Report- Supporting the ‘Thematic assessment of Invasive Alien Species and their control’ of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)

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Contents

Introduction .............................................................................................................................. 2
IUCN Species Survival Commission (SSC) Invasive Species Specialist Group ............... 2
IPBES and the Invasive Alien Species Assessment ............................................................... 2
IUCN ISSG’s original contribution to IPBES IAS assessment ............................................. 3

Methods ..................................................................................................................................... 3
Dataset 1: Countries commitments to global conventions/international agreements relevant to IAS .................................................................................................................. 4
Dataset 2: National legislation considered relevant to the prevention and/or control of IAS ......................................................................................................................... 4
Dataset 3: National Biodiversity Strategy and Action Plan (NBSAP) targets alignment to Aichi Biodiversity target 9 ...................................................................................... 4
Dataset 4: Results of an online survey on policy responses, mandates, legal authority, and resourcing to manage the threat of IAS ................................................................. 5

Results ....................................................................................................................................... 6
Indicator 1: National adoption of IAS-relevant international policy ..................................... 6
Indicator 2a: National legislation and policy relevant to IAS .................................................. 11
Indicator 2b: National strategies for preventing and controlling IAS .................................. 12
Indicator 2c: National commitment to IAS related themes .................................................. 13
Indicator 3: Allocation of resources towards the prevention or control of IAS ....................... 18

Acknowledgement .................................................................................................................. 20

References ................................................................................................................................... 20
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Introduction

IUCN Species Survival Commission (SSC) Invasive Species Specialist Group

The IUCN SSC Invasive Species Specialist Group (ISSG) is the lead agency in the development of invasive species related indicators within the Biodiversity Indicators Partnership (BIP) of the UNEP-WCMC and custodian of this suite of indicators; and has committed to update the measures and develop trends that would inform global processes such as the IPBES assessments, Global Biodiversity Outlook, etc.

The IUCN ISSG is also one of the leading providers of open-access data and information on Invasive Alien Species (IAS). The data and information are available to users via the knowledge products of the ISSG, The Global Invasive Species Database (GISD) and the Global Register of Introduced and Invasive Species (GRIIS). Data in the form of customised datasets is provided to researchers and decision makers on request. ISSG is also working with other global institutions such as the Global Biodiversity Information Facility (GBIF) (so these infrastructures provide their users with IAS data) and The Group on Earth Observations Biodiversity Observation Network (GEO BON) (develop indicators related to IAS for monitoring). IUCN ISSG is therefore able to provide key datasets and analyses in the field of IAS.

IPBES and the Invasive Alien Species (IAS) Assessment

The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) is an independent intergovernmental body, established by member States in 2012 (139 States in 2020). The objective of IPBES is to strengthen the science-policy interface for biodiversity and ecosystem services for the conservation and sustainable use of biodiversity, long-term human well-being and sustainable development (see also Diaz et al., 2015).

In the IPBES Regional Assessments and Global Assessment Report, invasive alien species were identified as one of the main direct drivers of biodiversity loss worldwide. The rapidly growing threat that invasive alien species pose to biodiversity, ecosystem services, sustainable development and human well-being is, however, generally poorly quantified and little understood by decision makers (https://ipbes.net/invasive-alien-species-assessment).

In Medellin, Colombia in 2018, the IPBES Plenary approved the undertaking of a thematic assessment of invasive alien species and their control. The assessment report is scheduled to be presented for the Plenary’s acceptance, and its summary for policymakers for its approval, presumably in 2022. The IPBES assessment will assess the status and trends of invasive alien species, their impacts, their drivers, their management, and options for policy to deal with the challenges they pose. The assessment considers various knowledge and value systems including local and indigenous knowledge.
The assessment will aim to address questions of relevance to decision makers dealing with IAS, such as:

- What progress has been made in tackling the Aichi Biodiversity Targets of relevance to IAS globally?
- What global-level policy initiatives would assist in IAS prevention and management?
- What are the obstacles to the uptake of IAS prevention and management measures?
- What methods are available for prioritizing IAS threats?
- How can networks assist in the prevention and management of IAS? What role can regional partnerships play?
- Are there perverse policy drivers that unintentionally create risks in relation to IAS?
- How can decision makers decide which issues to tackle first given limited resources?
- Would there be value in developing a database of effective legislation, monitoring and response systems for IAS, and of those countries and other stakeholders in need of capacity-building?
- What are the impacts, risks and benefits of IAS for biodiversity and ecosystem services, sustainable development and human well-being?
- How might policy sectors, businesses, non-governmental organizations and other stakeholders benefit from better prevention and management of IAS?
- How does one prevent and manage IAS that cause harm to biodiversity but contribute to economic activities?

