



Societal biodiversity awareness

in Brazil, China, Colombia, India, Indonesia, Kenya,
Mexico, Peru, South Africa, and Vietnam

Indicator calculation and socio-demographic characteristics
Report for WWF Germany by

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1. Background, design and methodology of the study

Background of the study

On behalf of WWF, Hall & Partners has collected data on biodiversity awareness in ten non-European countries. Based on this data, SINUS Institute was commissioned to calculate the "societal awareness of biological diversity" indicator, developed within the framework of the nature awareness study in China, India, Indonesia, Vietnam, Brazil, Colombia, Mexico, Peru, Kenya and South Africa, as well as to evaluate and differentiate it according to sub-indicators and sociodemographic characteristics.

This report presents the results of the following services:

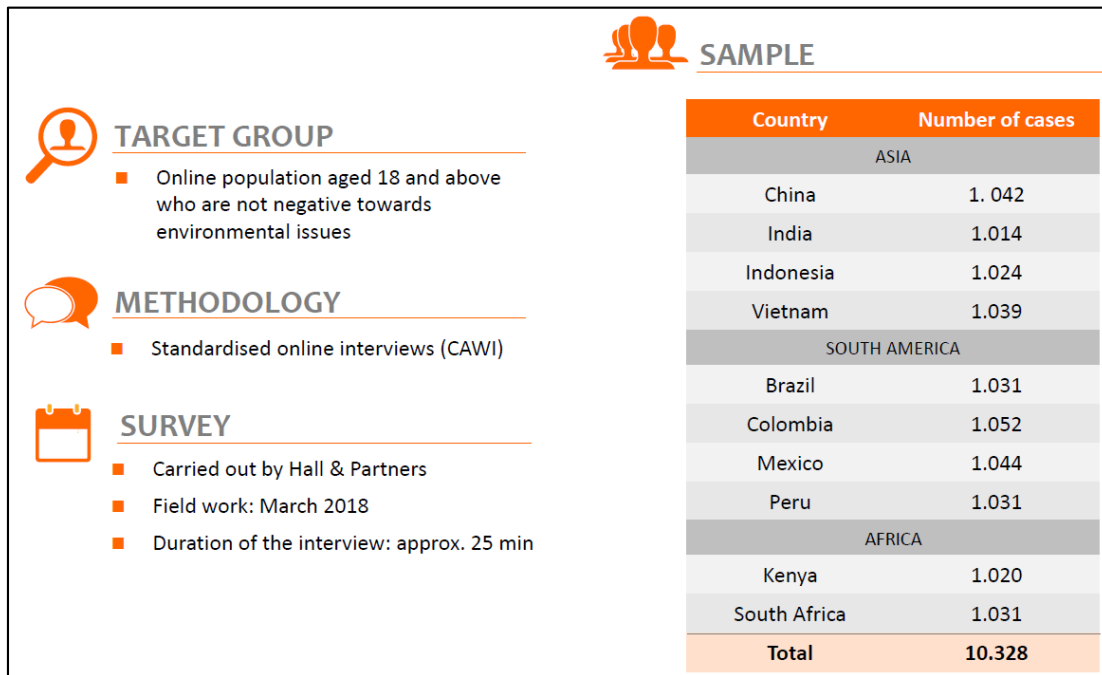
- Calculation of the overall indicator and the three sub-indicators
(in each case for all ten countries listed above)
- Evaluation of the questions used for the calculation of the indicators
(in each case for all ten countries listed above)
- Sociodemographic analysis of the overall indicator, the sub-indicators and the questions used for the calculation of the indicators
(in each case for all ten countries listed above)

Design and methodology of the study

The research is based on an online survey of 10,328 people aged 18 to 65. In each of the ten countries included in the study, at least 1,000 people were interviewed. The interviews were conducted in national languages. The survey was conducted from 3 to 13 March 2018.



Figure 1: Design and methodology of the study



In taking the sample, the aim was to cover as many important socio-demographic characteristics as possible. As far as possible that the following characteristics were checked: gender, age, education, household income, area of residence and children in the household. The distinctive feature of this survey is that in all ten countries only those individuals were surveyed who do not have a generally negative attitude towards environmental issues.



