

World phosphate markets — the new parameters

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The demand for concentrated and compound fertilizers has been growing rapidly during the last decades. One of the most important raw materials for the fertilizer industry is phosphate rock. This article examines the structure and nature of the world phosphate market, with the transnational corporations in focus.

The papers produced in the past concerning the world phosphate market put the emphasis almost entirely on market variables.

This constitutes, quite certainly, a serious limitation on any attempt to comprehend the accumulation mechanism peculiar to the phosphate sector and to the world accumulation process in general.

It is essential, though, and even imperative, to give thought to the dynamics of accumulation within the phosphate fertilizer industry — the logistic outlet for phosphate production — in order to elucidate its characteristics and trends. Any understanding of the potential for phosphate processing in producer countries needs to stem, in fact, from an analysis of the phosphate sector at the world level.

Without embarking on an exhaustive study of the world phosphate industry, which would far outstrip the limits set in this introduction, we shall begin by stressing one important factor: a fairly small number of multinational companies exert considerable influence not only on the marketing of intermediate and final products, but also on the natural phosphate import trade. Needless to say, it is essential to analyse the structure and nature of the world phosphate market in dynamic relation to the phosphate fertilizer industry, as an important link in the chain. This approach, we feel, is a plausible one for gauging the dynamics of an accumulation process occurring immediately at the international level.

Configuration of the phosphate sector

Stimulated over the past twenty or so years by a growing demand for concentrated and compound fertilizers, world production of phosphates rose rapidly by over 100 per cent in the 60s and by a further 50 per cent from 1970 to 1978, reaching a figure of 137.8 million metric tons in 1981¹. Of this world supply, 85—90 per cent was used in the form of fertilizers. The remaining 10—15 per

cent went for industrial purposes: soaps, detergents and sanitary materials, followed by animal feeds. Phosphate rock also plays a fairly considerable part in metal refining, the manufacture of pesticides and the treatment of water.

While the number of countries exploiting their natural deposits for commercial purposes is relatively large, their production is geographically highly concentrated. The leader on the world phosphate stage is the USA, with 40 per cent of world output, followed by the USSR, with 22 per cent. Morocco's share has from the outset been considerable, in line with the growth of the world market, and is in the region of 15 per cent². The USA and the USSR are the largest consumers of phosphate rock, while Morocco is the largest exporter.

Since the initiative taken by Morocco in 1974 to raise the selling price of phosphate rock, a rise which turned out to be based on the situation prevailing at the time, several countries have started to exploit their deposits notwithstanding their low grade, and this has led to the emergence in the world market of additional parties, most of them Third World countries.

In point of fact, the Third World countries provide about 60 per cent of world market supplies, while the West European and East European countries take two-thirds of world imports. In a high proportion of the developed countries the fertilizer industry depends on phosphate rock deliveries from a small number of Third World countries. The USSR sells mainly to Eastern Europe, the USA delivers 42 per cent of its sales to Western Europe, 24 per cent to Canada, 11 per cent to Japan, and 23 per cent to Third World countries, which get 54 per cent of their purchases from other Third World countries and 46 per cent from the USA³. Morocco, the USA and the USSR are, in fact, by far the largest exporters of phosphate rock, and account for over 70 per cent of exports, one-third being in respect of Morocco.

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Meanwhile, over half the world output of raw phosphate is converted into phosphoric acid, which is an intermediate product essential for making most of the simple phosphate-based fertilizers and the liquid or solid fertilizer blends. The most important feature of the phosphoric acid industry is the smallness of the Third World countries' total capacity. It consists of small plants scattered over some dozen countries.

As far as fertilizers are concerned, consumption in some of the market economy countries reached its peak in the 1970s, with the result that their share of world consumption has since fallen. But the share of the Third World countries has increased, especially in the case of the Latin American and Asian countries. The same applied to the USSR and the other Eastern European countries, whose shares have also increased.

As far as phosphate fertilizer production is concerned, the Third World

countries' share of world output rose from 3.9 per cent in 1960 to 12 per cent in 1977. However, the rise in output failed to match their consumption growth, which meant that these countries, taken together, were more dependent on fertilizer imports in 1977 than they had been in 1960. Their production capacity being still low and rudimentary, it is concentrated mainly on manufacturing technically simpler super-fertilizers intended for internal consumption, such as the simplest superphosphates and blends for which the processing procedures are relatively straight forward. The Third World countries remain the largest importers of phosphate fertilizers, with the USA as their main supplier and accounting for well over half of their imports in 1977⁴.

This point having been made, we consider it necessary to examine the nature and structure of the world market in phosphate rock before concentrating on

the phosphate fertilizer industry which, we repeat, is the main factor governing the dynamics of the transactions proceeding in the phosphate sector as a whole.

