

4 Clean production and equitable distribution



> To ensure that ocean mining does not escalate into a competition for the most promising claims, a UN agency administers the marine minerals in the international seabed area, ensuring that the environment is protected and that developing countries can share in the benefits. Commercial activities in coastal states' waters, however, are regulated by national law. As the off-shore oil industry shows, this does not always afford adequate protection for the environment.



The international community's responsibility

> The future exploitation of marine minerals in international waters is regulated by the International Seabed Authority (ISA). It ensures that marine minerals are equitably distributed among the world's countries and that damage to seabed habitats is minimized. Clear regulations and environmental standards are thus in place before exploitation begins. For environmentalists, however, the nature conservation provisions governing marine mining do not go far enough.

Doing things better

With many onshore oil, gas and ore deposits now more or less exhausted, the pressure on offshore resources is increasing. Oil and gas have been produced offshore for decades, and companies began extracting these fossil resources in deep water some time ago. By contrast, ore extraction from the seabed has not yet begun.

Disasters such as the *Deepwater Horizon* oil rig explosion and numerous tanker incidents have highlighted the dangers of offshore oil production and transportation.

But onshore too, mining, quarrying and oil production are destroying rainforests and human settlements and polluting soils and rivers. The challenge now is to prevent degradation on this scale from occurring in the marine environment in future by ensuring that marine resource extraction is safe and clean.

Humankind's most comprehensive treaty

The primary instrument governing the protection of seas is the United Nations Convention on the Law of the Sea (UNCLOS). UNCLOS was adopted at the 1982 UN Conference on the Law of the Sea and came into force, after protracted negotiations, in 1994. It is the "constitution for the seas". The most comprehensive international treaty ever concluded, it establishes rules for all types of use: navigation, fishing, oil and gas extraction, seabed mining, marine conservation and marine scientific research.

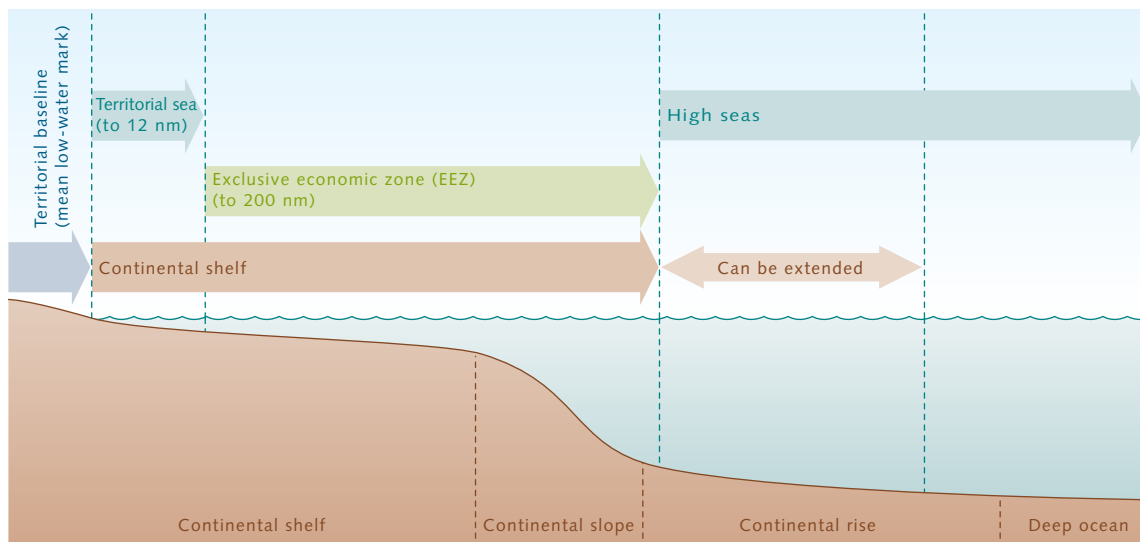
To date, 165 states and the EU have signed and ratified the Convention. UNCLOS establishes the general obligation for states parties to protect the marine environment, which is then elaborated in more detail in specific regulations for the various types of use.

UNCLOS applies in principle to all maritime zones and to all states which, by ratifying the Convention, agree to be bound by this legal regime. However, states' jurisdiction and powers to implement legislation vary in each of the maritime zones. The following legal zones are distinguished:

TERRITORIAL SEA: The territorial sea – the 12-mile zone – is the sovereign territory of the coastal state. Activities in this maritime zone are governed by the laws and regulations adopted by the coastal state. Coastal states that have ratified UNCLOS must ensure that their legislation is in line with its provisions.

EXCLUSIVE ECONOMIC ZONE (EEZ): The exclusive economic zone starts at the seaward edge of the territorial sea and extends to a distance of 200 nautical miles (approximately 370 km) from the coastal baseline. The EEZ is therefore sometimes known as the 200 nautical mile zone. The seabed and the water column form part of the EEZ. Unlike the territorial sea, this zone does not form part of the coastal state's sovereign territory. However, each coastal state has exclusive rights to exploit the natural resources there, such as oil and gas, minerals and fish stocks. Other nations may only exploit these resources with the coastal state's consent. Resource extraction in the EEZ is governed by the legislation adopted by the coastal state, which must be in line with UNCLOS provisions. For other types of use, particularly shipping, the principle of freedom of the high seas applies in the EEZ as well.

CONTINENTAL SHELF: The continental shelf comprises the seabed that extends, with a steep or gentle gradient, outward from the coastal baseline and constitutes the natural geological prolongation of the coastal



4.1 > The United Nations Convention on the Law of the Sea divides the sea into various legal zones, with the state's sovereignty decreasing with increasing distance from the coast. Every state has a territorial sea, not exceeding 12 nautical miles, which extends from the baseline. In the territorial sea, the sovereignty of the coastal state is already restricted, as ships of all states enjoy the right of innocent passage through it. In the exclusive economic zone (EEZ), which extends for up to 200 nautical miles from the coastal baseline, the coastal

state has exclusive rights for the purpose of exploring and exploiting the natural resources, whether living or non-living, of the waters. This means that it is entitled to exploit any oil and gas fields, mineral resources and fish stocks found here. On the continental shelf, which is defined as the natural prolongation of a country's land territory and may extend beyond the EEZ, the coastal state has sovereign rights for the purpose of exploring and exploiting the natural resources, whether living or non-living, on or under the seabed.

state's land territory. The continental shelf is of particular economic relevance as it is here that large oil and gas fields, gas hydrates and massive sulphides are found. The "inner continental shelf" has the same spatial scope as the EEZ (200 nautical miles). In some cases, the continental shelf drops to such a depth that it forms part of the deep ocean floor. However, in many parts of the world, there are regions in which an outer continental shelf is geologically identifiable which starts within the EEZ and stretches beyond the 200 nautical mile limit, thereby extending the coastal state's sphere of influence. The state may apply to establish these extended outer limits of its continental shelf by submitting scientific evidence to the Commission on the Limits of the Continental Shelf (CLCS) in New York. The Commission then makes a binding recommendation on recognition of this outer limit, which may not exceed 350 nautical miles from the baseline. Alternatively, a coastal state may request recognition of an outer limit up to 100 nau-

tical miles seawards – and in some cases even more – from the 2500 metre isobath as the extension of its continental shelf beyond the limits of the EEZ.

HIGH SEAS: After the 200 nautical mile limit is the maritime zone known as the high seas. No state may subject any part of the high seas to its sovereignty. The high seas are open to all states. Nonetheless, regulations apply to the exploitation of the resources of the high seas. Fishing, for example, is regulated by Regional Fisheries Management Organizations (RFMOs), which set a Total Allowable Catch for individual species. By contrast, just one organization – the International Seabed Authority (ISA) established by the United Nations – is responsible for controlling the allocation and exploitation of resources in and on the seabed. The Authority's jurisdiction extends to all mineral resources of the seabed beyond national jurisdiction, which UNCLOS defines as the common heritage of mankind.

Deep sea

The deep sea refers to the totally dark layers of the ocean below around 800 metres. On some coasts and continent shelves, the transition from the land to deep sea is so abrupt that a depth of 800 metres or more is reached within the EEZ. The coast of Japan is just one example.

In simple terms, then, a distinction can be made between national and international maritime zones. The ISA has jurisdiction over marine mining in international waters, including – at least in theory – oil and gas production. However, oil and gas fields are mainly found in the EEZs, so the extraction of these resources in international waters is not an issue at present.

UNCLOS – a long time in the making

Whereas gas and oil fields are mainly located in the EEZs, high-yield manganese nodules and, to some extent, cobalt-rich crusts and massive sulphide deposits are found in the high seas. Experts often use the term “the Area” to denote the seabed, ocean floor and subsoil in international waters beyond the limits of national jurisdiction.

For many years, the allocation of the Area’s seabed resources was a contentious issue for the international community, and this was one of the main reasons why UNCLOS did not enter into force until 1994, 12 years after its adoption by the UN Conference on the Law of the Sea. UNCLOS was conceived in the 1970s, which was a time of great change in two respects. Firstly, with the discovery of extensive manganese nodule deposits

in the Pacific, the sea seemed to be a vast repository of natural resources which were there for the taking. Secondly, many former French, British and Portuguese colonies had become sovereign states and were now seeking to cement their political and economic independence, inter alia by asserting their claims to marine resources. Accordingly, in 1982, UNCLOS initially provided for the establishment of an International Seabed Authority (ISA), which in turn was to set up a body, known as the “Enterprise”, to serve as the ISA’s own mining operator. The idea was that benefits would be shared equitably among the various states. Under the Convention, the industrialized countries would share their scientific knowledge and mining technology free of charge for the benefit of all. The former colonies and developing countries ratified UNCLOS immediately, but there were protests from the industrial nations.

