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Economic implications of sea-bed mining in the international area: report of the Secretary-General

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DOCUMENTS OF THE CONFERENCE

DOCUMENT A/CONF.62/36

*[Original: English]
[30 January 1975]*

Provisional agenda of the third session of the Conference

1. Opening of the session by the President of the Conference
2. Minute of silence for prayer or meditation
3. Statement by the President
4. Organization of work
5. Consideration of the subject-matter referred to in paragraph 3 of General Assembly resolution 3067 (XXVIII) of 16 November 1973
6. Adoption of a convention dealing with all matters relating to the law of the sea, pursuant to paragraph 3 of General Assembly resolution 3067 (XXVIII) of 16 November 1973, and of the final act of the Conference
7. Signature of the convention and the final act (at Caracas)

DOCUMENT A/CONF.62/37*

Economic implications of sea-bed mining in the international area: report of the Secretary-General

*[Original: English]
[18 February 1975]*

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* Incorporating document A/CONF.37/Corr.1 of 24 March 1975.

Preface

Following the extensive debate on the report of the Secretary-General: "Economic implications of sea-bed mineral development in the international area" (A/CONF.62/25)¹ and other related issues, the First Committee of the Third United Nations Conference on the Law of the Sea requested the Secretary-General to prepare a follow-up report² in accordance with the terms of reference of General Assembly resolution 2750 A (XXV) of 17 December 1970.

While some representatives suggested that the objective of this follow-up report should be to analyse the possible adverse effects of sea-bed mining on developing country exporters of minerals, others suggested a wider scope for the study, for example, to include the effects on consuming countries and the interests of the world community at large.³ It should be noted that the preceding reports and studies on these matters, and especially on economic implications of the various limits proposed, have presented detailed analyses of the various aspects involved, and that relatively little new information has since become available. Accordingly, the present report is focused on policy issues in the context of the law of the sea Conference, concentrating on possible courses of action open to the world community in order to harmonize the interests of traditional producers and consumers. Since the most immediate problem in this regard is that of deep sea-bed mining, the emphasis is upon issues associated with the mining of manganese nodules, and the exploitation of other minerals, such as hydrocarbons, is not discussed.

[The secretariat of UNCTAD was consulted in the preparation of this report.]

I. Implications of deep sea-bed mining

1. Resources involved

1. As already noted, the present report deals mainly with deep sea-bed mineral resources. Little if any economically exploitable oil or natural gas is likely to be found in the deep sea-bed in the next few decades.⁴

2. While the more than threefold recent increase in the price of phosphates has rekindled interest in offshore phosphorite deposits, little is likely to be produced from the area since very large deposits are found in the relatively

¹ See *Official Records of the Third United Nations Conference on the Law of the Sea*, vol. III (United Nations publication, Sales No. E.75.V.5).

² Previous United Nations reports on this subject are: "Possible impact of sea-bed mineral production in the area beyond national jurisdiction on world markets, with special reference to the problems of developing countries: a preliminary approach" (A/AC.138/36), May 1971; and "Additional notes on the possible economic implications of mineral production from the international sea-bed area" (A/AC.138/73), May 1972.

³ See the summary record of the 16th meeting of the First Committee; *Official Records of the Third United Nations Conference on the Law of the Sea*, vol. II (United Nations publication, Sales No. E.75.V.4).

⁴ The petroleum potential of very deep waters is quite speculative, and even if the continental rises and oceanic basins were to hold considerable amounts of hydrocarbons, the exceedingly high cost of their possible recovery as compared to other alternative fuels suggests that these resources will not be developed in the foreseeable future.

shallow waters of the outer continental shelf and upper slope. Another deep sea-bed resource offering interesting prospects is the hot brines and metallized muds. Though some occurrences have been reported in the mid-Atlantic and the Pacific Oceans,⁵ the most attractive deposits are those in the Red Sea, and these would probably fall within the national jurisdiction of the riparian States. In the more distant future the mineralizations within the bedrock of the mid-ocean ridges might become economically exploitable. For the next two or three decades, however, manganese nodules are expected to be the main minerals of economic interest in the international area.

3. The richest nodule deposits have been found in the central-east Pacific, clearly in the international area. These deposits constitute the primary interest of most companies and consortia developing nodule mining systems. However, it can also be assumed that some commercial activity will take place in the extensive areas of ocean basins in proximity to land in the central Pacific and off the coasts of North and South America which would come within the proposed 200-mile economic zone.⁶ Since the attractiveness of a deposit is in function of its metal grade, cost of production and the International Authority or government take, it is logical to assume that the coastal States concerned would offer conditions to nodule miners sufficient to compensate for the lower grade of their deposits.⁷

2. Structure of the future nodule industry

4. The highly sophisticated nature of nodule mining and processing, the stiff cost of the entrance fee and the complexity of operating on a multinational scale under novel legal rules to be established by the international régime and machinery, all conspire to make the nodule industry a rather restricted club for the near future. Unless

⁵ *Undersea Technology*, September 1972, p. 11 and *Science News*, 24-31 August 1974, pp. 118 and 119.

