Legislation for prevention and control of invasive alien species (IAS), encompassing "Trends in policy responses, legislation and management plans to control and prevent spread of invasive alien species" and "Proportion of countries adopting relevant national legislation and adequately resourcing the prevention or control of invasive alien species"

Key facts

Indicator type	Response
Is the indicator **applicable for national use?**	Yes
Current development status	Developed and ready for use
What is the **coverage**?	Global
Is the indicator **freely available?** If so, where? Please provide a link.	Yes Link:
Is the indicator **peer-reviewed?**	Yes
Who is involved in the production of this indicator/**who are the partners?** Please provide partner logos.	Invasive Species Specialist Group of the Species Survival Commission of the International Union for Conservation of Nature IUCN SSC ISSG Monash University, Australia La Trobe University, Australia

Target information

TARGETS	Please provide details
Please indicate the primary **Aichi target** and any secondary targets that this indicator aligns to?	**Primary:** Target 9 - By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment. **Secondary:** NA
Is the indicator an **official SDG indicator**, if so, for which target?	Target 15.8 - By 2020, introduce measures to prevent the introduction and significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species
Is the indicator **relevant for other SDG targets**? If so please state which.	NA

Is the indicator an **official indicator for other MEA (e.g.** CITES/CMS/RAMSAR**)**, if so, for which targets?	NA
Is the indicator included in the **IPBES core or highlighted** indicators?	IPBES Global Assessment Chapters IPBES Regional Assessment Chapters
Is the indicator **relevant for other MEA targets**? If so please state which.	Convention on the Conservation of Migratory species of Wild Animals (CMS) Ramsar Wetlands Convention

Themes: (What themes is your indicator relevant to?)

THEME	Mark relevant themes with an X
Agriculture	
Marine and freshwater habitats	
Pollution	
Finance, research and knowledge	X
Human well-being	
Policy and conservation actions	X
Species	X
Terrestrial habitats	
Sustainable use of natural resources and land	

Who is the main contact point for the indicator? (Name and email address)

Shyama Pagad (s.pagad@auckland.ac.nz)

Description of the indicator: (what the indicator is/measures, what policy questions it addresses, brief background/history of development).

This indicator measures national and global legislation for prevention and control of invasive alien species (IAS), which encompasses, specifically; trends in policy responses, legislation and management plans to control and prevent spread of invasive alien species; and proportion of countries adopting relevant national legislation and adequately resourcing the prevention or control of invasive alien species.

Explicitly, this indicator aims to quantify trends in the:

1. National adoption of IAS-relevant international policy.
2. Percentage of countries with (a) national legislation and policy relevant to IAS; (b) national strategies for preventing and controlling IAS, and (c) national commitment to IAS related themes.
3. Allocation of resources towards the prevention or control of IAS.

Indicator 1: National adoption of IAS-relevant international policy

Adoption of all multinational agreements considered has increased over the past decade (Table 1). The greatest increase occurred with the International Convention for the Control and Management of Ship's Ballast Water and Sediments (BWM), which observed a 19% increase in signatories (Figure 1). However, the BWM has the fewest signatories overall. Most agreements exhibit uniform adoption across geographic regions. However, the Convention on the Conservation of Migratory Species of Wild Animals (CMS), and the BWM have comparatively lower levels of adoption across East Asia and Africa respectively (Figure 3).
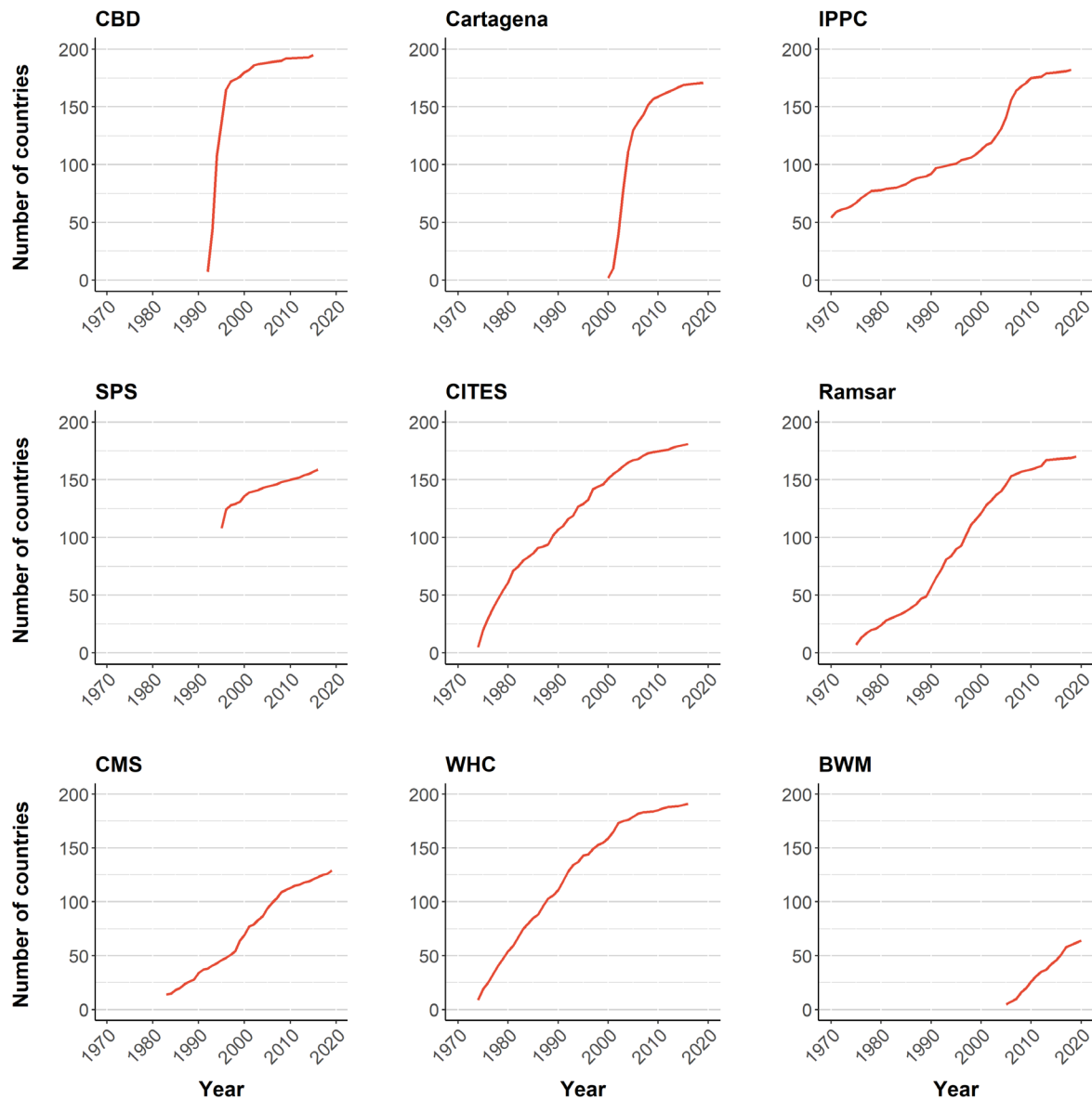
Table 1: Number of countries in 2010 (n = 192) and 2020 (n = 195) having adopted multinational agreements relevant to the prevention and control of invasive alien species. Only countries party to