In subsequent years, the modalities for a future marine mining regime were renegotiated in order to achieve a consensus on UNCLOS. Among other things, the requirement for no-cost technology transfer was dropped, and the establishment of an “Enterprise” was postponed indefinitely. These new rules and amendments were finally incorporated into the 1994 Agreement on Implementation, which supplements the Convention. Today, the rules and regulations contained in the Convention and the Agreement are implemented by three international bodies:

- the International Tribunal for the Law of the Sea (ITLOS) in Hamburg;
- the Commission on the Limits of the Continental Shelf (CLCS), which decides on the extension of individual states’ exclusive economic zones;
- the International Seabed Authority (ISA), which controls seabed mining in the Area.

Both the Convention and the Agreement establish the rules applicable in “the Area”, the 12-mile zones and the EEZs. For example, states parties are required to adopt legislation to limit and control mining activities and must protect and preserve rare or fragile ecosy-

4.2 > The island state of Nauru is the world’s smallest republic. With an area of around 20 square kilometres, it is roughly twice the size of Capri.



stems and the habitats of endangered species. Cross-border pollution must be avoided. Companies and states may be held liable for any damage caused.

Clear rules for marine mining

The Convention and the Agreement establish a legal framework formulated in general terms. They do not provide any detailed instructions for practical action. The ISA has thus adopted regulations for each of the three types of mineral resources found in “the Area” – manganese nodules, cobalt-rich crusts and massive sulphides – with detailed provisions on the mining of these resources. At present, these regulations only cover the first two phases of marine mining, i.e. prospecting and exploration. As prospecting merely involves general seismic surveying of the seabed by ship, with minimal ground sampling, prospecting activities simply have to be disclosed to the ISA. Exploration, on the other hand, involves intensive seabed sampling and therefore requires a licence from the ISA. Regulations for commercial exploitation do not exist as yet; a draft regulatory framework for exploitation of manganese nodules is expected in 2016 at the earliest.

The absence of a regulatory regime for exploitation is due in part to a number of unresolved environmental issues. Intensive exploration is under way in various areas, and scientists on research vessels are constantly collecting new information about seabed habitats. The findings will feed into the future exploitation regime, which should be in place long before mining of manganese nodules starts. No country currently has any specific plans to begin nodule exploitation.

One authority for all states

The ISA is a small authority with just 40 permanent members of staff, who come from a variety of countries. It owes its existence to the fact that the international community was able to agree that the use of seabed resources should benefit all states. The ISA is developing clear rules before the exploitation of marine minerals begins. It is the first time in history that such an approach has been taken, and contrasts starkly with the



4.3 > The International Seabed Authority (ISA), based in Kingston, Jamaica, is responsible for ensuring the equitable sharing of benefits derived from seabed minerals.

situation onshore where, regardless of the type of resource – coal, oil or gas – exploitation has invariably taken precedence, resulting in environmental degradation, until it was recognised that mistakes had been made and remedial action should be taken.

The ISA is also responsible for deciding whether a state or company should receive a licence. To date, the ISA has granted around 25 exploration licences. No exploitation licences have been issued as yet. States wishing to explore an area of the sea must apply to the ISA for an exploration licence, for which a fee of 500,000 US dollars is payable. Private companies can also apply for a licence, subject to their application being sponsored by their home state. The sponsoring state provides guarantees that the company has sufficient financial and technical capability, and accepts liability for the company's activities. An exploration licence is valid for 15 years and may be renewed once for a further five years. It is noteworthy that all the regulations can be expanded and updated on an ongoing basis so that the ISA can bring them into line with new scientific findings or extraction technologies.

Under ISA rules, developing countries which lack relevant expertise of their own can participate in deep-sea mining in “the Area” by entering into cooperation with a mining company, provided that the company establishes a subsidiary in the developing country. This is now possible following a decision by the International Tribunal for the Law of the Sea, whereby the developing country must accept liability for the company concerned. One of the first countries to take this path is the island state of Nauru, which is cooperating with a mining company via a subsidiary incorporated in Nauru.

Already regulated: manganese nodule exploration

So far, the regulatory regime for manganese nodules, known as the Regulations on Prospecting and Exploration for Polymetallic Nodules in the Area, RPEN, is the most advanced one. This mineral is easier to extract than cobalt-rich crusts and massive sulphides and is likely to be the first to be exploited in “the Area”.

The first exploration licences were issued as early as 2001 to six applicants, or “pioneers”: China, Japan, France, Russia, South Korea and the Interoceanmetal Joint Organization (a consortium involving Bulgaria, Cuba, the Czech Republic, Poland, Russia and the Slovak Republic).

The framework for manganese nodules contains 40 Regulations. Among other things, these Regulations state that the applicant must divide the area for exploration into two parts of equal estimated commercial value, each covering no more than 150,000 square kilometres – making two areas, each equivalent to the combined area of England and Wales. The ISA selects one of the two areas for itself – this is then a “reserved area” – and issues an exploration licence to the applicant for the other area.

The “reserved area” can continue to be reserved for the “Enterprise”, to be established at a later date, or may be made available to developing countries wishing to engage in marine mining operations in future. The identity of these countries is still unclear, however. As the “reserved area” has already undergone prospecting, the developing country can dispense with this costly procedure and start exploration directly.

Under ISA rules, the maximum area of 150,000 square kilometres allocated to a state under the licence is subsequently reduced over time. Portions of the area explored – amounting to 75,000 square kilometres after eight years from the date of the contract – progressively revert to the ISA. This procedure is known as “relinquishment”. This means that the contractor cannot place any areas in reserve but must decide early on which area of seabed he wishes to continue to explore with a view to mining there in future. This ensures that a nation does not seize all the most attractive sites for

itself. The relinquishment clause does not apply if the total area allocated to a state for exploration is smaller than 75,000 square kilometres.

The regulations governing manganese nodules also contain provisions on the conduct of exploration activities and establish a requirement for environmental impact assessments. Such an assessment must be carried out, for example, during exploration phases with intensive sampling, and must include testing of the equipment and methods to be used. In addition, if trial sediment plume generation is carried out during exploration, this requires an environmental impact assessment. The aim is to determine the impact of large-scale operation of mining vehicles on the seabed. The contractor must report regularly to the ISA on the progress of exploration activities. The ISA may also deploy independent observers on the contractor’s research vessels. There are plans to soon make the rules on exploration even more stringent and detailed. To date, the ISA has approved 13 applications for licences for manganese nodule exploration.

Exploring massive sulphides in blocks

The rules applicable to prospecting and exploration for massive sulphides and cobalt-rich crusts are similar to those which apply to manganese nodules, but there are some variations on points of detail.

The Regulations on Prospecting and Exploration for Polymetallic Sulphides in the Area, adopted in 2010, apply to the known hydrothermally formed deposits of sulphides, including some 165 deposits whose exploitation appears to be viable. Under the Regulations, the area covered by each application may not exceed 300,000 square kilometres in size. The subsequent exploration must then be confined to a small part of this area, comprising not more than 100 blocks of at most 10 by 10 kilometres. The blocks must be arranged by the applicant in at least five clusters. The ISA’s purpose, in adopting these provisions, is to ensure that companies or states do not secure high-yielding sites for themselves across a wide area but confine their activities to small areas. As a result, the actual exploration area ultimately amounts to no more than 10,000 square kilome-

tres (100 blocks of 100 square kilometres). These Regulations also contain a relinquishment clause. Within specified time periods, the contractor must relinquish the major part of the area allocated for exploration, with the remaining area allocated after relinquishment not exceeding 2,500 square kilometres. This remaining area would presumably offer the applicant the best prospects for exploitation of the resource, with the rest being relinquished to the International Seabed Authority. So here too, the area ultimately remaining for commercial exploitation is significantly reduced. Applications for prospecting and exploration of massive sulphides have been submitted by China, France, India, Russia and South Korea. Germany is currently preparing an application.

Rules on the exploration of cobalt-rich crusts

The latest Regulations on Prospecting and Exploration for Cobalt-rich Ferromanganese Crusts in the Area were adopted at the 18th session of the ISA in 2012. Here, the challenge was to develop rules for a resource for which no feasible mining technology currently exists. Furthermore, the crusts are found on seamounts, which are known to be particularly species-rich habitats, and many of which are already at risk from fishing and bottom trawling. Mining would intensify the pressure on these habitats.

Under the Regulations, the area covered by each application for prospecting must be located entirely within a geographical area measuring not more than 550 by 550 kilometres. The area covered by subsequent exploration must comprise not more than 150 cobalt crust blocks no greater than 20 square kilometres in size, which must be arranged by the applicant in clusters consisting of no more than five blocks. By the end of the tenth year from the date of the contract, the contractor must have relinquished to the ISA at least two thirds of the original area allocated to it.

The ISA is currently considering a Russian application. China and Japan have already been issued with exploration licences, making China the first country in the world to hold exploration licences for all three types of marine mineral resources.

Exploration and future exploitation of manganese nodules

UNCLOS (Article 136)

defines the marine minerals in the international seabed area ("the Area") as "the common heritage of mankind".

International Seabed Authority (ISA)

adopts regulations for prospecting and exploration. Rules on exploitation are expected by 2016 at the earliest.

A state undertakes prospecting activities in a large area of the seabed. Prospecting must merely be disclosed to the ISA.