The world market in phosphate rock: its nature and structure

The world market in phosphate rock, considered in the long term and despite occasional fluctuations, has experienced steady growth. Most experts concur in forecasting an average annual growth of 4—5 per cent, at least until the year 2000.⁵

Phosphate rock, as a mineral for which there is no substitute product, provides a prime example of State domination of production and sales in the main producer countries, the USA being an exception to the rule.

The natural phosphate market is a non-transparent one based on mutual agreement. There is no bargaining in the

Table 1
Production of phosphate rock 1960—1984

	1960		1965		1970		1975		1980		1984	
	kt	%	kt	%	kt	%	kt	%	kt	%	kt	%
Industrialized capitalist countries	18 398	46.5	27 798	46.0	37 640	46.4	47 039	44.3	59 488	42.9	55 025	37.6
USA	17 796	45.0	26 704	44.2	35 053	43.2	44 301	41.7	53 363	38.5	48 820	33.3
Israel	224	0.6	414	0.7	1 241	1.5	711	0.7	2 611	1.9	3 312	2.3
Republic of South Africa	268	0.7	610	1.0	1 249	1.5	1 774	1.7	3 282	2.4	2 593	1.8
Others	110	0.3	70	0.1	96	0.1	253	0.2	233	0.2	300 ²	0.2
Third world countries	14 459	36.6	19 792	32.7	23 247	28.7	30 941	29.2	42 886	30.9	48 682	33.2
Morocco ¹	7 506	19.0	9 807	16.2	11 400	14.1	16 230	15.3	18 824	13.6	21 133	14.4
Jordan	362	0.9	857	1.4	891	1.1	1 353	1.3	4 243	3.1	6 263	4.3
Tunisia	2 101	5.3	3 040	5.0	3 024	3.7	3 481	3.3	4 582	3.3	5 346	3.6
Brazil	—	—	—	—	—	—	—	—	2 921	2.1	3 400	2.3
Togo	—	—	974	1.6	1 508	1.9	1 161	1.1	2 933	2.1	2 696	1.8
Senegal	213	0.5	1 038	1.7	1 128	1.4	1 871	1.8	1 652	1.2	1 874	1.3
Syria	—	—	—	—	—	—	857	0.8	1 319	1.0	1 514	1.0
Others	4 253	10.8	4 066	6.7	5 293	6.5	5 990	5.6	6 412	4.6	6 456 ²	4.4
Socialist countries	6 683	16.9	12 849	21.3	20 179	24.9	28 140	26.5	36 294	26.2	42 890	29.2
USSR	5 719	14.5	11 115	18.4	17 784	21.9	24 150	22.8	24 668	17.8	28 890	19.7
China	300	0.8	910	1.5	1 700	2.1	3 400	3.2	10 726	7.7	13 200	9.0
Others	664	1.7	823	1.4	695	0.9	590	0.6	900	0.6	800 ²	0.5
Total	39 540	100.0	60 439	100.0	81 066	100.0	106 121	100.0	138 668	100.0	146 597	100.0

Sources:

Transnational Corporation in the Fertilizer Industry, UN/ST/CTC 25, New York 1982, Mining Annual Review 1985 and corporate sources.

Note:

¹ Including Western Sahara.

² Estimate.

The Office Cherifien des Phosphates group is a major actor in the international phosphate industry. Picture from the OCP Youssofia dark phosphate calcination plant.

proper sense. Every year, there are negotiations covering sellers and buyers who sign annual supply contracts mostly negotiated during the November—December period for the following year beginning 1 January. 'Spot' sales account for no more than a few tens of thousands of tons per year. The singular characteristic of the phosphate rock market is its duopoly structure. Demand is centralized at the Office Chérifien des Phosphates (Morocco) and PHOSROCK⁶, and at offices for the other small exporters such as the USSR, Togo, Jordan, Nauru etc. The demand — and this, incidentally, is the most important point — comes from the concentrated fertilizer industries in the developed agricultural countries. Hence there is no international stock exchange for phosphates or forward deals as there are for a number of basic products.

Apart from PHOSROCK, which restricts over-competition between American producers on foreign markets, no agreement or cartel between phosphate producers exist at present, and this situation will probably persist so long as the USA remains a large exporter of raw phosphates.

The United States — Morocco duopoly

The tranquility of the world market in phosphates was shaken, after the world shortage phase created artificially from mid-1973, by an unprecedented surge of buying as a precaution against inflation and the rising prices of fertilizers and of raw materials in general. The two protagonists who instigated this unlocking process were the big world producers, USA and Morocco. In 1978 they exported 61 per cent of total world deliveries between them.