the Convention on Biological Diversity (CBD) at the time of reporting were considered in the analysis. Nine multinational agreements, in addition to the CBD, were considered.

| International Agreement	2010	2020	Percentage Increase
Convention on Biological Diversity (CBD)	192	195	2%
International Convention for the Control and Management of Ship's Ballast Water and Sediments (BWM)	26	64	19%
Cartagena Protocol (Cartagena)	159	171	6%
Convention on International Trade in Endangered Species (CITES)	175	182	4%
Convention on the Conservation of Migratory species of Wild Animals (CMS)	113	129	8%
International Plant Protection Convention (IPPC)	176	183	4%
The World Organisation for Animal Health (OIE)	179	179	0%
Ramsar Wetlands Convention (Ramsar)	160	171	6%
Agreement on Sanitary and Phytosanitary Measures (SPS Agreement) of the World Trade Organisation (WTO)	149	160	6%
World Heritage Convention (WHC)	186	192	3%
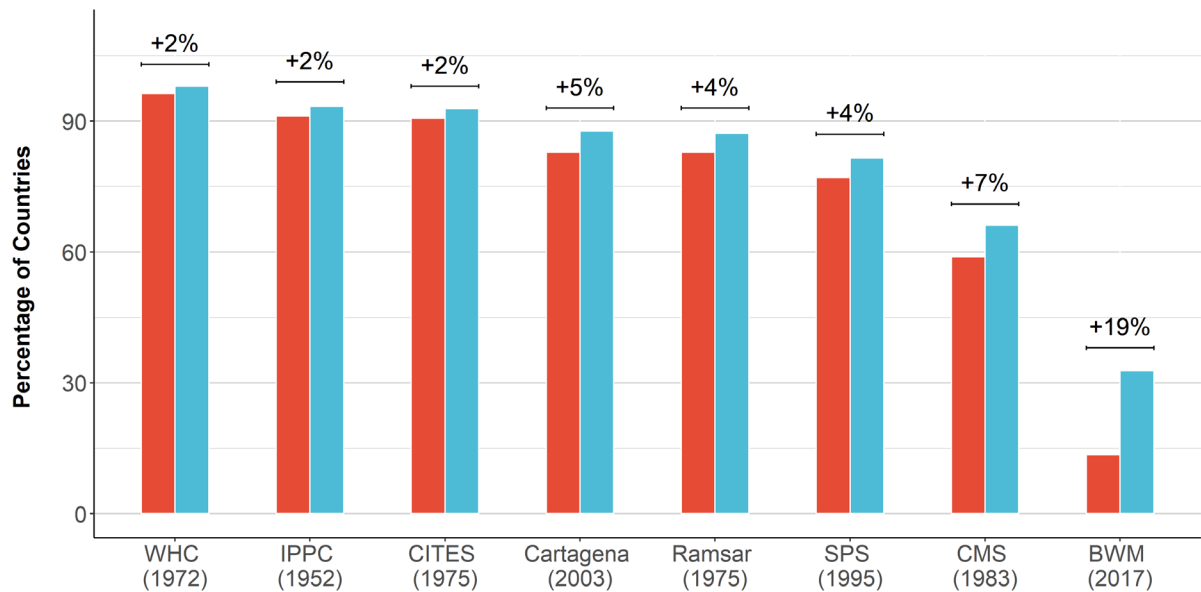
Figure 1: Total percentage of countries in 2010 (red bars; n = 192) and 2020 (blue bars; n = 195), and % increase since 2010 (shown above), signatory to eight multinational agreements relevant to the prevention and control of invasive alien species. Only countries party to the Convention on Biological Diversity at the time of reporting were considered in the analysis. The eight multinational agreements (year of establishment below acronym in figure) analysed were the Cartagena Protocol (Cartagena), the International Plant Protection Convention (IPPC), the Agreement on Sanitary and Phytosanitary Measures of the World Trade Organisation (SPS), the Convention on International Trade in Endangered Species (CITES), the Ramsar Wetlands Convention (Ramsar), the Convention on the Conservation of Migratory species of Wild Animals (CMS), the World Heritage Convention (WHC), and the International Convention for the Control and Management of Ship's Ballast Water and Sediments (BWM).
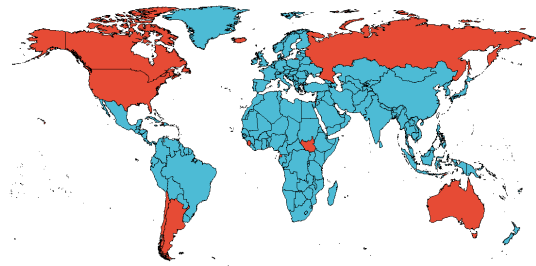
Figure 2: Adoption of nine multinational agreements relevant to the prevention and control of invasive alien species (1970 - 2020). Only countries currently party to the Convention on Biological Diversity were included in the analysis. The nine multinational agreements analysed were the Convention on Biological Diversity (CBD), the Cartagena Protocol (Cartagena), the International Plant Protection Convention (IPPC), the Agreement on Sanitary and Phytosanitary Measures of the World Trade Organisation (SPS), the Convention on International Trade in Endangered Species (CITES), the Ramsar Wetlands Convention (Ramsar), the Convention on the Conservation of Migratory species of Wild Animals (CMS), the World Heritage Convention (WHC), and the International Convention for the Control and Management of Ship's Ballast Water and Sediments (BWM).
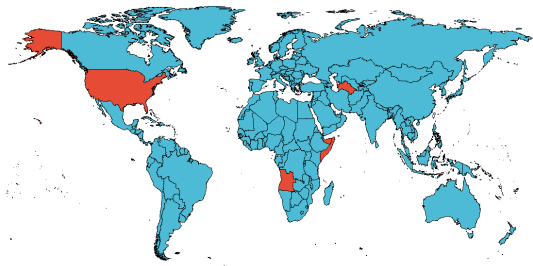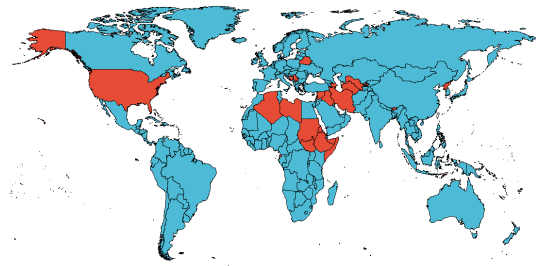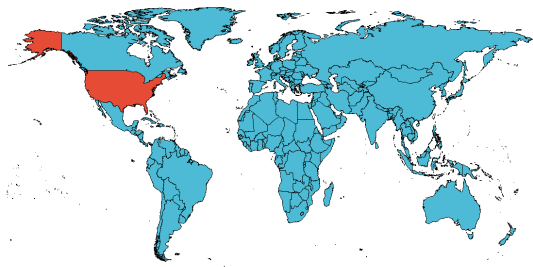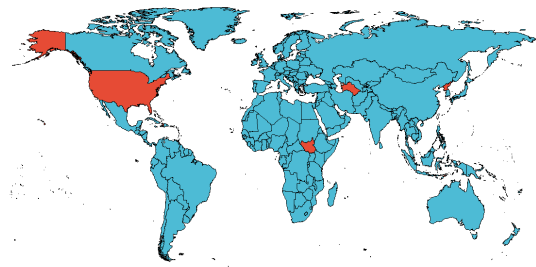
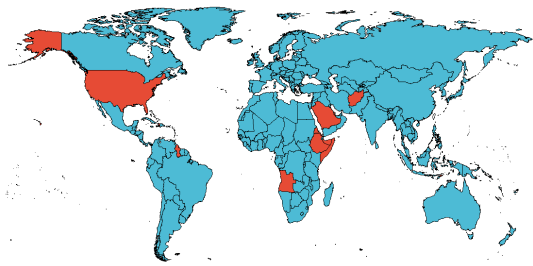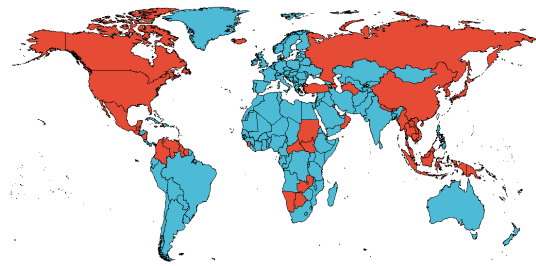**CBD**
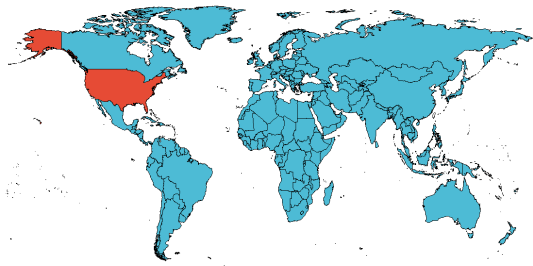
Cartagena