⁶ See, for example, CNEXO, Annual report, Paris, 1973, p. 19 and the nodule survey projects of ESCAP: Project (CCSP-1/TG.1) "Seabed investigations for manganese nodules in the deep submarine shelf on east side of Tonga Platform" and Project (CCSP-1/WS.2) "Seabed investigations for manganese nodules in oceanic areas surrounding Western Samoa" (see E/CN.11/L.343).

⁷ The table below indicates how a lower government fiscal charge can easily serve as an incentive for entrepreneurs to opt for the exploitation of lower grade deposits within national jurisdiction. The data used were obtained from tables 9 and 10 of the United Nations report contained in document A/CONF.62/25. A 3 million tons/year operation recovering nickel, copper and cobalt and other minor metals is used for the sake of comparison. It is assumed that recovery of nickel and copper alone would vary, and that initial investment and cost of operations would be the same irrespective of nodule grade and location.

Net profit after "tax" for different grades of deposits and fiscal charge
(in millions of US dollars)

Metal recovery (nodule grade x recovery efficiency) (percentage)	Gross value of metals	Gross profit of operation	Net profit of investor for different levels of government take over gross profit				
			50	40	30	20	10
Ni = 1.5; Cu = 1.3	268	193	97	116	135	154	174
Ni = 1.4; Cu = 1.2	253	178	89	107	125	142	160
Ni = 1.3; Cu = 1.1	238	163	82	98	114	130	147
Ni = 1.2; Cu = 1.0	223	148	74	89	104	118	133
Ni = 1.1; Cu = 0.9	208	133	67	80	93	106	120

there should be an early and radical change in these expectations, fewer than 10 ventures are likely to become operational within the next decade.⁸ Indeed, there has been a discernible trend towards the merging of individual firms, for example, the United States firm Kennecott Copper organized a consortium including Noranda Mines from Canada, Rio Tinto Zinc and Gold Fields of the United Kingdom, and Mitsubishi of Japan; Deepsea Ventures (United States) followed suit with a group twice enlarged, now including Nichimen, C. Itoh and Kanematsu-Gosho of Japan, Union Minière of Belgium and United States Steel; there have, however, been reports that the German group AMR and International Nickel are about to announce the formation of yet another international consortium; meanwhile the French-Japanese-led consortium for development of a two-ship CLB system is going ahead with their work to test a prototype in late 1975. Within the next year the formation of one or two new groups could be announced.

5. In addition to the likely small number and large size⁹ of operations, the nodule industry will also be characterized by the joint production of several minerals. While the primary objective of miners will be the recovery of nickel and copper, the metallurgy of nodule processing will permit the simultaneous production of substantial volumes of manganese, cobalt, molybdenum, vanadium and smaller quantities of trace metals. Although the variety of minerals encountered in nodules is an added attraction to miners, it might also constitute a source of problems in world metal

markets. As metals will be produced from nodules in quite different proportions from those of existing world demand for them, prices of some metals will be affected.

3. *Impact of sea-bed mining*

6. While the different proportions between the volumes of potential metal recovery from nodules and their world demand indicate some market imbalance, the actual impact on metal prices will depend on the relative increase in metal production from nodules and land-based sources as compared to the increase in demand for these metals. Metal production from nodules will depend on the product mix chosen by miners and the scale of activities, which in turn will depend on other factors such as the regulatory and financial measures of the Authority. But the impact of nodule mining on metal markets is not unilateral since falling metal prices will affect the economics of metal recovery from nodules and the further expansion of the nodule industry. A simplified diagram of these interrelations is seen in figure 1. Since this is an interdependent model, a change in a major variable will affect the prices of metals which in turn will affect the other variables. Thus, only an approximate picture can be drawn of the likely impact of nodule mining.

7. On the basis of available information,¹⁰ it has been estimated that by 1985, nodules will be the most important source of cobalt, supplying over one half of world demand and probably reducing cobalt prices to two thirds of