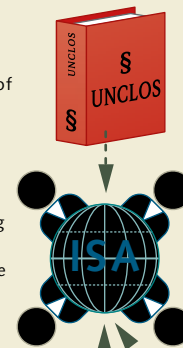
The state applies to the ISA for an exploration licence for two areas of equal estimated commercial value, each amounting to 150,000 square kilometres, in a part of the seabed that has already been prospected.

The ISA selects one of these areas for itself and retains this as a "reserved area" for subsequent exploitation by the "Enterprise" or developing countries.

The applicant state receives the other area for exploration.

After eight years, at the latest, the state relinquishes 75,000 square kilometres of explored area to the ISA.

The other 75,000 square kilometres are retained for marine mining. Only part of this area will be exploited. Some parts are kept as reference zones for the conservation of biodiversity. Harvesting will only take place in areas with high nodule density.



4.4 > Under the ISA Regulations, a country is initially allocated a large exploration area, half of which must later be relinquished to the ISA. This half is then reserved for developing countries. However, the state may not exploit the remaining half in its entirety. Some parts of the area must be excluded in the interests of deep-sea fauna conservation.

Clearing the way for exploitation

Under all three sets of Regulations, the ISA, by granting a licence, expects the states engaged in exploration to maintain standards of good conduct. Should it transpire, during exploration, that the applicant is causing excessive damage to the natural environment or is failing to comply with the rules, an application to extend the exploration period or to exploit the marine mineral in future may be denied. Indeed, the ISA has the power to withdraw the licences for all three marine minerals. Regulations on the exploitation of marine minerals have not yet been finalized. However, in 2012, the Secretary-General of the ISA presented a workplan and timetable for the formulation of regulations on manganese nodule exploitation, to be established prior to 2016. The regulations are to include the following provisions:

- Exploitation should start with a mining test on a 20 to 50 per cent commercial scale. It is anticipated that the data and information obtained from this mining test will feed into the regulations, particularly as regards safety and the protection of the marine environment.
- Comprehensive environmental monitoring must be established and other environmental impact assessments performed throughout the exploitation phase. Monitoring means continuous long-term scientific observation and documentation of all operations, whereas environmental impact assessments are additionally carried out for individual activities. Monitoring and assessments should be updated regularly to take account of the latest scientific knowledge and mining technology.
- Contractors must provide detailed information about the entire production process, including information on collection techniques; depth of penetration into the seabed; methods for nodule separation and washing on the seafloor; methods for transporting the nodules to the surface; methods for discharging production residues (tailings); location and duration of the mining test; and environmental impacts.

One option currently under discussion is to issue provisional mining licences for approximately three years, in line with the precautionary approach, with a view to gathering experience. Regular licences would then be issued to applicants after three years if no concerns arise.

It is unclear, at present, how high the mining royalties should be in future. It is essential to determine whether the best system would be based solely on mining royalties or involve a combination of royalties and profit-sharing for the ISA. In addition, a fixed annual fee – in an amount that has still to be determined – could become due at the start of production. For the mining companies, these financial arrangements – alongside environmental protection obligations – will be a crucial factor in their decision on whether or not to begin marine mineral exploitation in “the Area”.

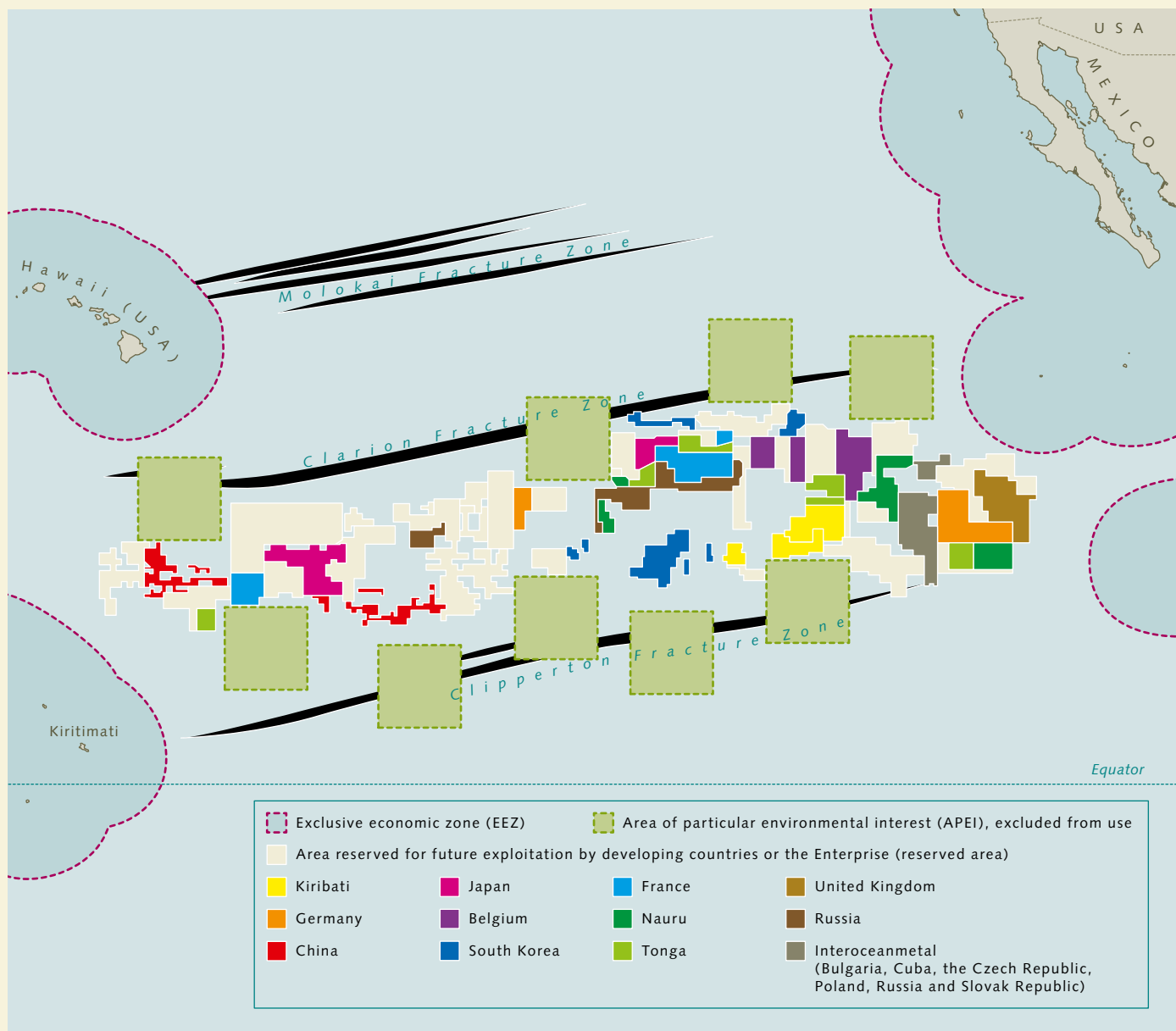
For the future, the ISA is planning to incorporate the comprehensive set of rules, regulations and procedures for prospecting, exploration and exploitation of marine minerals in the international seabed area into a single item of legislation known as the Mining Code.

The “Enterprise” – the ISA’s commercial arm

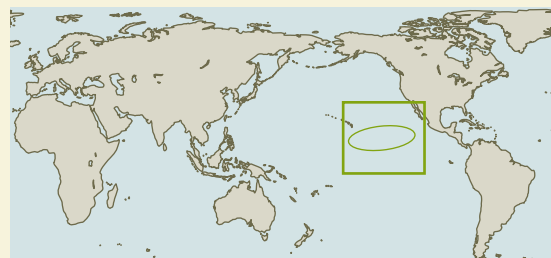
Interestingly, the debate about the establishment of an “Enterprise”, as the commercial arm of the ISA, has recently resumed. This was prompted by a proposal received by the ISA from an Australian/Canadian mining company to develop a joint venture with the “Enterprise” and to contribute the requisite mining technology. The establishment of such an undertaking is entirely possible, in principle, within the framework of the UNCLOS Agreement on Implementation and would in no way conflict with the concept of equitable benefit sharing. The “Enterprise” would not compete with individual states for areas of the seabed but would undertake mining operations in unallocated areas. The benefits would then be shared equitably. This would mean that there would be two strands to the ISA’s work in future: it would continue to act as the authority responsible for issuing licences, and would also operate as the “Enterprise”. At present, however, there are no clear rules for the establishment of the “Enterprise”, and

Precautionary approach

The precautionary approach is applied in risk management and was among the principles adopted at the 1992 United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro. According to the precautionary approach, where there are threats of serious or irreversible damage to the environment, lack of full scientific certainty shall not be used by states as a reason for postponing measures to prevent environmental degradation. The precautionary approach was incorporated into the Rio Declaration as Principle 15.



4.5 > The Clarion-Clipperton Zone (CCZ) in the Pacific has the world's largest known deposits of deep-seabed polymetallic nodules, covering an area approximately the size of Europe. To date, the International Seabed Authority (ISA) has issued 12 exploration licences for the CCZ. Designation of the reserved areas and areas of particular environmental interest (APEIs) has already taken place.



the ISA therefore regards the founding or planning of a joint venture as premature. It is likely to be some years before relevant rules are in place.

Mining and nature conservation – squaring the circle?