The USSR, whose exports fell by 31.25 per cent from 1975 to 1978, faces the prospect of becoming a net importer of raw phosphates and its derivatives by 1990⁷. The indications supporting this forecast are the agreements concluded



with the Third World countries Morocco and Jordan.

Under its 14 March 1978 Agreement with Morocco⁸, the USSR undertakes to exploit the vast deposits of Meskala. This is the first time, in fact, that the USSR has entered into such a long-term commitment (30 years) with a Third World country under agreements other than of a traditional clearing nature⁹. This one has the advantage, for the USSR, of ensuring it a regular supply over a long period of years, two million tons a year in stage 1, and ten million tons from 1990 onwards, in order to fertilize its Ukrainian 'granary'¹⁰ and reduce its dependence on Canadian and American grain, and especially to cope with possible grain embargoes as happened in January 1980.¹¹

The other agreement, with Jordan, provides for a USSR undertaking to supply materials and equipment for exploiting the natural phosphate deposits in Jordan, which will pay for its materials imports with phosphate rock exports. Thus Morocco and the USA will remain the only dominant countries in the world rock market thanks to the scale of their exports and also, of course, to the vastness of their reserves.

The USA, however, with its enormous super-production capacity coupled with an assured home market for the bulk of its output thanks to the size of its fertilizer industry, hold some major trump cards. All this helps to facilitate its conquest of even the remotest markets, pro-

vided it sells them its surpluses at prices defying competition. The surge of prices in 1974—75 and the market switch in the United States' favour provides a striking example of this.

Furthermore, the advances made in modern transport have opened the way to a very substantial reduction in transport costs and a diminution of the location advantage enjoyed by Moroccan phosphates. In addition, there are the Kennedy Round agreements which provided for the introduction of very low customs tariffs: 3 per cent on American phosphate imports to the EEC member countries¹².

A phenomenon of recent date is likely to have a wide impact on the configuration of the world phosphate market — the fact that Paribas and Total, in France, seem to have drawn the conclusions from developments in the market and the shortages that might upset it. Their subsidiary, Compagnie Francaise de l'Azote (COFAZ), has decided to open a phosphate mine in the USA. In July 1976, specifically, a cooperation agreement was announced with linked participation by COFAZ and one of the main world producers of phosphates and fertilizers, the American Agro-Chemical Company (Agrico)¹³. It provided for the establishment of a mining company in the USA by COFAZ shareholders for the purpose of repurchasing from Agrico part of its reserves in Florida and part of the jointly-owned share in a mine at Payne Creek. Thanks to

these measures, COFAZ ensured that its phosphate requirements are met at a price of 15 dollars a ton. The French firm had previously been getting its supplies from Senegal at 38 dollars and from the American market at 33 dollars. The advantage to COFAZ is plain to see; as for the American firm, the counterpart benefit of the agreement was to provide wider access to the French and European phosphate markets.

Obstacles to phosphate marketing

Phosphates, whether raw or processed, are still subject to import ceilings and other non-tariff barriers in many countries. For example, imports of phosphoric acid and superphosphates from countries covered by the generalized system of preferences are admitted free to the EEC countries, whereas they are subject to 13.2 per cent and 4.8 per cent duties respectively if they come from elsewhere under the most favoured nation clause.¹⁴

It has to be mentioned, though, that in practice there are certain restrictions on the generalized system of preferences in so far as these arrangements do not cover certain products for which the Third World countries have a fairly considerable export potential. In 1976, indeed, not a single Third World exporting country exceeded a given ceiling or quota. Had they done so, the most favoured nation tariffs clause would have been applied. On their side, the non-tariff barriers tend to cancel out the benefits conferred by preferential arrangements. Phosphoric acid imports from the USA, for example, have to meet certain quality criteria in order to qualify for admission. Thus article 12 of rule 3322/80 of the Community Council dated 16 December 1980 specifies that, where preferential imports of phosphate products from one or more beneficiary countries create, or threaten to create, economic difficulties for the Community or a region of the Community, the Commission may introduce customs duties of its own accord.¹⁵

With regard to the problem of transport, the costs and insurance charges are heavy. For Morocco, Tunisia, Jordan and Togo, they represent 30—40 per cent of exports, or 250—300 M USD in 1978.¹⁶ The transport arrangements are set by the importers. Incidentally, the Third World countries have repeatedly protested against the fluctuations in sea transport charges and have urged the conclusion of international agreements to determine the scale applied.