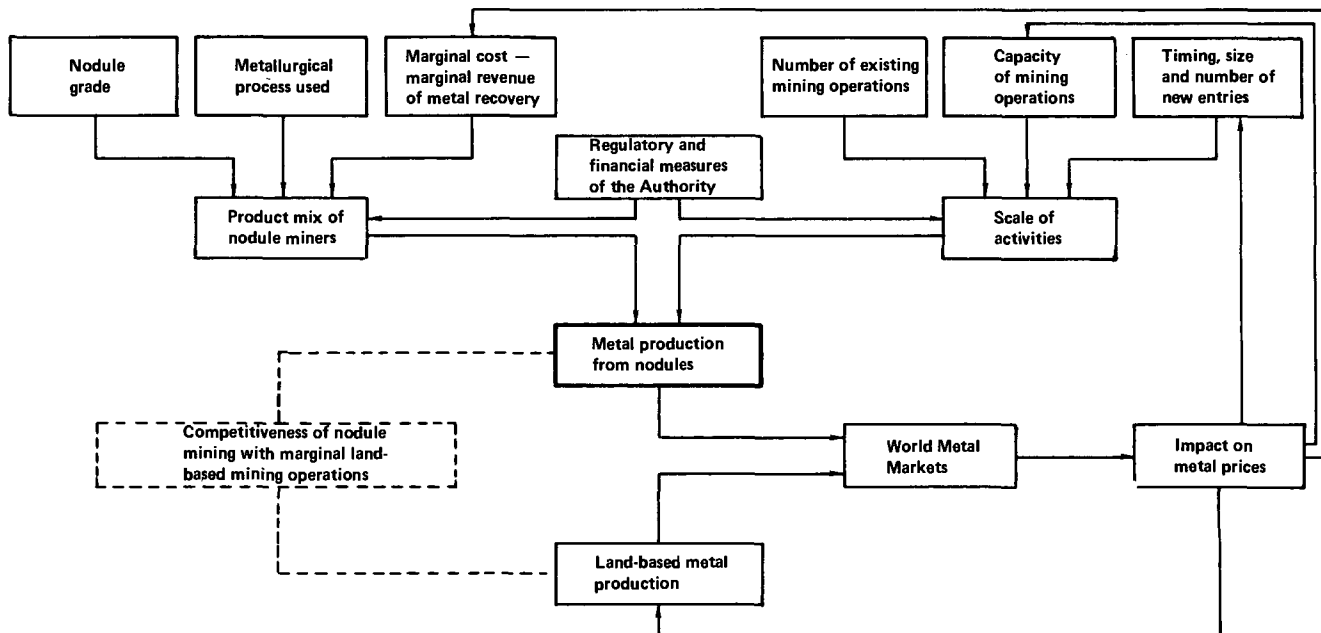
⁸ For an estimated schedule of entries into nodule mining to 1985 see A/CONF.62/25, part II.

⁹ As costs of developing complete systems escalate, so do the sizes considered for the projects. Deepsea Ventures for instance is now talking about the recovery of up to 4 million tons of nodules per year; AMR is considering eventual operations of 10 to 15 million tons/year.

¹⁰ See A/CONF.62/25, part II. These estimates are based on the assumption made therein that the total volume of nodules mined and processed by 1985 would be of the order of 15 million metric tons, with a resulting production of 920,000 tons of manganese, 220,000 tons of nickel, 200,000 tons of copper, 30,000 tons of cobalt and 38,000 tons of other metals.

Figure 1

Simplified diagram of the impact of metal production from nodules on metal markets



present levels. The probable impact on manganese prices is still uncertain since several potential miners are doubtful whether the recovery of this mineral will be economic. Tentative projections indicate that manganese recovery from nodules might account for as much as 13 per cent of the import requirements of advanced market economy countries, which would cause a decline of at least 50 per cent in the price of manganese metal, and some decline in the prices of ferromanganese and manganese ore. Nickel production from nodules will probably help to counter the steady trend of price increases for this metal around the middle of the next decade. Copper prices are not expected to be much affected by nodule mining since supply from this source is likely to account for only 1.3 per cent of world demand by 1985. In the more distant future, if nodule mining does in fact become an attractive economic proposition and the industry expands very rapidly in the absence of any controls, the pressure on metal prices would obviously increase. This pressure is hypothetical, however, and presupposes that the world community does not act to regulate markets of raw materials. Moreover, it is obvious from the interrelation of variables in the impact model (fig. 1) that decreases in metal prices would act as a brake to the further expansion of the nodule industry.

8. To the extent that nodule mining may affect metal prices, some impact can be expected on producers and consumers.

(a) The direct financial impact will be symmetrical on consumers and producers. For example, since only the prices of cobalt and of manganese are expected to drop during the first decade of nodule mining, a certain shortfall in export revenues of traditional suppliers will result in a corresponding saving for consumers. Consumers, however, would be primarily interested in lower prices for copper since this metal is imported in large volumes by many countries. Copper production from nodules is not likely to assist this aspiration of consumers in the foreseeable future. But if this were to happen, the international community would have to weigh the benefit to consumers against a corresponding adverse effect on the economy of several developing countries which are highly dependent on copper mining.

(b) The extent of the impact of lower metal prices will depend on the degree of concentration of supply and demand and on the income effect of such changes. Since at present mineral exports are concentrated among a few producers while imports of varying magnitudes are spread over a much larger number of countries, the relative impact on the balance of payments will be much greater on the few producers than on the many consumers. The income effect can be visualized as the relative change in the economy of a country (incomes and employment) attributable to a change in the price of metals. For some developing country producers of minerals this effect can be quite serious, while the most drastic declines in cobalt and manganese prices and the stabilization of nickel prices will obviously have a negligible income effect on consuming countries.

