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Expert Group Meeting on Regional Co-operation
among Developing Countries in the
Fertilizer Industry

Vienna, 8-10 February 1978

SUGGESTED AREAS OF CO-OPERATION
AMONG DEVELOPING COUNTRIES IN THE FERTILIZER INDUSTRY *

by the UNIDO Secretariat

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Introduction

1. The Second General Conference of UNIDO held at Lima, Peru in March 1975, recommended that UNIDO should include among its activities a system of continuing consultations between developed and developing countries and among developing countries themselves. The objective of these consultations is to assist the developing countries to achieve their industrialization goals which include in particular the goal of producing at least 25 per cent of world industrial output by the year 2000.
2. The First Consultation Meeting on the Fertilizer Industry convened in Vienna, 17-21 January 1977, reviewed the arrangements that had been made for co-operation amongst developing countries in the fertilizer industry. It recognized that for developing countries with smaller markets it would be desirable to plan for regional co-operation and a combination of resources and skills. A high priority should be given in the programme of regional groups to the preparation of feasibility studies, the setting up of fertilizer plants, and the building up of a marketing and distribution network within the region. UNIDO should extend assistance to these efforts when requested to do so. International, technical and financial assistance from bilateral and other sources should also be made available for such regional group efforts. Furthermore, UNIDO should consider giving assistance to establishing regional development centres for the fertilizer industry.
3. The Consultation Meeting, therefore, recommended that

"the opportunities for co-operation between developing countries at the subregional, regional and interregional levels and the international support needed for that co-operation"

be examined in depth, if necessary by convening a working group.
4. The purpose of this expert group meeting is to contribute to the formulation of the conclusions and recommendations on these points than can be considered at the Second Consultation Meeting on the Fertilizer Industry, tentatively scheduled for 6 - 10 November 1978 in Innsbruck, Austria.
5. As a basis for preparing this paper suggesting areas of co-operation in the fertilizer industry, UNIDO invited consultants to prepare papers describing the experience of and potential for such co-operation in the ANDFAN and ASFAN group of countries, in India and Pakistan and in the two areas where regional federations of fertilizer producers already exist - the Arab countries and Latin America.
6. The paper examines the opportunities for co-operation in the production of fertilizers; in trade in fertilizers, intermediates and raw materials; and in the construction and operation of fertilizer plants. The institutional arrangements needed to promote such co-operation are also considered.

I. COOPERATION IN THE PRODUCTION OF FERTILIZERS, INTERMEDIATES AND RAW MATERIALS

7. The First Consultation Meeting on the Fertilizer Industry suggested that the developing countries should aim to achieve self-sufficiency in the fertilizer production as soon as possible and in any case by the year 2000. The term 'self-sufficiency' should be interpreted with reference to a stimulated optimum level of fertilizer consumption rather than the present low levels.
8. The present level of consumption of fertilizers in developing countries and forecast levels in 1981/1982 and 1985/1986 are shown in Annex A. The level of production in 1975/76 and the expected capability to supply fertilizers in 1981/82 are also shown in Annex A.
9. It is clear from these estimates that developing countries, as a group, are making rapid progress to the target of self-sufficiency. However, so far the establishment of new production units has mainly been the result of a national response to national requirements. Some export-oriented plants have been established but only a few plants have been established as a result of a decision by developing countries to combine their resources and skills.
10. There are few examples of bilateral co-operation in the field of production of fertilizers so far. Two new fertilizer plants in Pakistan are being established with the help of the financial resources of Arab countries. 1/ Venezuela and Colombia have established a jointly owned plant in Colombia which manufactures fertilizers from ammonia imported from Venezuela. 2/
11. Some examples of subregional co-operation are:- In the ASEAN group of countries it has been decided that new capacities for nitrogen fertilizers should be built in Indonesia and Malaysia, for phosphate fertilizers in the Philippines and for potash in Thailand; the remaining member of this group, Singapore, will establish new capacities in other industries.
12. In the ANDEAN group an initial attempt to co-ordinate plans for new capacities in the fertilizer industry was made in 1974. A further attempt was made in 1977 and results achieved so far will be presented to the meeting. 3/
13. There may be other groups of developing countries who could, within the framework of an existing agreement on economic co-operation, consider the possible allocation of production of different types of fertilizers, intermediates and raw materials to different countries within the sub-region.
14. The meeting might discuss what kind of information is needed if co-operation within a region is to be intensified in the future. Countries with small markets may well be able to establish NPK plants which would rely on supplies of ammonia, phosphates and potash imported from other developing countries. The meeting might also consider who should initiate the studies needed to examine the markets and resources of different regions with a view to identifying such potential opportunities for co-operation. The type of co-operation discussed above might be developed within the same region or in some cases, on an interregional basis.