By far the largest known deposits of marine mineral resources in the world are in the Clarion-Clipperton Zone (CCZ) in the Pacific, where many billions of tonnes of manganese nodules extend across an area the size of Europe. In order to protect and preserve habitats of a significant size in this vast area, the ISA adopted an environmental management plan for the CCZ at its 18th session in 2012. The plan identifies nine Areas of Particular Environmental Interest (APEIs) in the CCZ, where extraction of marine minerals is prohibited. Each APEI consists of a quadrilateral core area of at least 200 km in length and width, surrounded by a buffer zone, 100 km wide, in order to ensure that benthic communities in the APEIs are not buried or adversely affected by mining plumes drifting in from areas where extraction is under way. This means that there are, in total, nine 400 by 400 km protected areas in the CCZ, each with a total area of 160,000 square kilometres. Together, the nine APEIs thus cover almost 1.5 million square kilometres – around one-sixth of the CCZ and equivalent to an area twice the size of Turkey. At present, an environmental management plan and APEIs only exist for the CCZ; there are none for other licence areas, such as those in the Indian Ocean, although according to experts similar arrangements are needed elsewhere as well.

The environmental management plan goes even further. Not only does it designate 9 APEIs; it also obliges contractors to designate areas that are representative of the full range of habitats and species assemblages before exploitation begins. These reference zones should be of sufficient size, have similar topography and biodiversity to the impact zone, and must not be mined. In practice, this means that the licence areas will not be worked in their entirety, but only in specific sections. The aim is to preserve natural habitats as a basis for the subsequent recolonization of the mined area. The ISA is currently developing guidelines for such reference areas.

However, critics point out that there is currently a lack of information and data relating to habitats in the CCZ and a lack of standards for the surveying and assessment of habitats as a viable basis for the selection of reference zones. This would be vital in view of the overall purpose of the zones, namely to preserve representative habitats. They also stress that special protection is needed for habitats with endemic biotic communities.

The demise of the commons

Despite criticism that the ISA lacks the capacities needed to implement comprehensive protection regimes in all the international waters, the ISA's work is regarded as well-nigh exemplary, for it operates in accordance with the precautionary approach, one of the guiding principles established, *inter alia*, in the Convention on Biological Diversity. Moreover, the ISA ensures the equitable distribution of resources defined as the common heritage of mankind. Scientists thus view with concern the efforts being made by some states to extend their jurisdiction beyond the limits of their EEZs into the outer continental shelf. The exemptions in the UNCLOS provisions on the continental shelf, which are invoked by these countries, mean that they would then be able to claim exclusive rights to the marine mineral deposits located in these outer areas.

According to experts, these exemptions – which were originally to be invoked in exceptional circumstances – are creating some bizarre scenarios. Russia, for example, is currently claiming around 40 per cent of the international Arctic seabed as its continental shelf, arguing that the undersea mountains in the central Arctic, such as the Gakkel Ridge, are a geological formation originating in the Russian EEZ, and that in accordance with this definition, Russia should be able to extend its area of jurisdiction to 350 nautical miles. UNCLOS also provides for the extension of the continental shelf to 100 nautical miles (nm) seawards from the 2500 metre isobath. This would enable Russia to extend its jurisdiction even further, beyond the 350 nautical mile limit. As the Russian authorities see it, the permissible combination of these two methods should allow Russia to claim 40 per cent of the Arctic seabed

More protection regimes for the international seabed area?

A further point of criticism is that so far, the ISA has not extended protected status to any valuable seabed habitats outside the licence areas, despite the fact that as the Authority established and legitimized by UNCLOS, it is ideally placed to do so. At present, designating marine protected areas in the high seas is extremely complicated due to the plethora of organizations involved. What's more, some protection regimes relate solely to specific marine fauna, particularly fish, in the water column, while others focus exclusively on the conservation of biotic communities on the seabed.

The International Maritime Organization (IMO), for example, can designate Particularly Sensitive Sea Areas (PSSAs) in which shipping is restricted or prohibited, e.g. to protect important fishing grounds, whale breeding areas, or areas of archaeological significance. One example is the Great Barrier Reef along the coast of northeast Australia. The possibility of extending PSSA status to the Sargasso Sea in the western Atlantic is also under discussion in IMO circles at present. The Sargasso Sea hosts vast amounts of the macroalgae *Sargassum*, masses of which float on the surface of the water and provide an important habitat for many marine fauna. However, Particularly Sensitive Sea Area status merely restricts commercial shipping by regulating transit through the area.

In other regions, fishing may be restricted in marine protected areas (MPAs). Such areas have been proposed under the Convention for the Protection of the Marine Environment of the North-East Atlantic (OSPAR Convention), a regional marine protection agreement which has been signed and ratified by a number of Western and Northern European countries. The fisheries management organization responsible for the Northeast Atlantic has taken account of the OSPAR Convention and has closed most areas of the Northeast Atlantic to bottom trawling.

These examples show just how complex a task it is to designate protected areas, which, in any case, only protect individual areas of the sea. Making matters worse, the regulations pertaining to protected areas are only binding on the few states which have signed up to the relevant agreement. Other states can simply ignore the regulations. What is needed, therefore, is a general obligation to protect habitats in their entirety from seabed to surface. In practice, however, no such arrangements exist.

In the areas covered by the OSPAR Convention in the Mid-Atlantic Ridge, only bottom trawling is currently prohibited. To establish a comprehensive protection regime, it would be helpful if the ISA were to recognise these MPAs and extend protected

area status to the seabed in these regions. This would protect seamounts and banks not only from bottom trawling but also from mining interests in future. At present, however, the ISA cannot recognise these areas because its jurisdiction extends solely to seabed mining. In order to protect valuable marine areas in international waters, an implementing agreement to UNCLOS for the conservation of marine biodiversity would have to be adopted first of all. A United Nations working group has been preparing such an agreement for some years, but it is proving to be a slow process.

This is almost inexcusable, for a comprehensive protection regime for valuable marine areas has been demanded at the highest level for many years. Back in 1992, for example, the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro adopted the Convention on Biological Diversity (CBD), whose objective is the conservation of biological diversity in both terrestrial and marine ecosystems throughout the world. Recent decisions adopted by the Conference of the Parties to the Convention on Biological Diversity (CBD) call for the establishment of marine protected areas in marine areas beyond the limits of national jurisdiction, and for ecologically or biologically significant marine areas (EBSAs) in need of protection to be identified.

The **United Nations Conference on Sustainable Development (Rio+20)** in 2012 therefore urged the international community to bring the ongoing process to develop an implementing agreement to UNCLOS on the conservation of marine biodiversity to a swift conclusion. At present, however, the instruments available under UNCLOS and, indeed, to the ISA for the designation of marine protected areas are very limited. The ISA cannot designate any marine protected areas outside marine mining areas, nor can it recognize such areas. In view of the great pressure on seabed habitats, it is unacceptable that the preparation of the implementing agreement is taking so long.

The OSPAR Commission has observer status in the Assembly of the International Seabed Authority and is negotiating with this and other maritime organizations, such as the International Maritime Organization (IMO) and the International Commission for the Conservation of Atlantic Tunas (ICCAT), on the establishment of comprehensive marine protection regimes in the near future. A key prerequisite, however, is the adoption of an implementing agreement to UNCLOS on the conservation of marine biodiversity, in order to provide general protection for biological diversity in fragile habitats.

Go-it-alone approaches instead of concerted international action

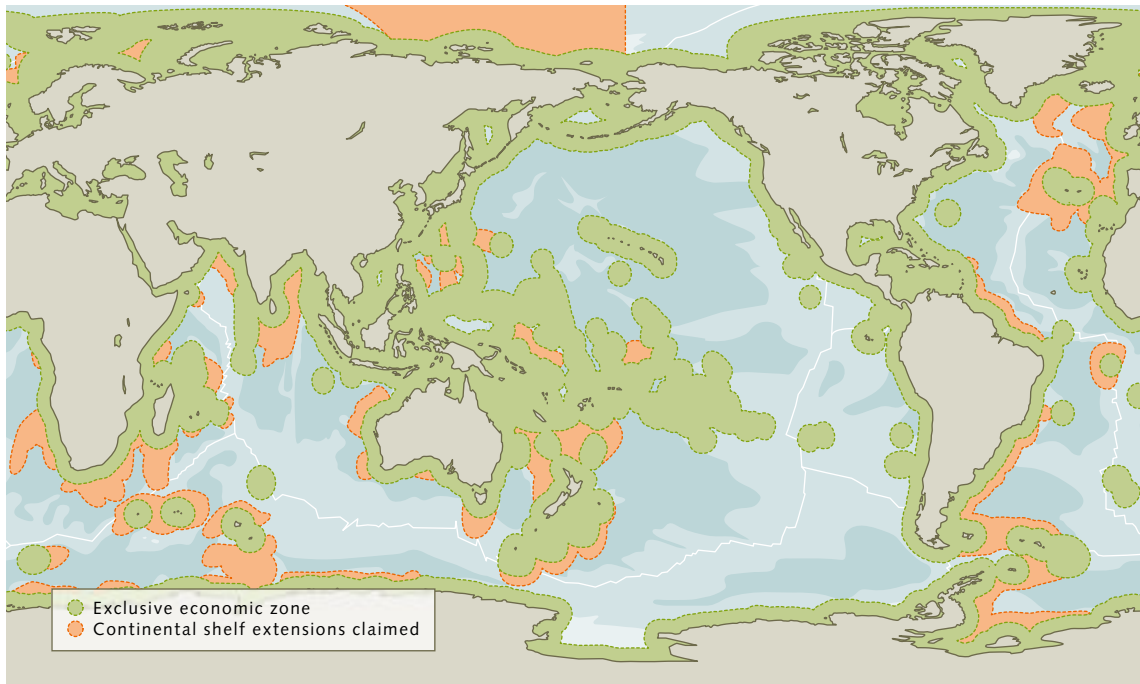
The United Nations Convention on the Law of the Sea (UNCLOS) regulates the use of the seas, which cover 71 per cent of the Earth's surface. UNCLOS has been signed and **ratified** by 165 states and the European Union, making it a powerful instrument of international law. However, around 40 countries – for many different reasons – have not acceded to the Convention. Nonetheless, these states are bound by many of its provisions which – as the codification of **customary international law** – are universally applicable, such as those pertaining to the protection of the marine environment. In addition, a further norm applicable under customary international law entitles states to claim an EEZ even if they have not ratified UNCLOS. The most notable example of a state that has signed but not ratified the Convention is the United States. Although the US President and Administration have long supported ratification, the US Senate has yet to give its consent. As matters stand, however, the Senate is finding it impossible to achieve a majority position in favour of ratification.

