

A Case Study on a Joint Venture Project

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Introduction

As early as 1984, the discussion in Special Commission 2 – the UNCLOS body charged with preparing the work of the Enterprise – had already led to the conclusion that joint ventures between the Enterprise and national or transnational companies of high competence in the technology of deep seabed mining will be “the most feasible option” for the early entry into operation of the Enterprise¹. A decade later, under the modified conditions for seabed mining reflected in the 1994 Agreement Relating to the Implementation of Part XI of the UN Convention on the Law of the Sea (UNCLOS) of 10 December 1982 (the Implementation Agreement or IA)², the Authority will explore the possibilities for joint agreements of different kinds with investors. Regarding the areas reserved to it, the Enterprise may act only through joint ventures³. Since the Convention otherwise distinguishes terminologically between joint ventures and other forms of joint agreements⁴, it must be concluded that Sec. 3 of the IA⁵ refers to some agreement similar to this peculiar form of institutionalized joint venturing. The international mining industry provides one typical example of such joint venture undertakings.

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¹ Statement to the plenary by the Chairman of Special Commission 2, LOS/PCN/L.5 of April 1984.

² See Art. 2 (1) IA: “The provisions of this Agreement and Part XI shall be interpreted and applied together as a single instrument. In the event of any inconsistency between this Agreement and Part XI, the provisions of this agreement shall prevail”.

³ Sec. 2 (2) IA.

⁴ See Annex III, art. 11 (1): “Contracts may provide for joint arrangements between the contractor and the Authority through the Enterprise, in the form of joint venture or production sharing, as well as any other form of joint agreement”.

⁵ Sections of the Agreement are those of the Annex that forms an integral part of it.

No deep seabed mining project is under way yet, and few dare to make prognoses as to how and when such projects will become economically sustainable⁶. While the basic technology may exist⁷, assumptions regarding reliability and efficiency are based on theoretical analyses and small scale testing. There is thus uncertainty as to how well or how unsatisfactorily these systems would function should they be employed on a commercial scale⁸. Profitability and time frames can thus only be estimated, which has legal repercussions⁹. It can be expected that state-owned investors will be the first to reach commercial scale exploitation. For example, India has identified nodule resources for mining on an economic scale in the Central Indian Basin. India has progressed far in her work to develop methods for processing the nodules and has carried out techno-economic analyses of the project. The first test mining is scheduled for 1995, followed by commercial production in 2005. In certain areas, India will be dependent on foreign technology and support. A great number of countries and companies wish to establish cooperation with India.

In order to influence through legal means the form joint seabed mining ventures will take in the future, it seems insufficient to follow the evolution of seabed mining as it is happening. Instead, one may attempt to leap ahead of these developments by, for example, tapping into the experience gained in conducting other mining projects by way of joint ventures. Acknowledging this, Sec. 2 (1) (f) of the IA identifies one task of the Enterprise as assessing "approaches to joint venture operations" in that very interest.

⁶ In the words of J.M. Markussen, *Exploitation of Polymetallic Nodules – Availability of Technology and Economic Feasibility*, in: J. Vandermeulen/S. Walker (eds.), *Ocean Technology, Development, Training and Transfer, Proceedings Pacem in Maribus XVI*, August 1988, 1991, 82–91: "Quite frankly, after having studied these matters since 1979, I consider it extremely doubtful whether anyone today can say anything for certain about the profitability of deep seabed mining projects".

⁷ *Ibid.*, 83; the main technologies tested so far are described by R.M. Fellerer, *Exploration, Mining, and Processing*, and H.-C. König, *Deep-Ocean Mining – A Status Review*, in: P. Halbach et al. (eds.), *The Manganese Nodule Belt of the Pacific Ocean*, 1989, ch. 7.

⁸ Markussen (note 6), 84.

⁹ See Sec. 1 (5) (f): "Adoption of rules, regulations and procedures necessary for the conduct of activities in the Area as they progress. Notwithstanding the provisions of Annex III, article 17, para 2(b) and (c) of the Convention, such rules, regulations and procedures shall take into account the terms of this Agreement, the prolonged delay in commercial seabed mining and the likely pace of activities in the Area" (emphasis added).

Part I: Identifying Data

A. Establishing the matrix

There is an almost infinite variety of joint venture agreements used in transnational economic law, proving the flexibility of this instrument for purposes of domestic as well as transnational economic and business relations¹⁰. Therefore, a matrix for identifying and analyzing joint venture agreements used for mining projects is needed; one that will yield useful data for understanding joint venture mining in the Area.

*I. Mode of exchange and nature of partners determine
the nature of a joint agreement*

Buxbaum has elaborated a framework for the purpose of analyzing contracts in transnational economic relations and business. He identifies two concepts which determine the benefits of such contracts: the mode of the transaction and the nature of the actor participating directly or indirectly in that transaction¹¹. The “mode” refers not to the product of the exchange but to the one salient feature that is critical to a contract-based relationship; that is whether the exchange is one-time or long term. The “nature of the actor” means not a specific identity but the party-related characteristic that critically affects contracts, namely whether the actor is private or public¹².

¹⁰ Preparatory Commission – Special Commission 2, Information note on elements of joint ventures – Background paper by the Secretariat, LOS/PCN/CN.2/4, reproduced in R. Platzöder, *The Law of the Sea: Documents 1983–1989* (equal to: Third United Nations Conference on the Law of the Sea, 1973–1982, 1989ff.), vol. VI, 383ff.: Para 1. “Experience over the last decades indicates an increasing tendency to tailor arrangements to suit the peculiarities of a specific venture and to meet the objectives of any particular investment project. By far the most popular and useful sort of investment arrangement is the joint venture, due to its flexibility”.

¹¹ R.M. Buxbaum, *International Mining Projects as a Research Paradigm of Transnational Economic Law*, in: G. Jaenicke/C. Kirchner/H.J. Mertens/E. Rehbinder/E. Schanze (eds.), *International Mining Investment*, 1988, 101–124, 103.

¹² The first element – the exchange process – can be associated with economics, the second – the actors – with political science, see Buxbaum (note 11), at 103. As the Implementation Agreement conception is predicated on a political task for the Authority to fulfil with market oriented instruments, the close mesh and integration of institutional economics would also be helpful in drawing up an analytical framework. Such cannot be the aim of this paper however.

This paper will focus on large-scale mining arrangements for non-seabed resources in order to draw parallels for mining within the Area. According to Buxbaum transnational mining projects are the quintessential long term contractual relationship of transnational economic law: they involve a long startup time in which there is no financial return and little possibility of a hedge in the form of progress payments as is the rule, e.g., in so-called turn-key contracts. The initial investment is exceedingly risky and the possible return ranges from modest to extreme. Other characteristics of such transnational projects are highly interactive requirements between the parties at all stages of the relationship from initial infrastructure development to operational aspects, indefinite duration of the operational stages and, finally, a unique mix of procedural issues combining both market-derived processes and significant challenges to the actual functioning of those markets¹³. The joint venture agreements entered into by the Authority will not differ much as to the mode of agreement. In fact, mining contracts are distinguishable from other contracts, namely because of the uniquely institutional nature of the joint venture form of many of these contracts. In large part they create not the substantive rules for the various operational decisions that need to be made during the life of the project but the procedural rules determining how those substantive decisions are to be made¹⁴.

II. Specific characteristics of the International Seabed Authority, its interest and bargaining position

Notwithstanding similar, large-scale non-seabed projects, the characteristics of the International Seabed Authority (Authority) are specific, without transnational precedent. If the task of this paper consists in comparing objectives of the Authority as defined by the IA and performance of the economic-legal instrument of a joint venture mining agreement, more must be known about structure and objectives of the Authority. The legal regime of the IA offers many interesting legal features, only a few of which have to be presented here briefly since they form the backdrop for any negotiated agreement that the Authority can enter into with investors. Public interest and market based implementation coexist within

¹³ Ibid., at 106/7.

¹⁴ Ibid., at 107.

the Authority¹⁵. The Authority is the organization through which States Parties to the Convention shall, in accordance with the regime for the Area established in Part XI and the IA, organize and control activities in the Area, particularly with a view to administering the resources of the Area¹⁶. The Enterprise for its part is the executive arm *in statu nascendi* of the Authority.

It is remarkable that the Authority is assigned the task of administering the resources of the Area – the job description for an agency type action – but discharges this assignment alongside its rule setting functions by using market oriented instruments, particularly joint ventures with investors. Under the Convention, the Authority will administer both the reserved and the non-reserved areas for mining purposes. According to UNCLOS, when read in the light of the IA, the Authority shall perform the functions of the Enterprise until the Enterprise begins to operate independently¹⁷. Until that time, the basic allocation of tasks will still be that the “Enterprise is the organ of the Authority which shall carry out activities in the Area ... as well as transporting, processing and marketing of minerals recovered from the Area”¹⁸.

Art. 2 UNCLOS describes the Enterprises’s relationship to the Authority in a nutshell: It shall enjoy “autonomy within the Authority’s policies”. With regard to exploiting the reserved area, the IA requires that the Authority acting through the Enterprise enter into joint ventures with investors. At the same time, however, the IA does not exclude such a procedure for the on-reserved areas allocated to an investor for exploitation. The Authority will enter into contractual relationships with investors with regard to both areas, notwithstanding that the IA is predicated on the assumption that the yields from the two types of areas will be distributed differently between the investor and the Authority¹⁹. Thus, the Authority will enter with investors into two different types of contractual relations: for non-reserved areas the approved plan of work takes

¹⁵ See Preamble: “Reaffirming that the seabed and ocean floor and subsoil thereof, beyond the limits of national jurisdiction (hereinafter referred to as “the Area“), as well as the resources of the Area, are the common heritage of mankind; Mindful of the importance of the Convention for the protection and preservation of the marine environment and of the growing concern for the global environment; Noting the political and economic changes, including market-oriented approaches, affecting the implementation of Part XI ...”.

¹⁶ Sec. 1 (1) IA.

¹⁷ Sec. 2 (1) IA.

¹⁸ Annex IV, art. 1 (1).

¹⁹ The Enterprise can operate both in reserved and non-reserved areas, Annex III, art. 11 (2), 13 (14).

the form of a contract; for the reserved area, the Authority will enter into a joint venture with an investor which also presupposes an agreement in the form of contract. To establish the search matrix for useful cases, the twofold contractual mining regime envisioned by the IA has to be specified a bit further and its characteristics have to be identified.