IPPC
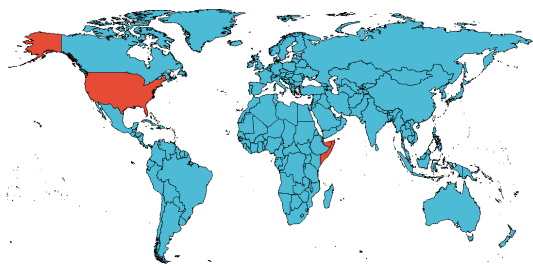
SPS

OIE

CITES

Ramsar

CMS

WHC

BWM
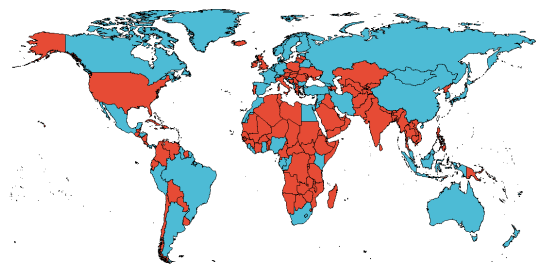
Figure 3: Countries that have adopted (in blue) multinational agreements relevant to the prevention and control of invasive alien species. Only countries party to the Convention on Biological Diversity were considered in the analysis. Multinational agreements include: the Convention on Biological diversity (CBD), the Cartagena Protocol (Cartagena), the International Plant Protection Convention (IPPC), the Agreement on Sanitary and Phytosanitary Measures of the World Trade Organisation (SPS), the World Organisation for Animal Health (OIE), the Convention on International Trade in Endangered Species (CITES), the Ramsar Wetlands Convention (Ramsar), the Convention on the Conservation of Migratory species of Wild Animals (CMS), the World Heritage Convention (WHC), and the International Convention for the Control and Management of Ship's Ballast Water and Sediments (BWM).

# Indicator 2a: National legislation and policy relevant to IAS

- 190 countries party to Convention on Biological Diversity now have national legislation relevant to IAS (Figure 4).

- Around 20% of countries have national legislation/ regulation specifically targeting IAS (Table 2). They include the United Kingdom, Argentina, Norway, Iceland, Japan and Montenegro. Note: the European Union regulation applies to its 27 member states even if the member states have no national legislation. In many cases (including Italy) there is also a national legislation to provide details on the roles and competencies at the national level

- In addition to national legislation related to animal and plant health[1] that is broadly relevant to IAS, 69% of countries have legislation relevant to IAS in other sectors (Figure 4). These include protected area and fisheries (mostly related to introduction of species through aquaculture, mariculture and the aquarium trade) legislation (Figure 4).