(c) As regards the "impact on consumers", reference has been made to savings on imports of metals and ores, and alleviating balance of trade problems. This will not be applicable for the first one or two decades of nodule mining when only the prices of cobalt, manganese and to some extent nickel will be affected, since the net value of imports of these minerals is relatively small in consuming countries and possible savings could not be expected to improve their balance of trade noticeably. Another argument has been that declines in metal prices will benefit consumers at large, namely, the public. However, savings from lower prices of raw materials, which do not represent a large proportion of

costs, tend to be absorbed by manufacturers in the form of higher profits or wages, and are seldom passed on in the form of lower prices to consumers.¹¹ Moreover, the minerals in point are not important inputs into wage goods—major items of consumer expenditure—for which declines in prices would have important real income effects.

9. It follows that only a few traditional mineral producers are likely to be affected by nodule mining in the near future. Export revenues for developing country producers of cobalt will keep increasing until the early 1980s and for manganese producers until the mid-1980s, at which time competition from nodules would start decreasing their export earnings. Developing countries, with just one exception, are not highly dependent on the exports of these minerals. By the end of the next decade nodule mining might exert a downward pressure on nickel prices, affecting a few developing countries; the countries in question, however, are not highly dependent on nickel exports.

10. If the impact of nodule mining is expected to be rather moderate for both producers and consumers for the foreseeable future, who will benefit most from this new industry? The answer is obviously the world community at large and the advanced countries possessing nodule technology in particular. The latter countries would benefit from a redistribution of revenues among mineral producers, and would tend to become the dynamic centres of future mineral production. They would gain from: (a) the spillover effect of technology into other activities; (b) the income effect of producing equipment and supplies for nodule miners (backward linkages), incomes and employment from nodule mining, transporting and processing, and the establishment of new industries for further processing the metals (forward linkages); and (c) lesser dependence on foreign suppliers of raw materials—in fact, they would become net exporters of cobalt, and perhaps of manganese and nickel.

11. Assuming that an effective international régime and machinery will be created, the future sea-bed mining industry can bring some important net benefits for the world community at large. It will establish a practical field of international co-operative effort in resource exploitation at a time when increasing concern is being voiced over the adequacy of natural resources for the continuing growth of the world economy. It will thus also contribute to the creation of new institutional arrangements to minimize the adverse effects of technical progress on the economies of developing countries producing raw materials. Last, but by no means least, nodule mining will in due course generate substantial revenues, which could be used for the benefit of developing countries and, particularly, the least developed countries.

II. Policies for the harmonious development of sea-bed resources

1. The global picture

12. The negotiation of a régime for the utilization of resources in the international area is taking place at a time

¹¹ This point was forcefully made in a study by the United States Department of State on possible restrictions in supply of mineral products other than oil at the height of the energy crisis (January 1974). "For most [mineral] products even quite substantial price increases will result in relatively small increases in prices of finished products." See *Mineral Resources of the Deep Seabed, Hearings before the Subcommittee on Minerals, Materials and Fuels of the Committee on Interior and Insular Affairs, United States Senate, 93rd Congress, second session, on amendment No 946 to Senate Bill 1134*, (Washington, Government Printing Office, 1974), p. 940.

when world economic conditions and national policies are being reviewed in many forms and in many United Nations and other international bodies, especially in preparation for the forthcoming special session of the General Assembly. Many proposals have been made for co-operative international action to create a "new international economic order".¹²

13. There is a general preoccupation with the adequacy and use of resources for continued economic growth. In the industrial centres, an assured supply of raw materials is being linked to long-term national survival. But for the many developing countries not endowed with large reserves of petroleum, the maintenance of a minimum capacity to import is a matter of survival for the near future. These countries were, by and large, the hardest hit by the recent crisis. Despite several programmes instituted to assist the hardest hit developing countries, it is reasonable to expect that these countries will have to increase their exports which are in most cases raw materials.

14. Thus, both producers and consumers of raw materials have a stake in the harmonious development of natural resources. The exploitation of deep sea-bed resources, the common heritage of mankind, most obviously form one of the cornerstones of the immense co-operative effort envisaged in the new international economic order. It is also a crucial element in the negotiation of a new convention on the law of the sea.

2. The framework for sea-bed resource exploitation

15. Whatever particular form is given to the international régime, the Authority will need to be given sufficient flexibility within a clear legal framework to respond effectively to new difficulties similar to those now encountered. It has often been stressed that little is yet known about the potential resources of the area.

16. For example, the French-American Mid-Ocean Undersea Study (FAMOUS) has recently confirmed that the mid-ocean ridges contain large quantities of minerals, among them deposits of almost pure manganese. Exploitation of these deposits is well beyond current technical and economic limits, but the possibility of future exploitation cannot be dismissed.

