EQUITABLE SHARING OF FINANCIAL AND OTHER ECONOMIC BENEFITS FROM DEEP-SEA MINING

The recovery of minerals from the ocean floor beyond national jurisdiction will produce revenue for the International Seabed Authority (ISA). It is expected that this revenue will be in the form of royalties and other payments made to ISA by operators working under exploitation contracts.

The United Nations Convention on the Law of the Sea (UNCLOS) establishes the principle that all activities in the Area, including recovery of minerals, must be carried out for the benefit of all humanity, irrespective of the geographic location of States. In pursuance of this principle, UNCLOS requires ISA to provide for the equitable sharing of financial and other economic benefits on a non-discriminatory basis.[1]

Currently, commercial recovery of minerals from the Area is not taking place. As the ISA Council advances its work on adopting the necessary regulatory framework that would permit commercial recovery, the ISA Finance Committee, which has the primary responsibility to draft appropriate rules and procedures on equitable sharing, has started to develop proposals for equitable sharing of financial and other economic benefits.

This policy brief summarizes the work carried out under the supervision of the Finance Committee since 2018 and identifies the main questions that will be considered going forward.

Equitable sharing of non-monetary benefits

This policy brief focuses on equitable sharing of financial benefits. However, UNCLOS gives equal weight to non-monetary benefit-sharing as a means of giving effect to the overall objective of the benefit of humanity. There is no limit to the category of non-monetary benefits, and it is not possible to quantify them as they may change over time. The fact that UNCLOS establishes a legal regime for the Area that limits access to resources and prevents unrestrained exploitation is a benefit to humanity in itself.

UNCLOS identifies other non-monetary benefits, such as:

- the orderly, safe and rational management of the resources of the Area
- the expansion of opportunities for participation in activities in the Area for all States parties, irrespective of their social and economic systems, development status or geographical location
- the promotion of long-term equilibrium between mineral supply and demand, and increased availability of minerals to ensure adequate supplies to consumers.

To this list can be added the non-monetary benefits that accrue from the protection of the marine environment through the rules, regulations and procedures of ISA, capacity-building, and increased knowledge of the marine environment and deep seabed. This includes increased scientific knowledge made available through ISA as a result of exploration activities, as well as international cooperation in marine science and the results of marine scientific research in the Area carried out pursuant to UNCLOS, Articles 143 and 144.

[1] UNCLOS, Article 140.

Priority allocation of revenue received by ISA

Pursuant to UNCLOS, all amounts received in connection with activities carried out in the Area are treated as the "funds of the Authority."[2] However, not all these funds will be available for equitable sharing. First, the administrative expenses of ISA must be deducted from the revenues received. Presently, these expenses are funded by assessed contributions from the ISA Member States, determined according to the scale used for the regular budget of the United Nations and adjusted for differences in membership. Therefore, as revenue from mining increases, assessed contributions will decrease over time until the entirety of ISA's administrative budget is paid from revenue.

Second, a portion of the funds must be allocated to the Economic Assistance Fund envisaged under UNCLOS, Article 151(10) and the Agreement relating to the Implementation of Part XI of UNCLOS (1994 Agreement), Annex, Section 7. The purpose of the Economic Assistance Fund is to assist developing countries which suffer serious adverse effects on their export earnings or economies resulting from a reduction in the price of an affected mineral or in the volume of exports of that mineral, to the extent that such reduction is caused by activities in the Area. The amount of the fund is to be determined by the Council, based on a recommendation of the Finance Committee. The modalities for access to the Fund, including the criteria for determining serious adverse effects, fall within the mandate of the Economic Planning Commission (which is yet to be established).

A formula for equitable sharing

Equity is a complex idea that resists simple formulations. In theory, it can be an abstract moral or ethical construct. In its practical application by governments and institutions to problems of distributing public resources and burdens (which Young (1994) calls "equity in the small") equity is strongly shaped by context, cultural values, by precedent, and by the specific types of goods and burdens being distributed. Equity can also be subjective, based on revealed preferences of the pool of eligible beneficiaries (i.e., their observed behaviour in other contexts) and exigencies of practical implementation.

In the case of the mineral resources of the Area, which are designated by UNCLOS as the "common heritage of mankind", the eligible beneficiaries are the Members of ISA (States parties to UNCLOS) which collectively represent humanity. Since each State party has an equal voice, equity in distribution can be achieved through sharing rules that ISA considers appropriate to its needs.

As a general principle, the equitable sharing of resource rents can be based either on the concept of shared ownership, or it can reflect an implicit or explicit desire to redistribute income or wealth, for example from wealthier States to poorer States. In the latter case, shares should be distributed based on some indicator of priority in the redistribution goal, and would, typically, embody some form of progressivity in income that favours poorer States in the distribution scheme. In stipulating that activities in the Area must be carried out for the

[2] UNCLOS, Article 171.