Figure 2: Sample Structure

Figures in percent	∅	ASIA				SOUTH AMERICA				AFRICA	
		China	India	Indonesia	Vietnam	Brazil	Colombia	Mexico	Peru	Kenya	South Africa
Gender											
Male	51	51	51	51	49	51	50	50	50	54	50
Female	49	50	49	49	51	49	50	50	50	46	50
Age groups											
18-29 years old	39	30	36	41	52	33	38	31	38	62	32
30-39 years old	28	34	28	32	30	24	26	25	27	28	29
40-49 years old	18	23	19	18	12	20	20	23	20	7	20
50-65 years old	14	13	17	10	6	23	16	21	15	2	19
Education											
Primary education	9	5	2	20	7	3	8	8	4	6	24
Secondary education	21	17	7	12	14	37	25	22	23	24	29
Higher education	70	78	91	68	79	60	66	70	74	70	46

Basis: Biodiversity Awareness Study, n=10.328

■ highly overrepresented ■ strongly underrepresented
■ overrepresented ■ underrepresented

Figures in percent	∅	ASIA				SOUTH AMERICA				AFRICA	
		China	India	Indonesia	Vietnam	Brazil	Colombia	Mexico	Peru	Kenya	South Africa
Household income											
Low income	29	30	25	30	17	25	36	35	39	22	25
Middle income	39	45	39	42	39	38	36	26	30	50	42
High income	29	25	31	24	42	33	21	35	25	23	27
No answer	5	1	5	4	1	5	8	4	6	5	7
Area of residence											
City	65	86	79	56	66	57	78	82	82	20	41
Suburbs	30	12	17	36	24	41	21	16	17	69	52
Countryside	5	2	4	8	10	2	2	2	1	11	7
Children in household											
Children in household	77	78	83	86	78	77	70	85	75	69	67
No children in household	23	22	17	14	22	23	30	15	25	31	33

Basis: Biodiversity Awareness Study, n=10.328

■ highly overrepresented ■ strongly underrepresented
■ overrepresented ■ underrepresented



2. Construction of the societal indicator and analysis procedure

Background on the development of the societal indicator

The central political document regulating the safeguarding of biodiversity at the international level is the 1992 United Nations Convention on Biological Diversity (UN Biodiversity Convention, CBD), which was also signed and ratified by the Federal Republic of Germany. To implement the Convention on Biological Diversity in Germany, the National Strategy on Biological Diversity was adopted by the German Federal Cabinet on 7 November 2007. A key objective of this strategy is to raise public awareness of the conservation of biodiversity and intact nature. More specifically, the following goal was set: "By 2015, at least 75 percent of the population will regard the conservation of biological diversity as a priority social task. The importance of biological diversity is firmly anchored in society's awareness. People's actions are increasingly aligned with and lead to a significant decline in the pressures on biological diversity" (BMU 2007, page 60 ff).

In order to make it measurable and thus empirically tangible, the societal indicator "Biodiversity Awareness" was developed. It indicates the degree to which this objective has been achieved (see Kuckartz and Rädiker 2009) and is part of the set of indicators of the National Strategy on Biological Diversity (Ackermann et al. 2013). Since 2009, the data for its calculation have been collected every two years through nature awareness studies. This report presents this indicator for the first time for ten non-European countries.

Structure of the societal indicator

The societal indicator is composed of the sub-areas "knowledge", "attitude" and "behaviour". For each of these three sub-areas, criteria are defined that reflect the objectives of the National Biodiversity Strategy. Based on these criteria, a sub-indicator is created for all three areas:

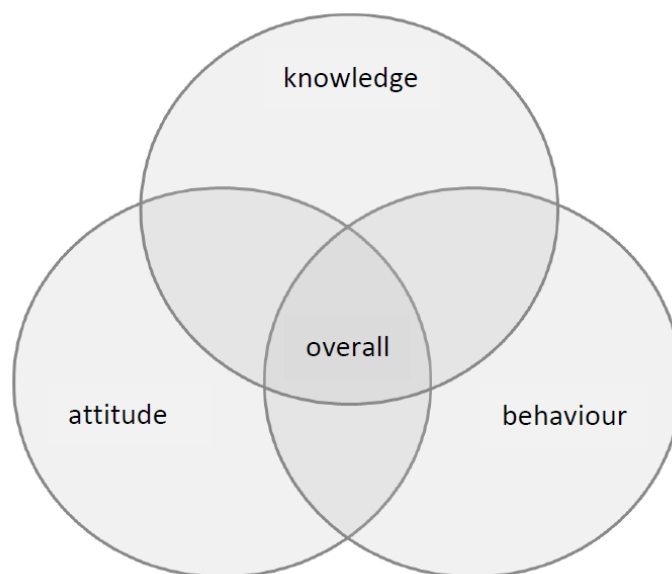
- The **knowledge indicator** measures the understanding of the term "biodiversity". It indicates the percentage of respondents, who are familiar with the term "biodiversity", including the identification of at least one of its components (species diversity, ecosystem diversity, genetic diversity).