Some of the Third World countries have developed their own transport fleets - a costly arrangement which involves a heavy capital outlay. Morocco and Tunisia are cases in point. For the former, Marphocean, a joint Franco-Moroccan company (OCP 46 per cent, Comanav 24 per cent, Gazocean 30 per cent) operates six ships representing a capacity of 100 000 tons. Four additional ships have been ordered from Dunkirk shipyards. For Tunisia, Gabès Chimie Transport, a joint Franco-Tunisian company, operates two ships with a capacity of 20 000 tons¹⁷. Finally, as far as phosphate rock prices are concerned, the listed figures are not necessarily those applied in transactions, in view of the sometimes substantial rebates that may be granted for a number of reasons. The effect is to leave the process of mutual phosphate price formation shrouded in obscurity.

THE PHOSPHATE FERTILIZER INDUSTRY

The characteristic feature of the fertilizer industry is its monopolistic nature. With the overriding call for total integration, in fact, the large firms working for the export market are usually associates of the big oil, mining and chemical companies. Hence the bulk of world rock supply is bought by multinationals equipped with vast processing plants. They make the phosphoric acid themselves; and when they do buy it, it is only to top up their supply. This explains why the volume of trade in phosphoric acid

which had been growing larger and larger for the Third World countries, absorbs only a small proportion of world output. It is subject to regular fluctuations which primarily hit the export-oriented producer countries such as Morocco, Tunisia and so on.

The multinationals exert their influence not only on the marketing of intermediate and end-products but also on the rock import trade, the effect being to strengthen their hold on the world phosphate industry. Their scope for market access is out of all proportion to that of the rock producers.

Control of world trade in natural phosphate

Rock export sales by the Third World countries are effected through the sales departments of the companies involved in the extraction and enrichment operations. However, as Table 2 shows, the companies handling the phosphate trade in the main importing countries are multinationals. They vary in size, with an annual income averaging between one million and 100 million USD in 1977. The figure for the Noranda Sales Corporation (Canada) is said to have been close to 2 G USD.¹⁸ In addition to natural phosphates, the companies are interested in fertilizer raw materials such as nitrates, sulphur and potassium. Boliden AB, a Swedish transnational, controls the raw phosphate import trade and the manufacture of phosphoric acid and fertilizer products through its subsidiaries Boliden Intertrade AB and Supra AB respectively. Commercial companies are thus exploiting processing plants either on their own account or through subsidiaries.

Several American companies serve as middle-men in rock marketing and distribution in the consumer countries (Searle, Donaldson, Univar and Norton) and share in the large volume rock sales on the most profitable markets. The European multinationals involved

are Rhone-Poulenc, Alusuisse, Klöckner and Amalgamated Metal Corporation. Apart from Rhone-Poulenc, which seems to be the only one with substantial phosphate mining interests, in Senegal, the case of a multinational participating simultaneously in mining, marketing and processing is rarely met with in the phosphate sector, except, of course, in the USA.

Specific relations between the main suppliers of phosphate intermediate and end-products

The main link in the chain, because of the amount of capital invested, is the phosphate processing industry. In the EEC countries, in fact, nine companies by themselves own two-thirds of the phosphoric acid production capacity¹⁹: BASF AG and Veba Chemie AG (Federal Republic of Germany); Société de Prayon (Belgium); Compagnie Française de l'Azote and Rhone-Poulenc SA (France), Montedison SpA (Italy); and Fisons Ltd and Imperial Chemical Industries (United Kingdom).

In the USA, as few as six companies own some 60 per cent of phosphoric acid production capacity.²⁰ They are Agrico Chemical, CF Industries, Freeport Chemical, Gardinier, International Minerals & Chemical, and Texasgulf. Production capacity is highly concentrated, in fact. Some of the big producers also hold the monopoly for selling their products on the home market. Fosfórico Espanol SA, for example, controls nearly 90 per cent of the Spanish phosphoric acid production capacity²¹.

Again in the USA, where mining and processing are integrated operations, a number of fertilizer manufacturing companies set up the Phosphate Chemical Export Company (PHOSCHEM) in July 1975. Its members are Agrico Chemical, American Cyanamid, First Mississippi Chemical, Freeport Chemical, WR Grace, International Minerals & Chemical, Occidental Chemical and Texasgulf, and it has been registered

in the Webb-Pomerene Act. PHOSCHEM sells phosphate fertilizers on behalf of its members, some of whom are, incidentally, members of PHOSROCK.

Actually, PHOSCHEM has been controlling almost the whole tonnage of phosphoric acid exported by the USA and 75 per cent of the exports of the other phosphate fertilizers.