IUCN ISSG’s original contribution to IPBES IAS assessment

In relation to the IPBES IAS assessment, this IUCN ISSG report aims to deliver an update on the policy responses, legislation and management measures to control and prevent the spread of IAS (in particular, a 2020 update of the BIP indicator related to Policy responses and the Sustainable Development Goals (SDG) 15.8.1). This information will be relevant for the IPBES Assessment Chapter 6.

The first measurement of this indicator was completed in 2010, where aims (1) national adoption of IAS-relevant international policy, (2) (a) and (b) percentage of countries with (a) national legislation and policy relevant to IAS; (b) national strategies for preventing and controlling IAS were addressed as per the relevant target at that time. The second measure in 2017 additionally included (2) (c) national commitment (mandate and legal authority) to key IAS related themes, and (3) resourcing by national governments for the prevention and control of IAS, as identified by the Sustainable Development Goals indicator 15.8.1 (“Proportion of countries adopting relevant national legislation and adequately resourcing the prevention or control of invasive alien species”).

Methods

This indicator measures the adoption of policy by countries for the prevention and control of 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 (see Figure 1). The following datasets and information were compiled (attached Appendix 1-4) to complete analyses.

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

The signing and ratification by parties to the CBD, of nine selected global conventions/multilateral agreements that had some relevance to IAS, were studied to measure the change in the adoption of by countries signatory to the Convention on Biological Diversity (CBD), excluding the European Union. The nine selected conventions/multilateral agreements 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). Results were analysed and are presented below. Sources of data included InforMEA1 and CBD country profile pages2. The data was compiled in a database (Dataset 1 see Appendix 1). Results were analysed and are presented below.

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

Two key resources, FAOLEX3 and ECOLEX4 were used to compile data and information on changes in national legislation adopted and enacted to prevent the introduction and manage the spread of IAS. Additionally, national government websites were also consulted for additional information. The data and information were collated in an Excel file – Dataset 2 (see Appendix 2). Notes were documented, including key words to describe the type of legislation e.g. Plant health, Animal Health, Fisheries and Aquaculture, Environment, Protected areas and Invasive Alien Species. A comparison was made with results from the previous two measures and results analysed.

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

Article 6 of the Convention requires each Contracting Party of the CBD, in accordance with its capacity, to develop national strategies, plans or programmes for the conservation and sustainable use of biological diversity or adapt existing strategies, plans or programmes that will reflect measures set out in this Convention. A national strategy will reflect how the country intends to fulfill the objectives of the Convention considering specific national circumstances, and the related action plans will constitute the sequence of steps to be taken to meet these goals. National strategies reflect varying degrees of compliance with the goals and targets set out in the Strategic Plan for Biodiversity (2011- 2020).

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1 InforMEA- The United Nations Portal on Multilateral Agreements <https://www.informea.org/en>
2 CBD Country profiles <https://www.cbd.int/countries/>
4 ECOLEX- the gateway to Environmental Law operated jointly by FAO, IUCN and UNEP <https://www.ecolex.org/>
Data provided by the CBD elaborates the status of submissions of NBSAPs and their compliance to the Strategic Plan

- Parties whose post-2010 NBSAP takes the Strategic Plan for Biodiversity (2011-2020) into account: 157
- Parties whose post-2010 NBSAP does not take the Strategic Plan for Biodiversity (2011-2020) into account: 13
- Parties who have not yet submitted a post-2010 NBSAP: 21
- Parties that have not yet submitted an NBSAP: 5

NBSAPs submitted by all contracting parties were studied to find out if targets set out were directly aligned to Goal B Aichi target 9\(^5\) set out in the Strategic Plan for Biodiversity. The data was compiled as Dataset 3 (see Appendix 3) and analysed.

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

An update of an online survey (see Appendix 4 for survey form) conducted in 2017, was launched in the beginning of March 2020 to collate data and information on the resourcing by national governments to prevent the introduction of and manage the spread of IAS.

Difficulties with sourcing information from countries regarding the level of national investment in IAS management at the pre-border, border, and post—border stages have prompted the use of proxy-indicators, such as:

- Has the threat of IAS been addressed in National Biodiversity Strategy and Action Plans (NBSAPs)?
- Have governments developed a National Invasive Alien Species Strategy and Action Plan (NISSAP)?
- Do governments have a dedicated (staffed) programme on IAS management?
- Have governments or other agents secured any funding from global financial mechanisms such as the Global Environment Fund (GEF) for implementing IAS related projects?