- The **attitude indicator** determines the appreciation of biological diversity. It indicates the percentage of respondents, who assume that biodiversity on earth is declining and at the same time have a positive attitude towards biodiversity and its conservation.
- The **behavioural indicator** measures the willingness to make a personal contribution to the conservation of biodiversity. It indicates the percentage of respondents, who express enough willingness to contribute to the conservation of biological diversity.

The **overall indicator** is calculated based on the three sub-indicators and determines what percentage of the population meets the requirements in all three sub-areas (knowledge, attitude, willingness to act). Since, according to the chosen structure, it is not enough if a person meets the requirements in only one or two sub-areas (e.g. sufficient knowledge and positive attitude, but not sufficient willingness to act), the values of the overall indicator are inevitably lower than those of the sub-indicators. Strictly speaking, the overall indicator can be at most as high as the lowest sub-indicator (see Figure 3).¹

Figure 3: Sub-indicators and overall indicator „biodiversity awareness“



¹ The development, operationalisation and concrete calculation of the indicators can be accessed in Kuckartz und Rädiker (2009).



Method of analysis

In addition to the calculation of the overall indicator, the three sub-indicators and the evaluation of the questions underlying the calculation of the indicators, the survey data was differentiated according to the following characteristics: gender, age, education, household income, area of residence and children in the household.

- **Age groups:** under 30 years old, 30 to 49 years old, 50 to 65 years old
- **Education level groups:** low: „No formal schooling“ or „Primary or secondary education“; middle: „Some college“; High: „University or undergraduate“ or „University Post graduation“
- **Household income:** was categorized into “low”, “medium” and “high” for each country.

Differences in the response behaviour of these population groups were examined using the Chi-square test (e.g. age group under 30 years old compared to the average). This is based on a confidence range of 95 percent and 99 percent respectively, usual for social science purposes. Accordingly, characteristics are interpreted as **overrepresented or underrepresented** in the sample if this can be indicated with a probability of at least 95 percent. Characteristics are considered to be **strongly overrepresented or strongly underrepresented** if a probability of 99 percent can be assumed.

The result of the significance tests always depends on the size of the group. The larger the group (the higher the number of cases), the easier it is to prove the significance of a weak over- and underrepresentation.

3. Key results of the analysis

Overall indicator and sub-indicators

A **comparison of the ten countries** shows that the respondents in Colombia, Mexico and Peru most frequently meet all the requirements of the **societal indicator** (Colombia: 52%, Mexico and Peru: 48% each). Also, in India an above-average number of respondents have a high awareness of the importance of biological diversity (India: 42%, average: 38%). In contrast, the numbers in China (33%), Indonesia (32%) and South Africa (32%) are below average. The lowest value by far can be found in Brazil (18%). Across all countries, the average value of the overall indicator is 38% (see Figure 4).



The value of the **knowledge indicator** is higher in the four South American countries included in the study than in the four Asian and two African countries. For example, while in Colombia 79% of respondents said that they knew at least one of the three subcomponents of biological diversity (diversity of species, ecosystems, genes), the average in India is 54% and 48% in South Africa.

The **attitude indicator** is different: the respondents in Vietnam (79%), Indonesia (77%) and China (76%) were the first to express a sufficiently high level of understanding of biodiversity conservation. The value of this sub-indicator in Brazil is significantly lower (55%).

The differences in the **behavioural indicator** are the smallest in a country comparison - except for the result in Brazil: The range is from 80% of respondents in South Africa to 90% of respondents in Kenya. In Brazil, on the other hand, only 40% of those surveyed indicated a high willingness to contribute to the conservation of biodiversity themselves.