17. Fortunately, the problems envisaged in nodule mining are such that a policy package can be formulated to harmonize the interests of consumers and producers and of developing and industrial countries. These interests have been extensively analysed elsewhere,¹³ as regards the level of resource exploitation they can be summarized as: (a) maximum availability of minerals to consumers; (b) minimum adverse impact on the economies of developing countries exporting minerals; and (c) highest possible revenues for the International Authority. While the latter objective might seem at first glance complementary to the objective of maximum production, it requires also that the interests of traditional producers be safeguarded since a fall in mineral prices would cause the revenues of the Authority to shrink.

18. The harmonization of these interests is made considerably easier by: (a) the economics of nodule mining, (b) the relative volumes of metal production from nodules and the world demand for them, and (c) the relative importance of the four principal metals to the economy of

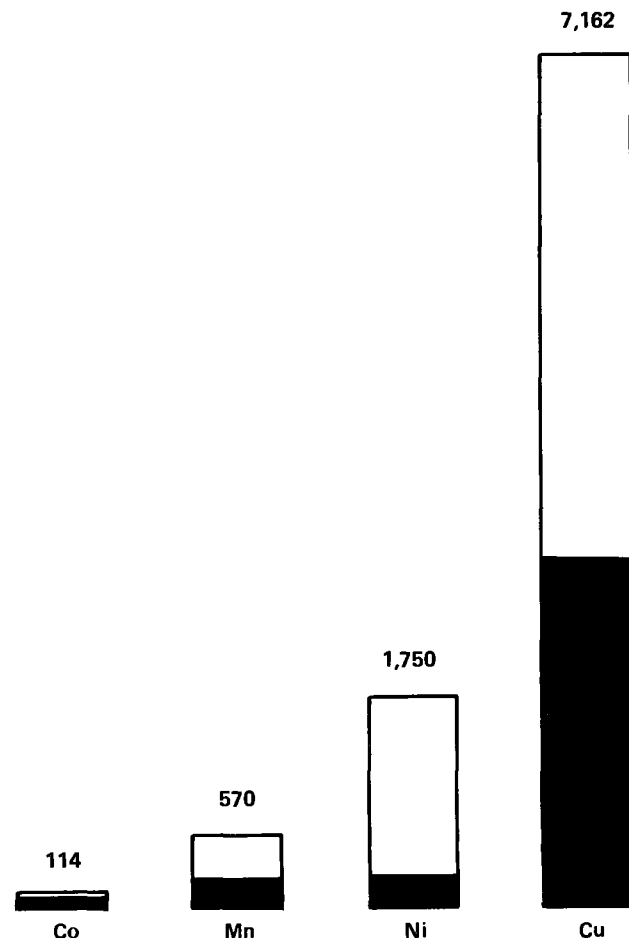
developing countries. On the first point, it is generally expected that nickel will be the mainstay of the nodule industry, accounting for over half of the total revenues of mining operations. This factor will serve as an automatic built-in stabilizer for the future expansion of the industry: if expansion is too rapid, nickel prices will fall, thus reducing the economic incentive for further expansion. It can be concluded that in the foreseeable future, even in the absence of any regulations, the nodule industry would gear its plans primarily in function of increases in nickel demand.

19. The disparate proportions in which metals can be produced from nodules, as compared with existing demand for these metals, are responsible for the expected differential impact on metal prices. It was seen that nodule mining will affect first the price of cobalt, then of manganese and eventually that of nickel, with the price of copper practically unaffected for the foreseeable future. The sensitivity of metal prices to nodule mining happens to be in inverse proportion to the total value of these four metals, as can be seen in figure 2.¹⁴ For the developing

¹⁴ The values in these figures are somehow overstated since they were obtained by multiplying mine production by the average price of the metal (for manganese of metal-in-ore).

Figure 2

Approximate 1972 value of world mineral production (shaded area represents production of developing countries) (in millions of US dollars)



¹² General Assembly resolution 3201 (S-VI).

¹³ See A/AC.138/73 and A/CONF.62/25.

Sources: A/CONF.62/25; *Engineering and Mining Journal*, March 1973, p. 78; UNCTAD (TD/B/C.1/CONS.7/L.2), pp.28, 41.

countries in particular, the relative size of their mineral output is a matter of capital importance; the combined production of cobalt, manganese and nickel represents just one sixth of the total value of copper production.

20. These factors indicate that an acceptable strategy for harmonizing interests of consumers and producers might aim at: (a) preventing any serious impact on the price of copper, and (b) minimizing the impact on the economies of developing countries that produce cobalt, manganese and nickel. These objectives could be attained with the combined use of production controls, commodity arrangements and compensation.¹⁵ The proper use of these policy instruments in the context of the broad strategy suggested above is discussed in the remainder of this document.

3. Production controls

21. No particular value judgement need be attached to the concept of controls. Like fire or water, they can be used wisely for constructive purposes or unwisely to cause damage. All economic systems—market or centrally planned economies—use some measure of production control. In the United States, for example, the Federal Government has exercised extensive controls over the agricultural sector, by the guarantee of minimum prices and the allotment of maximum acreage for certain crops. Similar systems of control are exercised collectively by the European Economic Community. But perhaps even more relevant are the controls over the petroleum industry where Governments decide the location and size of the areas offered to interested companies for exploration and exploitation.