In the first instance, National Statistical Officers (NSO’s) were contacted by email including details of what the survey was about and why it was being conducted. If no response was received after two reminders, National CBD focal points were contacted. NSOs in some cases forwarded the request to the Depts of Environment. The survey closed on July 31\(^{st}\). Eight rounds of reminders and follow-up messages were sent to representatives of each country. A version of the survey in Word and PDF format was also attached for those who preferred to complete the survey by email. 143 of the 196 countries contacted completed the survey, 142 were valid and one was disqualified for not completing key components of the survey.

\(^5\) TARGET 9 - Technical Rationale extended (provided in document COP/10/INF/12/Rev.1) <https://www.cbd.int/sp/targets/rationale/target-9/>
Results of this update including analyses are described below.

Results

Indicator 1: National adoption of IAS-relevant international policy

Methods: The analysis of indicator 1 used data provided in the Global-conventions_2020.xlsx file. All countries currently party to the Convention on Biological Diversity were considered in the analysis (n = 195).

Results: Adoption of all international agreements considered has increased over the past decade (Table 1; Figure 2). The greatest increase occurred in relation to the International Convention for the Control and Management of Ship’s Ballast Water and Sediments (BWM), which observed a 19% increase in signatories (Figure 3). However, the BWM has the least number of 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 little adoption by East Asian and African countries respectively (Figure 4).

Table 1: Number of countries in 2010 (n = 192) and 2020 (n = 195) having adopted international 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 international agreements, in addition to the CBD, were considered.

<table>
<thead>
<tr>
<th>International Agreement</th>
<th>2010</th>
<th>2020</th>
<th>Percentage Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convention on Biological Diversity (CBD)</td>
<td>192</td>
<td>195</td>
<td>2%</td>
</tr>
<tr>
<td>International Convention for the Control and Management of Ship's Ballast Water and Sediments (BWM)</td>
<td>26</td>
<td>64</td>
<td>19%</td>
</tr>
<tr>
<td>Cartagena Protocol (Cartagena)</td>
<td>159</td>
<td>171</td>
<td>6%</td>
</tr>
<tr>
<td>Convention on International Trade in Endangered Species (CITES)</td>
<td>175</td>
<td>182</td>
<td>4%</td>
</tr>
<tr>
<td>Convention on the Conservation of Migratory species of Wild Animals (CMS)</td>
<td>113</td>
<td>129</td>
<td>8%</td>
</tr>
<tr>
<td>International Plant Protection Convention (IPPC)</td>
<td>176</td>
<td>183</td>
<td>4%</td>
</tr>
<tr>
<td>The World Organisation for Animal Health (OIE)</td>
<td>179</td>
<td>179</td>
<td>0%</td>
</tr>
<tr>
<td>Ramsar Wetlands Convention (Ramsar)</td>
<td>160</td>
<td>171</td>
<td>6%</td>
</tr>
<tr>
<td>Agreement on Sanitary and Phytosanitary Measures (SPS Agreement) of the World Trade Organisation (WTO)</td>
<td>149</td>
<td>160</td>
<td>6%</td>
</tr>
<tr>
<td>World Heritage Convention (WHC)</td>
<td>186</td>
<td>192</td>
<td>3%</td>
</tr>
</tbody>
</table>
Figure 2: 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 3: 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).
**Figure 4:** 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**

**Methods:** The analysis of indicator 2a used data provided in the *National-Legislation_2020_ver3.xlsx* file. All countries currently party to the Convention on Biological Diversity were considered in the analysis (n = 195). Five countries were not included as no information was available on any legislation related to plant health, Animal health or alien species. They were classified as ‘data deficient’. National legislation themes included animal health, plant health, environmental (including protected areas and biosecurity), freshwater and marine (covering fisheries, wetlands and marine legislation) , invasive alien species (for e.g. the European Legislation on IAS⁶, the Invasive Alien Species Act of Japan⁷ Species and others (including hunting and policy focused on specific species).

**Results:**

190 parties to Convention on Biological Diversity have national legislation relevant to IAS (Figure 5a). This is an increase of 42% since 2016. Around 20% of countries have enacted national legislation/ regulation focused on IAS. They include the EU, 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 plant and animal health, that is broadly relevant to IAS, 69% of countries have legislation relevant to IAS in other sectors (Figure 5). These include protected areas and fisheries (mostly related to the

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⁷ Invasive Alien Species Act (No. 78 of 2004). Date of text: 02 June 2004
introduction of species through aquaculture, mariculture and the aquarium trade) legislation (Figure 5).