In the US, UNCLOS has long been the subject of public debate. Recently, a number of senior officials in the US Navy and Coast Guard called publicly for the US to accede to the Convention. They point out that without accession to the Convention, the US's only option, in order to assert its rights, is to maintain a military presence on the high seas, but in view of the increasing claims from many other nations to the outer continental shelf, this is certainly not enough. There is a fear that key marine areas with large resource deposits, especially in the Pacific region, will be claimed by other countries and lost to the US. Furthermore, the officials and, indeed, numerous politicians regard ratification as essential in order to maintain the US's credibility in other maritime disputes and to ensure that the US can negotiate on equal terms. As the US can only enforce claims to continental shelf expansion via UNCLOS and the Commission on the Limits of the Continental Shelf (CLCS), the US has no prospect of long-term legal certainty in maritime matters unless it ratifies the Convention. Above all, if other countries submit overambitious claims to extend their jurisdiction beyond the EEZs – for example, in the Arctic – the US lacks the legal instruments that it needs to take effective counteraction.

The reaction from opponents of accession to UNCLOS came swiftly and was predictably fierce. Numerous Republican politicians, for example, argued that a situation in which licence fees have to be paid to developing countries would be unacceptable. In their view, this newfangled principle of benefit sharing is a bottomless pit that poses a major threat to US companies. So

when will the US ratify the Convention? Only time will tell. Other countries have not acceded to the Convention because they are involved in disputes over their maritime boundaries. Iran, for example, is withholding ratification because of disputes over the delimitation of the EEZs in the Caspian Sea, where major oil fields are located. Peru, too, is unwilling to accede to the Convention due to simmering conflicts with neighbouring Chile over the delimitation of the EEZs. What's more, around 50 years ago – long before the creation of EEZs – Peru laid claim to a maritime domain, extending for 200 nautical miles, as its territorial sea and sovereign territory, and enshrined this in its constitution. If Peru were to accede to the Convention, it would be forced to downgrade this maritime area to the status of an EEZ and would merely enjoy usage rights there in future. This would also require a constitutional amendment, which is politically unattainable in Peru at present.

For many countries, national interests far outweigh common interests. That also explains why the Arctic littoral states frequently resort to symbolic gestures to defend their claims to the resources that lie beneath the ice. Russia courted media attention very effectively when on 1 August 2007, Russian researchers planted the national flag on the Arctic seabed at a depth of more than 4000 metres, underlining Russia's claim to the territory beyond its EEZ. Shortly before Christmas in 2010, Canadian Immigration Minister Jason Kenney symbolically issued Santa Claus with a Canadian passport, on the grounds that the North Pole is part of Canadian territory, and reaffirmed that "Mr Claus" was now entitled to enter and exit Canada at will. This gesture, although tongue-in-cheek, was intended to underline Canada's claims to the Arctic and was reported by the media all over the world. Although the competing claims to the Arctic seabed can hardly be described as a bitter dispute, some countries are flexing their muscles, for there is much at stake: new seaways, as well as access to oil and gas fields. Researchers have also found small deposits of manganese nodules in the Arctic, although these are not thought to be economically significant. Ultimately, it is the Commission on the Limits of the Continental Shelf (CLCS) which must decide, based on geological data, whether the national territorial claims are justified or not. It is uncertain, at present, which nations will be permitted to extend their jurisdiction. However, both Canada and Russia recently commissioned new ice-capable naval vessels and awarded contracts for the construction of new Arctic naval bases, not only as a means of safeguarding their coastal security but also as a demonstration of power.



4.6 > With the expansion of the coastal states' exclusive economic zones (green) into the outer continental shelf (orange), the international waters and seabed area are reduced, representing a loss to the international community. Antarctica, however, has special status. Some states are claiming an EEZ here, as shown on the diagram, but these territorial claims are not recognised under international law.

and the marine mineral deposits located there. However, the Commission on the Limits of the Continental Shelf dismissed Russia's application in 2009 and called for more detailed geological surveys. Since then, Russia has launched several expeditions to collect geological data as evidence that the undersea ridges in international Arctic waters are submerged extensions of the geological formations found in its EEZ. In late 2013, Canada also announced that it was claiming an extension of its Arctic continental shelf as far as the North Pole. In 2014, Russia plans to resubmit its application with new data – coinciding, incidentally, with Denmark's expected application to extend its continental shelf north of Greenland. Denmark, Canada and Russia are not isolated cases. Currently, 78 countries are claiming a continental shelf expansion beyond their existing EEZs. The ISA has received seven applications backed up by information to justify expansion, and a further 46 provisional submissions for which scientific information may be submitted at a later date. The Commission has not yet dealt with these latter submissions because – as in the case of Russia – there is still a lack of detailed scientific data proving that the geological formations in

and outside the EEZ are connected. According to experts in the Law of the Sea, this trend towards continental shelf expansion profoundly undermines the original concept of “the Area” as a form of commons, based on the principle that the seabed and its resources should be used for the benefit of all nations equally. What's more, in some regions, the 200 nm EEZs already occupy most of the sea area. In the Pacific, for example, the individual island states lie so far apart in some cases that despite their small land area, they can claim vast areas of the sea as their exclusive economic zones, which means that the international community has no claim to many of the resources found there. The EEZs already occupy around one third of the total area of the sea, and the claims for continental shelf expansion submitted to the Commission would increase this by a further 8 per cent.

An end to this trend is not yet in sight. Some submissions have already been approved by the Commission, such as those lodged by the United Kingdom and Ireland to extend their continental shelves farther out into the Atlantic. The United Kingdom has a particular interest in producing oil here and is seeking partners to engage in oil production in this new territory.

Commons

The term „commons“ is used to denote land that is used collectively by members of a community; examples are fields, grazing areas and woodland pastures. Economists and social scientists also use the term in non-agricultural contexts, applying it, for example, to fisheries in international waters. The “tragedy of the commons” is a phrase that is frequently heard, the tragedy being that these shared resources, being available to everyone, are quickly depleted and destroyed by individuals acting according to their self-interest.

The coastal states' responsibility

> Large oil and gas fields and extensive deposits of massive sulphides are found in various countries' coastal waters. If a state wishes to extract the marine resources located in the area under its jurisdiction, it must do so within the legal limits established by the United Nations Convention on the Law of the Sea (UNCLOS), but its own mining and environmental legislation also have a crucial role to play. However, these laws do not always provide an adequate level of protection, as the impacts of the Deepwater Horizon oil rig explosion have shown.

Each country must play its part

The exploration and exploitation of certain marine minerals on the deep ocean floor are governed by detailed regulations adopted by the International Seabed Authority (ISA). They also cover aspects of environmental protection. The exploitation of marine minerals in the international seabed area in future will thus be regulated by a uniform set of rules that are applicable worldwide. However, no such regime exists for the coastal states' exclusive economic zones (EEZs) and continental shelves. Although the United Nations Convention on the Law of the Sea (UNCLOS) obliges every state party to protect and preserve the marine environment, it is a matter for each individual state to adopt its own detailed legislation on the use of its exclusive economic zone (EEZ), on marine mining on the continental shelf, and on the protection of the marine environment. However, as the ongoing pollution of coastal waters and disasters such as the *Deepwater Horizon* oil rig explosion show, this does not guarantee that the marine en-

vironment will indeed be protected. And yet states have a particular responsibility, because the coastal waters within the EEZs are the world's most intensively utilized marine areas, providing food and income for very large numbers of people. Over time, the pressure on the EEZs has increased. At one time, the coastal waters mainly supplied fish. During the last century, the tourism industry expanded and later, industrial sites were established along the coasts and oil and gas drilling rigs were installed on the continental shelf. Effluents from factories and intensive farming are still polluting coastal areas, and over the next five years, marine mining is likely to have a considerable impact as well, particularly the extraction of massive sulphides, which are mainly found on the continental shelf.

Marine mining – controlled by governments

Given the very important role played by the marine environment and the range of pollutants to which it is exposed, states should be treating the marine areas under their jurisdiction with particular care. Indeed, UNCLOS contains comprehensive provisions to that effect. However, they are framed in very general terms, and countries have considerable leeway to decide how to transpose these provisions into national law. In some cases, national legislation does not adequately protect the sea from overexploitation and pollution. What's more, not every country safeguards compliance with environmental legislation or regularly monitors its industrial enterprises. Although relevant legislation is in place, environmental pollution and degradation still routinely occur in many countries. For experts, therefore, the worry is that some countries could well adopt a similarly lax approach to marine mining on their continental shelves. They could even attract potential

4.7 > A boy plays in a carpet of algae at the seaside in Qingdao in China. Excessive use of fertilizers is one of the causes of algal blooms. Coastal waters are being polluted elsewhere as well, despite international marine protection agreements.