¹⁵ This strategy would be in consonance with the Programme of Action on the Establishment of a New International Economic Order proposed by Dr. Raúl Prebisch, Special Representative of the Secretary-General for the United Nations Emergency Operation. He suggested, among other things, that "a far-sighted commodity policy is urgently needed. Among other important measures it should include stabilization or compensatory agreements." (see A/C.2/294, p. 15).

22. In the same manner, production controls could be exercised by the Authority to ensure implementation of a broad strategy for sea-bed resource development, with the primary objective of preventing any serious impact on the economies of copper-exporting developing countries. Since the nodule industry is expected to expand primarily as a function of market opportunities for nickel, restrictive production controls could remain as dormant powers. If and when, in the more distant future, nodule mining should prove economically attractive even at substantially lower prices for nickel, some controls could be invoked to prevent a serious impact on copper prices. Since the time horizon for such a scenario is so long,¹⁶ it is impossible to foresee the conditions of the world economy and the balance of interests between producers and consumers which might prevail by then.

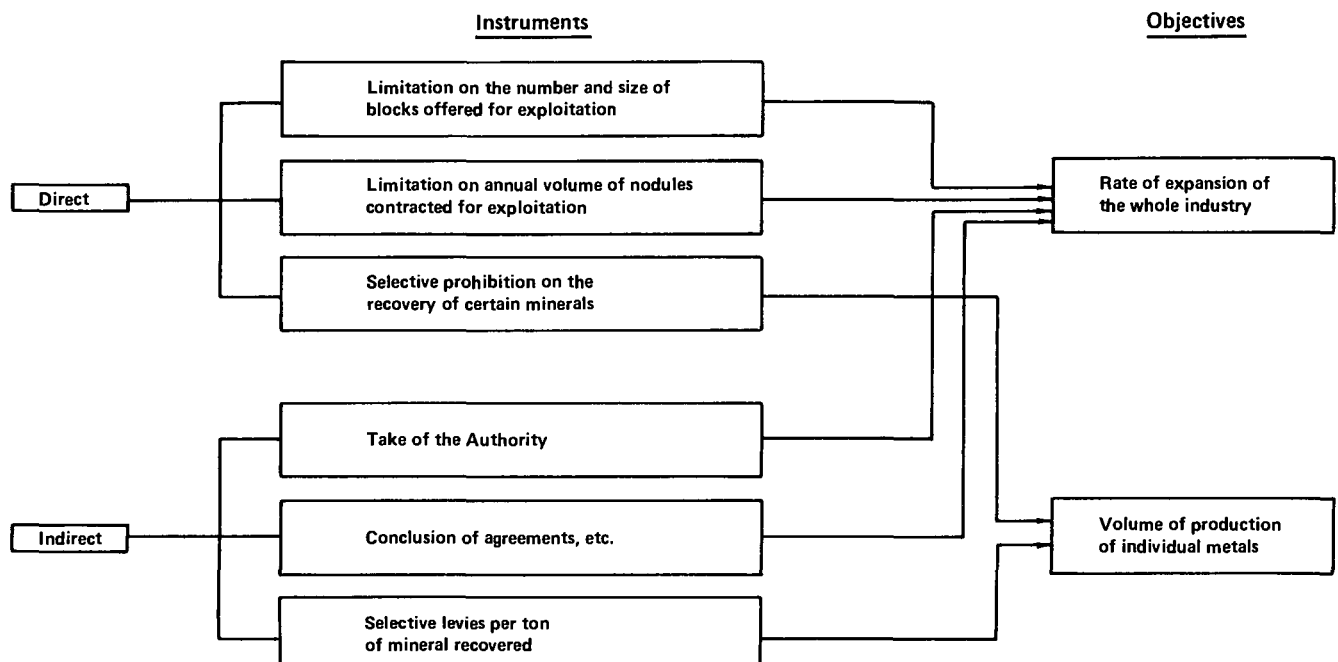
23. Production controls can take many forms (see fig. 3). The rate of expansion of nodule mining can be controlled directly by: (a) limitations on the number and/or size of blocks offered for exploitation, and (b) limitations on the annual volume of nodules contracted for exploitation. The growth of the industry can also be controlled indirectly by: (a) regulating the take of the Authority, and (b) the pace at which exploitation agreements, etc. are negotiated by the Authority. The volume of production of individual minerals—i.e. manganese—could be selectively regulated if it were felt that their markets had been unduly depressed. This could be done by an outright prohibition on new mining ventures to recover the mineral in question or by the imposition of differential *ad valorem* levies per ton of metal recovered.¹⁷

¹⁶ At present, the world demand for copper is 14 times larger than that for nickel. Even if demand for nickel were to increase at the unlikely rate of 10 per cent per annum from 1975 until the end of the century, while the rate for copper increased by 4 per cent per annum, by the year 2000 the total volume of copper consumed would still be three times larger than that of nickel.