Table 2: Examples of national legislation focused on invasive alien species

National Legislation	Country
Resolución Nº 376/97 - Medidas para la introducción de ejemplares de una nueva especie exótica al país, cualquiera fuera la causa o destino de la misma.	Argentina
Invasive Alien Species Act (No. 78 of 2004)	Japan
Law on alien and invasive alien species of plants, animals and fungi.	Montenegro
Invasive Alien Species (Enforcement and Permitting) Order 2019 (S.I. No. 527 of 2019);	United Kingdom
Regulation (EU) No 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species	European Union

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[1] **The International Plant Protection Convention (IPPC)** is an international treaty relating to plant health. It is a binding instrument which provides a framework for international cooperation to prevent the spread of pests of plants and plant products between countries and to promote appropriate measures for their control within countries. IPPC recognizes the threat that alien species- weeds, pests and diseases pose to native and cultivated plants and ecosystems. Measures related to these threat form part of the Regulatory Framework of the IPPC. While the Convention applies mainly to quarantine pests involved with international trade, it extends to the protection of natural flora and plant products and pests that affect unmanaged ecosystems.

The World Organization for Animal Health (Office International des Epizooties or OIE) in November 2011 published specific "Guidelines for assessing the risk of non-native animals becoming invasive". The OIE standard for import risk analysis covers the potential movement of pathogens. The guidelines developed in the document mentioned above are intended to address the complementary process of assessing the risk of non-native animals becoming invasive.
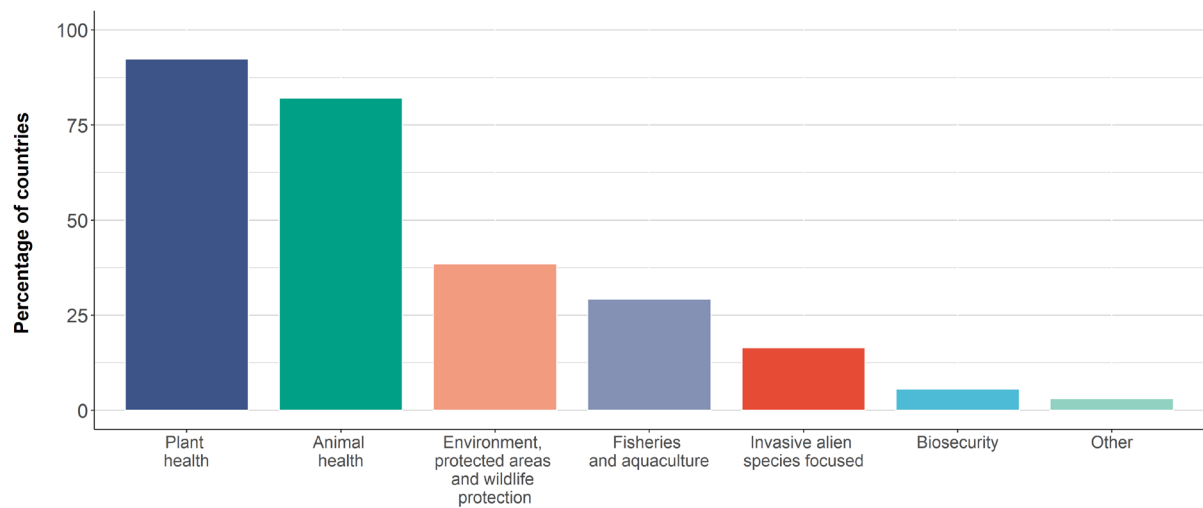
Figure 4: Adoption of national legislation relevant to the prevention and/or control of IAS for 195 countries reporting to the Convention on Biological Diversity. The percentage of countries (number of countries above bars) and national sectoral legislation with IAS-relevant legislation is shown.

Indicator 2b: National strategies for preventing and controlling IAS

Of the 195 countries party to the Convention on Biological Diversity, 80% (n = 156) have targets related to IAS management in their NBSAPS[2]. 74% (n = 145) of these countries have aligned their IAS targets to Aichi Biodiversity Target 9 (Figure 5). Although not included in analysis, the European Union has also aligned its IAS targets with Aichi Biodiversity Target 9.
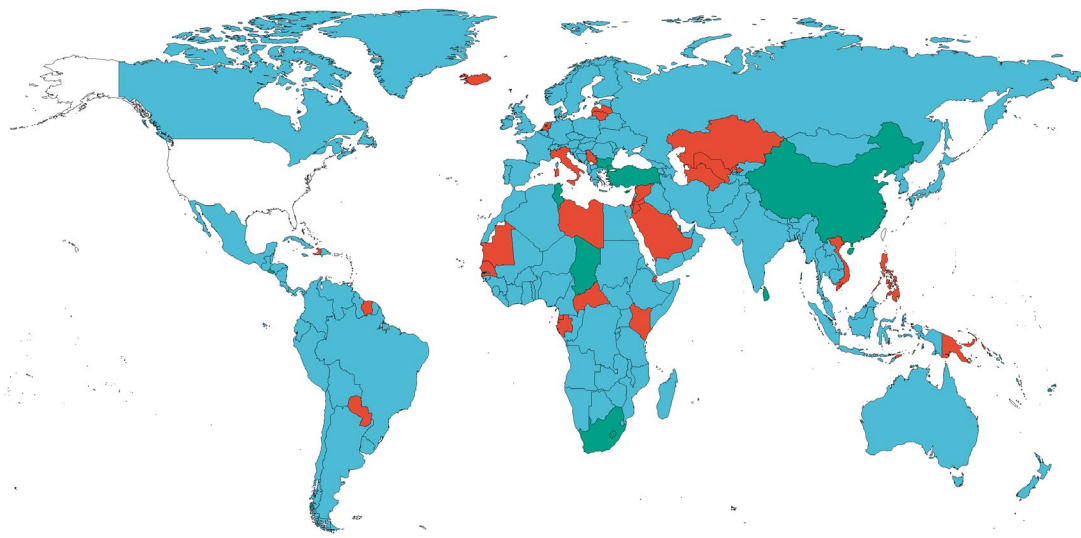
Figure 5: Countries that have aligned their IAS targets to Aichi Biodiversity Target 9 (blue). Those countries with IAS targets partially aligned with Aichi Target 9 (green), and those without an NBSAP (red) are also shown. Only countries party to the Convention on Biological Diversity were considered in the analysis.