The only major US exporters of any size not belonging to PHOSCHEM are Mitsui and Gardinier. In other countries, cartels of phosphatic products manufacturers have been set up to protect the home market. In Japan, there is the Phosphate and Compound Manufacturers Association, and in the United Kingdom the Fertilizer Manufacturers Association.

The concentration of production capacity in the hands of a few large transnationals has adverse effects on the distribution of phosphate products by Third World countries and their access to markets. Given the smallness of their home market, they have to export their processed products, if they are to have any hope of seeing their phosphate sector industrialization policy achieve ultimate success. Furthermore, the buying and selling of phosphate products is based essentially on contracts concluded with the leading manufacturers having commercial and financial links with subsidiaries and associated companies in the main consumer countries.

Factors contributing towards perpetuating this situation and accentuating the multinationals' monopolization of the downstream sectors are the problems of technology and financing, but also the cost of the additional materials required for rock-processing.

Problems of technology and financing

The manufacture of more highly concentrated phosphate substances involves complex operations requiring far heavier capital outlay and higher working costs. The relevant technologies are

in the hands of the big companies in the developed countries. The necessary equipment is obtainable, and the choice is very wide.

The purchasers, however, inevitably remain dependent on the suppliers even after the plant has been built. And firms selling turn-key plants never enlighten the buyer on the construction of the respective equipment and how to get it ready for production.

In the event, the concentration of sectoral production in the hands of a small number of undertakings produces no reduction in competition in general, even if it reduces competition in pricing. It intensifies other methods of competition, including technological innovation.

The transfer of technology involved is effected without the techniques being adapted to the new environment, for the priority objective of the multinational is never the transfer and adaptation of technology but the enlargement of the international network of goods circulation under its own domination.

Apart from technology, the construction of processing plants involves very heavy capital outlays, this presenting the Third World countries wishing to furnish themselves with such equipment with a further obstacle. Because of their size, the required investments constitute an enormous barrier, in as much as capital is scarce and recourse has to be had to foreign and hence more costly sources of finance. Again, in view of pressing demands in other sectors, it is not at all easy for a Third World country to accumulate such sums by itself, and what is even more important is the fact that phosphate processing is not an activity which can generate many jobs.

Cost of additional materials

The cost of obtaining sulphur and ammonia, the essential additional materials, is another massive obstacle. In fact, with the exception of Tunisia and Algeria which possess ammonia, the Third World countries buy these materials at

prices generally higher than those in the developed countries, by reason not only of the freight costs but also of the smallness of the quantities bought.

The fact is that most developed countries which are big producers get their supplies in the form of by-products from their petrochemical and metallurgical industries. Any world shortage of sulphur and ammonia would have a profound effect on the Third World countries and hamper the expansion of their phosphate industry.

INTER-SECTIONAL RELATIONS AND THE ACHIEVEMENT OF ADDED VALUE

Internal competition at sectoral level and the over-capacity which is its chronic feature (leaving aside the 1974—76 period of artificial shortage) favour entrepreneurial policy with its aims expressed in market terms.

The investments at the extraction stage are enormous, mainly in low-grade deposits requiring additional equipment for extraction and enrichment before the raw phosphate is in marketable condition. On the basis of World Bank estimates for Tunisia, for example, the prices paid for its natural phosphate exports in 1978 appear to have been insufficient to meet depreciation costs representing 10 per cent of investment in the plant: a modest yield compared with the rates obtained in other sectors²².

In many of the Third World countries, furthermore, the processing units operate below capacity, despite their enormous cost. In Togo, for example, the cost of a minimum-sized but economic processing complex might well represent one-fifth or one-sixth of the investment costs envisaged under its Third Development Plan for 1976—80, estimated at 250 000 million CFA francs.²³ To make matters worse, phos-

phate processing is not an activity which can create many jobs. According to the estimates made by the United Nations Industrial Development Organization (UNIDO), it takes a total workforce of 455, comprising 21 senior staff, 89 technicians and specialists, 270 operatives and maintenance workers and 75 labourers to operate a Third World plant with a minimum capacity of 193 545 tons of P_2O_5 content, with 1 000 tons for H_3PO_4 and 1 275 tons for diammonium phosphate.²⁴

The exploitation rate, moreover, is less than half the installed capacity. This situation reflects the combined effect of the following factors: difficulty of operation, poor maintenance, high fixed costs of operation, lack of outlets, or impossibility of marketing the product, inadequate supplies, poor transport and storage facilities, lack of working capital, etc.

The example of Morocco is highly significant in this connexion with over 70 per cent of investment representing a foreign currency outflow for purchasing capital equipment in the absence of a domestic production. Furthermore, two-thirds of the expenditure goes for purchasing sulphur and spare parts. And nearly half the value added goes abroad (foreign staff salaries, studies in connexion with plant installation and commissioning, depreciation for renewal of equipment, financial costs for servicing the capital borrowed from abroad)²⁵.