¹⁷ See A/AC.138/36 and A/AC.138/73.

Figure 3

Production controls: policy instruments and objectives



24. Indirect controls are generally more difficult to administer. They require an intimate knowledge of the operation of the industry and of mineral markets, as well as considerable discretionary powers for the Authority to adjust the instruments to changing conditions. For these reasons, direct controls might be more appropriate. One possible scheme of direct control over the rate of expansion of the industry would be based on the increase in demand for nickel. It has been estimated that such a scheme would authorize twice as much nodule mining capacity as the known plans of the industry for the period 1976-1985.¹⁸

25. It must be clear that any scheme of production control could only be enforced by the Authority in the international area. To the extent that economically exploitable nodule deposits are found within the limits of national jurisdiction—particularly in the vicinity of islands in the central Pacific and off the west coast of the American continent—strict production controls become less meaningful. Miners could easily bypass these controls by operating within the national jurisdiction of States offering more attractive conditions.

4. Commodity arrangements

26. If it is agreed that the long-term objective of nodule development should be to prevent a serious impact on copper markets, then, for all practical purposes, the nodule industry could expand unrestrained for the foreseeable future. As a result, prices of cobalt and, to a lesser extent, of manganese and nickel would be affected. Special measures might be called for to minimize the impact of lower mineral prices on the economy of developing country producers. Two mutually supportive lines of action can be envisaged, namely, commodity arrangements and compensation.¹⁹

27. Commodity arrangements take many different forms, depending on the objectives of the arrangement, for example, protection against long-term price declines, smoothing out of price fluctuations, conservation of a non-renewable resource, and the encouragement of domestic processing capacity. Given the universal character of the future Authority, it would not appear to be acceptable to consider the establishment of a producer's cartel with the participation of nodule miners to restrict supply and maintain oligopoly profits.

28. One possibility would be for the Authority to encourage or even to require that sea-bed miners participate with other producers as well as the major consumers in commodity agreements. The objective of this type of arrangement would be to stabilize prices at a commonly agreed fair and remunerative level for producers, with the co-operation of consuming countries. Past experience with major agreements of this kind is limited, the International Coffee Agreement being the most instructive example of the difficulties of administering such arrangements over extended periods of time. The question of what constitutes a fair and remunerative price is always the most difficult element to negotiate, in view of different cost functions for individual producers.

29. Creation of buffer stocks is an effective means of dealing with price fluctuations. The markets for cobalt, manganese and nickel, however, are not characterized by recurrent sharp fluctuations. Oligopolistic conditions of

supply for cobalt and nickel have been clearly translated into steadily rising prices for these metals. Manganese, which is mostly sold against long-term contracts, has a far more competitive market and prices have declined to about one half of the levels attained two decades ago. The administration of buffer stocks is by no means a simple task, considering the very high financial costs of stockpiling, the logistics involved and the decision of price levels at which the metal stocked would be offered in the market. The highly cyclical copper market would be best suited for a buffer stock scheme, but in spite of repeated efforts, the members of the Intergovernmental Council of Copper Exporting Countries (CIPEC) have been unable so far to complete all the necessary arrangements to implement the scheme.

5. Compensation

30. To the extent that preventive measures are insufficient to avoid adverse effects in the economies of developing countries that produce minerals, some compensatory measures may be called for. A wealth of experience exists from the many compensatory schemes established by Governments to protect the incomes of some domestic producers of primary commodities. But the most relevant example of a scheme of an international character is the agreement by the European Economic Community to guarantee a minimum level of export earnings for 44 developing countries of Africa, the Caribbean and the Pacific. Under this agreement, eight major commodities (including copper) exported by these developing countries would be the object of a stabilization scheme. In the event of a decrease in export earnings for one year due to fluctuations in prices or quantities, the developing country concerned will be entitled to ask the Community for a compensatory financial transfer.²⁰ The institution of a compensatory scheme for mineral producing developing countries affected by sea-bed mining would require the clarification of two issues, namely, the source of funds for compensation and the over-all administration of the scheme.

31. The most obvious source of funds for compensation would be the revenues of the Authority. If these were so employed, however, very little might be left for other purposes, such as distribution to the developing countries. In fact, studies prepared by UNCTAD²¹ have concluded that nodule mining could not generate enough revenues for the Authority to compensate the losses incurred by developing countries due to the increased supply of minerals from the sea-bed. The concept of "loss" in these studies is the most generous possible, including the gains foregone by increased prices in the absence of nodule mining. The definition of what is a "loss" for the purpose

²⁰ Commission of the European Communities, *Information note on development and co-operation*, (482/X/74-E), August 1974.