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[2] According to the CBD < https://www.cbd.int/nbsap/> 157 Parties have taken the Strategic Plan for Biodiversity (2011-2020) into account while preparing their post 2010 NBSAPS, 13 Parties have not taken the Strategic plan into account. 21 Parties have not submitted an NBSAP post 2010 and 5 Parties are yet to submit an NBSAP

Indicator 2c: National commitment to IAS related themes

On average across all IAS related themes, institutions in 74% of countries have a clear legal mandate and/or necessary powers to implement policy instruments related to the management of IAS (Table 3). Across policy instruments, more institutions have a clear legal mandate in comparison with the necessary powers to manage IAS (Figure 6). The development of plans and policies, management of intentional introductions, and commitment to public awareness of IAS has the highest level of commitment (Figure 6). Fewer countries have the necessary powers across themes in comparison with the number that have a clear legal mandate (Figure 6). Across IPBES regions, Asia and the Pacific, Europe and Central Asia, and the Americas have the highest percentage of countries with mandates and powers to manage invasive alien species (Figure 7; Figure 8).

Table 3: Policy implementation instruments in place across countries. Number of countries (n = 141) whose institutions have a clear legal mandate and/or necessary powers to support nine policy implementation instruments for invasive alien species (IAS) management.

IAS theme	Description	Legal mandate	Necessary powers
Contain and eradicate	Containment and eradication of populations of IAS within the country	98	83
Enforcement	Enforcement of relevant legal provisions regarding the control of IAS	106	94
Information management	Recording and management of information on IAS	106	99