The first step in this direction ought to be the analysis of the interests, strengths and bargaining powers of the participants in a joint venture. The Authority's interests are circumscribed by the objectives assigned to it in Sec. 1 (5) of the IA. However, the Authority may prioritize among those, i.e. it may choose the relative weight it will give to each of them in negotiating a joint venture agreement with an investor. Furthermore, it can decide on the ways and means of achieving the objectives assigned. The Authority's prioritization in the negotiations with investors will be a function of the incentives that result from the combined IA and Convention regime. The mining regime as it stands now creates strong incentives for the Authority to make seabed mining on a commercial scale possible. The incentive for the Authority results from the evolutionary approach taken towards the Enterprise under the IA. It is clear that the independently operating Enterprise would make the Authority competitive in seabed mining, start the "fee flow", and thus secure the Authority's role of an independent player in the seabed mining business. Correspondingly, the Preparatory Commission for the International Seabed Authority and the Law of the Sea Tribunal (Prep-Com) had an intensive interest in making sure that already at the point of registration the investor would undertake the joint exploration of mine sites in the area reserved to the Authority. The IA stipulates that the investor is under no predetermined obligation to respond favorably to a corresponding request by the Enterprise²⁰. Thus, the PrepCom inserted a proviso into its 1994 "Understanding on fulfillment of obligations by the registered pioneer investor, the Government of the Republic of Korea, and its certifying State, the Republic of Korea"²¹, which requires the investor to perform exploration of the Authority's mine site upon request from the Authority. Secondly, the IA allows negotiated decisions on the subject of technology transfer. The Understanding provides for related solutions by making clear the existing priorities of the

²⁰ Sec. 2 (5) IA.

²¹ Hereinafter referred to as RoK Understanding. The PrepCom concluded this Understanding with the most recently registered pioneer investor, the Government of the Republic of Korea, and its certifying State, the Republic of Korea, LOS/PCN/L.115/Rev.1, p. 13 of 6 October 1994.

PrepCom, which currently are in the sector of training and technology transfer.

Fortunately, the PrepCom, whose decisions the Authority must implement²², has given an indication of how it would set the priorities in negotiating joint agreements with investors.

B. The nucleus

Such an indication of priorities can be distilled from the most recently signed "RoK Understanding concluded upon registration of the Korean Government as pioneer investor". The current priorities and conceptions of the PrepCom – and probably those of its successor the International Seabed Authority – are evident from this Understanding, which is a registration on agreed upon terms. Relevant excerpts from the text of the Understanding provide²³:

Para 2. The pioneer investor shall provide training pursuant to resolution II, para. 12 (a) (ii), in conformity with the specific programme for training approved by the PrepCom in accordance with the principles, policies, guidelines and procedures contained in documents LOS/PCN/SCN.2/L.6/Rev. 1 and LOS/PCN/SCN.2/L.7, taking into account the report contained in document LOS/PCN/BUR/R.6. It is agreed that the cost of such training shall be borne by the pioneer investor and shall be free of cost to the PrepCom. The precise number of trainees, the duration and the fields of training shall be agreed upon between the PrepCom and the pioneer investor according to its capabilities.

Para 3. In accordance with resolution II, para. 12 (a) (iii), the pioneer investor undertakes to perform the obligations prescribed in the UNCLOS and the Implementation Agreement relating to the transfer of technology, and further agrees that training in the use of all available technology shall constitute a substantial component of the training programme referred to in para. 2.

Para 4. The periodic expenditures for exploration to be incurred in accordance with resolution II, para. 7 (c), by the registered pioneer investor in respect of the development of the pioneer area shall be determined by the PrepCom in consultation with and with the cooperation of the registered pioneer investor within 12 months of the adoption of this Understanding. Such expenditures shall be reviewed by the PrepCom from time to time in consultation with and with the cooperation of the pioneer investor.

Para 6. The pioneer investor will undertake, if so requested by the PrepCom, a programme of exploration in accordance with the provisions of

²² Sec. 1 (5) (b) IA.

²³ LOS/PCN/L.115/Rev.1, Annex, of 6 September 1994.

resolution II, para. 12 (a) (i), of one mine site for the Enterprise in the area designated as the reserved area for the conduct of activities by the Authority.

Para 10. This [the annual] fee shall be payable from the date of commencement of commercial production. This fee may be credited against other payments due under the system adopted in accordance with paragraph 1 (d) of section 8 of the annex to the IA. The amount of the fee shall be established by the Council.”

The following priorities clearly emerge from this Understanding:

- at least starting up the exploration, conceding that small-scale exploratory mining is different from commercial full-scale exploitation;
- providing training as a matter of consultation and cooperation. A developing country with the means to buy it will experience no problems in procuring technology, now or in the future. However, this technology can easily become a so-called black box. Detailed knowledge of the technology is essential, along with the building up of a system of control. Not last, a training program enabling the receiver to master the technology is also needed²⁴;
- negotiating the fees and the amounts of money to be invested in the operation of exploring and exploiting.

The Understanding provides a clear illustration of how the PrepCom – acting in the presumed interest of the Authority and the Enterprise – intends to prioritize, namely that it will fulfill its assigned tasks by way of joint venturing. In fact, the final report of Special Commission 2, which included a model agreement, quite impressively showed in its discussion of drafts submitted along the way, that it now had come to the point where the maxim “if one wants to know what the law is, one should look at real life”²⁵ was gaining appeal²⁶. The Understanding is, however, only

²⁴ Markussen (note 6), 91.

²⁵ W.D. Rogers, Foreword, in: R. Lillich (ed.), *The Valuation of Nationalized Property*, 1972.

²⁶ See Annex 5/8 of the Final Report: “31. The Enterprise in a Joint Venture: LOS/PCN/SCN.2/WP4 ‘Proposals on a joint venture – Proposals by the delegations of Belgium, France, Germany, Italy, Japan, the Netherlands and the UK’ was evaluated by the Special Commission as follows: this working paper, while recognizing that no hard and fast rules for a successful joint venture agreement can be established, notes the importance of allowing the Governing Board of the Enterprise sufficient flexibility when negotiating with prospective partners. It discussed some of the key elements for establishing a successful joint venture agreement based on a model agreement contained in LOS/PCN/SNCN.2/WP.5. 33. That document contained a model agreement for establishing a joint venture between the Enterprise and national or transnational, private or State owned companies or consortia. The model agreement was not meant to tie discussions down to the specific clauses contained therein but rather to identify the issues that would have to be

a nucleus that leaves ample room for adaptation to changing circumstances and perceptions. It is a helpful case that provides insights to the approach of the PrepCom to joint venturing, yet also looks firmly toward the coming regime under the IA. In many respects, the PrepCom adopts exactly the single-institution approach to seabed mining by the Authority on the one hand and the private investors on the other, that seems to be mandated by the IA. Annex IV, art. 6 (g) in an organizational provision, states that "joint ventures are to be concluded by the Governing Board". Probably the first joint venture agreements will be concluded by the Authority's Council. However, according to Sec. 2 (2) of the IA, the Council has to issue a directive enabling the independent operation of the Enterprise. Therefore, the approval of the submitted plan of work and the decision on joint venturing both lie in the hands of the Council, see Sec. 1 (6) (a) (i). The familiar structure from the PrepCom's registering of pioneer investors is therefore maintained.

In fact, the PrepCom itself apparently wants this Understanding to be a model for the contracts to be concluded with other investors²⁷. The Understanding embodies the basic theory behind the IA that the Authority should achieve the objectives assigned to it on negotiated terms with the investors. Indeed, as the analysis against the backdrop of a classic joint venture will show, this Understanding covers the issues most often raised in joint venture negotiations. In this respect it offers creative solutions to the unparalleled position of the Enterprise, combining public interest assignments and market-based fulfillment of the Authority's tasks.

C. Choice of a case study capable of shedding light on the essential questions facing the Authority

For this case study, factual descriptions of mining joint agreements are legally significant, since they form the basis for comprehending a typical instrument used in a particular joint venture function.

addressed and equitably solved if the mutually beneficial joint venture was to be concluded between the concerned parties. In 1987, the delegation of Colombia submitted document LOS/PCN/SCN.2/WP.4, 'the International Venture'. This study provided a further analysis of a joint venture between a pioneer investor and the Enterprise, placing special emphasis on the exploration, research and development, and the training of personnel".

²⁷ See Understanding (note 21), Para. 12.

I. Criteria

It is essential first to define the factual characteristics that the case study should reveal. These characteristics include:

(1) Comparable factual conditions (possibly marine mining projects) and a project that is up and running. It must be asked whether the Enterprise will be a technologically advanced entity possessing all the necessary means to develop technology, to acquire it on the international market, and to carry the bulk of mining, or whether it will be politically acceptable for the Enterprise to adopt a supervisory and distributing function. A certain prediction must be made here, for the case examined to be useful. There is an element of uncertainty, but the choice will be made that for a first phase, the Enterprise will have the contractors provide the technology and conduct the actual mining. In a second phase, however, the Enterprise building on the experience thus gained may be capable of assuming either or both tasks.

(2) Minimum government involvement so as not to disturb the economic analysis;

(3) A comparable structure and function of contractual relationships;

(4) A close, potentially long-term relationship between the concessionary and the technology holder, since this will probably be the case under the Seabed regime.

The search for a joint venture project suitable for illustrating the likely advantages of seabed mining by joint venture could cast a wide net by looking at all other cases of marine mining. The cases where most experience has been gained so far are in mining fossil fuels such as oil²⁸ and natural gas, diamond mining, and cable laying²⁹. However, diamond mining case off of the southwestern coast of Africa most suitably fits the criteria established for an instructive case study.

²⁸ Eg. Texaco's October 1994 joint venture agreement with ABB, Stena Offshore, Asano and UIE Scotland, which paves the way for the \$ 795.2 million Captain field development in the UK North Sea, see: C. H o p s o n, Energy Correspondent, Reuter Textline, Lloyds List, October 13, 1994.

²⁹ BBC cycle, Financial Report (1994 Reuters, Ltd., June 3, 1994). NYNEX Corp. said Telecom Holding Co. Ltd. has purchased an option and indicated an intention to invest \$ 120 million in its submarine cable system joint venture, FLAG Ltd. NYNEX said FLAG, which stands for Fiberoptic Link Around the Globe, is developing a \$ 1.0 billion project to lay an undersea fiberoptic system extending from the United Kingdom to Japan through the Mediterranean and Indian Ocean regions. Telecom Holding is a subsidiary of TelecomAsia, a NYNEX joint venture in Thailand whose majority shareholder is Bangkok-based Charoen Pokphand Group.

II. Diamond mining off the southwest African coast – reasons for selecting this project

Marine diamond mining off of the southwest African coast has been chosen for several reasons but first because it has the crucial element of a quasi-concessionary system that the Convention also puts in place. This situation is exemplified by the diamond mining offshore of the country South Africa. Second, the strikingly similar technical conditions are marked in both cases by the development of new mining technology, the need for extensive exploration before starting exploitation and processing on a commercial scale. Third, the chosen case study has a finite number of players capable of mustering the necessary technology and the considerable investment capital³⁰. Fourth, both the mineral resources of the seabed and marine diamonds have land-mined equivalents.

