

 Global Mercury Partnership

Artisanal and Small -scale Gold Mining and Biodiversity: A Global Literature Review

Exploring interactions between ASGM and wildlife



Imelda Dossou Etui, UNEP - ICMGP16 - 24 July 2024

Content

1.Context of the global literature

review

2.Resources consulted

3.Interactions ASGM - Biodiversity

4. Key impacts

5. Ecosystem services

6. Conclusions and recommendations



TRIPLE PLANETARY CRISIS



Biodiversity loss

Climate change

Pollution

Relevant MEAs
including



Convention on
Biological Diversity



UNFCCC



MINAMATA
CONVENTION
ON MERCURY



COPs

BASEL / ROTTERDAM / STOCKHOLM



Objectives

- (i) Screening of existing information;
- (ii) Compiling and analysing current knowledge;
- (iii) Highlighting key findings; and
- (iv) Identifying gaps and recommendations.

Key topics explored

- Interrelationship between artisanal and small scale gold mining and biodiversity
- Socio-economic realities and ecosystem services
- Monitoring the impacts of gold mining on biodiversity
- Restoring Biodiversity - Sustainable Models and Actions

116 documents and 27 National Action Plans (NAPs) consulted

Type of documents

More than 80% are
Scientific Articles and
reports

Period coverage

More than 75%
between 2015 and
2024

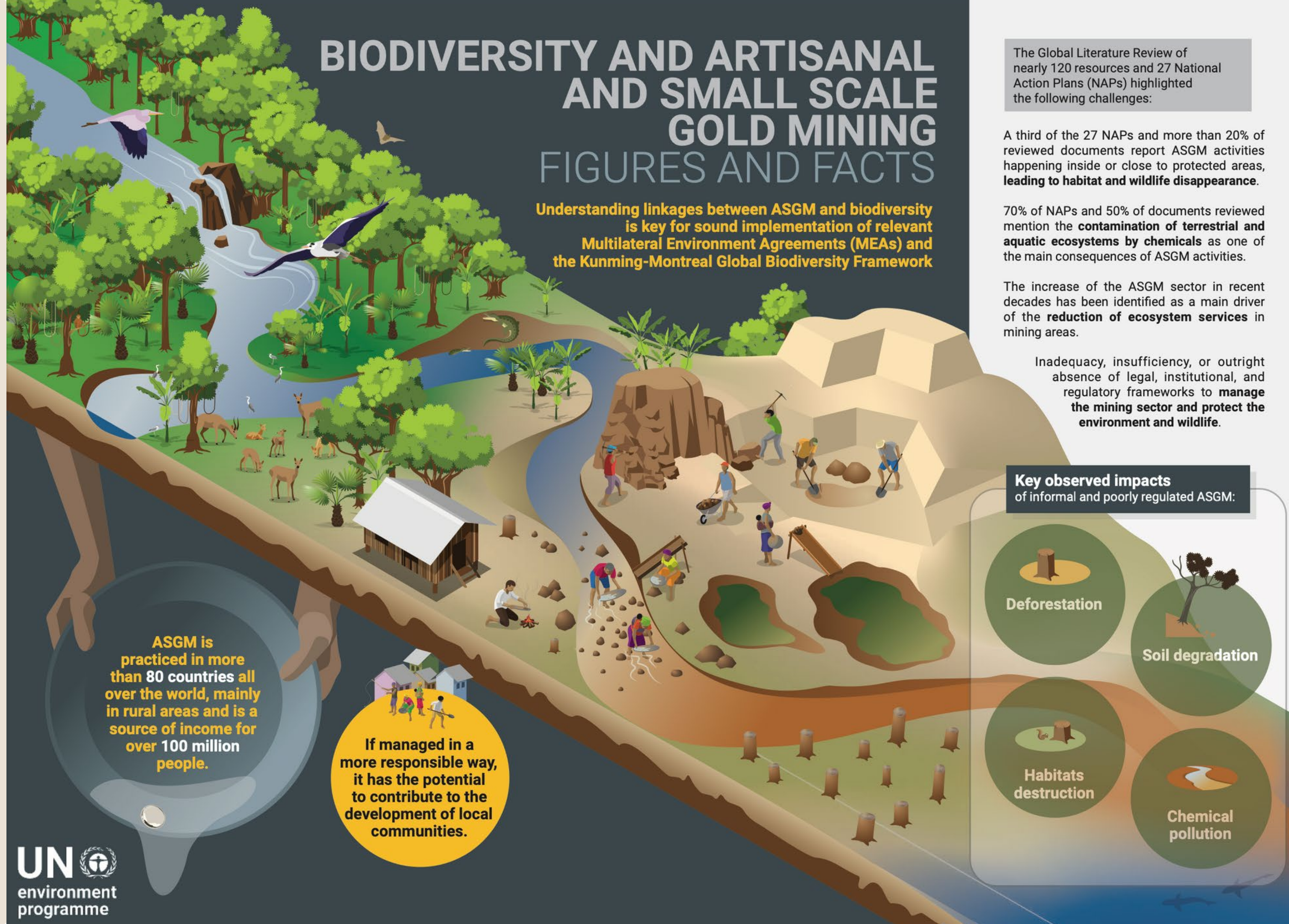
Geographic coverage

Global coverage (43)
Sub-Saharan Africa (40)
Latin America (28)
Asia (5)

19 out of the 27 NAPs from African countries (3 from Asia and 5 from Latin America)

Global Literature Review

Key Highlights



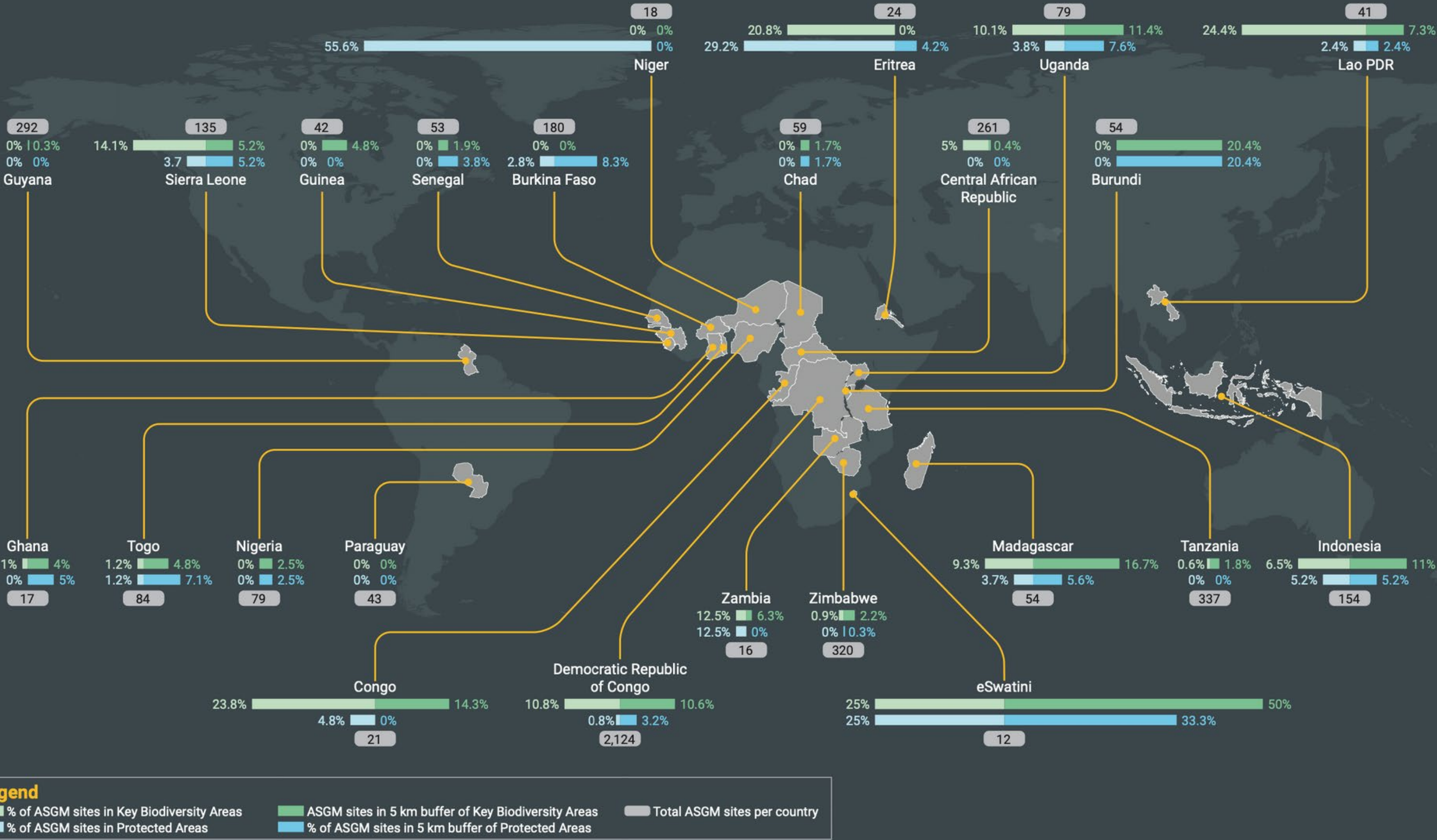
Interactions ASGM - Key Biodiversity Areas - Protected Areas