**Figure 5:** 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**

**Methods:** The analysis of indicator 2b used data provided in the *SDG Indicator 15.8.1 Part A(i) working_2020.xlsx* file. All countries currently party to the Convention on Biological Diversity were considered in the analysis (n = 195). 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.

**Results:** Of the 195 countries party to the Convention on Biological Diversity, 80% (n = 156) have targets related to IAS management in their NBSAPS. 74% (n = 145) of these countries have aligned their IAS targets to Aichi Biodiversity Target 9 (Figure 6). Although not included in this analysis the European Union have also aligned their IAS targets to Aichi Biodiversity Target 9. Eleven countries included targets related to IAS, but these were not aligned to Aichi target 9 i.e. did not include targets that aimed at identifying priority species and pathways and putting measures in place to manage them.
Figure 6: 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.

Indicator 2c: National commitment to IAS related themes

Methods: The analysis of indicator 2c used data provided in the Survey-results-working-0308+2.xlsx file. 196 countries were surveyed in 2020. 142 countries returned surveys. Of these, one country was disqualified for submission of an incomplete survey form.

Results: 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. Across instruments, more institutions have a clear legal mandate in comparison to the necessary powers to manage IAS (Table 2). The development of plans and policies, management of intentional introductions, and commitment to public awareness of IAS has the highest commitment (Figure 7). Whereas commitment to the containment and eradication of IAS along with other scientific processes had the lowest percentages of all listed thematic areas (Figure 7). Across IPBES regions Asia Pacific, Eastern European, and Western European and other states have the highest percentage of countries with mandates and powers to manage invasive alien species (Figure 8).
Table 2: 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.

<table>
<thead>
<tr>
<th>IAS theme</th>
<th>Description</th>
<th>Legal mandate</th>
<th>Necessary powers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contain and eradicate</td>
<td>Containment and eradication of populations of IAS within the country</td>
<td>98</td>
<td>83</td>
</tr>
<tr>
<td>Enforcement</td>
<td>Enforcement of relevant legal provisions regarding the control of IAS</td>
<td>106</td>
<td>94</td>
</tr>
<tr>
<td>Information management</td>
<td>Recording and management of information on IAS</td>
<td>106</td>
<td>99</td>
</tr>
<tr>
<td>Prevention - intentional</td>
<td>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.)</td>
<td>112</td>
<td>105</td>
</tr>
<tr>
<td>Monitor and detect</td>
<td>Monitoring and surveillance programmes to detect founder populations of IAS at an early stage</td>
<td>104</td>
<td>101</td>
</tr>
<tr>
<td>Plans and policies</td>
<td>Development of national plans and policies in relation to invasive alien species</td>
<td>121</td>
<td>115</td>
</tr>
<tr>
<td>Public awareness</td>
<td>Promotion of public awareness of IAS issues</td>
<td>110</td>
<td>105</td>
</tr>
<tr>
<td>Risk analysis</td>
<td>Risk analyses of potentially invasive species</td>
<td>103</td>
<td>100</td>
</tr>
<tr>
<td>Prevention - unintentional</td>
<td>Minimising the unintentional introduction of alien species</td>
<td>108</td>
<td>98</td>
</tr>
</tbody>
</table>
Figure 7: 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 8: 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 9: 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**

**Methods:** The analysis of indicator 3 used data provided in the *Survey-results-working-0308+2.xlsx* file. 196 countries were surveyed in 2020. 142 countries returned their surveys. One country was disqualified for submission of an incomplete survey form.

**Results:** 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 which 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 3; Figure 10). Across IPBES regions, African states had the highest number of countries surveyed without access to funding (Figure 11). Eastern European states were the only region not to access global funding for IAS related activities (Figure 11).

**Table 3:** 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.

<table>
<thead>
<tr>
<th>Funding sources</th>
<th>Number of countries</th>
<th>Percentage of countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global Funding Only</td>
<td>14</td>
<td>10%</td>
</tr>
<tr>
<td>National &amp; Global Funding</td>
<td>18</td>
<td>13%</td>
</tr>
<tr>
<td>National Funding Only</td>
<td>46</td>
<td>33%</td>
</tr>
<tr>
<td>No Funding</td>
<td>63</td>
<td>45%</td>
</tr>
</tbody>
</table>
Figure 10: Quantifying the allocation of resources (both national and through global financial mechanisms) towards the prevention and control of IAS.

Figure 11: Percentage of countries per IPBES region who access different funding types for IAS prevention and control (numbers of countries surveyed by IPBES region include Africa: n = 38, Americas: n = 25, Asia and the Pacific: n = 32, Europe and Central Asia: n = 46).
Acknowledgement

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References