Finally, the most important difference between marine diamond mining and the polymetallic nodules of the deep seabed – the economics – makes the comparison particularly worthwhile. The diamond mining giant De Beers proved in 1991 after a long preparatory phase that marine diamond mining was economically viable. Prices for gem diamonds are stable, calculable and high³¹. These factors are different for the more common mineral resources found in the polymetallic seabed nodules. The specific economic conditions for the marine diamond industry have created a greenhouse growth of sorts for the industry, which is already producing marine diamonds of 100,000 carats annually, but is still at the beginning of its expansion. Indeed one can observe the coming into being of a marine mining industry within a short period of time after political instability was overcome in South Africa by the final abolition of the White minority rule in May 1994, which may be comparable to the situation of seabed mining after the entry into force of the UN Convention on the Law of the Sea in November 1994. One of the striking features of the emerging marine diamond mining industry is its widespread use of joint venture agreements. Participants show great creativity in efficiently pooling their resources, which provides a model for the reader interested in forecasting the use of this market-based instrument *par excellence* by the investors and the Authority.

³⁰ The structure of the deep seabed mining industry, both private and state controlled, is described by J.-L. Gaster, *Der Meeresbodenbergbau unter der Hohen See*, 1987, 98–105.

³¹ Due to the Central Selling Organisation – a marketing cartel, see *infra* Part II B.

*III. Description and background*³²

The 300 km coastline extending from South Africa to Namibia holds the world's largest known resources of gem quality diamonds. Geological evidence indicates that about 1.5 km of the topmost part of kimberlites from Kimberley and its surrounding areas, consisting of 3 billion carats of diamonds, have been eroded and transported toward the sea by the Orange River system over 65 million years. Sea level variations and long shore drifts have distributed diamonds over the continental shelf off the west coast of southern Africa³³. The diamond resources were transported into the ocean from onshore by large rivers emptying into the Atlantic on the southwestern coast of Africa and were deposited on the continental shelf in water depths ranging to 300-m isobath.

In contrast, the marine minerals of the Deep Seabed (Abyssal Plain)³⁴, originated where they still are found today. The polymetallic nodules are concentrations of iron and manganese oxides containing nickel, copper, cobalt and several other metals. The nodules are found in deep ocean basins of depths up to 4000 m. Exploration for manganese nodules – the primary focus of the Convention – is aimed at delineating the nodule deposit and its basymetric environment. However, present day knowledge of the total technology involved in nodules mining and processing is inadequate for evaluating its commercial viability and only minimum requirements for a first-generation mine site can be established.

Notwithstanding these differences, from an industrial point of view striking similarities exist between diamond and deep sea minerals mining. Both are mined from aboard ships and excellent geophysical data is the key to success.

In South Africa, the diamond producing coast has been divided into 20 concessions by the government. Each is subdivided into shallow, mid-water and deep-water concessions, referred to respectively as the “a,” “b” and “c” concessions³⁵. The “a” concession is 1 km wide and parallels the

³² The author wishes to thank Mr. Barry Davies of BHP Minerals, Mrs. Amy Stephenson of Canadian Overseas Exploration Company, Toronto, and Mr. Graham Reese of De Beers Marine, Cape Town, who provided valuable information for this study. All factual errors and omissions remain of course the responsibility of the author as are the views and interpretations expressed therein.

³³ See S.Z. Qasim, *Deep-Sea Minerals*, in: Vandermeulen/Walker (eds.) (note 6), 75–81.

³⁴ Metalliferous muds, marine polymetallic sulphides and cobal-ferromanganese crusts, and the polymetallic nodules.

³⁵ Source: COEC: *Marine Diamond Mining – Opportunities in South Africa*.

coast. The “b” concession extends seaward for another 4 km and the “c” concession extends to the end of the continental shelf. In the shallow waters of the “a” concessions only divers can operate. With the development of the mid-level waters of the “b” concessions, remote control underwater mining technologies are used that greatly increase the volume and the operating hours per year as well as the profit margins. The “c” concessions require exploitation from aboard specially equipped ships. It is here that technological and know-how advances yield the greatest returns.

IV. The main players and the joint ventures

De Beers dominates the deep-water concessions and is heavily committed to mining diamonds from the sea. De Beers Marine has recovered 262,000 carats from the ocean within the two years since its commencement of commercial production in late 1991. Other major diamond mining companies such as BHP and TransHex are joining the marine diamond mining scene in South Africa. Diamond mining activities on the west coast of Africa include four of the richest and most profitable gemstone producers in the world: CDM operations to the north of the Orange River in Namibia; Alexcor mines to the south of the Orange River in South Africa; Kleinzee Mine (De Beers) at the Buffels River mouth in South Africa and Koingnaas Mine complex a further 75 kms to the south.

In the zone stretching south from Diaz Point in Namibia over Hottentots Bay to concessions off South Africa, diamond mining is conducted from aboard ships in depths of more than 150 m. The exploited minerals are worth in excess of US \$ 100,000 annually. This is the most ambitious marine mining operation currently under way in the world. A preferred form of conducting the projects is the joint venture. The main players in this zone also are internationally operating undertakings, such as BHP, BENCO, DeBeers and COEC, whose activities are discussed below.

BHP Minerals is the mining company which has most experience in marine mining joint ventures, although in absolute terms its turnover is not the largest. BHP Minerals is a business group of The Broken Hill Proprietary Company Ltd., Melbourne Australia, with subsidiaries in the USA, Canada and many other locations. BHP Minerals has the capital to conduct simultaneously several seabed mining operations which require the development of technology for heretofore unknown conditions. For a diamond mining project off the west coast of South Africa, the group has

entered into a joint venture with South African based Benguela Concessions Ltd. (Benco) which, if successful, could lead to the mining of marine diamonds from the seabed. Different from the mining envisaged by COEC, BHP-Benco does not intend to harvest the diamonds that are being discharged into the sea by rivers. Rather it intends to mine the seabed, for which technology has had to be adapted. The mining is to take place in deepwater sea concessions held by Benco off the coast of South Africa. The "Heads of Agreement", signed in November 1992, called for a two-phase program. In Phase I, BHP Minerals will contribute US \$ 15 million and earn a 30 % interest in the joint venture with Benco by undertaking a comprehensive survey and sampling program to establish reserves and by developing appropriate technology to mine diamonds from the seabed. If the results of Phase 1 confirm the viability of mining, BHP has the right to increase its interest in the joint venture to 75% by contributing a further US \$ 45 million to acquire, outfit and commission a prototype mining vessel. BHP is to manage the joint venture. As the results of Phase 1 were beginning to show the economic viability of the project, Phase 2 was initiated in late 1994 with negotiations on the precise terms governing it. BHP is to manage the joint venture.

Since the joint BHP-Benco venture has proven so successful, the partners have entered into another joint mining venture with Diamond Fields Resources Inc (DFR) to explore and exploit DFR's diamond exploration property off the coast of Namibia. The exploration property, called the Lüderitz Sea Concession, encompasses 660 square kilometres from Diaz Point to Hottentots Bay.

Under the terms of the "Heads of Agreement" signed in May 1994, BHP-Benco can earn a 50.1% interest in the project by carrying out and funding exploration, sampling and bulk testing activities. This work is aimed at producing a bankable feasibility study by August 1996 for an economically viable large-scale mining of the concession. The feasibility study is based on a projected minimum annual production of 100,000 carats with targeted annual diamond production in excess of 200,000 carats.

BHP has completed the first stage of an exploration drilling program using its 123 metre Geomaster diamond exploration vessel within DFR's concession³⁶. The sampling program comprised the drilling of 296 widely spaced, large diameter holes with a specially adapted "Bauer drill" on

³⁶ Press Release Diamond Fields Resources Inc., Jean Raymond Bouille, Co-Chairman of the Board, January 16, 1995.

board the Geomaster. Five areas, representing 254 sq.km. of different seabed geological environments, were selected for initial sampling based on previously identified extensive diamondiferous, seabed gravel deposits. The water depths in the test areas ranged from 30 to 120 meters³⁷. While the density of holes is insufficient for grade estimation purposes, the results confirm the predicted presence of diamonds in extensive seabed gravel deposits in water depths of up to at least at 73 meters. The results justify moving to the second sampling stage which has already commenced. The Geomaster is on-site carrying out a follow-up program, of 600 holes in the 30-plus meter waters. Plans are in preparation for a program, using other vessels, designed to evaluate the diamondiferous gravels present in waters under 30 meters.

Following an announcement on 2 June 1994, Canadian Overseas Exploration Corp. (COEC) confirmed that the Company would enter into transactions which will have the following impact on the Company's marine diamond interests³⁸: A five fold increase of marine diamond properties from 60 sq.km. to 330 sq.km. by creating two strategic blocks of contiguous concessions located in an important area of marine exploration as well as close proximity to known onshore diamond mining operations. Importantly the Company's interest has been expanded in the concession close to the Olifants River and creates a major holding adjacent to other concession areas undergoing active exploration programs by Namibian Minerals Corporation Ltd. and the BHP/Benguela/Ocean Diamond Mining joint venture. Initial estimates of marine diamond resources will increase from 5 million to 20 million carats according to reports available to the Company. In June 1994, COEC commenced negotiations with various companies to ensure that the Company's marine diamond interests would be brought into production at the earliest possible time. Following initial discussions with major international mining groups it became clear that the critical element in optimizing future production would be reliance on the skills of an appropriate contribution from a partner with a high level of experience in marine services. The suitable parties had to be found to bring into production the valuable diamond concessions which had been acquired. COEC attracted the interest of De Beers, one of the largest marine service groups in South

³⁷ A total of 2007 diamonds with an average 0.331 carats per stone and a quality typical of the west coast deposits which are in the 90 plus % gem content range were recovered from four of the areas. The largest stone was 1.57 carats in weight.

³⁸ Source: Business Wire, September 20, 1994.

Africa. Together they will build a suitable joint venture structure for long-term marine diamond mining operations. The directors of COEC have sought suitable partners from the mining and marine services industries to ensure that all aspects of operations from survey to diamond sales can be carried out, including: geophysical survey prospecting and sampling evaluation mining recovery at optimum levels, sorting and marketing through appropriate channels. In order to finance the purchase of the concession, perform a high quality survey and sampling program and proceed to a joint venture as described, the Company has entered into an Agency Offering Agreement with Credit Lyonnais Laing, London, to undertake the placement of 25,000,000 new common shares at C\$ 0.40 per share. The issue will raise C\$ 10 million before expenses. Canaccord Capital Corporation has been appointed as broker to the issue.

Part II: Analysis of the Undertaking in Light of the Experience with Joint Venturing in Seabed Diamond Mining

In the following pages, an attempt will be made to consider how the Authority may attain its objectives by way of joint venturing with investors.

A) Methodology used

This study can be successful only if the analytical framework it applies to the possible factual descriptions is not limited to legal considerations. In fact, economics as well as institutional economics and political science are neighboring disciplines that help, if not to find a new system, to sharpen the focus for how the law both impacts on and reacts to the emerging seabed mining practice.