- Many ASGM countries show the highest levels of biological diversity in all 3 key ASGM regions:
 - Africa: Congo, Côte d'Ivoire, Ghana, Guinea, Kenya, Madagascar, Nigeria, Tanzania, DRC, Uganda, Zambia and Zimbabwe;
 - Asia: Cambodia, Indonesia, Mongolia;
 - South America: Ecuador, Guyana, Paraguay.
- Relationships between ASGM operations and loss of biodiversity reported in all [27 NAPs](#).
- Occurrence of ASGM within or around the vicinity of protected areas: 9 out of the [27 NAPs](#) submitted (Congo, DRC, Lao Peoples Democratic Republic, Madagascar, Mongolia, Niger, eSwatini, Uganda, Zambia).
- More than 20% of reviewed documents highlight ASGM activities near or in the premises of biodiversity hotspots and protected areas.



UN
environment
programme

ASGM IN KEY BIODIVERSITY AREAS**
AND PROTECTED AREAS***



Interactions ASGM - Key Biodiversity Areas - Protected Areas

Key Biodiversity Areas

- **eSwatini**: 25% of ASGM sites in KBAs; 50% in 5km buffer
- **Lao PDR**: 24.4% of ASGM sites in KBAs
- **Congo**: 23.8% of ASGM sites in KBAs

Protected Areas

- **Niger**: 55.6 % of ASGM sites in Protected Areas
- **Eritrea**: 29.2% of ASGM sites in Protected Areas
- **eSwatini**: 25% of ASGM sites in Protected Areas and 33% in the 5km buffer of Protected Areas

*Countries that submitted the Minamata National Action (NAP) to the Minamata Convention as of June 2023 and that include coordinates of the ASGM site's locations in their NAP.
** source: BirdLife International (2022). The World Database of Key Biodiversity Areas. Developed by the KBA Partnership: BirdLife International, International Union for the Conservation of Nature, Amphibian Survival Alliance, Conservation International, Critical Ecosystem Partnership Fund, Global Environment Facility, Re:wild, NatureServe, Rainforest Trust, Royal Society for the Protection of Birds, Wildlife Conservation Society and World Wildlife Fund. Available at www.keybiodiversityareas.org
***source: UNEP-WCMC and IUCN (2023), Protected Planet: The World Database on Protected Areas (WDPA) [Online], March 2023, Cambridge, UK: UNEP-WCMC and IUCN.

Key impacts

01

Deforestation: in the past 20 years, approximately 63% of deforestation (8,600 km²) caused by mining activities occurred after 2010.