Figure 4: Overall indicator and sub-indicators

Figures in percent	Ø	ASIA				SOUTH AMERICA				AFRICA	
		China	India	Indonesia	Vietnam	Brazil	Colombia	Mexico	Peru	Kenya	South Africa
Overall indicator*	38	33	42	32	39	18	52	48	48	38	32
Knowledge indicator	61	42	54	49	54	70	79	77	76	55	48
Attitude indicator*	69	76	77	66	79	55	71	67	72	66	64
Behavioural indicator	80	84	85	82	82	40	87	85	85	90	80

Basis: Biodiversity Awareness Study, n=10.328, *n=9.893

■ highly overrepresented ■ strongly underrepresented
■ overrepresented ■ underrepresented

Sociodemographic consideration of the indicators across all countries (global)

Across all countries, a detailed analysis according to socio-demographic characteristics shows that a high level of awareness of the importance of biodiversity (overall indicator) is dependent on **education** (low vs. high: Δ 11 percentage points), **household income** (low vs. high: Δ 8 percentage points), **area of residence** (urban vs. rural: Δ 7 percentage points) and **age** (under 30 years vs. over 50 years: Δ 6 percentage points). The lowest value is found in the group with a formally low level of education (30%),



the highest value in the group with the highest household income (43%). The level of the overall indicator increases with the level of education and household income, but decreases with age. In addition, the overall indicator is higher in the urban population than in the rural population (see Figure 5).

Figure 5: Overall indicator and sub-indicators across all countries by socio-demographics

Figures in percent	∅	Gender		Age (years-old)			Education		
		M	W	18-29	30-49	50-65	Low	Middle	High
Overall indicator*	38	39	38	41	37	35	30	33	41
Knowledge indicator	61	61	60	65	59	56	42	55	65
Attitude indicator*	69	70	68	69	69	70	68	66	70
Behavioural indicator	80	79	82	80	80	78	79	76	81

Figures in percent	∅	Household income			Area of residence			Children	
		Low	Medium	High	City	Suburbs	Countryside	Yes	No
Overall indicator*	38	35	38	43	40	35	33	39	37
Knowledge indicator	61	56	59	68	63	57	50	61	59
Attitude indicator*	69	67	70	72	71	65	67	70	68
Behavioural indicator	80	78	80	82	81	79	80	80	79

Basis: Biodiversity Awareness Study, n=10.328, *n=9.893

■ highly overrepresented ■ strongly underrepresented
■ overrepresented ■ underrepresented

The **knowledge indicator** shows large differences in **education** (low vs. high: Δ 23 percentage points), **household income** (low vs. high: Δ 12 percentage points), **area of residence** (urban vs. rural: Δ 13 percentage points) and **age** (under 30 vs. over 50: Δ 9 percentage points). As in the case of the overall indicator, the lowest value is found in the group with a formally low level of education (42%), the highest value in the group with the highest household income (68%) (see Figure 5).

The socio-demographic differences in the **attitude and behavioural indicator** are relatively small: Respondents with high household incomes and respondents living in cities have an above-average level of awareness of biodiversity conservation (Attitude indicator: 72% and 71% respectively, average: 69%). The behavioural indicator is slightly higher for women (82%) than for men (79%), for the formally better educated (81%) higher than for the middle and low educated (76% and 79%



respectively) and for persons with a high household income (82%) higher than for persons with a middle and low household income (80% and 78% respectively).


Socio-demographic consideration of the indicators in the individual countries

The **sociodemographic characteristics** included in the analysis have different effects on the **overall indicator** in the countries surveyed.

- **Age** plays a particularly important role in China: while only 24% of Chinese respondents aged 50 to 65 meet the requirements of the societal indicator, the result is 44% among those with age under 30 (see Figure 6).
- The impact of **education** is particularly noticeable in India, Vietnam and Kenya. For example, only 19% of the formally low educated Vietnamese surveyed meet the requirements of the overall indicator. By contrast, the formally medium and highly educated people meet 40%.
- **Household income** is highly relevant in India, China, Peru and South Africa. In Peru, for example, it ranges from 42% (low household income) to 55% (high household income).
- The **area of residence** has a comparatively low significance for the result in the individual countries (no statistically significant differences). Differences are most likely to be found in Indonesia, Kenya and China.
- In Mexico and South Africa it is relevant whether **children are part of the respondents' household**. Mexicans who stated that children live in the household meet the requirements of the overall indicator more often than Mexicans who state that no children live in the household (50% vs. 38%). Surprisingly, in South Africa the opposite is the case (overall indicator: children in household: 29%, no children in household: 39%).
- **Gender differences** are not apparent in the participating countries.