The ideal joint venture, both from a micro- and macroeconomic point of view, is the one that brings together partners with complementary skills and resources. Such complementarity cannot be narrowly confined to complementary technologies of the participants but can also encompass other assets that are valuable to both partners, such as specific market access, holding a concession, providing capital, etc.³⁹. Economics and

³⁹ See the joint venture agreements that Corning Glass Works entered into with Siemens, several European PTT, and others that have the know-how for cabling (Corning had invented a glass fiber suitable for long-distance communication). Joining forces with the PTT was necessary not because of their special technology but because national governments would procure mainly through the national PTTs. The European Commission

antitrust teachings on the analysis of any agreement emphasize the bargaining power of the parties⁴⁰ and the resulting contractual equilibrium⁴¹. In fact, interests and bargaining powers of the prospective parties to a joint agreement are determinative of the eventual shape to be given to their agreement. The concept of joint ventures, on the other hand, is so flexible that it can be adapted to the specific needs of the partners.

The language of institutional economics provides three frames of reference relevant to the study of the forming and implementation of long-term transactions. The first speaks of integrative complexity of such exchange relationships. Under these concepts, a mineral mining agreement would rank high on the scale of integrative complexity. This is because the several stages of investor performance – exploration, exploitation, processing and marketing – have common traits. Each is difficult to define, each overlaps and doubles back on the other to a degree, and each is open to and thus has to adjust for exogenous factors (e.g. the world demand and market prices for the minerals) that are in part within and in part outside of the control of one or the other party⁴². A second economic concept addresses the partly mutual, partly conflicting search of the parties for optimizing as opposed to so-called “satisficing” solutions to both their individual and their mutual overall goals. Third, the economic vocabulary yields questions about the competitive positioning

(DG IV) was notified of the agreements and cleared them under Regulation 17/62 after some changes to the agreements had been negotiated. The Commission’s reasoning focuses on the efficiency-enhancing effect of the agreements necessary to bring the superior glass fiber cable on to the market. See Commission of the European Communities, Decision of 14 July 1986, 86/405/EEC, OJ No. L 236/30, at para. 46. For a lucid analysis of this case and the Commission’s stance on joint ventures under Art. 85 and 86 E(E)C-Treaty see V. Korah, *Critical Comments on the Commission’s Recent Decisions Exempting Joint Ventures to Exploit Research that Needs Further Development*, in: *Eur. L. Rev.* 1986, 18–39.

⁴⁰ Information note (note 10), Para. 4: “The question of the bargaining power of the parties is to be raised. Traditional notions of foreign investor/developing host State positions will not necessarily hold true, due to the international character of the Enterprise. Strengths and weaknesses of either participant are not likely to follow traditional patterns. Furthermore, since the underlying policies and regulations governing the Enterprise are or have been promulgated through a multilateral forum, its bargaining power may be subject to influence by varying priority interests. It is not unlikely that the final joint venture will represent a ‘package’ including questions of jurisdiction, governing law, duration, ownership, control, financial policies and technical aspects”.

⁴¹ The latter notion was relied on heavily by the Chambers of the U.S.-Iran Claims Tribunal.

⁴² Buxbaum (note 11), at 107.

and strategizing of the parties to long-term contracts. Particularly in mining agreements, the vulnerability of the invested capital, as spent money, is high.

The case study examined should be tuned to the specific conditions resulting from characteristics of the legal regime set up by the Convention. When the Authority is a party to a joint agreement certain limits to the forming of the joint agreement follow from the regulatory regime of the UNCLOS. The IA sets up a peculiar regime, with both strict and flexible elements. Apart from the general rule setting powers of the Authority, the Enterprise will hold a valuable concession in whose exploration the investor has already invested funds. Further, the investor is under an obligation at least to negotiate in good faith towards technology transfer. Finally, the IA did leave important leeway to the Authority in negotiating the financial terms of a joint agreement.

Antitrust analysis provides other interesting insights that, although not detailed further in this paper, may be helpful in this context. Antitrust considerations are particularly important for maintaining the economic independence of the partners to a joint venture agreement.

B. Bringing about economically and environmentally sound seabed mining

An important overall objective of the UNCLOS regime is the bringing about of economically and environmentally sound seabed mining using market based approaches such as joint ventures⁴³. The role of joint ven-

⁴³ Expressed particularly in paragraphs 2, 3 and 5 of the Preamble to the Implementation Agreement (IA). See PrepCom, Special Commission 2, Geneva 13 August – 5 September 1984, LOS/PCAN/SCN.2/WP.4, 27. August 1984 – Proposal on Joint Venture, proposals by the delegations of Belgium, France, Germany, Italy, Japan, the Netherlands and the UK, reproduced in Platzöder (note 11), vol. V, 392, Para. 4: “Such joint venture would clearly need to have regard to the respective interests of both the Enterprise and the investor, but they would offer potential benefits to both parties. A joint venture would facilitate: (i) harnessing the organizational skills and proven technological capability of existing operators in the development of the parallel system of exploitation envisaged in the Convention; (ii) the enhancement of the technological capabilities of the Enterprise through cooperation and the on-site training of personnel; (iii) bringing forward the development of resources in the area reserved to the Enterprise; (iv) the sharing of the substantial financial costs associated with a mining operation between the Enterprise and the investor, and of the possible financial benefits forthcoming, thereby improving the prospects of further exploitation of the deep seabed; (v) reducing the burden of the financial investment required through the opening up of greater opportunities for the external financing of a mining project”.

turing in an upstart mining industry is well illustrated by the marine diamond mining off of the southwest African coast.

1. The start up of the marine diamond mining industry

From the experience of marine diamond mining off of the coast of southwestern Africa emerges the picture of a jump-started mining industry, for which three necessary pre-conditions can be identified. Certain framework conditions set the stage, creating the general ripeness of the situation for exploitation. Yet the jump start was actually triggered by the coming in of the capitalized, innovative and experienced mining companies as they entered into joint ventures with the concessionaries. This then led to an array of follow up joint agreements concluded by other players, both public and private. Given the robust start of these diamond mining projects, it is important to identify the factors that will secure their continued growth. As we will see, the diamond mining case is less instructive on how to reconcile environmental and economic concerns in the development of a new marine mining industry.

1. Setting the stage for marine diamond mining

For the following reasons, it was not until recently that the world turned its attention to marine diamond mining⁴⁴. First, recent political events in South Africa, including the end of the *Apartheid* era, the beginning of a new democratic government and the lifting of trade sanctions attracted foreign investments and “first world” support for South Africa. Second, recent developments in ocean mining technology, following the success of oil recovery in the North Sea and other areas, account for the proven technology used in marine diamond mining. Third, the diamond trade enjoys a strong but idiosyncratic market due to the very limited customer base for gem diamonds *en gros* and monopolistic price setting by the London-based Central Selling Organisation (CSO). Also, the quality of marine diamonds (95% gem quality vs. kimberlites) is highly sought after by the jewelry industry, which is the biggest sector for diamond sales⁴⁵. Fourth and finally, limited concessions are available. The west coast of South Africa and Namibia are divided into concessions

⁴⁴ Source of the following economic and business analysis: The Wall Street Transcript, Sept. 19, 1994.

⁴⁵ Jewelry sales in Asian markets have expanded as the Asian economy, especially in Japan and China, develops and continues to prosper.

by the government for purposes of marine diamond mining. De Beers dominates in both countries in access to the deep water concessions available and demand always outstrips supply.

2. The trigger

The arrival of new players – particularly the expansion of the first international mining company to the field of marine diamonds through BHP's \$ 60 million investment – attracted international attention. This led to De Beers' heavy investment in marine diamond mining, evidenced by the increase in its marine diamond mining fleet from two ships to seven, and going on to nine within the next several years. Each ship costs approximately \$ 70 million.

Among the many challenges to developing the marine diamond industry is the relative lack of proven technology. The vast resource and the high gem quality of marine diamonds have been known for a long time but only in late 1991 did De Beers prove that they could be successfully mined. De Beers started widespread, systematic prospecting and experimental mining more than 20 years before they started mining commercially. The company pioneered the development of a reliable offshore mining method through the 1980s and finally late in 1991 proved that the world's largest resources of gem quality diamonds could be commercially mined. Still, marine diamonds mining technologies and methods continue to develop and to be fine tuned.

3. Continuous growth?

As the land-based reserves of diamonds in Southern Africa become depleted, attention is increasingly turning to the marine diamonds to ensure the maintenance of diamond production levels. The question remains whether the Central Selling Organisation (CSO) – one of the world's last cartels – will continue to maintain its monopoly. While De Beers still controls in excess of 85 % of the world's diamond sales, newcomers such as BHP may change this picture, particularly since marine diamonds – unlike onshore mining – need only a year or two to develop to full production. However, there is a finite number of companies with ocean mining technology, equipment and diamond mining experience in general, which will make for a quasi-oligopolistic market structure.

The expenditures for exploration and development will focus on determining diamond reserves for which good geophysical surveys and the most suitable type of mining technology are needed.

4. Sustainable growth?

Little experience exists regarding environmental aspects of deep seabed resource mining. This is in part because the marine diamond mining technology of drilling is in and by itself less destructive than the quasi-plowing proposed for the mining of the deep seabed nodules. Furthermore, government regulation in this area is almost non-existent, as a result of the politically unstable transitional phase during which the commercial scale mining of marine diamonds started. Given this dearth of environmental models in the marine diamond case study, and the increased interest in environmental matters on the part of the international community under UNCLOS and the IA, the deep seabed mining industry can and ought to provide leadership in addressing environmental concerns.

5. Setting the stage for deep seabed mining

The framework conditions identified at the start of the diamond mining industry's growth⁴⁶ are at least partly matched for deep seabed mining, in terms of technology, players involved, political-economic considerations, market potential and environmental concerns. Generally speaking, the technology for exploration, exploitation and processing of polymetallic nodules is available today. There is every reason to believe that this will continue to apply in the years to come. This ignores neither the necessity of nor the potential for further considerable improvement of the existing technology, such as happened with marine diamond mining: BHP improved the technology pioneered by De Beers thus gaining an edge over the latter, and then capitalized on its improvements by a follow up joint venture with a third party, Diamond Fields Resources (DFR).

Clearly, States are not the only players that can muster the forces necessary for deep seabed mining. From the beginning, private consortia and enterprises have been involved. Indeed, private involvement will eventually decide the long term prospects for seabed mining. It is not entirely clear why, at the end of 1970 when UNCLOS negotiations were getting underway, the private consortia basically adopted a wait and see position and concentrated instead on ensuring their claims under existing national laws. Probably a combination of political and economic factors induced the cautious positioning of industry. The diamond mining case provides an interesting parallel matrix for assessing the consequences of an increasingly stable political and legal setting.

⁴⁶ See Part II.B. 1-4, immediately above.

As to market potential for seabed mining, it is realistic to expect that suppliers of the end product will increase in number as the time for commercial exploitation approaches, as new companies seeing a market potential join in. The majority of supplier firms today have a need-related point of departure for their engagement. They have entered this area because they have a need for metals and they see the potential for synergetic effects, for profits and the like. They are engaged in every phase of a project as a matter of vertical integration, where the countries or consortia wish to become engaged in everything from exploration to marketing of the finished metals. In addition to these actors an increasing number of supplier companies will specialize in parts of the necessary technology⁴⁷. Today there is also a category of "independent suppliers". A Finnish company, e.g., offers services for mining of deep seabed resources. In Norway, 30 companies and organizations have joined forces to offer technology, products, and services for marine exploration, mining, transport, and processing. Another possible trend is increased international cooperation. To a great extent, the various actors work with the same technological concepts. Pooling resources would result in faster and more cost effective development of deep seabed mining⁴⁸.