Another note worthy feature is the amount of value added at the level of the concentrated fertilizer subsidiary, where the volume of investment is small, especially bearing in mind how well equipped the developed countries are as far as infrastructure is concerned.

According to the OCP's calculations, indeed, with phosphate 75 costing 63 dollars per ton on 1 July 1974, the cost per ton of triple superphosphate may range between 165 and 170 dollars, whereas similar exports from European ports fetch 300—400 dollars.²⁶

There is no denying the fact that the value added is produced in the developed countries, and only marginally in the Third World countries. The extraction of value added has become less tangible but more solidly established through the internationalization of production in the phosphate sector, made possible not only by the international flow of phosphoric acid but also by the phosphate-processing industry's shift towards the periphery.

International flow of phosphoric acid

The lower contents found in natural phosphate and the surge in transport costs per tricalcic unit have encouraged a preference for phosphoric acid transport, given the improvements made in the sea transport of that corrosive product, and especially the longer hauls that have now become possible. In fact, the higher the phosphates' P_2O_5 content, the lower the effective freight costs become, since the residue is waste.

For the developed countries, getting deliveries in the form of phosphoric acid rather than rock is a considerable advantage, for they no longer need to obtain sulphuric acid supplies. In many regions, furthermore, the huge investments needed for producing phosphoric acid have made the construction of small plants uneconomic.

However, the international movement of phosphoric acid cannot by itself account for the dynamics of accumulation, which is also due to the action of the fertilizer multinationals.

Redeployment of the phosphate-processing industry

Part of the reason why the "industrialization" of the Third World is tolerated is that it opens up potentialities for exporting engineering skill and technical know-how from the developed countries and institutes new parameters for the international division of labour. The new forms of domination impose new con-

straints which are less tangible but more firmly rooted. Universalized capitalism seeks markets which respond to its new productive potential by re-deployment of the international division of labour. Most of the countries which have embarked on phosphoric acid production are, in fact, producers of raw materials connected with fertilizer manufacture. The possibility of finding unremunerated or modestly remunerated sources of finance is another factor involved in the concern to reduce the volume of capital advances. In this case, also, the finance can come from national or international public sources (public support).

In fact, the re-location of the rock-to-phosphoric and conversion industry comes within the general context of differentiation in capital use in the developed and developing capitalist countries.

In dominated economies capital is in a privileged position, enjoying the advantage, among others, of low wages, absence of strict legislation on matters of land development and safeguards against ecological disaster, for in the phosphate industry, and essentially at the conversion into phosphoric acid stage, the emissions are highly pollutant. In the United States, for example, the industry's adverse effects on the environment and the damage it may cause to human life, whether directly through the emission of harmful effluents or indirectly, through uglification, have led American legislators to be rigorous in their demands. Applications for authorization to open new worksites are scrutinized more closely than here to fore. The firms are asked to submit detailed plans indicating the proposed measures to protect the environment, and this demand is reflected in higher production costs and longer periods for project execution.

Our conclusion must be that fertilizer industries installed in the Third World countries are having to adapt and re-organize themselves in line with the de-

mands of the world fertilizer market, with sufficient room to operate within the limits dictated by that market, which is, after all, under the domination of a handful of multinationals. In any case, the factor being dominant in the world phosphate market, as Morocco is as the leading exporter, does not imply control of the industry that uses that commodity. In the final analysis, it is the phosphate fertilizer industry, as the main market, which dictates the relationship of forces. The installation of rock-processing units in the Third World countries is bound, of course, to have upstream and downstream effects, for the end in view is to integrate that industry within the national economy in general. In the case of plant delivered in running order, however, integration is problematical, the stumbling block this time being the engineering firm supplying the ready-to-run plant and not the national economy.

The Third World countries need to work out techniques, which have so far been controlled by the developed industrial countries, especially considering the fact that for almost all their products they lack the technical, economic and financial means which would enable them to impose their own prices and remain unencumbered by whatever arrangements the developed countries lay down.

Notes:

¹ UNCTAD, *Processing and marketing of phosphates: areas for international co-operation*. United Nations TD/B/C.1/PSC/22, 1981, page 3.

² Ibid, page 3.

³ Jacques Charbonneaux, 'Le marché mondial des phosphates: Industries et travaux d'outre-mer', No 321, August 1980.

⁴ UNCTAD: op cit, page 4.

⁵ Jean Roue, 'Le marché des phosphates' in *Matières premières et échanges internationaux*, Economica 1980, page 245.