Prevention - intentional	Prevention of the intentional introduction of species assessed as potentially invasive (including importation for the purposes of agriculture, aquaculture, the nursery trade, farming and animal breeding, the pet trade etc.)	112	105
Monitor and detect	Monitoring and surveillance programmes to detect founder populations of IAS at an early stage	104	101
Plans and policies	Development of national plans and policies in relation to invasive alien species	121	115
Public awareness	Promotion of public awareness of IAS issues	110	105
Risk analysis	Risk analyses of potentially invasive species	103	100
Prevention - unintentional	Minimising the unintentional introduction of alien species	108	98
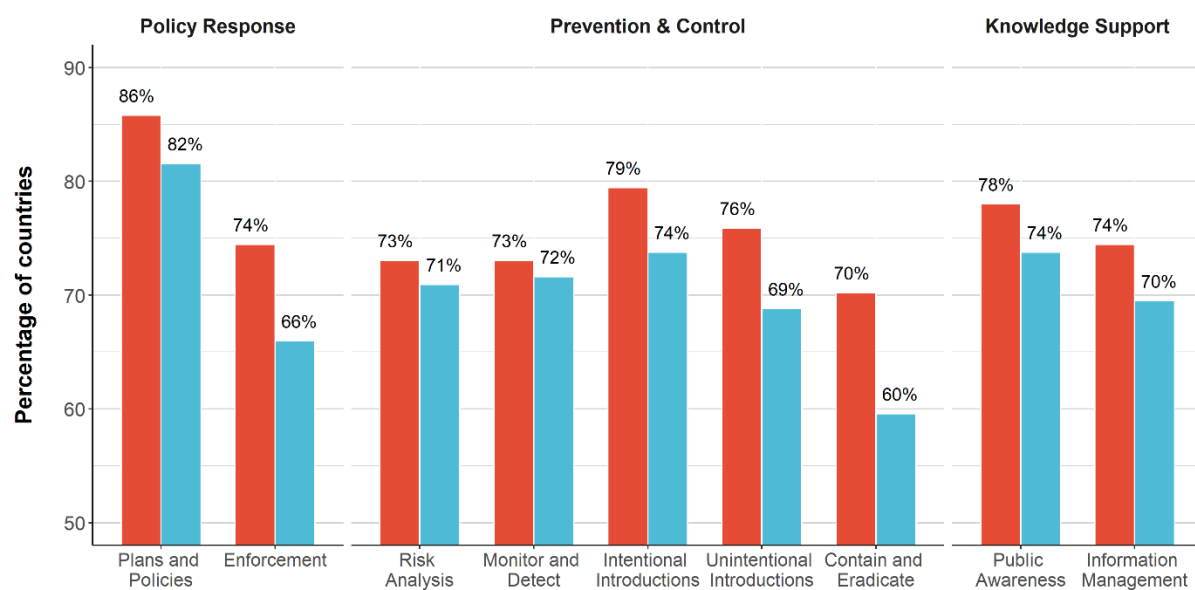
Figure 6: Percentage of countries surveyed (n = 141) with institutions that have a clear legal mandate (red bars) and/or necessary powers (blue bars) to support the nine policy instruments related to invasive alien species (IAS) management (Table 3). Themes relate to three broad categories of response; policy response, prevention and control, and knowledge support.
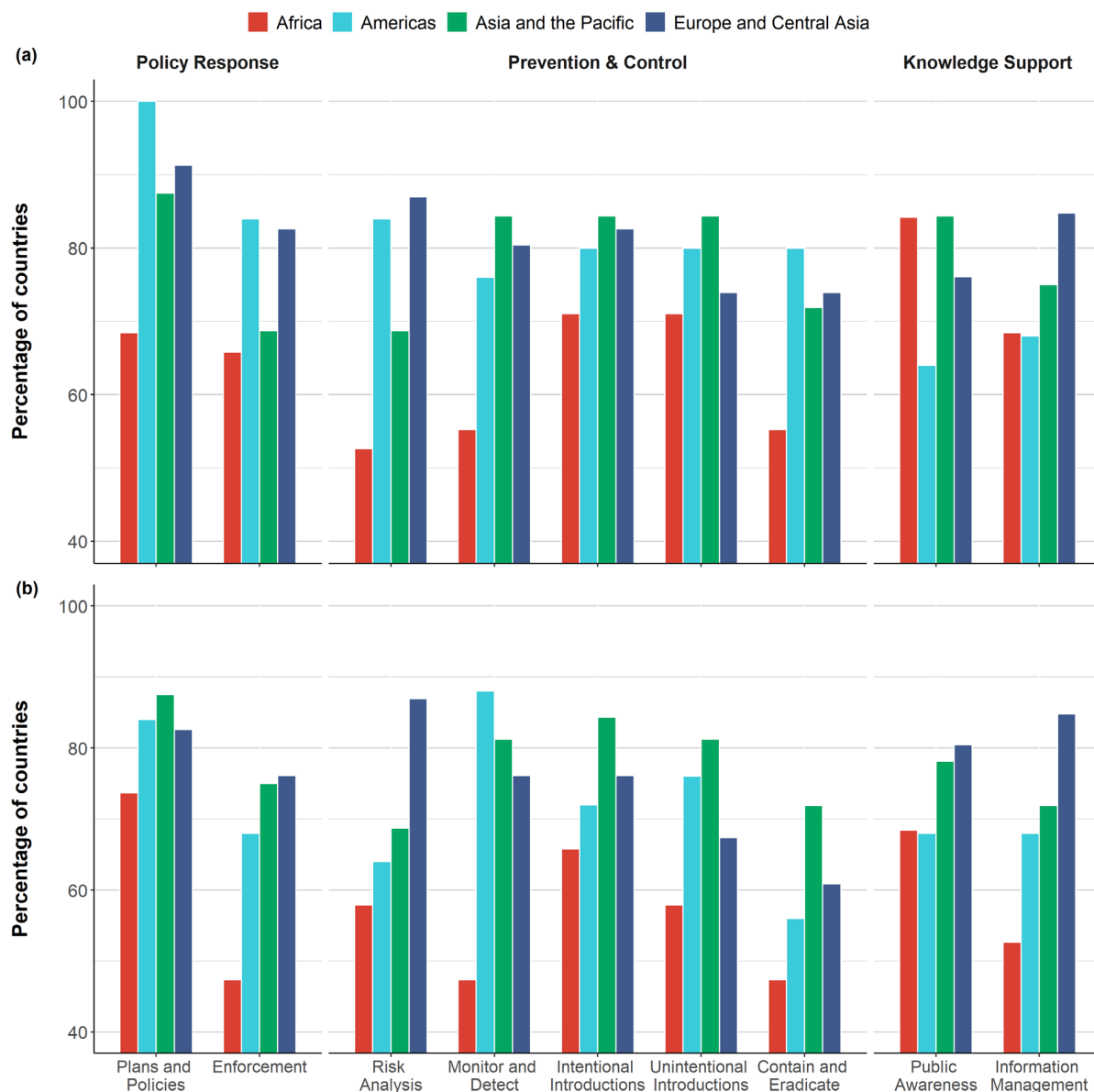
Figure 7: Percentage of countries surveyed within each IPBES region whose institutions have a (a) clear legal mandate and/or (b) necessary powers to support nine instruments related to invasive alien species (IAS) management (Africa: n = 38, Americas: n = 25, Asia and the Pacific: n = 32, Europe and Central Asia: n = 46). Themes relate to three broad categories: policy response, prevention and control, and knowledge support.
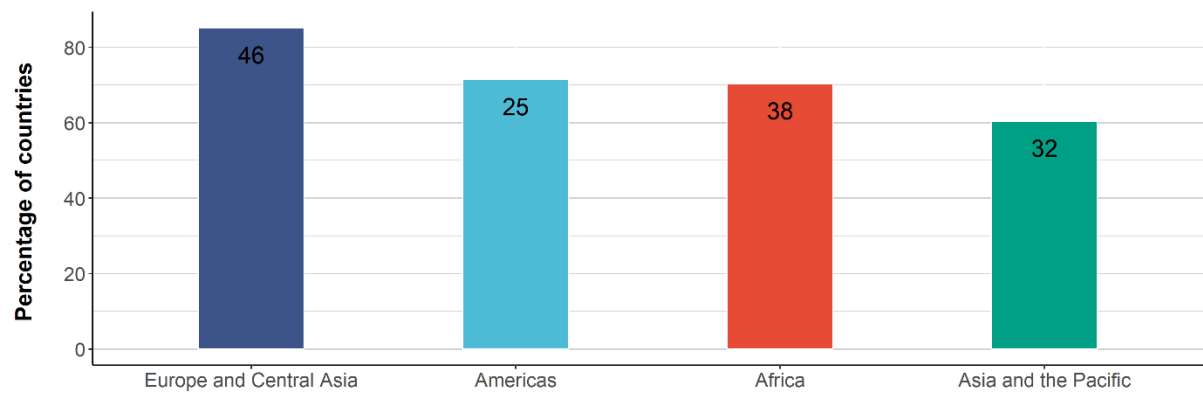
Figure 8: Percentage of countries per IPBES region that returned survey results (number of countries shown within bars). Total number of countries surveyed per region: Africa (n = 54), Americas (n = 35), Asia and the Pacific (n = 53), Europe and Central Asia (n = 54).