As to the protection and preservation of the marine environment, under the Implementation Agreement, the investor will have to submit an environmental impact assessment (EIA) with its application which will work in favor of the Authority ensuring the environmental protection. The crucial role of environmental information has been discussed elsewhere in detail and is referred to here. Be it added though, that South Africa, by not requiring a prior EIA, had not⁴⁹.

II. Objectives of mining joint venture agreements in the diamond and the deep seabed mining cases: a comparison

Returning to the marine diamond mining case studies, both the BHP-Benco and the BHP/Benco-DFR joint ventures draw a line between two stages of engagement, i.e. exploration and exploitation. Whereas the former determines the probabilities of a profitable mining project, the latter constitutes the assumption of real responsibilities and liabilities.

⁴⁷ They could be called niche-suppliers.

⁴⁸ Markussen (note 6), 90.

⁴⁹ It has to be added that assessment may stop short of a full fledged statement of environmental impacts, at least when parting from the terminology used under the U.S. National Environmental Protection Act.

Can the Authority match the flexibility of private undertakings in such a cost-benefit analysis? The Implementation Agreement draws a rather clear distinction between the two phases of exploration and exploitation⁵⁰. As it was put succinctly during the workings of Special Commission 2: "It is assumed that in the initial phase of the activity of the Enterprise, the joint venture will cover only the mining stage (the recovery of the minerals from the seabed). It does not seem advisable to burden the Enterprise in the initial stage with the additional personnel, technical, and financial problems of the processing and marketing stages. From the economic point of view, the establishment of a separate processing plant and a marketing organization is not justified on the basis of exploitation of only one or perhaps two mine sites in the initial stage of the activity of the Enterprise"⁵¹. A solution to this problem would be to include a provision in the joint venture agreement on also using the plants and other installations set up onshore by the investors for the processing minerals from its area⁵².

The Understanding between the PrepCom and the Republic of Korea⁵³ illustrates the potentially limited nature and conception of joint agreements involving the Authority. It is limited to exploration and does not cover exploitation, processing or marketing. By contrast, distinguishing between the exploration and exploitation phases is indeed current practice in the international mining business, as becomes evident from the BHP joint venture where the partners agreed clearly to distinguish between the two phases. BHP can leave the joint venture with a considerable but compensable loss should the exploration not prove promising. BHP considers the capital invested in the exploration as risk capital and thus applies a corresponding discount rate. However, the partners have linked the two phases of exploration and exploitation both legally and economically by securing for BHP the option to invest and thus earn another 45% share of

⁵⁰ Sec. 1 (5): Between the entry into force of the Convention and the approval of the first plan of work for exploitation, the Authority shall concentrate on (a) Processing of applications for approval of plans of work for exploration in accordance with Part XI and this Agreement and ... (c) Monitoring of compliance with plans of work for exploration approved in the form of contracts.

⁵¹ PrepCom Special Commission 2: A Model Joint Venture Agreement for Seabed mining submitted by the delegation of the F.R. Germany, LOS/PCN/SCN.2/WP.5, 15. Oct. 1984, Para. 4, reproduced in *Platzöder* (note 11), vol. V, 397.

⁵² According to Annex IV, art. 1 (1), the Enterprise is competent for transporting, processing and marketing. While it may be true that the legal regime of these stages will differ from the actual mining stage, all stages have to be taken into account.

⁵³ See note 21, above.

the joint venture once exploitation appears economically viable⁵⁴. Such a link between exploration and exploitation is also indirectly provided for in the Understanding with the Republic of Korea (the RoK Understanding). In fact, for the Korean Government the annual mining fee becomes payable with the start of the exploitation on a commercial scale. It remains a decision of the investor whether or not to abort the exploitation phase.

It is probable that the RoK Understanding needs a follow-up agreement on processing and mining which would have to be concluded once the exploitation on a commercial scale has become a realistic possibility. Generally speaking it will take at least eight to ten years from the time a country or company has finished preliminary testing of mining, transport, and processing technology until a total concept has been developed that is ready to be applied on a commercial scale⁵⁵. The technology has to be first tested in a one-to-ten scale and then in a one-to-three scale relative to commercial production. In this period the resources must also be explored and the operation must be planned in detail for optimal utilization of the equipment. The first-generation projects are expected to have an annual production capacity of three million tons of dry nodules, with the duration of the project being some 20 to 25 years⁵⁶. The actual timing will of course be affected by expectations regarding profitability, particularly on the world minerals markets. It is self-evident but may be underscored that there is no uniform profitability line for all players. Rather the calculations will vary from undertaking to undertaking and only an individually negotiated agreement instead of a uniform one will secure efficient exploitation of the seabed resources.

Production and marketing are separate issues requiring very specific knowledge that encompasses exploitation, processing and marketing. Here, a further lesson can be learned from the comparison with the marine diamond mining business. It was already pointed out that the stable prices for diamonds ensured by the marketing through CSO was of great importance for the jump start of the marine diamond industry. The CSO as one of the world's last cartels has in fact managed to keep the prices steady in spite of a large increase in supply through land mining. The pricing of the metals harvested on the seabed will thus be an impor-

⁵⁴ BHP projects it will contribute its working money by first mustering and commissioning a ship specifically equipped for commercial scale mining.

⁵⁵ Markusen (note 6), at 86/7.

⁵⁶ *Ibid.*, at 87.

tant task for the Authority. The IA formulates fairly strict directives as to the pricing. The pricing shall take that for land mined metals into account while reflecting the true cost for marine mining. Such is the rule in mining undertakings that are projected over a long period of time and for which it is hard to predict the development of markets and other relevant factors. It may even be that the investor will enter into a joint venture agreement on the marketing of the nodules. An example for such a strategy is provided by the mining project undertaken by COEC off the coast of South Africa. Just like BHP, this is marine diamond mining. COEC is looking for a partner to enter into a joint marketing agreement since it does not have all the necessary large outlet networks of its own.

Marketing joint ventures in many respects differ from those mainly destined to further R&D related activities. In fact, drawing on the analyses pioneered under anti-trust laws both in the U.S. and in Europe, the economics of both are quite different. R&D joint ventures are generally looked upon favorably under anti-trust laws since they are directed towards making markets more efficient by providing consumers with more choices for where to spend their resources. Marketing joint ventures, on the other hand, are viewed suspiciously since they tend to eliminate competition between the parents and to have the joint venture set monopolized prices. Applying this to the situation of deep seabed mining, the exploration phase, including the large scale testing of equipment, would qualify as efficient. Risk capital is in effect being used to produce widgets that were not available before. The analysis might be different when marketing is to be considered. The public purpose of the Enterprise requires that it secures its own price setting capabilities. Any restrictions arising out of a joint agreement would have to be consistent with a "rule of reason".

III. The legal and political framework of the joint venture agreements

Deep seabed mining will start up under substantially different conditions than did marine diamond mining. The legal regime for the Area and the International Seabed Authority provided for in UNCLOS is an internationalized legal order and not one of a sovereign State. The internationalized regime of deep seabed resources is detailed, stable and flexible enough to allow for utility maximization in several contexts. A number of joint venture relevant issues that are more or less directly affected by this are addressed here.

1. Contract governance and law-governance

The success of a transnational joint venture hinges to a large extent on the quality of its legal regime, primarily in terms of reduced transaction costs. In long-term contractual relationships, as in the diamond and deep seabed minerals cases, only a combination of contract governance and law-governance structures will support and encourage the supply of investment to mining ventures on “superior terms”⁵⁷. Some governance structures can be developed within the sole contracting framework, and require only the most general overarching legal rules concerning the validity and enforceability of contracts. Other governance structures can be developed only within the controlling legal framework itself⁵⁸. The point is here to have a mature legal order in the relevant area at one’s disposition. Only secondarily does it matter whether the joint venture submits to the host state’s law, as De Beers prefers to do, or the investor’s home state, which is BHP’s preference. The “ideosyncretical”⁵⁹ regulation of many joint venture relevant issues in the IA is a decisive advantage as it lightens the burden that would otherwise arise in drafting and negotiation of individual contracts.

2. Government dealings/Hedging of political risks

The choice between international or national law governance also impacts the issue of political risk and government action. This issue is often crucial for transnational mining projects; indeed lessons can be learned from marine diamond mining experience. The factors that make mining joint ventures hard to negotiate – particularly in countries marked by political instability – are known as the loyalty problem on the investor’s side and the hostage situation of the investor⁶⁰, although these are not actual factors under the Convention.

⁵⁷ Information note (note 10), Para. 5/6: The governing law would also be the national law, subject to negotiations. This law may, however, often be found incomplete with regard to the complex and specific needs of joint venturing in the Area. The international nature of the site and resources in a seabed mining venture brings a further element into the picture. Therefore, the joint venture agreement is likely to contain provisions on questions regarding ownership and equity participation, duration of contract, control and management, relinquishment, royalties, pricing and marketing, profits, training, financing, transfer of technology, and settlement of disputes.

⁵⁸ Buxbaum (note 11), at 1108.

⁵⁹ Expression coined by Buxbaum (note 11).

⁶⁰ See, on both phenomena H. Rieger, *Dealing with Mining Investment: An appraisal of practical needs and theoretical shortcomings*, in: Jaenicke et al. (eds.) (note 11), 125–138, 127 et seq.

The BHP venture shows how private industry goes to some length to hedge such possible risks. The BHP agreement was concluded in 1992 when the dismantling of *Apartheid* was already well under way and continued throughout the transition of South Africa and Namibia. That reveals the risk hedging effect of entering into a joint venture with a concessionary of the nationality of the host country⁶¹. The joint venture that creates an interest on the part of the authorities in the continuation of the joint venture project can thus hedge the risks inherent in political transitions. The expectation of stability that law raises thus materializes around the other participant⁶².

In the deep seabed mining context, political turmoil in the Authority is hedged by the joint venture with the Enterprise.