⁶ The members of PHOSROCK are Agrico Chemical, American Cyanamid, Borden

Chemical, Freeport Phosphate Rock, W R Grace, IMCC, and Occidental Chemical.

⁷ Jean Roue, op cit, page 246.

⁸ *Maghreb-Machrek*, July-August-September 1978, page 6.

⁹ Clearing: what is involved here is a barter system, the imports not occasioning the outflow of gold or foreign exchange. In each of the countries concerned, the settlements are made by the importers in national currency at a compensation office, which likewise settles in national currency with the exporters. See Rachid Cherif, 'L'affaire des phosphates' in *l'Economiste du tiers monde*, 1978, No 26, July-August, page 22.

¹⁰ Rachid Cherif, 'Maroc-USSR' l'affaire des phosphates' in *l'Economiste du tiers monde*, July-August 1978, No 26 page 21.

¹¹ Embargo decreed by the Carter administration, see Philippe Chalmin, 'Cartel et embargo' in *Les marchés internationaux des matières premières*, Economica 1982, page 232.

¹² F Oualalou, *Propos d'économie marocain*, SMER Rabat, 1980, page 35.

¹³ *Le Monde*, 1976-07-17.

¹⁴ UNCTAD, op cit, page 18.

¹⁵ Ibid, page 19.

¹⁶ Ibid, page 54.

¹⁷ Francisco Vergara, 'Les phosphates' in *Annuaire de l'Afrique et du Moyen Orient*, 1981-82, Economie et développement. Paris, page 153.

¹⁸ UNCTAD, op cit, page 27.

¹⁹ Ibid, page 39.

²⁰ Ibid, page 39.

²¹ Ibid, page 40.

²² Ibid, page 54.

²³ Ibid, page 47.

²⁴ See 'Second worldwide study on the fertilizer industry 1975-2000' UNIDO ICIS, 1981, page 148. In UNCTAD, op cit, page 48.

²⁵ A Bellal, 'Secteur public, Etat et stratégie de développement' in Association des Lauréats de la Faculté de Droit de Casablanca 'Secteur public et développement économique', Symposium on 6, 7, 8 and 9 February 1980, Casablanca, page 144.

²⁶ F Oualalou, op cit, page 40. ►

Table 2
National and multinational linkages of the principal
companies trading in phosphates in major importing countries

Country	Company/organization	Parent companies ¹	Subsidiary and associated companies
Australia	Ajax Chemicals	G D Searle (United States)	(Holds agency for various companies including W R Grace and Agrico Chemical (United States))
	Chemical Resources	—	—
Austria	Indupromat	—	Subsidiary: Indupromat (Romania) Associate: Metafin (Austria)
Belgium	Sprl Gustave Adam	—	—
	ASE Europe NV	—	Associates: connections in several countries, including Saudi Arabia, Morocco, Tunisia, Egypt, North America and Western Europe.
	Caemi International	Caemi Internacional (Brazil)	Subsidiaries: Caemi International in Netherlands, Federal Republic of Germany, United Kingdom, United States, Italy and Spain, and other companies. Associates: some 10 companies in Brazil including Industria e Comercio de Minerios (ICOMI) and Mineracoes Brasileiros Reunidas (MBR).
	Donaldson Europe NV	Donaldson (United States)	Subsidiaries include Donaldson in France and Federal Republic of Germany.
	Rodesco	—	—
	Sudamin	Captiade Panama (South American Consolidated Enterprises), The Hochschild Group	Associates include companies in London, Paris, Madrid, Tokyo, New York, Sao Paulo, Bogota, Buenos Aires and Santiago.
	Arnold Suhr Belgie	Arnold Suhr Holding	Subsidiaries: Arnold Suhr in United Kingdom, Netherlands, Federal Republic of Germany, France and Switzerland.
Canada	Belfour Guthrie (Canada) Ltd	—	—
	Canada Colors and Chemicals	—	Subsidiary company: Sulco Chemicals
	Noranda Sales Corp Ltd	Noranda Mines	Associates include: Cia Minera Las Cuevas (Mexico)
	The Pigment and Chemical Van Waters and Rogers Ltd	—	—
	P Brøste A/S	Univar (United States)	Associates: Univar Group Companies
Denmark	Handelshuset Wilhelm Hansens	—	—
France	Cie Industrielle et Minière	Rhone-Poulenc	Subsidiaries: Sté. Minière de Corrèze; Sté. Sénégalaise des Phosphates de Thise; and Sté. Minière de San Albin.
	Somatrex	—	—
GDR	Bergbau-Handel	State organization	—
FRG	Alusuisse Erze	Alusuisse Ltd (Switzerland)	Subsidiary: Swiss Aluminium Mining (United Kingdom) Associates: Alusuisse Group companies
	K D Feddersen and Co	—	Subsidiary: Akro Plastic GmbH
	Klößner	—	Subsidiary and associated companies include: Klößner in Brazil, Austria, United Kingdom, South Africa, France, Netherlands, Spain, Italy, Japan and Sweden.
India	Apco Mineral Industries	—	Associate: Everest Minerals
	Minerals and Metals Trading	—	Subsidiary: Mica Trading Corp of India.
	Overseas Trade Links	—	—
Italy	Continente commerciale	—	—
	Ferrometal	Jugometal (Yugoslavia)	—
	Minermet Sas dell'Ing E Scheinin	Minermet SA and Refraco SA (Switzerland)	Associated company: Unimin SpA
	Marc Rich	Marc Rich and Co AG (Switzerland)	—
Japan	AMC (Japan) Ltd	Amalgamated Metal (United Kingdom)	Associates: AMC Group companies
	Several large trading companies including Mitsubishi, Mitsui, Nichimen, Sumitomo and Toyo Menka Kaisha	—	All maintain a world network of subsidiary companies