Indicator 3: Allocation of resources towards the prevention or control of IAS

Almost half of the countries surveyed (n = 141) have neither a national budget allocation or have accessed funding from any global financial mechanism for IAS prevention or control activities. Of those countries that have access to a source of funding, 46 have a national budget allocation only, 14 only receive funding through a global financial mechanism, and 18 receive funding from both national and global sources (Table 4; Figure 9). Across IPBES regions, Africa had the most countries with no access to funding (Figure 10). The Europe and Central Asia was the only region that did not access global funding for IAS related activities (Figure 10).

55 countries indicated that they have also developed a National Invasive Species Strategy and Action Plan (NISSAP). Of the 55 countries that reported having a NISSAP, only 47 of these are accessible online.

Table 4: Sources of funding for the prevention and control of IAS for the 141 surveyed countries in 2020. 'National funding only' refers to a national budget allocation, and 'global funding only' refers to a global financial mechanism as funding sources for IAS related activities.

Funding sources	Number of countries	Percentage of countries
Global Funding Only	14	10%
National & Global Funding	18	13%
National Funding Only	46	33%
No Funding	63	45%
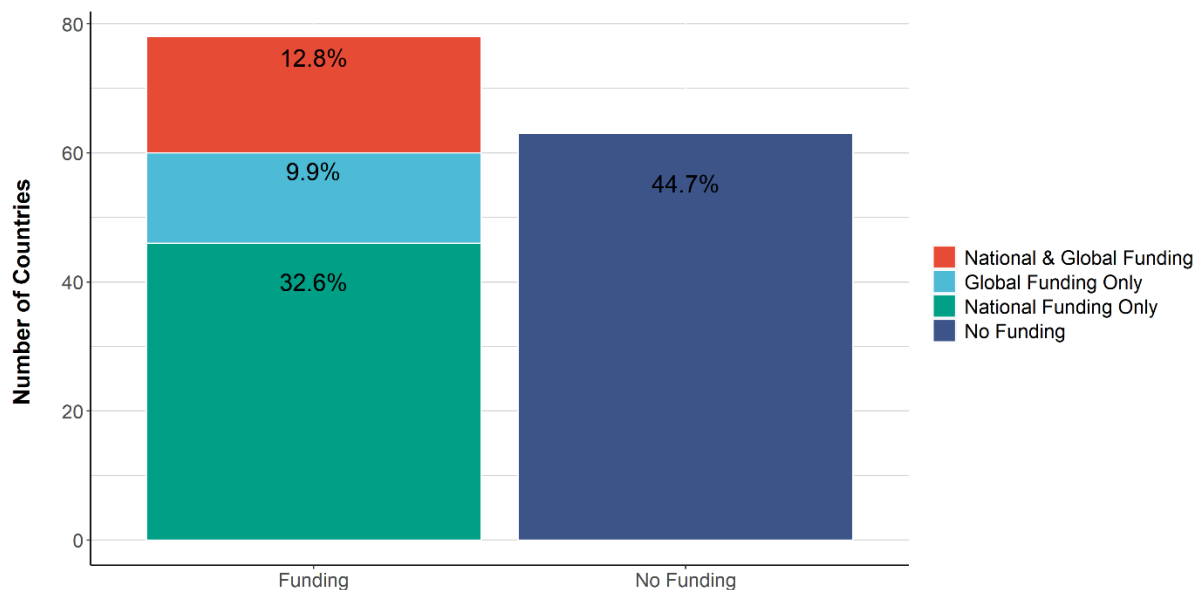
Figure 9: Allocation of financial resources (both national and through global financial mechanisms) towards the prevention and control of IAS.
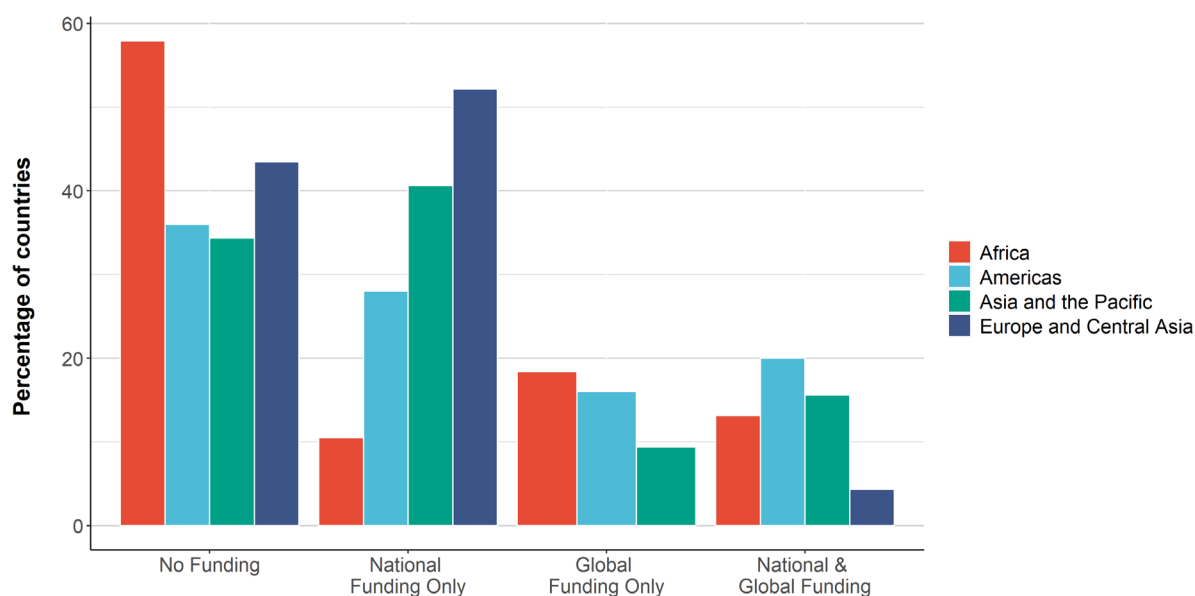
Figure 10: Percentage of countries per IPBES region that have accessed different funding sources for IAS prevention and control (Africa: n = 38, Americas: n = 25, Asia and the Pacific: n = 32, Europe and Central Asia: n = 46).

There has been small improvement in the adoption by countries of policy relevant to invasive alien species over the last decade, although this comes off a high baseline of adoption by countries overall (over 80% of countries in most cases). The main exception to this is the most recent convention on ballast water and sediment (BWM, Table 1), where adoption rose from 14 to 33 % over the decade. A 19% increase in adoption by countries of this convention that is a key instrument in reducing the spread and rate of introduction of marine invasive alien species is lower than desirable considering the importance of this pathway as a driver of biological invasion.

There has been a substantial increase in countries adopting national-level legislation since 2010, although legislation specifically targeting invasive alien species that negatively impact biodiversity and ecosystems remains low (<17%).

There is widespread adoption of IAS targets by countries, as well as generally close alignment between national-level targets and Aichi Target 9. In addition, the majority of these countries have a clear legal mandate to implement IAS policy (Table 3), although necessary powers of implementation to support IAS management is somewhat lower. Levels of existing mandate and powers are lower across some IPBES regions than others, in particular lower across Africa and the Americas in comparison with Europe and central Asia (although aggregation of country data by IPBES region for this purpose belies intraregional variation).

Resource allocation in support of IAS prevention and control remains woefully inadequate, with 45 % of countries surveyed reporting no funding allocation for this purpose. Global funding mechanisms remain important with 23% of countries relying entirely or partly on global financial mechanisms to support IAS related activities (Table 4).

Data and methodology: (please delete/add info as appropriate)

Coverage: Global

Scale: Global data – aggregated from national data

Time series available: 1950 to 2020

Next planned update: 2022

Possible disaggregation: by IPBES regions and by country

Metadata used:

Four datasets were updated for the measurement of this indicator:

Dataset 1: Countries commitments to global conventions/international agreements relevant to IAS,

Dataset 2: National legislation considered relevant to the prevention and/or control of IAS

Dataset 3: National Biodiversity Strategy and Action Plan (NBSAP) targets alignment to Aichi Biodiversity target 9,

Dataset 4: Results of an online survey on policy responses, mandates, legal authority and resourcing to manage the threat of IAS.

Key Data sources:

- Food and Agriculture Organisation of the United Nations 2020 FAOLEX database <http://www.fao.org/faolex/en/>
- InforMEA United Nations Information Portal on Multilateral Environmental Agreements <https://www.informea.org/en/about>
- CBD – National Biodiversity Strategies and Action Plans (NBSAPS) <https://www.cbd.int/nbsap/>

Methodology:

This indicator measures the adoption of policy by countries for the prevention and control of invasive alien species (IAS), by quantifying trends in (1) the national adoption of IAS-relevant international policy; (2) the percentage of countries with (a) national legislation and policy relevant to IAS; (b) national strategies for preventing and controlling IAS, and (c) national commitment to IAS related themes; and (3) the allocation of resources towards the prevention or control of IAS. These trends were analysed to provide five indicators on policy adoption for the prevention and control of IAS using four datasets:

Dataset 1: Countries commitments to global conventions/international agreements relevant to IAS,

Dataset 2: National legislation considered relevant to the prevention and/or control of IAS

Dataset 3: National Biodiversity Strategy and Action Plan (NBSAP) targets alignment to Aichi Biodiversity target 9,

Dataset 4: Results of an online survey on policy responses, mandates, legal authority and resourcing to manage the threat of IAS.