"benefit of mankind," irrespective of the geographical location of States, whether coastal or landlocked, UNCLOS implies an underlying shared ownership (by current and future generations) rationale for equitable sharing. At the same time, however, UNCLOS also requires particular consideration to be given to the interests and needs of developing States and of peoples who have not attained full independence or other self-governing status, implying an income redistribution rationale.[3]

Three alternative formulae for equitable distribution of a given sum of money amongst States parties have been developed and tested. Using the revealed preferences of States parties as a starting point (in this case, the methodology for calculating the scale of contributions to the budget of the United Nations), each formula takes the population of each State party as a percentage of the total population of all States parties and applies to that a social distribution weight calculated by reference to the per capita gross national income (GNI) of each State party. In each formula, the objective is to ensure that the share of proceeds received by relatively lower-income States parties (as measured against the mean per capita income of all States parties) is higher than the share received by relatively higher-income States parties. An ex-post evaluation of equity and impact upon global social welfare from the allocated share to each State party was carried out using established measures of relative inequality and impacts upon global social welfare to test the relative merits of each of the three formulae. Empirical results showed that allocated shares from one formula (the geometric mean allocation formula) had superior global social welfare and produced the lowest relative inequality.

A possible formula for distribution of revenue

The geometric mean functional form for the allocation formula is written:

$$S_i = \frac{\left[\left[\frac{\overline{GNI}}{GNI_i}\right]^{\eta=1} * P_i\right]^{\frac{1}{2}}}{\sum_{i=1}^{N}\left[\left[\frac{\overline{GNI}}{GNI_i}\right]^{\eta=1} * P_i\right]^{\frac{1}{2}}} = \frac{\left[\left[\frac{\overline{GNI}}{GNI_i}\right]^{\eta=1}\right]^{\frac{1}{2}} * P_i^{\frac{1}{2}}}{\sum_{i=1}^{N}\left[\frac{\overline{GNI}}{GNI_i}\right]^{\eta=1} * P_i^{\frac{1}{2}}}$$

where

S_i denotes the allocated share of States party i in a time period,

P_i denotes the share of the total population of State party i

$\overline{GNI}$ denotes the average per capita GNI of all States parties,

GNI_i denotes the per capita GNI of State party i and

N denotes the total number of States parties that receive an allocation (N = 167).

The degree of progressivity given to the social distribution weight $\omega_i = \left[\frac{\overline{GNI}}{GNI_i}\right]^{\eta=1}$ is represented by η.

Therefore, the development status of any State party is implicitly defined calculating its mean per capita income over that of all States parties to see whether a particular State party is above or below the mean (and of course impacted by η) through the social distribution.

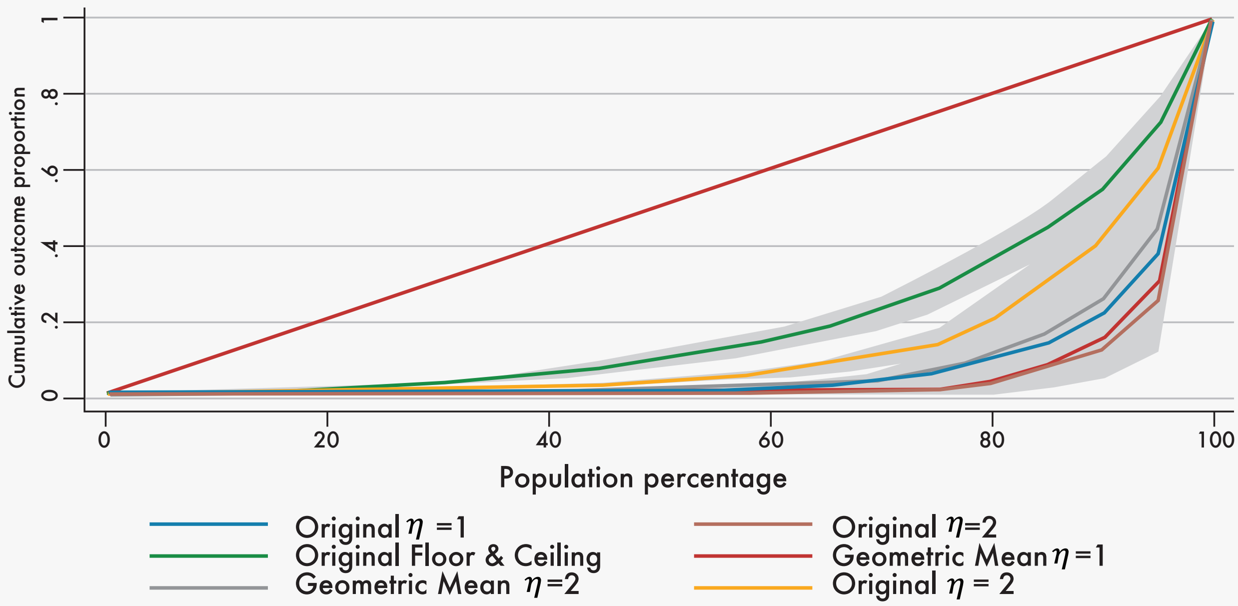
[3] UNCLOS, Article 140.