⁶¹ The political risk hedging effect of joint venture agreement is relied on in numerous politically delicate business projects, see Mining Annual Review, July, 1994, 128. The Taiwanese state-run Chinese Petroleum Corp. (CPC) in Taipei sent an expert team to survey oil resources and refinery conditions in China, despite a four decade-old ban on direct contact between Taipei and Beijing. The CPC has proposed a joint venture with the U.S.-based Chevron Oil and China's Ocean Petroleum to extract oil near Diaoyutai, also known as Senkaku islands. Under the plan, the CPC and Chevron will set up a company in a third area and then work with China's Ocean Petroleum in searching for oil reserves around the island group in the East China Sea. Taiwan has large reserves of natural gas estimated at 19.2 billion m³. CPC has discovered a deposit of natural gas off the island's north-west coast. An exploratory well some 25 km off Hsinchu county was found capable of producing an estimated 200,000 m³/d of natural gas. Taiwan's state-run Chinese Petroleum Corp (CPC) is to enter a joint venture with China in exploring for petroleum in the East China Sea, local press reports said on Monday (Agence France Presse, January 3, 1994). The two sides would sidestep sensitive political issues in negotiating the formation of the joint venture, and oil extracted would be allocated according to the joint venture shares, daily newspaper The United Evening News said. The newspaper, quoting unnamed sources from the cabinet-level Mainland Affairs Council (MAC), said that the MAC has tentatively approved the project on condition that it be undertaken by private concerns. It said the CPC would use a private firm to work with China's Ocean Petroleum Company for the joint venture. Taipei bans direct investment and contact with Beijing. Both claim to be the seat of the true China.

⁶² The submarine cable lying industry is where the most valuable experiences in international joint ventures with heavy government involvement have been gained. BBC Summary of World Broadcasts, April 27, 1994: A Sino-British joint venture has been set up to develop, instal and maintain international submarine cables. The Sino-British Submarine Systems Co. Ltd. is owned by the Directorate-General of Telecommunications of the Chinese Ministry of Posts and Telecommunications, Cable & Wireless of the United Kingdom and Hong Kong Telecom. China has 51% of the company's registered capital of 27 million US dollars, and Cable & Wireless and Hong Kong Telecom's investment will be represented by their joint company, Great Eastern Telecommunications Ltd. The new joint venture will acquire an advanced deep ocean submarine cable installation and maintenance ship.

The mining regime under the UNCLOS is marked by its own form of transition on a macro-level. Overlapping claims by State parties – particularly regarding the Clarion-Clipperton Zone and insecurity as to the entry into force of the Convention, the final shape that the seabed regime would take, and the outcome of the negotiations in the PrepCom – contributed to a general climate favoring a cautious approach by private investors. It is arguably impossible to disassociate the pure economics from the politics of deep seabed mining in the investors' decision-making process. Towards the end of the PrepCom's activity mostly publicly owned investors were actively pursuing seabed mining plans⁶³. More interesting than speculating on that point is to look at another real case, where the Republic of Korea entered the ring as an applicant that was not privileged as an original pioneer investor. Nonetheless, it was registered on agreed terms under the Implementation Agreement by concluding the Understanding with the PrepCom.

Generally speaking, the internationalization governing the seabed resource regime under the Convention is in some way the answer proposed by Buxbaum on how to avoid the inefficiencies that come with contractually inserted, stabilizing clauses of one sort or another⁶⁴.

3. Tenure security

Tenure security and the financial terms of contract are two additional points where the internationalized regime for deep seabed resources lives up to Buxbaum's analytic framework for transnational contracts. He contends that governance structures require "an idiosyncratically detailed legal framework" in close symbiotic support of the contractual agreement. Behind this rather harmless sounding language is hidden one of the most difficult issues of international mining contract structuring⁶⁵.

The Implementation Agreement (IA) provides that the approval of the plan of work submitted for a proposed seabed mining project shall be in the form of a contract. In fact, Annex III, art. 16 of the IA accords

⁶³ Representatives of six registered pioneer investors in deep seabed mining – China, France, India, Japan, Russian Federation and the Interoceanmetal Joint Organization (IOM) – received certificates of compliance with their obligations under UNCLOS on March 15th, 1995. They received the certificates from the President of the PrepCom. The Republic of Korea, registered as a pioneer investor only last year. Hence, it did not receive a certificate today (Source: UNDP – UN Information Officer).

⁶⁴ See Rieger (note 60), at 130.

⁶⁵ See the impressive, multi-volume work of the Frankfurt Project.

exclusivity and tenure security to contracts concluded between the Authority and an investor. The tenure security is spelled out in more detail in art. 153 (6), which provides that a contract shall not be revised, suspended or terminated except in accordance with Annex III, art. 18 and 19. The penalty provisions of art. 18 are modified in that under the IA, the Authority has to give a prior warning before termination. More interesting, however, is art. 19, which regulates the revision of contract. Each party to the contract is under an obligation to enter into the revision of contract when there is a likelihood that the circumstances have arisen that would render the contract "inequitable" or make it "impracticable or impossible to achieve the objectives set out in the contract or in Part XI".

The achieving of such objectives is to be read in the light of the evolutionary approach taken by the IA toward developing the institutions and regulations for seabed mining. It is crucially important to assess the regulatory powers conferred upon the Authority for defining the objectives and principles of the Convention regarding deep seabed mining by way of rulemaking. The provisions that accord the regulatory power to the Authority are contained in section 1; for exploration and exploitation generally, sec. 1 (f); protection and preservation of the environment sec. 1 (g); and timely elaboration of rules, regulations and procedures for exploitation, including protection and preservation of the marine environment, sec. 1 (k).

An important point remaining to be addressed is the relationship between tenure security and the Authority regulatory powers. The rule making power is vested in the Council of the Authority, yet hedged as to its substance, see Sec. 1 (15)⁶⁶. The "principles" laid down in Sec. 2 (5) through 2 (8) as well as their concretizing "norms" shall guide the Council. Furthermore, according to Sec. 1 (16), the regulatory work of the PrepCom shall be taken into account by the Council in drawing up its own rules, regulations and procedures. Sec. 1 (16) (c) does in fact curtail the transaction costs that could arise from the Authority taking a "hold out" position by not engaging in rulemaking. Should the Authority not

⁶⁶ "The Authority shall elaborate and adopt, ..., rules, regulations and procedures based on the principles contained in sections 2,5,6,7 and 8 of this Annex, as well as any additional rules, regulations and procedures necessary to facilitate the approval of plans of work for exploration or exploitation, in accordance with the following subparagraphs: ...". The following subparas (a), (b), (c) basically set out the lines of what law should govern exploitation if the Council does not fulfill its rulemaking mandate. Subpara. (c), however, adds another substantive law element by providing that there shall be a principle of non-discrimination among contractors.

abide by its deadlines, a “hammer”⁶⁷ falls and the provisions elaborated provisionally by the PrepCom become effective. The investor can determine the running of the time limit for Authority rulemaking in its application. Taken together, these provisions on Authority rulemaking clearly curtail its bargaining power *vis-à-vis* the investor. A factually crucially important element is, of course, who makes the decisions in the Council. On this point, too, there are detailed provisions in the IA ensuring a large representation of the investors’s home States⁶⁸.

The resulting picture is considerably different from the dealings of an investor with a sovereign host state, whose permanent sovereignty over resources cannot be disputed. As to their wording, stabilization clauses inserted into investment contract impose on the host country’s government the obligation to refrain from amending or altering the legal regime for the mining venture either in general or in certain aspects (expropriation, fiscal regime, import and export regulations etc.)⁶⁹. However, the practical effectiveness of such clauses is disputed⁷⁰. It is probably asking too much of a State to promise that it will not change its laws affecting a certain foreign investment, or only in accordance with certain principles and norms.

The huge impact that isolating the investment from direct or indirect changes of the legal and political environment has on the strategic structuring of the joint venture agreement can be illustrated by marine diamond mining. The considerable albeit somewhat calculable political risk was most effectively hedged by mining on the concession of Benco, a South African firm. This is why BHP entered into a contractual joint venture not exposing its assets separately and opted for taxation according to U.S. law (the operation in South Africa is attributable to the San Francisco Headquarters of BHP Minerals). The currently prevailing contractual joint venture agreements in diamond mining may give way to an incorporated form. The legal system of South Africa would be capable of supporting such structures, since the country is not among the “soft

⁶⁷ The use of this term, originally coined for the U.S. Clean Air Act 1990, may be excused.

⁶⁸ See sec. 3 of the IA.

⁶⁹ Rieger (note 60), at 130.

⁷⁰ They were referred to, however, in the so-called LIAMCO (*British Petroleum Exploration Co. (Libya) Ltd. v. Sincat and National Oil Corporation Libyan Arab Republic*, ILM 13 (1974), 106 (Lagergren).

States” whose legal order cannot provide the structural elements for complex undertakings such as joint venture mining operations⁷¹.

There are parallels in the re-emerging stability of the political and legal environment in South Africa post-*Apartheid* and in the Law of the Sea after its acceptance by the industrialized nations⁷². However, the specific strength of the Part XI Implementation Agreement regime, of which the Authority and the Enterprise are integral parts, is that it provides legal certainty and stable conditions for investment decisions under the umbrella of an internationalized regime. The Enterprise’s joint ventures will contribute to forming and stabilizing this regime.

IV. Attracting investment (risk) capital

The attraction of risk capital can be studied from the example of the BHP venture. A number of factors made it easier to invest in a mining project to take place on the South African continental shelf⁷³; regulation concerning taxation, capital transfer and others may be mentioned among these factors.

The decisive element in the BHP investment decision was the private agreement structure. The capital that companies such as BHP and COEC invest in diamond mining is risk capital, a typical feature of mining projects generally. Both firms have entered into long-term joint venture agreements and thus hedged the objective risk inherent in mining projects. This is done by creating a long-term and thus stable relationship with their respective partners that will support longer periods with small or no return on capital. Game theory confirms that the players start to take each other’s interests into consideration once they develop the expectation of having to deal with each other over longer periods of time, during which multiple mutual exchanges will occur.

The second element of hedging investment risk in the mining business is to spread the investment over two separate phases, i.e. exploration and exploitation. The two phase venture creates the possibility to contribute

⁷¹ Cf. on the soft state phenomenon B u x b a u m (note 11).

⁷² J. Stephenson, Chairman of COEC, tellingly designates South Africa not as an emerging but as a re-emerging nation.

⁷³ In its calculations, the Undertaking included the fact that the Republic of South Africa at the time of conclusion of the joint venture agreement offered very favorable tax conditions in order to attract foreign investment capital.

working capital in the form of technology development and hardware acquisition⁷⁴.

The RoK Understanding reflects these classic considerations of long-term contract structuring and capital and risk spreading. Both sides to the Undertaking spread and hedge the risk, the investor by strictly concentrating on the exploration phase for which the financial volume is limited to an amount equivalent of at least US \$ 30 million. The IA provides, however, for an attenuated obligation to abort the exploitation stage and obligates the investor to submit a plan of work that would then be approved in the form of a contract after five years. It is clear that the Authority has no instruments at hand to enforce this provision and neither has the certifying State. The most effective pressure will come from the capital already invested.

The Understanding with Korea draws a factual line between the two phases of exploration and exploitation. In order to get the exploration going, the Authority has waived its claim to the annual fee for the time being. Thus, the claim to the annual fee is subject to negotiation, in which the investor's engagement in transfer and training shall play a role. The part of the Convention based claim which the Authority waives in the negotiations is its equity share in the exploratory joint venture. The financial engagement of the Authority will react to the commercial exploitation becoming a more real possibility.

