	Agree somewhat	Partly agree/partly disagree	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.	57	34	Not surveyed	5	2	2
I am afraid that the climate crisis and the destruction of nature will impact my lifestyle.	25	34	23	13	4	1

A5.3 Below are some statements on the topic of climate and nature. To what extent do you personally agree with the statements? (Figure 17)

Data in percent	Agree strongly	Agree somewhat	Partly agree/partly disagree	Disagree somewhat	Don't agree at all	Don't know/no answer
I am personally in a position to make an active contribution to protect nature and the climate.	18	36	31	10	3	2
We in Germany are in a position to work together to protect nature and the climate.	33	37	23	4	1	2

Chapter 6: Teenagers' attitudes towards the need for transformative change and assessment of technological developments

A6.1 In your opinion, is a comprehensive change in lifestyles and economic activities in Germany necessary to stop the global nature, environment, and climate crisis? (Figure 19)

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

A6.2 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 activities in Germany is necessary: "yes", "yes, somewhat", "partly yes/partly no" (Figure 21)

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

A6.3 Do you think the energy transition towards predominantly renewable energies is the right way to go? (Figure 22)

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

A6.4 How do you rate the following statements about the energy transition and nature conservation? (Figure 23)

Data in percent	Agree strongly	Agree somewhat	Partly agree/partly disagree	Disagree somewhat	Don't agree at all	Don't know/no answer
New wind turbines and solar plants should only be built where they do not disturb animals and plants.	35	26	18	9	11	1
When I'm out in nature, I don't mind seeing wind turbines or solar panels.	30	22	23	14	10	1
To protect nature, I am willing to use less electricity, for example for computers or smartphones.	12	28	29	21	9	1

A6.5 To what extent do you agree with the following statements? (Figure 24)

Data in percent	Agree strongly	Agree somewhat	Disagree somewhat	Don't agree at all	Don't know/no answer
When plants are specifically genetically engineered, the potential effects on nature should always be explored.	47	22	13	14	4
In my opinion, commerce should label foods made of animals that have been fed genetically modified feed.	45	23	13	16	3
I don't think humans have the right to genetically modify plants and animals.	28	28	24	12	8

A6.6 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 nature experiences? (Figure 25)

Data in percent	Agree strongly	Agree somewhat	Partly agree/partly disagree	Disagree somewhat	Don't agree at all	Don't know/no answer
Digital nature offerings such as virtual nature experiences or information sites on the internet have already motivated me to experience nature outdoors.	14	20	24	20	16	6
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

A6.7 To what extent do you agree with the following statement? “I can imagine myself using an app to find out about the endangerment of nature, successes in nature conservation, or even possible actions that I could personally take.” (Figure 26)

Data in percent	
Agree strongly	19
Agree somewhat	28
Partly yes/partly no	25
Disagree somewhat	13
Don't agree at all	11
Don't know/no answer	4

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Notes

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