How do we evaluate equity in each formula?

The equity of allocated shares among States parties for each allocation formula can be evaluated by ex-post analysis using empirical and formal measures of inequality and global social welfare. These measures include the Gini coefficient, Lorenz curve, Pen's parade, Atkinson inequality index and generalized entropy measures.

Figure 1 clearly shows that the geometric formula (red) with the progressivity parameter set at η=1 has the most equitable distribution among States parties followed by the original formula with a floor and ceiling rate (green) followed by the original formula (no floor and ceiling rate) on the Lorenz curve. The analysis also shows that raising the progressivity parameter from η=1 to η=2 (higher values of η should favour lower-income States) creates more losers than gainers in allocated shares. The Lorenz curve depicts income inequality by comparing it to a straight diagonal line representing perfect equality among States parties. The Lorenz curve lies beneath the diagonal line and shows the actual distribution. The wider the disparity between the diagonal line and the Lorenz curve, the greater the disparity in allocated shares among States parties. Here, the geometric mean allocation diverges from the other two formulae after around 10-12% of States parties receive an allocation. The original formula with a floor and ceiling begins to diverge from the original formula without a floor and ceiling only after 55% of States parties receive an allocation.

Figure 1. Lorenz curve showing allocated shares among States parties for the original, geometric mean and original with floor and ceiling formulae



The alternative formulae, the rationales and methodology for calculation are fully explained and elaborated in ISA Technical Study 31 (ISA 2021c). The ISA Secretariat also developed a web-based country comparison model to facilitate visualization and comparison of the impact each of the three alternative formulae has on any member of ISA under different scenarios.[4] One important conclusion from the model is that in the initial period of commercial activity, when any revenue will be necessarily limited by the small scale of operations, the individual returns to a large number of countries would be very small.

[4] bit.ly/dsm-distribution-model

Table 1. Indicative shares of largest and lowest beneficiaries under alternative distribution scenarios

	Country	Total population (percentage)	Average GNI per capita (US$)	Share under the geometric mean formula (percentage)	Share under the original formula (percentage)
Indicative shares of the largest five bene-ficiaries	India	20.51	1,916	7.23	27.72
	Democratic Republic of the Congo	1.25	500	3.50	0.10
	China	21.23	9,320	3.34	5.90
	Somalia	0.22	107	3.19	5.41
	Pakistan	3.19	1,535	3.18	5.38
	Bangladesh	2.45	1,613	2.72	3.93
Indicative shares of the lowest five bene-ficiaries	Tuvalu	<0.01	5,475	0.0125	<0.001
	Palau	<0.01	17,418	0.0088	<0.001
	Cook Islands	<0.01	19,983	0.0085	<0.001
	Nauru	<0.001	12,026	0.0042	<0.001
	Monaco	<0.001	180,859	0.0001	<0.001

Extracted from: ISA. Model of equitable sharing of financial payouts from deep-seabed mining royalty fund. bit.ly/dsm-distribution-model

A second important conclusion is that a limited number of States parties would enjoy exceptionally large gains in allocated shares regardless of the formula applied. A statistical generalized linear model regression analysis showed that this is due to the share of the population, which has a greater impact on the outcome by several orders of magnitude than the social distribution weight.

Seabed Sustainability Fund

A possible alternative to a simple financial distribution could involve a qualitative distribution of the net financial benefits from recovery of deep-sea minerals through establishing a global fund to invest in knowledge and competence related to the Area. This would also include basic and applied research, capacity-building, and fostering other public goods related to the deep sea.

Here, financial benefits would be used to invest in people and preserve and develop the Area sustainably to maintain its value for future generations. Evidence from multilateral institutions shows how difficult it is to mobilize financial resources for common purposes. This deficit also affects the global ocean beyond national jurisdiction.

Arguably, establishing a global fund is also more in line with a precautionary approach. Improved understanding and knowledge of the deep sea and its ecosystems ensures rigorous management of the Area and benefits all countries (a global public good) since all depend on the ocean to supply essential ecosystem services.