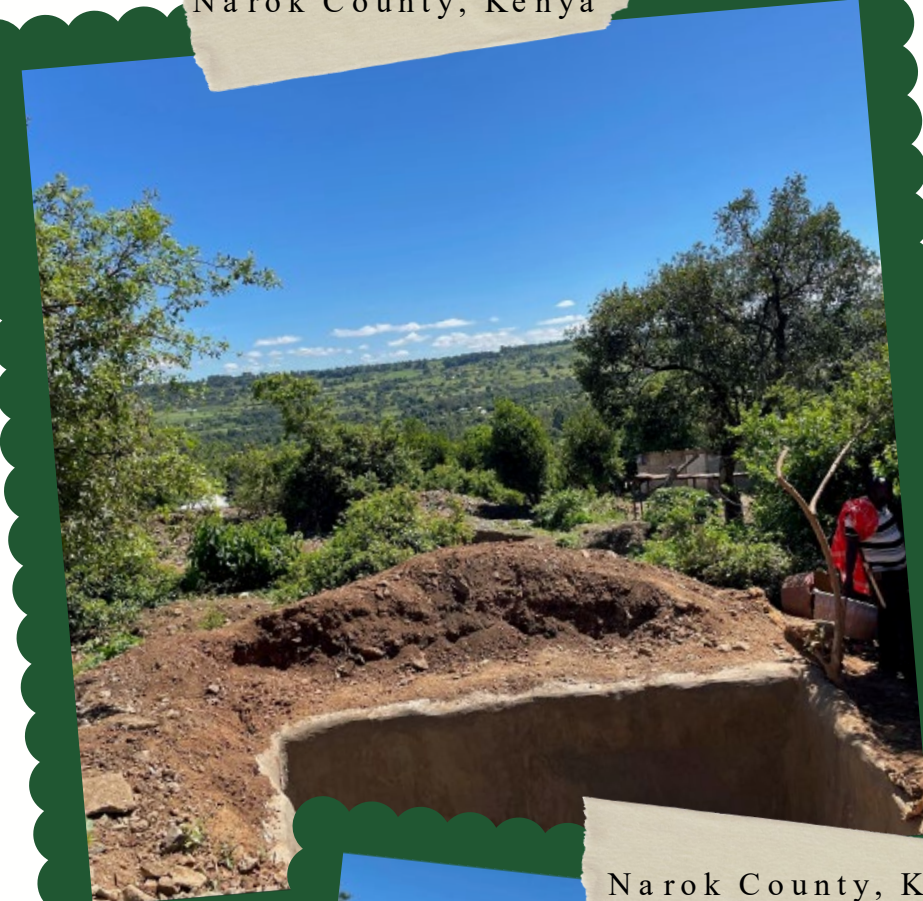
02

Loss of vegetation and forest cover: More than 50% NAPs report deforestation, loss of vegetation, and loss of forest cover as results of ASGM activities.

03

Land degradation and loss of habitats: Forest clearance for various reasons.

Narok County, Kenya



Narok County, Kenya



Key impacts

4

Chemical pollution

Mainly through the use of Hg and Cn:
Nearly 70% of NAPs and 50% of documents reviewed mention the contamination of terrestrial and aquatic ecosystems by chemicals.



5

Physical impacts on water

The increase in water turbidity reported as a common physical impact: the increase in the water turbidity is known to reduce light in the water column and oxygen levels in the water, leading to a decline in aquatic life in the areas affected.



Ecosystem services affected



Provisioning Services

- Provision of food, fuel, and fibre
- Generation and renewal of soil fertility, including nutrient cycling



Regulating Services

- Purification of air and water
- Prevention of rivers drying
- Detoxification and decomposition of wastes
- Stabilization and moderation of the Earth's climate
- Moderation of floods, droughts, temperature extremes, and the forces of wind
- Pollination of plants, including many crops
- Control of pests and diseases



Supporting Services

- Provision of shelter and building materials
- Habitats for plants and animals
- Maintenance of genetic resources as key inputs to crop varieties and livestock breeds, medicines, and other products



Cultural Services

- Cultural and aesthetic benefits
- Scientific Research
- Cultural and spiritual beliefs

Key take aways

- Interaction ASGM - Environment - biodiversity visible at all stages of the mining process.
- Multifaceted findings that require cross-sectoral and multi-stakeholders action towards effective support of concerned MEAs.



- ASGM in protected areas
- Tropical regions of greatest concern
- Key species affected



- Limited adequate initiatives for mine closure
- Mapping ASGM impacts on the environment



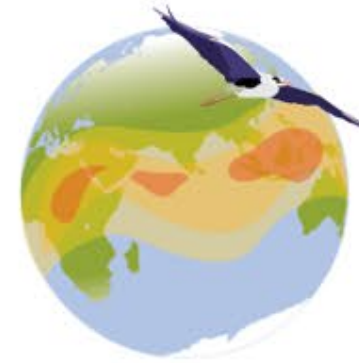
- Insufficiency and/or lack of adequate policy frameworks
- Need for improving communication and awareness raising



ARTISANAL AND SMALL-SCALE GOLD MINING AND BIODIVERSITY - RECOMMENDATIONS



STRENGTHENING THE SCIENCE



A better understanding of mercury biogeochemical cycle in tropical ecosystems is fundamental to better understand the transport and fate of mercury emissions from artisanal and small-scale gold mining.

Amphibians, freshwater fish, birds, and bats are particularly sensitive.



More in-depth knowledge of sensitivity, risk, and threats of contamination to aquatic and terrestrial species by mercury from gold mining is essential.

MAPPING



Use Remote sensing and other mapping tools as promising tools to access the extent of artisanal and small-scale gold mining overlap with the biodiversity hotspots and monitor restoration efforts.

RESTORING THE BALANCE



Promote landscape restoration, rehabilitation and remediation of contaminated sediments - to ensure sustainable and environmentally friendly closure of abandoned artisanal gold mining sites.

Artisanal and Small -scale Gold Mining and Biodiversity: A Global Literature Review

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Ecotoxicology 33, 484–504 (2024).
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Thank You!

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 <https://www.unep.org/globalmercurypartnership/>

 <https://www.unep.org/globalmercurypartnership/what-we-do/artisanal-and-small-scale-gold-mining-asgm/ASGM-and-biodiversity>