Country	Company/organization	Parent companies ¹	Subsidiary and associated companies
Mexico	Minerals Industriales SA de CV	—	Associate: Mineral La Cruz del Sur SA
	Norton SA	Norton Co (United States)	Associated companies: Norton Group companies
Netherlands	DRM Dutch Raw Materials	—	—
	Negev Phosphates Ltd	Negev Phosphate (Israel)	—
	Frans Swarttouw BV	—	Subsidiaries: several national companies
New Zealand	ICI New Zealand Ltd	ICI Australia Ltd	Subsidiaries: a number of national companies
Norway	Harald Mathisen A/S	—	—
Republic of Korea	Korea Minerals and Metals Co	—	—
Spain	Aldabo-Julia SA	—	—
Sweden	Boliden Intertrade AB	Boliden AB	Subsidiaries include: Boliden Intertransport, Boliden Intertrade Oil and Boliden Intertrade Raffinaderi; Bolisse and Sulphur Handels und Vertriebs (Switzerland); Boliden Intertrade (United Kingdom); and Wilkinson and Sons (United Kingdom). Associates include: Boliden Intertrade (Portugal); Buck Shipping International (Burmuda); and Hall-Buck Marine Services (United States)
Switzerland	Alusuisse Mining Ltd	Alusuisse Ltd	Associated companies: Alusuisse Group companies.
	Bolisse AG	Boliden Intertrade (Sweden)	Subsidiaries: Sulphur Handels-und-Vertriebs; and Wilkinson and Sons (United Kingdom). Associate: Buck (United States).
	Imic SA	Imic Holding Inc	Subsidiary companies: Imic Trading and Interacid Trading. (Holds exclusive agency for Swift Chemical in West Europe).
	Joseph Müller Corp	Holding and Management AG	—
Turkey	Organik Kimya Sanayi ve Ticaret AS	Organik Holdings AS	Associated companies: Alkem Kimya; Kimsa; Elkasas; Filament; Beltas; and Rokril
United Kingdom	Blue Circle Industries	—	—
	Derby and Co Ltd	Engelhard Minerals and Chemicals	Subsidiaries: Derby (South Africa) and Derby (Australia) Associates: Philipp Brothers Group Companies
	Ellis and Everard Chemicals	Ellis and Everard Ltd	Subsidiary/associated companies: Beta Chemicals; Quigley Leisure; East Midland Pools; and Capital Swimming Pools.
	R D Harbottle and Co (Mercantile) Ltd	—	Subsidiary/associated companies: Seabright Chemicals; Stour Chemicals; Askdown Rawlinson; and Pettifers
	Kerr-McGee Chemicals	Kerr-McGee Chemicals (United States)	—
	Logan and Allen Ltd	Tennant Trading Ltd (Member of the Consolidated Gold Fields Group)	Associated companies: Tennant Chemicals Ltd and Thomas Hill Jones Ltd.
	Podmore and Sons Ltd	—	Associated companies: Podmore-Generale (Italy); Quiminsa (Spain) and N V Podmore (Belgium)
	T R International (Chemical) Ltd	Simon Engineering	Subsidiary/associated companies include: TR America (United States); TR Scandinavia; London Chemical Co; Tokyo Kaseihin Co; and Sté francocontinentale de Produits Chimiques (France).

Source:
UNCTAD Secretariat, derived from various sources of information, including publications of The British Sulphur Corporation Ltd and Metal Bulletin Ltd.

Note:
¹ " — " denotes that the parent company is the same as the company listed.