Each indicator was calculated as follows:

Indicator 1: National adoption of IAS-relevant international policy

This indicator measured change in the adoption of nine multinational agreements by countries signatory to the Convention on Biological Diversity (CBD), excluding the European Union as an entity (n = 195). The nine multinational agreements analysed were, the Cartagena Protocol (Cartagena), the International Plant Protection Convention (IPPC), the Agreement on Sanitary and Phytosanitary Measures of the World Trade Organisation (SPS), the World Organisation for Animal Health (OIE), the Convention on International Trade in Endangered Species (CITES), the Ramsar Wetlands Convention (Ramsar), the Convention on the Conservation of Migratory species of Wild Animals (CMS), the World Heritage Convention (WHC), and the International Convention for the Control and Management of Ship's Ballast Water and Sediments (BWM).

The year of accession/ratification was recorded, or if the country had adopted the agreement in the case of the OIE. 2010 was used a baseline to assess change in adoption over the past decade. Dataset 1 was used for the analysis of this indicator.

Indicator 2a: National legislation and policy relevant to IAS

Indicator 2a was analysed using dataset 2. All countries currently party to the Convention on Biological Diversity were considered in the analysis (n = 195), excluding the European Union as an entity. Data for five countries were not comparable and were not included.

This indicator analysed national legislation relevant to IAS. Across countries, IAS relevant policies are found in legislations, regulations and acts related to the Environment, Forestry, Plant health, Animal health, Fisheries, Water, Species including Wild Fauna and Flora and Genetically Modified Organism (GMO). Most countries adopt a sectoral approach to IAS management. A few have adopted a more focused approach- one example is the 2014 Regulation (EU) No 1143/2014 of the European Parliament on the prevention and management of the introduction and spread of invasive alien species.

To quantify adoption of IAS relevant policies, seven national legislation sectors were considered; animal health, plant health, environment (including protected areas and wildlife protection), biosecurity, fisheries and aquaculture (including wetlands and marine legislation), invasive alien species, and others (including hunting well as policy on particular species, such as the Giant African Snail, *Achatina fulica*). Examples of national legislation focused on IAS specifically were noted.

Indicator 2b: National strategies for preventing and controlling IAS

The analysis of indicator 2b used data provided in dataset 3. All countries currently party to the Convention on Biological Diversity were considered in the analysis (n = 195), excluding the European Union as an entity. This indicator measured whether countries firstly had targets related to IAS management in their NBSAPS, and secondly, whether these targets were aligned to Aichi Biodiversity Target 9.

NBSAPS are a key policy instrument that reflect, how national biodiversity strategies intend to fulfil the obligations of the CBD, and how the related action plans outline the steps to be taken to meet these goals. All parties to the CBD are obligated to revise their NBSAPS to reflect compliance with the revised Strategic Plan and Aichi Targets.

Indicator 2c: National commitment to IAS related themes

The analysis of indicator 2c used data provided in the dataset 4, the results of an online survey of 196 countries. 73% of countries returned surveys (n = 142). Of these, data for one country was not comparable and was excluded from analysis. All countries were analysed together and then grouped according to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) geographic regions. This indicator quantified the commitment of countries to key IAS themes[3] and whether they had a clear legal mandate and/or necessary powers to execute them:

  a. Development of national plans and policies in relation to invasive alien species (Plans and Policies)

  b. Risk analyses of potentially invasive species (Risk Analyses)

  c. Prevention of the intentional introduction of species assessed as potentially invasive (including importation for the purposes of agriculture, aquaculture, the nursery trade, farming and animal breeding, the pet trade etc.) (Intentional Introduction)

  d. Minimising the unintentional introduction of alien species (Unintentional introduction)

  e. Promotion of public awareness of IAS issues (Public awareness)

  f. Monitoring and surveillance programmes to detect founder populations of IAS at an early stage (Monitor and Detect)

  g. Containment and eradication of populations of IAS within the country (Eradicate and Contain)

  h. Recording and management of information on IAS (Information management)

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[3] Adapted from Shine, C., 2008, A toolkit for developing legal and institutional frameworks for invasive alien species. Global Invasive Species Programme, Nairobi)

i.   Enforcement of relevant legal provisions regarding the control of IAS (Enforcement)

Indicator 3: Allocation of resources towards the prevention or control of IAS

The analysis of indicator 3 used data provided in the dataset 4, the results of an online survey of 196 countries. 73% of countries returned surveys (n = 142). Of these, data for one country was not comparable and was excluded from analysis. This indicator analysed how countries allocate resources to facilitate the implementation of IAS management actions. Respondents were asked if their countries had a) an allocation from the National budget to manage the threat of IAS, and b) if the country had accessed funding from any global financial mechanisms such as the Global Environment Fund (GEF) for implementing projects related to IAS management. All countries were analysed together and then grouped according to the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) geographic regions.

Producing this indicator nationally: Please provide a brief description on how easy it is to produce this indicator at the national level

Several of these indicators use national level data and others are not appropriate for national scale use as a trend-based indicator.

Use of the global method and data at the national level: Please provide explanatory text in the box below which answers the following questions:

Are there national subsets of global data available for use to calculate this indicator?

All data can be disaggregated nationally and by region

Can the indicator methodology be applied with in-country data to develop a national indicator?

In part

Is there guidance on how to produce the indicator at the national level? Please provide a link to available guidance.

No

Examples of national use: Please provide examples on where and how the indicator has been used at the national level, and links to case studies if available

NA

Availability of global data for national use: Please add an 'X' to the option that applies and provide a link if data is freely available

Freely available for non-commercial use	Available with agreements in place with providers	Contact provider
	X	IUCN SSC Invasive Species Specialist Group

Contact person(s) for supporting national use: Please provide an alternative contact name and email address if this is different than the main indicator contacts

Shyama Pagad

Further resources: Details of further information – publications and links

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