4.8 > In July 2010, a waste tank at a copper mine in the coastal province of Fujian in China burst open, spilling toxic slurry into a river and killing 1900 tonnes of fish.

investors by offering them the chance to carry out mining operations with no obligation to achieve stringent and costly compliance with environmental regulations, and without having to worry about checks or inspections.

Toothless legislation

A recent comparative analysis of the mining industry in the G20 states reveals the difficulties arising in the implementation of existing environmental legislation in some countries. The findings for the Latin American G20 countries Argentina, Brazil and Mexico are particularly interesting. Although the study relates to on-shore mining, it identifies specific problems which are likely to affect marine mining in future as well. In all 3 countries, detailed regulations and standards for environmental protection are in place, but a number of central challenges stand in the way of robust compliance:

- Government agencies tasked with overseeing the mining industry are poorly equipped with personnel, and there is also a shortage of skilled labour in some cases, as well as problems accessing funding. As a result, very few site visits or inspections of

mines take place. Instead, assessments are generally confined to desk reviews of applications and documentation.

- Government agencies tasked with overseeing the mining industry are too close, either spatially or administratively, to political decision-makers. In some cases, assessors' offices are located in regional government buildings, enabling politicians to exert influence over their activities.
- Even if the regulatory agencies are able to work independently, concerns are often ignored. Critical findings are not taken seriously or are disregarded by decision-making bodies, such as mining authorities.
- There are very few quality standards or certification schemes for consultancies that prepare environmental impact assessments, making it very easy for industrial enterprises to commission biased reports that gloss over the negative impacts of mining.

Critics point out that the environmental degradation that could potentially occur in marine mining could

well go undetected or be covered up. In onshore mining, open conflicts have often occurred in the past between local communities and industrial enterprises or government agencies, turning the spotlight on environmental degradation. Marine mining, on the other hand, takes place at great depth and is hidden from sight.

Following a good example?

Not everyone shares these concerns. In the view of some experts who specialize in the Law of the Sea, the ISA Regulations have established universally applicable standards of best practice for marine mining. Although these do not constitute binding regulations that must be incorporated into national legislation on deep-sea mining on the continental shelf, the ISA instruments serve, nonetheless, as a model to which coastal states must, at the very least, aspire. What's more, if it transpires that a state is causing massive environmental damage on its continental shelf, it may face prosecution in an international court such as the International Tribunal for the Law of the Sea (ITLOS); for example, legal proceedings may be initiated by neighbouring countries whose waters have been polluted.

Both cobalt-rich crusts and massive sulphides are mainly found on the continental shelves of island states that have no mining industry of their own. It is very likely that future mining operations here will be undertaken by international extraction industry companies on a contractual basis. It is not in these companies' interests to destroy the marine environment on the state's continental shelf, for if a company that causes such degradation were to apply for a licence to extract resources in the international seabed area in future, the ISA would be justified in refusing the application due to a lack of confidence in the company concerned – resulting in its loss of access to profitable seabed areas.

A further relevant factor, in the view of some experts in the Law of the Sea, is that when selecting mining areas, mining multinationals will not necessarily give preference to unreliable states with lax legislation, for experience has shown that cooperation with these countries can be extremely problematical for the companies concerned. Negotiated contracts are not always complied with, and in politically unstable regions, there is also a risk of political upheavals, possibly resulting in the cancellation of the contracts by the new governments and leaders and hence the loss of

4.9 > A tanker's useful life ends – and an oil disaster begins. In November 2002, the Prestige sank off the northwest coast of Spain, spilling around 60,000 tonnes of oil into the sea and polluting almost 3000 kilometres of French and Spanish coastline.



the company's investment. A very much higher level of legal stability is afforded by marine mining in international waters ("the Area"), which is properly regulated under ISA licences, with reliable contract periods and firm agreements.

Can oil disasters be prevented in future?

Marine mining is still a vision for the future. Offshore oil production, on the other hand, is a long-established industry which generates billions in profits every year. Unlike marine mining, however, the oil industry's environmental and safety standards were not established before extraction commenced, but have been developed over time – generally in response to accidents or larger oil pollution incidents. In compliance with UNCLOS, most countries now have environmental legislation and regulations for offshore oil production, but accidents and spills still occur. There is a concern that the number of major oil spills will increase in future as a result of the trend towards drilling at ever greater depths, and that these incidents will be almost impossible to control, as was the case with *Deepwater Horizon*, for example.

Much thought has therefore been given to ways of improving the situation. Two key issues arise here: firstly, how incidents can be avoided and the environment can be protected, and secondly, who is liable in the event of a disaster. Experts propose the following solutions:

- better safety standards and more stringent controls for the operation of drilling and production rigs;
- clearly defined liability in the event of an incident occurring;
- creation of funds to pay for clean-up operations after major spills and to provide compensation swiftly and with minimal red tape to injured parties.

The issue of liability, in particular, is currently the subject of intense debate. When an incident occurs, public attention generally focuses on the facility operators, on



the grounds that they have failed to comply with national safety and environmental standards. The ensuing legal disputes often drag on for years, greatly delaying the payment of compensation to injured parties. However, the states with jurisdiction over the area in which the installations are located also bear responsibility.

The situation becomes more complicated if neighbouring countries' waters are polluted as well. One example is the fire at the *Montara* wellhead platform in the Timor Sea, off the northern coast of Western Australia, in 2009. This incident was very similar to the *Deepwater Horizon* disaster. The blowout released between 5000 and 10,000 tonnes of oil, contaminating Indonesian fishing grounds. The *Montara* platform was located in the Australian EEZ, but Australia refused to pay compensation. The question, then, is how state liability and payment of compensation can be regulated more effectively in future.

Guaranteed compensation after tanker incidents

The situation would be much simpler if a uniform set of rules on liability were adopted and recognised at international level, also governing the payment of compensation to injured parties. This type of international liability regime, which would be binding on all states, makes sense not only for the oil industry but for all other ultrahazardous activities in the EEZs or on the continental

4.10 > The operation of nuclear power plants, such as the one seen here at Onagawa, 80 kilometres north of Fukushima on the east coast of Japan, is classed by jurists as an "ultrahazardous activity" because accidents at industrial plants of this type can have extremely serious and far-reaching consequences.

Oil – a dirty business in West Africa

The very poor regulation and control of the oil industry in some countries nowadays are exemplified by the situation on the Atlantic coast between Angola and Côte d'Ivoire in Africa. There are major oil fields here, mainly in Angola and Nigeria. However, both these countries have failed to utilize the oil revenue in a manner which creates prosperity for all.

The situation in Nigeria is catastrophic: here, oil production in the Niger Delta has fuelled ongoing armed conflicts and has polluted wetlands, mangrove forests and the habitats on which thousands of people depend. One reason for this disastrous situation is that the Nigerian government does not share the benefits accruing from the oil industry equitably. It negotiates cooperation agreements with oil multinationals and issues production licences, receiving many billions of dollars in revenue from these arrangements every year. But although a formula for the distribution of revenues between the federal budget, the governments of the individual states and the local authorities exists, very little money flows back to the oil-producing regions. According to experts, this is due to a high level of corruption in the upper echelons of government. What's more, under the 1978 Land Use Act, land where oil is found falls under the direct control of the state, and in most cases, no compensation is paid to communities or private owners. Among other things, this injustice results in pipelines being illegally tapped and large quantities of oil being bunkered and sold abroad, especially in neighbouring Benin, Côte d'Ivoire and Senegal. The tapping of pipelines is also polluting large areas of the Niger Delta. According to experts, the annual revenue from this illegal oil industry is an estimated one billion US dollars a year.

At present, various rebel groups are fighting for control of the illegal oil industry. The situation is also difficult because even before the oil boom began in Nigeria in the 1970s, conflicts had erupted between various ethnic groups, even escalating into civil war. These conflicts were fuelled by politicians who channelled the profits from oil to those groups which served their particular political interests. In some cases, politicians supplied the rebel groups with arms, worsening the conflicts.

Nigeria's oil wealth has led to an oil war. Although the multinationals are not directly involved in the hostilities, oil production in such politically unstable regions raises all manner of questions. Even the multinationals' social engagement has often led to new conflicts in Nigeria. To the multinationals' credit, they have attempted, of their own volition, to improve living conditions for local communities in the oil-producing regions through financial support and social engagement. But even here, conflicts have frequently arisen between communities receiving support and their neighbours who went away empty-handed. The oil companies bear a share of the responsibility for what

is happening in the oil-producing countries, as became apparent in 2013, when the Anglo-Dutch company Shell faced legal action in a court in The Hague for the environmental damage caused in the Niger Delta. Between 2004 and 2007, there had been several attacks on pipelines in the Niger Delta, spilling large quantities of oil and polluting villages, farmland and fish ponds. Farmers, fisherfolk and a Dutch environmental organization therefore took Shell to court. The court dealt with a total of five charges, with Shell being accused of having failed to provide adequate security for its pipelines. The court found Shell's Nigerian subsidiary to be liable on one count: Shell had neglected its duty of care and had shown particular negligence. In 2006 and 2007, this has enabled sabotage to be committed in a very simple way by opening the valves on an oil well with an adjustable spanner. On the four other counts, however, the court ruled that because the pipelines were laid underground and were adequately secured, Shell was not liable.