A resource fund of this type could also provide a mechanism for addressing intergenerational equity by smoothing out the flow of disbursements, delinking disbursements from the dynamics of resource revenue (such as price and revenue pro-cyclicality) and minimizing uncertainty over the overall wealth to be shared. The returns on investment in human, physical, financial and natural capital could be used to finance consumption benefits (through the provision of private and public goods and services) in the future. In this way, with appropriate restrictions on drawing down the fund's principal, the fund could provide a flow of benefits for generations after the cessation of revenue-producing activities.

Many factors need to be considered in establishing a Seabed Sustainability Fund. These include the institutional and governance arrangements needed to operationalize such a fund. In its report to the Council, the Finance Committee endorsed the application of the evolutionary approach to the governance of the fund while noting the need to scale up the internal capacity of ISA to manage such a fund over time (ISA 2021a). This approach of using existing institutional mechanisms wherever possible instead of creating new institutions was generally endorsed by the Council and Assembly during their discussions in December 2021.

More fundamentally, the objects and purposes of a fund will need to be clearly defined. Should it be focused on scientific research and capacity-building relating to the deep sea, or should it have broader objectives?

Delegations participating in December 2021 sessions of the Council largely supported the concept of a fund to advance marine scientific research. One such fund would promote increased knowledge and sustainable use of the resources of the ocean and the protection and preservation of its biodiversity. It would enhance available technology for the effective protection of the marine environment, capacity-building and transfer of technology.

Some delegations and groups considered that the fund should be more broadly conceived to finance global public goods, such as climate change mitigation and the eradication of infectious diseases. Others emphasized the priority objective of increasing knowledge and protecting marine biodiversity in areas beyond national jurisdiction. A suggestion was also made that the fund could support the establishment of regional marine scientific and technological centers as reflected in UNCLOS, Articles 276 and 277. In this connection, some delegations also emphasized the need to consider the vulnerability of States such as Least Developed Countries, Landlocked Developing Countries and Small Island Developing States.

Once the purposes of a fund are defined, ISA will need to grapple with how the money available to be spent at a given point in time will be distributed. In considering this question, the ISA Finance Committee noted the importance to align the fund with the ISA Strategic Plan[5] and High-Level Action Plan[6] for 2019-2023, as well as all other strategic frameworks endorsed by the Assembly, such as the Action Plan to support the UN Decade of Ocean Science.[7] The fund could also support projects proposed by ISA Members and third parties through co-financing. These options are not mutually exclusive and could be enriched through further ideas from a scientific guidance body or a demand analysis (like the priority capacity-building needs assessment carried out by ISA in 2020). Inclusivity is an important objective and suggests that consideration may be given to regional offices hosted by regional institutions, with ISA playing a role as a global coordinator and facilitator of a network.

Conclusion and future action

It is not yet known when commercial recovery of minerals from the Area will begin, and revenue will start to flow to ISA. Even when commercial recovery begins, initial revenue flows will be used to offset assessed contributions of Member States to the administrative budget of ISA and to support the Economic Assistance Fund to be established pursuant to Article 151(10) of UNCLOS. Nevertheless, it is important that ISA establishes a mechanism for equitable and non-discriminatory sharing of financial and other economic benefits for the current and future generations as required by UNCLOS well in advance of any commercial recovery.

The work done so far by the Finance Committee has already established a conceptual basis for equitable sharing and evaluated alternative allocation formulae for direct distribution. Other options for distribution have been suggested, including a Seabed Sustainability Fund. Based on the outcomes of discussions in the Council at its meetings in December 2021, the Finance Committee has been requested to give further detailed consideration to the objects and purposes of such a fund, the mechanisms for its operation and appropriate governance arrangements. These issues will be taken up during 2022 and 2023.

[5] ISA. Strategic plan of the International Seabed Authority for the period 2019–2023 (2018) (ISBA/24/A/10). <https://isa.org.jm/files/files/documents/isba24_a10-en.pdf>
[6] ISA. High Level Action Plan for 2019-2023 (2019) (ISBA/25/A/15). <https://isa.org.jm/files/files/documents/25a-15-e.pdf>
[7] ISA. Decision of the Assembly relating to the action plan of the International Seabed Authority in support of the United Nations Decade of Ocean Science for Sustainable Development (2020) (ISBA/26/A/17).

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ABOUT THE INTERNATIONAL SEABED AUTHORITY

Made up of 167 Member States, and the European Union, ISA is mandated under the UN Convention on the Law of the Sea to organize, regulate and control all mineral-related activities in the international seabed area for the benefit of humankind as a whole. In so doing, ISA has the duty to ensure the effective protection of the marine environment from harmful effects that may arise from deep seabed related activities.