Figure 6: Overall indicator and sub-indicators in China by gender, age and education

Figures in percent		Ø	Gender		Age (years-old)			Education		
			M	W	18-29	30-49	50-65	Low	Middle	High
Overall indicator*		33	35	32	44	29	24	24	25	35
Knowledge indicator		42	44	40	55	39	25	19	31	46
Attitude indicator*		76	77	74	75	75	82	76	70	77
Behavioural indicator		84	82	86	86	82	85	80	81	85

Basis: Biodiversity Awareness Study, China, n=1.042, *n=980


■ highly overrepresented ■ strongly underrepresented
■ overrepresented ■ underrepresented

Significant socio-demographic differences can also be identified in the **knowledge indicator**.

- Not surprisingly, the responses in the knowledge field vary greatly depending on the **educational background** of the respondents. In Kenya, for example, 32% of the formally low educated respondents know at least one of the three subcomponents of biological diversity, compared to 62% of the highly educated respondents (see Figure 7). Only in Indonesia no big differences can be found.
- Responses also vary depending on **household income**. This is particularly true in South Africa, India, China, Brazil and Peru. The differences are also noteworthy in Mexico and Kenya.
- **Age** again plays the biggest role in China. 55% of the Chinese surveyed under the age of 30 meet the requirements of the knowledge indicator. In the group of 50 to 65-year-olds the value is only 25%. Further significant age differences can be found in India, Vietnam, Peru and South Africa.
- In India, Brazil, Peru and Kenya, knowledge of the concept of biodiversity is more widespread in **cities** than in suburban and rural areas. In Peru and Kenya, however, the differences are not significant.
- In Brazil, respondents with **children in the household** meet the requirements of the knowledge indicator more often than respondents without children in the household (72% and 61% respectively).



Figure 7: Overall indicator and sub-indicators in Kenya by gender, age and education

Figures in percent 	Ø	Gender		Age (years-old)			Education		
		M	W	18-29	30-49	50-65*	Low	Middle	High
Overall indicator*	38	40	35	38	38	46	23	29	42
Knowledge indicator	55	57	54	56	55	50	32	42	62
Attitude indicator*	66	69	63	66	67	79	59	64	68
Behavioural indicator	90	87	94	89	92	96	88	89	91

Basis: Biodiversity Awareness Study, Kenya, n=1.020, *n=991

■ highly overrepresented ■ strongly underrepresented
■ overrepresented ■ underrepresented


Compared to the overall and knowledge indicators, the socio-demographic differences in the **attitude and behaviour indicators** are small. Significant socio-demographic differences can only be identified in a few cases.

- **Educational background** plays a role in India: Formally low educated people fulfil the requirements of the behavioural indicator far below average (57% compared to 85% on average).
- **Age** has an effect on the attitude indicator in South Africa: the age groups of 30-49 year olds and 50-65 year olds (68% and 67% respectively) meet the requirements of the indicator more often than the group of 18-29 year olds (57%).
- **Household income** is particularly influencing the results in India. Respondents with a high household income meet the requirements of the attitude and behaviour indicator (82% and 92% respectively) more frequently than respondents with a low household income (66% and 76% respectively) (see Figure 8). In China and Vietnam, below-average values were registered for the behavioural indicator in the low-income groups.
- The **area of residence** is relevant in China and India. Compared to rural areas, population of urban and suburban areas in China achieve higher scores in the attitude indicator and in India higher scores in the behaviour indicator.
- **Differences between the genders** are only evident in Kenya and Mexico. More women (94% and 89% respectively) meet the requirements of the behavioural indicator than men (87% and 82% respectively).
- Whether **children live in the household** only has an impact on the results in India. Respondents with children in the household more often meet the requirements of attitude and behaviour indicator than respondents without children in the household.