There have been many other incidents similar to those dealt with in these legal proceedings. According to an independent assessment of the environmental impacts of oil contamination in the Niger Delta, commissioned by the United Nations Environment Programme (UNEP), there is massive environmental damage in the Niger Delta. The project team surveyed pipelines, oil wells and oil spill sites, and their report concludes that pollution is extensive. There is a particularly serious problem with toxic hydrocarbon pollution of soil and water. In 49 cases, hydrocarbons were found in soil down to depths of 5 metres, and in 41 cases, the hydrocarbon pollution had reached the groundwater. Furthermore, fishing has declined sharply in the region as fish stocks have decreased, presumably because of the pollution.

In Nigeria, around 15 per cent of oil is produced offshore in coastal waters, rather than onshore, and this is increasing. Although offshore oil production is more expensive, it is considered to be more secure, as the drilling rigs are less accessible to rebels and are therefore relatively well protected against attack. But even here, attacks have occurred. In 2008, rebels from one of Nigeria's largest militant groups, the Movement for the Emancipation of the Niger Delta (MEND), attacked an offshore oil rig 120 km off the coast in a demonstration of seaborne power. Nonetheless, the expansion of the offshore oil industry, according to social scientists in Nigeria, could help to mitigate the problems facing the region and reduce the potential for conflict, for unlike onshore oil production, communities are not directly impacted by the offshore industry, and pollution of soils and drinking water is avoided.

Unlike the situation in Nigeria, all Angola's oil production takes place offshore, and the set of problems affecting the sector is different. But in Angola too, very few people share in the benefits of the country's oil wealth, and the gap between rich and poor is very wide.



4.11 > In the Niger Delta, oil stolen from pipelines is processed in illegal refineries such as this one by the Imo River, causing additional water pollution.

The main oil-producing region is found in the coastal waters off the Angolan province of Cabinda, an exclave of Angola located in neighbouring Congo. And yet Cabinda is one of the country's poorest regions, and apart from a few coastal roads, it has very little infrastructure. The Angolan capital Luanda, on the other hand, is the most expensive city in the world. In no other city are rents and living costs as high as they are here. Angola is now the largest oil-producing country in sub-Saharan Africa. Contracts are negotiated between the state-owned oil company Sonangol and multinationals. These production agreements contain formulae for the sharing of profits from oil production between the host country and the multinationals. However, the actual amount of profits is generally unclear, as the data published are invariably incomplete, incomprehensible or inconsistent. As is evident from the extreme contrast between rich and poor, the profits from Angola's oil industry benefit only the elite.

Although experts applaud Angola for introducing stringent anti-corruption legislation and for taking action publicly to combat corrup-

tion, it is safe to assume that some of the oil revenue is being misappropriated at the top echelons of government. This is partly because Sonangol is not controlled or regulated by independent authorities. Angolan and international non-governmental organizations are therefore calling for more transparency and public debate in order to achieve more equitable distribution of profits and sharing of benefits.

Environmental pollution on a scale comparable with Nigeria has not occurred in Angola. However, in 1991, an explosion occurred on board the oil tanker *ABT Summer* off the Angolan coast, spilling its cargo of around 250,000 tonnes of oil and polluting the coastline. Fortunately, no major oil spills have occurred since then. Nonetheless, Angolan non-governmental organizations are critical of the ongoing pollution of coastal waters by oil discharged in effluent from the rigs, and estimate that more than 10 smaller oil spills occur every year.

A contentious issue is whether the decline of fish stocks off the coast is due to these oil spills, or whether overfishing has played a greater role.

shelves as well. The term “ultrahazardous activity” is used by jurists to denote activities which, although not prohibited, can cause accidents that involve a substantial risk of harm, particularly transboundary pollution. Examples are the operation of nuclear power plants, chemical works and, in this case, oil drilling rigs. It is uncertain whether states will agree to adopt common rules.

Such an approach is entirely feasible, however. The International Convention on Civil Liability for Oil Pollution Damage was adopted for tanker operations back in 1969 and was updated in 1992. With this Convention, there is now a binding legal regime at international level for dealing with civil claims for compensation for oil pollution damage involving oil-carrying ships. Its main purpose is to ensure that compensation is paid swiftly and without excessive red tape to injured parties following tanker incidents. Legal proceedings are instituted before the courts of the state where the incident took place. The Convention, which has been ratified by 109 countries, establishes a robust international liability regime based on the application of uniform rules. Often, international civil law proceedings become very protracted because there are major differences between countries’ legal systems. For example, there may be different legal language, procedures and time limits, such as periods of limitation. What’s more, a legal dispute may drag on because conflicting evidence is submitted in expert opinions and second opinions, with the result that injured parties receive no compensation at all.

Often, legal disputes centre on the question of fault: in other words, who is responsible for the damage. Another contentious issue, very often, is whether an incident could have been averted had parties acted differently. Thanks to the Convention, this is no longer relevant in relation to tanker incidents, for the Convention places liability for such damage on the owner of the ship from which the polluting oil escaped or was discharged. This liability, in general, is strict: in other words, it applies whether or not the owner is at fault or could have averted the damage. There are only a few specific exceptions, such as civil war or a natural disaster of an exceptional character, in which no liability for pollution damage attaches to the owner.

Compensation payments from one large fund

Because the owner of the ship from which polluting oil escaped or was discharged bears strict liability, the Convention establishes a system of compulsory liability insurance for owners. Under the Convention, the costs of damage are initially met by the shipowner’s insurer. If the costs of damage exceed the amount provided under this insurance, a compensation fund comes into operation and, in a multi-stage process, meets further costs up to an amount of approximately 1 billion US dollars. This International Oil Pollution Compensation Fund (IOPC) was established under the International Convention on Civil Liability for Oil Pollution Damage. The Fund guarantees that injured parties actually receive compensation. It covers the costs of clean-up operations after tanker incidents and makes compensation payments to injured parties such as fishermen and the tourism industry. The oil-importing nations pay contributions into the Fund, which they then claim back from their national oil-processing industry. The rate of the contributions to be paid is based on the volume of oil imported.

The appealing aspect of the Fund is that payments are made immediately after an incident, irrespective of the question of fault – in other words, regardless of whether the incident was caused by human error on the part of the tanker captain or by the shipowner’s failure to properly maintain the vessel. This is critical, especially in situations when insurance payments are delayed as a result of legal disputes. The injured parties receive compensation from the Fund swiftly and without excessive red tape.

In some cases in the past, the Fund has negotiated directly with injured parties, thus avoiding lengthy delays in payment of compensation and removing the need for the parties concerned to pursue the matter through the courts. Once the Fund has compensated the victims, it can reclaim the money from the shipowner or his insurer. The Convention and the Fund form a two-pronged instrument that is both unique and unbeatable: the Convention creates legal certainty, and the Fund ensures that compensation is disbursed after every single incident in which damage occurs.



4.12 > The oil slick from the Hebei Spirit tanker, which was holed off South Korea in December 2007, polluted many kilometres of coastline. The authorities mobilized 12,000 clean-up workers, who attempted to remove the oil, sometimes using very basic equipment such as buckets and shovels. The costs of this type of clean-up operation are immense.

No fund for drilling rigs

The Convention and the IOPC Fund were developed in conjunction with the International Maritime Organization (IMO) and apply solely to vessels, not to fixed installations such as drilling rigs or anchored semi-submersible platforms. Although a similar model is conceivable in principle for these installations as well, there appears to be little interest on the part of the oil industry. At present, oil companies are covered by insurance, but this is merely general liability insurance up to an amount of 1.5 billion US dollars. Some drilling projects are uninsurable. But as the explosion at the *Deepwater Horizon* rig showed, this kind of general liability insurance does not come close to covering the costs of damage caused by a major oil spill. Nonetheless, the oil companies rejected an insurance scheme developed by reinsurers over a period of several years, which would have covered individual drilling projects and provided a 10 to 20 billion US dollar payout for environmental damage and follow-up costs. Experts believe that there is a very simple reason why the oil companies rejected the scheme: the oil companies are so wealthy that they regard this level of insurance cover as irrelevant. The interest in a liability convention and fund modelled on those in place for tanker incidents is correspondingly low. This is regrettable, for such a scheme would make legal disputes or proceedings after oil rig disasters a much less common occurrence in future.

Strict liability

Experts in the Law of the Sea regard a strict form of civil liability, such as that which now applies to tanker operations, as ideal. However, the adoption of conventions governing liability for other types of ultrahazardous activity, thereby establishing a uniform civil liability regime at the international level, is likely to be some years away. A transitional solution could be to introduce new regulations on state liability, meaning that it is the state, in every case, which covers damage caused by ultrahazardous activities, rather than a private company. At present, a state is only liable if it breaks the rules – for example, because its legislation or regula-

tions are inadequate or because it has failed to fulfil its supervisory obligations in respect of chemical plants or drilling rigs. In order to avoid protracted legal disputes over issues of liability, a system that jurists term “strict state liability regardless of fault” may be a viable solution for ultrahazardous activities. This means that the state is always liable, regardless of whether or not the operator of the installation is at fault. Similar situations are familiar in every-day life. If a dog bites a child, the dog owner is liable in every case, whether or not he has trained his dog properly and sent it to dog training classes – in other words, whether or not he is at fault. He is “liable regardless of fault”. There are good arguments for introducing this form of liability for the operation of drilling rigs as well, for it is, after all, the state which authorizes the performance of this “ultrahazardous activity”. Furthermore, in many cases, states issue licences to companies, often charging very substantial licence fees, and thus have a stake in the company’s profits. If this form of state liability were introduced, protracted lawsuits and disputes, such as those which arose between Australia and Indonesia in the case of the *Montara* platform, could be avoided. At present, the concept of state liability is *only* enshrined in international law for large-scale transboundary pollution: here, international law establishes liability for *culpable* behaviour that violates the rules. The principle is enshrined at the highest level of international law and **customary international law**. It was first recognised in international jurisprudence more than 70 years ago as a result of the Trail Smelter case – the first major transboundary pollution incident – in the 1920s. Smoke from the Trail Smelter in Canada, which processed lead and zinc, had contaminated Canadian farmers’ fields in the surrounding area and caused damage to crops. The Canadian operator responded by building tall chimneys, so that the toxic smoke would be transported away from the fields. As a consequence, the pollution reached Canada’s neighbour, the USA, and destroyed US farmers’ crops. Compensation was paid out to the Canadian farmers very quickly, but lawyers acting for the US farmers and the Canadian company failed to reach an agreement on compensation. The case was therefore referred to the International Joint Commission (IJC), an independent



4.13 > The Trail Smelter in the Canadian province of British Columbia became famous for a legal dispute between Canada and the USA. It took years for US farmers to receive compensation for damage to crops and soil contamination.

binational organization established in 1909 to negotiate agreements on boundary waters between the USA and Canada. The arbitration process became extremely protracted because the parties disputed to what extent the damage to crops was in fact caused by smoke. A final decision was not reached until 1941. The company made a relatively small payout to the US farmers.