The Authority shall provide incentives for contractors to undertake joint arrangements with the Enterprise and developing states or their nationals, to stimulate the transfer of technology thereto, and to train the personnel of the Authority and of developing states, under Annex III, art. 13 (1) (d), which according to Art. 8 (2) and (3) of the IA remains applicable. Art. 13 (1) (f) provides, however, that contractors ought not be subsidized so as to be given an artificial competitive advantage with respect to land-based miners. A 50 % share of the equity of the operating company and 50% of the ongoing capital investment would still put a high burden on member states and restrict the Enterprise's ability to enter into several agreements at the same time⁷⁵.

In the Understanding with Korea, the Enterprise's risks are equally quite skillfully hedged. In fact, the Enterprise reserves to itself the option of having the investor explore the reserved area at a time of choice. Thus, the Enterprise can pick the moment when the investor's investigation

⁷⁴ See Part II, B. II, above.

⁷⁵ Joint draft proposal (note 26), Para. 8.

shows that the money to be invested by the Enterprise in its own exploration will be well spent. Under the Understanding, the investor is obligated to provide the PrepCom with current data on the exploration of the area allocated to it. From the viewpoint of picking the right moment for starting the Enterprise's own exploration, this provision clearly has a risk-hedging function.

C. R&D, technology transfer and training

Marine mining related science and technology are developing at an exceptional rate⁷⁶. Today's marine industry consequently is an extremely scientifically oriented area of human activity which requires considerable capital investment and a multidisciplinary approach. A central issue for the modern marine industry – both diamond and deep seabed mining – is its dependence on research and development (R&D). Joint ventures can provide a framework for the scientific discovery necessary to research and development⁷⁷.

1. Terminology

Technology is applied science⁷⁸. The scope of the term technology includes the knowledge of how sciences might be applied to the service of man, the demonstration of such applications, and the material objects in which the knowledge is incorporated, such as designs, plant, and equipment. It comprises human skills and labor, information and capital goods⁷⁹. Marine technology also should not be perceived as a singular

⁷⁶ This concerns not only seabed mining but also traditional branches of marine industry such as transportation and fisheries as well as contemporary marine industries such as offshore gas and oil extraction. Finally it has laid the groundwork for new ocean uses such as seabed mining, ocean thermal energy conversion (OTEC), and the extraction of minerals from seawater.

⁷⁷ Final Report, Special Commission 2, Annex 3: The joint venture option for the Enterprise LOS/PCN/SCN.2/WP18/Rev. 1, 14 August 1992, reproduced in Platzöder (note 11), XV, 116, "Draft Basic Joint Venture Contract with recommended annotations by Special Commission 2", Para 10: "It was emphasized that R&D was an essential component of high technology ventures such as seabed mining and that the need for research and development could not be overstated during the early phases of the work of the Enterprise when exploration may not take place".

⁷⁸ M.C.W. Pinto, *Legal Aspects of North-South Transfer of Marine Technology*, in: Vandermeulen/Walker (eds.) (note 6), 405–447, 405.

⁷⁹ According to Annex III, Art. 5 (8), seabed mining technology is "the specialized equipment and technical know-how, including manuals, designs, operating instructions,

entity. Rather it consists of a number of elements, including technological information, technological means, and technological understanding.

How far will tomorrow's seabed mining technology be removed from that of today? Even though the basic technology for exploration, mining, transport, and processing is known, there is no cause to believe that radical changes will not take place in many areas. For example, great changes in exploration technology can be expected, as can greater integration between mining and processing⁸⁰.

2. Fostering R&D in a joint venture

The BHP-Benco joint venture shows the R&D fostering function of joint ventures that bring together two partners with complementary assets. The large mining company, BHP Minerals, may well possess the human and other resources needed to design a drill that theoretically is suitable for marine diamond mining. Yet as long as it cannot be tested and refined under the real conditions of marine diamond mining, the drill resembles science more than technology. This is where Benco's complementary assets lead to a micro- and macroeconomically more efficient cooperation with BHP.

The corresponding ancillary restriction is that the technology can be used only within the joint venture for a determined period of time. This is what the BHP-Benco joint venture provides for. A crucial factor in the BHP-Benco joint venture is its R&D character. BHP assumed the task in the joint venture of using its expertise for developing an effective and efficient exploration and exploitation technology. It has done so and thus acquired an advantage over any competitor. If BHP classifies the data on its mining technology for the large part as proprietary, the real asset is not so much the property rights as such but rather its mastering the technology and having it first at its disposition.

The BHP-Benco joint venture is also interesting because of the need to put a price on specific technology for which there is no readily available

training and technical advice and assistance necessary to assemble, maintain and operate a viable system and the legal right to use these items for that purpose on a nonexclusive basis".

⁸⁰ Markussen (note 6), at 85/6. He thinks that for exploration a device is needed that enables analysis of the metal content on location, on the seabed, and which in addition is capable of measuring nodule density and topography (at 86). For exploitation, environmentally acceptable and cost-effective concepts that result in greater integration of the mining and processing systems, thus making at-sea processing possible, would be needed. This might also alleviate environmental concerns.

market price. There is need for continued specific R&D in deep seabed mining technology. The technological concepts of today are a result of research and development activities on deep seabed mining as well, and not least, a result of general research and development in other fields. The concepts of today show that the seabed mining engineers have known how to apply to their own area elements of available conventional technology and know-how from the offshore mining and oil sectors as well as from shipping, and land-based metal production.

The further example of BHP-Benco exploring the concession of Diamond Field Resources Ltd. (DFR) in a separate joint agreement illustrates the specific ways that information is used and spread in the marine mining business. Since the holder of the technology will also put it to use, there are no licensing agreements entered into but rather a separate joint venture with a concessionary. BHP/Benco proceeded this way after having developed a successful technique for prospecting in deep water for diamonds⁸¹.

3. Environmental concerns

According to Art. 145 UNCLOS necessary measures shall be taken with respect to activities in the Area to ensure effective protection for the marine environment from harmful effects which may arise from such activities. The Authority is entrusted with continuously developing and adopting appropriate rules, regulations and procedures to this end⁸². To fulfill this task, the Authority needs much more knowledge about the environmental impacts of resource exploitation, about which little is known at this point. The DISCOL project⁸³ that attempted to simulate the environmental impact of mining with known mining techniques came to a pessimistic result, showing considerable adverse impact on natural resources⁸⁴. Since the concept of the seabed as the Common Heritage of

⁸¹ The average carat of the diamonds recovered in the DFR concession now lies closer to that of those found nearer to the shore, as theory predicted. This points toward a superior exploring technology.

⁸² See also Annex III, Art. 17 (f) according to which States are required to parallel the Authority's regulatory moves, Annex III, Art. 21 (3). See furthermore Sec. 1 (5) (g) IA: "Adoption of rules, regulations and procedures incorporating applicable standards for the protection and preservation of the marine environment".

⁸³ See H. Thiel/G. Schriever, *Deep-Sea Mining, Environmental Impact, and the DISCOL project*, in: *Ambio* 19 (1990), 245–250.

⁸⁴ The project used a plowing device. In close proximity to the plow tracks, the bottom was heavily blanketed by a deep layer of sediments. Megafauna was very rare and some

Mankind is linked to treating it in an environmentally conscious way, this is of serious concern.

The true dimensions of the impact cannot be known prior to large scale monitoring of the pilot mining operations⁸⁵. There will thus be the need for determining the environment related requirements as mining begins and also the need for quick fulfillment of these requirements by way of R&D. For example, the search for an environmentally sound way of harvesting the nodules has to be pursued in an integrated way with the research into and development of more efficient mining technology.

According to the Authority's market-based approach, the prime means of implementing the knowledge gained should not be through Command & Control type regulation but by providing the investors with the right incentives for developing exploitation technology that is environmentally tolerable.

4. Training and transfer⁸⁶

Marine technology transfer⁸⁷ will be technology transfer in a joint venture. The creation and generation of technology involves the application of human ingenuity and material resources over time, and thus in practice requires the expenditure of funds. This implies that the product must eventually be capable of being used to generate funds to recover the investment made in research and development, as well as to provide a return. Further, that return must be maximized through sale of technology at the appropriate time to the appropriate party. The transfer or communication of technology is an activity involving time and resources both for the transferor and transferee. The transaction costs incurred from transferring the technology will be less when the transferor and the trans-

dead specimens were found. The survival of these fauna will also depend on the availability of their food resources which may have been impacted during the disturbance to the environment, see *ibid.*, at 249.

⁸⁵ According to *ibid.*, 247, science knows that impacts due to the continuous mobilization of 60,000 m³ of mud per day over long periods of time will occur but has no means of assessing the true extent of mining related seafloor disturbance, subsequent recolonization, and wide-ranging transport of fine particulates in advance of the actual mining operation.

⁸⁶ See the paper prepared by T. Stoll in this volume.

⁸⁷ According to A. Lopez-Reina, Enterprise of the International Seabed Authority – the Colombian Proposal, in: Vandermeulen/Walker (note 6), 487–499, 489: “The purpose of technology transfer is the stimulation of Third World progress and the training of its inhabitants. This is considered to be the prerequisite for Third World participation in ocean mining as well as in the organization and management of the Enterprise”.

feree are closely connected. The cost on either side will depend on such matters as the nature and complexity of the technology, but also on the human and other resources available on the receiving side. The transfer of the necessary technology will be more effective and efficient if the transferor has the corresponding incentives. Transferring the technology in a joint venture is attractive to the transferor as less costly than other means⁸⁸. This can be achieved by having the transferee participate in the actual operation of the technology at an early stage, as is possible in a joint venture. Transfer can occur in many ways the RoK Understanding indicates, however, that both the PrepCom agree on training as the appropriate form of technology transfer for the exploration stage.

Elisabeth Mann Borgese has summarized the important aspects of technology transfer⁸⁹: The nature of modern technology, and of cutting edge, largely untested mining technology is such that "transfer" can no longer be considered as a self-contained transaction but requires so much service and training that any transfer really becomes a sort of joint venture between transferor and transferee. Cooperation at the early stage of R&D is cheaper than cooperation at the final level, which deals with the finished product. Participation in R&D has a built-in factor of training, or learning on the job. Technologies developed jointly are owned jointly. According to Mann Borgese, joint technology development is one way of applying the concept of the Common Heritage of Mankind to technology.

5. Ancillary restrictions and Independence

Because of its public task within the internationalized regime of seabed mining, the Enterprise is subject to more restrictions on its independence. Private economic operators, on the other hand, are much more free to structure their economic activities, within the limits of the national anti-trust law.

⁸⁸ Joint draft proposal (note 26): "Transfer of technology (para. 13). In land-based mining, transfer of technical knowledge appears to be taking place through the employment of local labor and on-site training; and this is perhaps as important as providing the necessary equipment of the State. Whilst the investor will seek commercial transfers for the transfer, and will want there to be adequate safeguards to prevent proliferation".

⁸⁹ E. Mann Borgese, *The Principle of Joint Development*, in: Vandermeulen/Walker (eds.) (note 6), 484–486.