²¹ See TD/B/483, TD/B/449/Add.1 and TD/B/484. Related studies by UNCTAD are: "Mineral production from the area of the sea-bed beyond national jurisdiction: issues of international commodity policy" (TD/113/Supp.4, March 1972); "Exploitation of the mineral resources of the sea-bed beyond national jurisdiction: issues of international commodity policy" (TD/B/449, June 1973); "Exploitation of the mineral resources of the sea-bed beyond national jurisdiction: issues of international commodity policy: case study of cobalt" (TD/B/449/Add.1, June 1973); "The effects of production of manganese from the sea-bed, with particular reference to effects on developing country producers of manganese ore" (TD/B/483, April 1974); "An econometric model of the manganese ore industry" (TD/B/483/Add.1, April 1974); and "The effects of possible exploitation of the sea-bed on the earnings of developing countries from copper exports" (TD/B/484, May 1974).

¹⁸ See A/CONF.62/25, part II.

¹⁹ The use of these policy instruments is also recommended in General Assembly resolutions 3202 (S-VI) and 3281 (XXIX).

of compensation must be decided beforehand for proper administration of the arrangement. In any event, the matter would appear to call for consideration in the context of the negotiations leading to a new law of the sea convention and taking account of the relevant provisions of the Declaration of Principles contained in General Assembly resolution 2749 (XXV).

32. Borrowing from the experience of the European Economic Community, one viable alternative would be to have the industrial consuming countries contribute to a fund which would be used by the Authority for compensation to those developing countries affected. The contribution of industrial consuming countries could be based on a proportion of a decrease in metal prices from levels prevailing before supplies from nodules reached the markets. The amounts involved for cobalt, manganese and nickel would not be very large, particularly if compensation were to be paid for a fixed period of time to permit the necessary readjustments in the economies of developing country producers.

33. As regards the question of administration of compensation, the calculation of "losses" justifying compensation is by no means a simple task. The price of minerals may fall due to reasons other than the supply from nodules, as in the case of copper which fell from a high of \$US 1.50/lb in April 1974 to \$US 0.62/lb by December 1974 as a result of a serious recession in industrial countries. A decline in the price of minerals may also be partly due to nodule mining within national jurisdiction. For example, one nodule operation of 3 million tons/year mining the cobalt-rich deposits in the vicinity of French Polynesia could supply some 45,000 tons of cobalt, which amounts to twice the present world production of this metal.

III. Conclusion

34. Studies carried out over the years have concluded that sea-bed mining is likely to affect some land producers of minerals. The many unknowns affecting the future volume of mineral production from nodules and the response of mineral markets to this additional source of supply explain why these studies vary in their conclusions as to the degree in which the four major minerals are likely to be affected. The question, therefore, is not whether

mineral markets will be affected by competition from nodules, but how soon, to what extent and by how much.

35. There is general agreement among experts that: (a) cobalt prices would be affected within a few years from the start of commercial operations; (b) manganese exports from developing countries could be affected within the first decade of operations of the industry if manganese recovery from nodules proved to be economical; (c) the projected steady rise in nickel prices could be stopped and probably reversed by the late 1980s under moderate to rapid rates of expansion of nodule mining; (d) an impact on copper prices might be possible in the more distant future if nodule mining were to expand at rates considerably higher than are foreseen at present; and (e) the exploitation of resources of the area will yield a net balance of benefits to the international community as a whole, and in particular to countries possessing nodule technology, to the major recipients of revenues from the Authority, and to some extent to mineral importing countries.

36. The proper use of policy instruments, such as those reviewed above in order to implement a broad strategy for nodule exploitation will be a rather complex task and it would accordingly seem desirable to consider means to provide the Authority with advice on which it could rely. This could include a review of factors affecting supply, demand and prices of minerals obtainable from the area and recommendations on a long-term plan for resource exploitation, including the measures necessary for its implementation. Among other things, such advice could cover:

(a) Schedules of the extent of the area or the volume of its resources which would be made available for exploitation;

(b) Guidelines regarding the size and composition of the take of the Authority to be negotiated in legal arrangements entered into with third parties for resource exploitation;

(c) Conditions for or limitations on the recovery of some of the minerals contained in sea-bed resources;

(d) Organization of and participation in international commodity arrangements for the stabilization of mineral prices at just and remunerative prices;

(e) Schedules of compensatory payments to be made to developing countries whose economies are adversely affected by resource exploitation.

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Letter dated 7 February 1975 from the representative of Turkey
to the Special Representative of the Secretary-General

[Original: English]
[18 February 1975]

I have the honour to enclose herewith the text of a note dated 6 February 1975 from the Ministry of Foreign Affairs of Turkey to the Embassy of the Republic of Greece in Ankara regarding the Greek Government's proposal to take the dispute in the Aegean Sea to the International Court of Justice at The Hague.

It has been the consistent belief of the Turkish Government that disputes in areas with special characteristics, such as semi-enclosed and enclosed seas, should as a matter of principle be resolved by mutual agreement of the States of the area. It is with the conviction that this search by the two Governments for a settlement in the Aegean Sea