Space law for earthly problems?

“Strict state liability regardless of fault” is not yet a reality. What’s more, because states enjoy immunity, a citizen or affected country cannot pursue, let alone enforce, legitimate claims through courts. In fact, international law and international customary law leave unanswered the question of how justice is to be done when damage occurs, and it is unclear which institution should dispense justice or fix penalties in such cases. The question, then, is whether, and how, a state can bring legal action against another state or force it to pay compensation. Due to the lack of clear rules, states generally reach agreement via diplomatic channels, often behind closed doors, which means that the injured parties cannot influence the process. After the *Deepwater Horizon* disaster, Mexico received compensation for the financial losses caused by the oil pollution, but this was

achieved as a result of diplomatic negotiations with US authorities. There is still only one instance of “strict state liability regardless of fault” being enforceable at the international level, namely in space law. Under the Convention on International Liability for Damage Caused by Space Objects, adopted in 1972, another state may, in respect of damage sustained in its territory due to the crashdown of a space object, present a claim to the launching state. As a general principle, the state from whose territory a space object is launched is liable.

For all other cases of transboundary pollution or damage, the situation continues to be problematical. Without a uniform international regime on civil liability for particularly high-risk activities in deep-sea mining or offshore oil production, there are currently only two options for obtaining justice or compensation: either to bring an action before the courts of a foreign state, or to reach an amicable agreement on compensation between the home state and the polluting state. In the majority of cases, however, both options are likely to involve a tough battle for justice.

Prevention – the best strategy

A clear liability regime and rules on compensation are important in order to make good any damage that

occurs. Far more important, however, is to prevent environmental pollution in the first place. To that end, stringent technical safety standards occur. Far more important, however, is to prevent environmental pollution in the first place. To that end, stringent technical safety standards are required. Here, the regulations applicable to oil-carrying ships serve as a good example. The requirement for tankers to be fitted with a double hull ensures that unlike the situation in the 1960s and 1970s, damaged tankers do not immediately start to spill oil. This has done much to avoid major incidents and pollution. Political benchmarks have also been set, with the adoption of agreements that declare certain areas of the sea completely off-limits to tanker traffic. There are several reasons why such high standards have been set in this particular industry. Firstly, tanker incidents have a significant media impact. The public pressure on policy-makers increased considerably from one oil disaster to the next. Furthermore, the principle of cause and effect is very straightforward in the case of an oil spill. If a captain runs his vessel aground, the circumstances which led to the grounding can generally be determined very quickly. On an oil rig, on the other hand, there are many people working simultaneously all over the installation, which means that clarifying the causes of an explosion is more difficult. There are many activities that are critical to security in the operation of a rig, and these can be analysed and improved.

This in turn is an argument in favour of a liability regime similar to that which exists for tanker incidents. A liability convention would create an obligation for rig operators and oil producers to contribute to a fund. As with the IOPC Fund, injured parties would then receive compensation swiftly, before the complex question of fault and the cause of the incident have been clarified. The adoption of a relevant convention and creation of a fund would also be a major step towards a new culture of safety in offshore operations, which is now well-established in the tanker industry.

Reducing consumption

Unfortunately, some environmental damage from industrial operations will always occur. The key task, there-

fore, is to reduce this damage to an absolute minimum. As long as people need resources, the extractive industries will have an adverse effect on habitats. The most important question, then, is how consumption of these resources can be reduced. One way forward is to develop recycling technologies and set up supply chains for reusable materials. Even in the established recycling industries, there is still room for improvement: one example is aluminium, with only around one third currently being recovered. All over the world, companies are working intensively to develop new processes for the recovery of special metals, such as rare earth elements, from computers and smartphones. These devices offer great potential for recycling as they are available in very large quantities, contain large amounts of special metals, and have short lifecycles. This means that the metals can be recovered and made available to the primary industry very quickly.

Furthermore, many environmentally sound and energy-efficient technologies now exist. Solar and wind energy plants and energy-efficient vehicle drive systems have reached a sophisticated stage of development. Dispensing with consumption is also helpful, for resources that are not consumed do not need to be extracted in the first place. The Western industrial nations in particular have maintained a very high level of consumption for some time. The transformation of the industrial nations into consumer societies began after the Second World War. Philosophers and social scientists refer to “1950s syndrome” – the period of rapidly rising living standards from 1949 to 1966, when energy consumption increased dramatically. At that time, supplies of energy and raw materials appeared to be inexhaustible and were correspondingly cheap.

This was reinforced by the discovery of major oil fields in the Middle East and the development of nuclear energy. There was enough oil, it seemed, to last for centuries. Food also became more affordable as a result of intensive farming and animal husbandry, which in turn were made possible by intensive use of machinery and energy. This era, researchers claim, was a historical anomaly and far from being the norm. We recognise this today, for we are now faced with increasing resource scarcity and a rapidly growing world population.

CONCLUSION

Can commercial exploitation of marine minerals be safe and equitable?

There are many signs that 2016 will mark the start of marine mining in the international seabed area, with the commencement of manganese nodule harvesting. This will open a new chapter in the commercial exploitation of marine resources, for the minerals in the international seabed area do not belong to individual states but are defined as the common heritage of mankind, and, according to the United Nations Convention on the Law of the Sea (UNCLOS), their benefits are to be shared equitably. UNCLOS is the most comprehensive international treaty ever concluded. It has been ratified by 165 states and the European Union and came into force in 1994. The International Seabed Authority (ISA) was established in Jamaica at the same time. This UN organization ensures that the marine minerals found in the international seabed area are equitably distributed and that developing countries can also share in the benefits. States wishing to extract marine minerals from the international seabed area must apply to the ISA for an exploration licence. To date, the ISA has issued 25 countries with exploration licences, which contain clear rules and environmental standards. Once exploration has finished, parts of the explored area must be relinquished to the ISA and are reserved for developing countries. ISA regulations governing the commercial exploitation of marine minerals are expected by 2016, initially for manganese nodules, and then for massive sulphides and cobalt-rich crusts. Only then can exploitation begin. The ISA's work is regarded as exemplary, for it is the first time in history that rules, regulations and procedures have been adopted before exploitation begins. It is also notable that within the future mining areas, the ISA has defined zones for the protection of deep-sea fauna, where extraction of

marine minerals is prohibited. Environmentalists criticize the fact that at present, pursuant to UNCLOS, the ISA cannot extend protected status to any zones outside the mining areas; they argue that the ISA is ideally placed to do so. The critics are therefore calling for UNCLOS to be amended.

In the waters under the jurisdiction of coastal states, there are no uniform rules applicable to marine mining. Under UNCLOS, every state is obliged to protect and preserve the marine environment, but in many places, the oil industry or effluent from land installations is causing severe pollution of the marine environment, partly because the authorities are too lax in their controls. Environmentalists view marine mining as a further source of disruption. A lack of controls is particularly worrying if a state allows "ultrahazardous activities", such as the operation of nuclear power plants or offshore drilling rigs, to take place in the area under its jurisdiction. Often, incidents at installations of this kind affect neighbouring countries as well, resulting in legal disputes between countries over compensation claims. Jurists are calling for "strict state liability regardless of fault" for states engaged in any kind of ultrahazardous activity, in order to facilitate international justice. At present, injured parties often obtain little or no compensation. Currently, an effective liability regime exists only for tanker incidents; this was established many years ago under the International Convention on Civil Liability for Oil Pollution Damage. The Convention also introduced a liability fund to which oil-importing countries contribute. Under the Convention, the shipowner is liable if an incident occurs, whether or not he is at fault. If the claims exceed the sum insured, the fund comes into operation and provides compensation. This liability regime could serve as a model for other industries, such as offshore oil production.

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Publication details

Project manager: Jan Lehmköster

Editing and text: Tim Schröder

Copy editing: Dimitri Ladischensky

Coordinator at the Cluster of Excellence: Erna Lange

Editorial team at the Cluster of Excellence: Erna Lange, Dr. Sven Petersen,
Dr. Lars Rüpke, Dr. Emanuel Söding, Dr. Klaus Wallmann

Design and typesetting: Simone Hoschack

Photo-editing: Simone Hoschack, Jan Lehmköster

Graphics: Walther-Maria Scheid

Printing: Ruksaldruck GmbH & Co. KG

Paper: Balance Silk, FSC-certified

ISBN 978-3-86648-221-0

Published by: maribus gGmbH, Pickhuben 2, D-20457 Hamburg, Germany

www.maribus.com