Figure 8: Overall indicator and sub-indicators in India by household income, housing situation and children in household

* Attention: low number of cases

Figures in percent		∅	Household income			Area of residence			Children	
			Low	Medium	High	City	Suburbs	Countryside*	Yes	No
Overall indicator*		42	30	41	54	44	36	35	44	36
Knowledge indicator		54	42	54	66	57	49	36	56	49
Attitude indicator*		77	66	78	82	78	70	74	78	69
Behavioural indicator		85	76	86	92	86	84	60	86	78

Basis: Biodiversity Awareness Study, India, n=1.014; *n=962

■ highly overrepresented
■ overrepresented

■ strongly underrepresented
■ underrepresented

4. Limitations and interpretation guidelines

Like any empirical study, this study has limitations that must be taken into account when interpreting the results. In order to critically reflect on the validity of the findings presented, the most important limitations are described below.

Representativeness of the sample

- In all countries, only those people were interviewed who do not have a generally negative attitude towards nature and environmental issues. This not only makes a comparison between countries difficult (since it is not known how large the proportion of people have a negative or positive attitude towards nature and environmental issues), but also explains the high indicator values (compared to Germany).
- Important socio-demographic characteristics of the samples (e.g. education, income, age) do not correspond to the actual socio-demographic distributions in the respective countries. This is particularly true for education: on average, 70% of the respondents have a high formal education, 21% a medium formal education and only 9% a low formal education. Since, as shown in the findings, the level of the society indicator (and especially of the knowledge indicator) varies greatly, especially with the educational background of the respondents, greater distortions ("upwards") can be assumed here.



- It should also be noted that (1) only a few of the respondents live in rural areas (5% on average) and (2) no information on regional distributions is available. For example, the population in Brazil differs greatly from region to region (rich south vs. poor northeast; the region most affected by declining biodiversity, and therefore probably more willing to contribute to biodiversity conservation is the population of the Amazon and the Pantanal).

Methodology of the study

- In contrast to the surveys in Germany, no personal interviews were conducted, but only online surveys. This means that the surveyed population does not represent the total population of a country, but "only" the online population. Furthermore, it must be taken into account (in a country comparison) that online penetration varies greatly from country to country.

Cultural differences

- When surveys are conducted in different countries, cultural differences or country-specific characteristics must be taken into account. This starts with the language. Thus, a solely formal translation of the questionnaire into the national language is not sufficient; for a country comparison, a cultural translation is necessary (especially for the term "biological diversity").
- In addition, there is a number of other cultural differences - values, religions, norms, world views, etc. - which can have a direct or indirect impact on the respondents' response behaviour. This applies, for example, to response tendencies such as the acquisition/consent tendency: the more the respondents orient themselves to subjectively perceived norms, the more they tend to respond in a socially desirable manner (approval tendency).

In this context, reference is made to the cultural scientist Geert Hofstede. In an empirical study he has developed a model of cultural dimensions. He distinguishes between the following dimensions: individualism vs. collectivism, power distance, masculinity vs. femininity, uncertainty avoidance, exuberance vs. restraint, and long-term vs. short-term orientation (for a summary, see Tautscher 2019). If one looks at the dimensions in the context of the "Societal Indicator of Biological Diversity" it can be assumed that, for example, the degree of long-term orientation (the degree of uncertainty avoidance, individualism, etc.) that prevails in a society has an influence both on the attitudes expressed towards the protection of biological diversity and on the individual willingness to actively contribute to the conservation of biodiversity.



5. Annex: Societal indicator based on structurally equivalent data

Due to the sometimes strong effects of different socio-demographic characteristics on the societal indicator, the raw data was evaluated by age, gender and education. The basis for the evaluation was the average values across all countries. In this way it was possible to examine how the level of the overall and sub-indicators would change if they were calculated for all countries included in the study with structurally similar data (see Figure 9).

Figure 9: Overall indicator and sub-indicators after evaluation of the samples

Figures in percent	∅	ASIA				SOUTH AMERICA				AFRICA	
		China	India	Indonesia	Vietnam	Brazil	Colombia	Mexico	Peru	Kenya	South Africa
Overall indicator*	38	34	39	31	37	18	53	48	48	40	34
Knowledge indicator	61	42	50	49	51	70	80	77	75	55	54
Attitude indicator*	69	75	76	65	80	56	71	67	72	67	63
Behavioural indicator	80	84	82	82	81	38	87	85	85	92	80

Basis: Biodiversity Awareness Study, n=10.328, *n=9.915

■ highly overrepresented ■ strongly underrepresented
■ overrepresented ■ underrepresented



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