Part III: Agreement Structures

Annex III, art. 11 is the most central provision of UNCLOS, since it makes clear that the joint agreement can and would be part of the contract between the Authority and the investor and that the joint agreement needs security tenure. Further, it hints at the important elements of economic interest and bargaining power.

1. Form

As to its form, the joint venture may be conceived as contractual or as incorporated. As the PrepCom Commentary to the Draft joint venture agreement points out, the form of the joint venture should not be overvalued⁹⁰.

All of the joint ventures in the diamond mining cases considered above – BHP-BENCO, BHP/BENCO and COEC-De Beers Marine – are contractual. In addition to the advantages of this form of joint venturing already pointed out, a specific advantage may be mentioned: the contractual form is more amenable to being renegotiated in the course of the long term relationship joint venture, since assets and capital are not separately owned.

The RoK Understanding, by contrast, is contractual and thus could be qualified as a contractual joint venture⁹¹. It seems that the PrepCom prefers to negotiate the regime of the joint venture as the project develops. It still may be pointed out that the BHP venture appears to assume that the adaptations can be accomplished when necessary within an incorporated joint venture. At this point in time nothing else could be expected. As long as the Enterprise – even as a nucleus – is not in existence, it could not be expected that the joint venture be put under the governing law of

⁹⁰ Final Report, Annex, (note 77), Para. 35: “During the discussion of the model, questions were raised as why the incorporated version had been preferred over the contractual formation of joint ventures. It was pointed out in response that the incorporated joint ventures can be easily transformed into a contractual one. However, many of the organizational questions could be dealt with conveniently by simply referring to the standard provisions of a given national legal order. Thus the practical advantage of an incorporated joint venture”.

⁹¹ Information note (note 10), Para. 8: “[t]he participants enter into a company relationship each supplying capital for the formation of a new entity. Various forms of company relationship may be possible, ranging from simple partnership to incorporation. Contractual joint ventures do not result in the formation of a new entity. Rather, they are contractual relationships entered into for the supply of capital, equipment, industrial property, technical assistance and know-how, services, licensing, royalties, marketing etc.”.

any country by incorporating it there. That, however, need not be the last word on the issue of incorporation. Whether to incorporate a joint venture agreement or not is in the first place a pragmatic decision. The question of the relationship between the joint venture agreement and the antecedent pioneer investor status arises for both the contractual and incorporated joint ventures. The pioneer investor status could be transferred to the joint venture, which would thus have its rights and responsibilities⁹². This concept combines flexibility with stability and tenure security.

2. Liability

Liability for contractual and extracontractual matters is of course a central issue to structuring joint ventures. How it is addressed, however, is not so much a question of the form the joint venture takes but of the specific bargaining⁹³. Under national law, certain kinds of arrangements can be entered into which will specify the limits of liability. The curious nature of the Enterprise as an autonomous organ of the Authority is raised in this respect. Several provisions of UNCLOS delineate allocation of responsibility and the limits of liability⁹⁴.

In the BHP-Benco joint venture, BHP has set up a double liability limitation system by limiting the amount of capital it is obligated to invest under the Heads of Agreement. This is of course only the lower investment capital mark; if the project goes well, BHP will extend its engagement. De Beers has chosen another path to limiting liability in its high risk marine diamond mining business: It has founded the wholly owned subsidiary Marine De Beers. Incorporation of joint ventures does not improve substantially on the liability hedging thus achieved.

⁹² Final Report (note 90), Para. 23.

⁹³ Information note (note 10), Para. 33.

⁹⁴ See, e.g. Annex II, art. 22: "The contractor and the Authority shall have responsibility or liability for any damage arising out of wrongful acts in the conduct of his operation respectively in the exercise of its powers and functions, account being taken of contributory acts of either side". Annex IV, articles 2 (3) and 3 curiously provide that the Authority shall not be responsible or liable for acts or omissions of the Enterprise, and vice versa. However, there is no provision indicating that the Enterprise itself can be liable to third parties. This probably has to be understood as providing for a negotiated liability regime of the Enterprise in its contractual relationship with third parties. The question may present itself in a different light in the second phase when the Enterprise conducts its own mining operations and causes harm in doing so.

The RoK Understanding does not contain any liability proviso. However, in the exploration stage covered by the Understanding only the investor becomes commercially active towards third parties. It is thus the investor that incurs a potential contractual liability of 100 %. No proviso in the Understanding makes it incumbent on the Enterprise to take over parts of a liability of the investor. The investor can protect itself by having a wholly owned subsidiary enter into the joint venture with the Enterprise. In the case at hand, however, the Government of the Republic of Korea seems to assume the obligations arising from the joint venture towards third parties.

It remains to be seen whether in future joint venture the Enterprise will allow investors to set up intermediary bodies with limited liability for parts of the project. An investor that does not limit its liability in one way or the other will gain a bargaining chip in negotiating with the Authority. Since it is a primary goal of the Authority to bring about mining at all, an investor that does not limit its liability will be more likely to enter into the necessary contracts with third parties whose procurement or services are needed.

3. Taxation

Taxation is another reason why incorporation of the Understanding and its follow-ups will not become an issue in the case of the Government of the Republic of Korea. This investor has a favorable tax status under its national law. This advantage enables the investor to adopt conciliatory positions on financial issues *vis-à-vis* the Prep Com/Authority. In dealing with private investors, however, this will become an important issue, depending on the law of the country the Enterprise will decide to do business under. Under the IA, the Authority enjoys considerable tax exemptions and will therefore be inclined towards contractual joint ventures.

The BHP projects provide another taxation perspective. Freed from worrying about (political) risk hedging, BHP in fact will in the future choose the tax regime most advantageous for its mining operations. This will not necessarily be the law of the home or the host state, but it will presumably be more efficient for BHP. Greater political stability thus allows greater overall economic efficiency.

4. Profit sharing⁹⁵

Each of the diamond mining joint ventures examined in this case study envisage that profits will be shared after marketing. No use is made of a royalty system. In fact, the investor is to use its own technology in exploiting the marine diamond sites. The classic royalty application, on the other hand, supposes that the investor spreads the information by having a contractor make widget by using the patented technology. It is true that the royalty system could be adapted to increase with the amount of diamonds mined. However, a profit sharing system seems to provide the more directly correlated incentives for effective mining.

The Implementation Agreement designs a fairly elaborate system as to how the profits made by selling the resources recovered should be distributed among the Authority and the investor⁹⁶. This is predicated on the Enterprise executing its own mining operations, possibly by using technology licensed to it.

However, by preparing a joint exploration venture with Korea in the Understanding, the PrepCom seems to indicate that the Authority will have the investor do the actual exploration using the technology developed and tested on the area allocated to it. If prolonged into the exploitation phase, this would also entail that the royalty payment scheme would become obsolete. It must, however, be said that the PrepCom has kept the door open for conducting its own mining operations by securing the most important resource of them all: the trained personnel. As BHP's mining operations show, the truly valuable resources are the geophysical data and trained and skilled personnel. Since the basic technology is known, constant R&D and improvements are possible to secure the competitive edge.

⁹⁵ Information note (note 10), Para. 30: "The distribution of profits or benefits depends upon the form of organization or arrangement. In a contractual joint venture, financial benefits may encompass license fees (royalties), management fees, salaries, interests on debt capital or loans, indirect fringe benefits, production sharing, guaranteed supplies or market guarantees, among other benefits".

⁹⁶ According to Sec. 8 (1) (c): "The system should not be complicated and should not impose major administrative costs on the Authority or on a contractor. Consideration should be given to the adoption of a royalty system or a combination of a royalty and profits sharing system. If alternative systems are decided upon, the contractor has the right to choose the system applicable to its contract. Any subsequent change in choice between alternative systems, however, shall be made by agreement between the Authority and the contractor".

5. Control and management

Mining joint agreements distinguish as a matter of practice between strategic decision-making and the actual running of the exploration and exploitation related activities. The day-to-day management lies with the investor. Current practice in the mining business is to have a participant assume the management functions⁹⁷. As the BHP example illustrates, this is not linked to capital share or disposition over the mining area, but to the venture partner who runs the operation.

In contrast, under the RoK Understanding, the Authority receives some control over aspects of the joint venture that are important to it, such as training. This control, however, is limited. It does not extend to the strategic decisions nor does it take the management, i.e. the actual operation of the exploration, out of the investor's hands.

The Authority can still influence the strategic decision on whether the joint venture should enter into the exploitation stage by setting incentives at the time of decision-making.

6. Term

All of the joint venture agreements examined here provide for a long duration. This is indeed the key factor for making both participants take into consideration the interests of the other, because there is an expectation raised that it will pay off in the next round of the game. The readiness to assist the other participant in meeting its goals is essential in something as sensitive as technology transfer and training. No legal obligation can force the participant to provide all the information and in the best way. However, providing the right incentives will ensure that very outcome.

The Understanding refers more often than not to negotiations to take place in the future. Thus, changes on important issues such as training and technology transfer will not be mandated unilaterally but negotiated. Thus the investor has hedged the most important of all political risks that arise out of the broad powers conferred upon the Authority (see, e.g., Annex IV, art. 1) for adopting rules and procedures on crucial issues.

⁹⁷ Information note (note 10), Para. 24: "The issue of control is central to any joint venture arrangement. Neither the equity nor the contractual joint venture involve predetermined procedures or machinery to deal with this problem, of controlling and managing the joint enterprise. In practice, the possession of technical expertise and 'know-how' may be factors which heavily influence the control and management of the joint venture".

7. Dispute settlement

The settlement of disputes is also an issue normally included within a joint venture agreement⁹⁸. Often a specific forum or method of settlement is designated. Here again, however, a special case is presented by the Enterprise. While an incorporated equity joint venture, as an independent entity, may be amenable to suit in national courts, the Enterprise has been given rather broad privileges and immunities under the Convention, and may be amenable to the jurisdiction of national courts only under certain circumstances. Under art. 13 (3) (a) (v) Annex IV, the Enterprise can be sued in the courts of that country where it has entered into a commercial activity. This condition is probably met when the Enterprise has entered into a contractual joint venture agreement in which the law of a particular country is designated as the governing law of the agreement. In fact, all the hypotheses enumerated in (a), in which the courts of a particular country have jurisdiction over the Enterprise, presuppose a voluntary act on its part establishing a link between the Enterprise and that particular country. The objective of art. 13 (3) thus is to avoid the Enterprise being sued in the courts of any country to which the Enterprise has no prior business connection⁹⁹.

Conclusions

Continued consideration of the experience of marine diamond mining joint ventures is instructive for the planning of seabed mining joint ventures. While seabed mining will take place in a considerably different context – both legally and economically – the similarities are sufficiently significant to see in the use of diamond mining joint ventures a glimpse of the questions that will also arise regarding seabed mining. The person who is interested in anticipating future developments in seabed mining is thus invited to follow this study to the diamond deposits off of the coast of southwest Africa.

⁹⁸ See Information note (note 10), Para. 36.

⁹⁹ Different: Information note (note 10), Para. 36, that apparently considers only the Law of the Sea Tribunal to have jurisdiction.