1/ Regional Co-operation in the Fertilizer Industry; The Experience of Pakistan in regard to financing two fertilizer plants ID/WG.265/3

2/ Regional Co-operation in the Fertilizer Industry: The Experience and Potential of the ANDEAN Group of Countries ID/WG.265/1, pages 6 and 7

3/ A model based on the World Bank Fertilizer Model for optimising planning of new production facilities was used. The approach may be discussed at the meeting.

II. COOPERATION TO PROMOTE TRADE IN FERTILIZERS, INTERMEDIATES AND RAW MATERIALS AMONGST DEVELOPING COUNTRIES

15. Although statistics may show that the developing countries are approaching self-sufficiency as a group in the production of nitrogen and phosphate fertilizers, the aggregate does not reveal the developing countries who have a deficit and a surplus of fertilizer supplies. For this reason it has been recommended for Latin America^{1/} that information on the import requirements of developing countries and the export potential of other countries should be collected and disseminated so that interested parties can take advantage of these potential trade opportunities.

16. As regards trade opportunities at the regional level, it is necessary to consider the reasons why deficit countries import a major part of their requirements from outside the region. It should be possible through regional consultations to elaborate measures that would give preference to regional producers where adequate supplies of fertilizers are available in the region as a whole. The meeting will have to consider what types of measure would be useful and feasible to adopt.

17. At an intra-regional level, it would appear that the main obstacle to increased trade among developing countries is lack of information on market requirements and the availability of supplies. It is therefore proposed that a regular report should be made available to those who wish to subscribe on current trends in the world fertilizer markets, the requirements of developing countries who import fertilizers, and the type of fertilizer available and its price from potential developing country suppliers.

18. If there is to be an increase in regional and intra-regional trade, steps will have to be taken to lower the cost of shipping fertilizers from one developing country to another. In this connexion, it is interesting to note that the Andean Group of countries have found that this factor adversely affects the competitiveness of fertilizers produced within the region; they have therefore agreed on joint efforts to create the necessary loading and unloading facilities; in addition, the possible purchase of vessels to transport fertilizers has been suggested.

19. Although the above discussion has been in terms of finished fertilizers, co-operation amongst developing countries can take place in the supply of intermediates and raw materials. In the case of raw materials, the quantities that have to be moved are even greater and the cost of transport is even more important. The meeting can therefore consider what initiatives can be taken to facilitate increased trade in fertilizers, intermediates and their raw materials amongst developing countries by improving transport and loading and unloading facilities.

20. It is the practice in some countries to negotiate long-term contracts for the sale of fertilizers, intermediates and raw materials. The meeting should consider to what extent such contracts are used for trade amongst developing countries at present and what role they might play in the future. ^{2/}

^{1/} Regional Co-operation in the Fertilizer Industry: Experience and Opportunities in Latin America, by Ing. Eduardo Guitierrez Salgado.
ID/WG.265/4

^{2/} Long-term sales contracts have been considered by the FAO Commission on Fertilizers. See Report of the Fourth Session, Rome 27-30 September 1977, Doc.CL72/2 para 15. A revised example of a long-term contract is being prepared.

III. COOPERATION IN THE CONSTRUCTION AND OPERATION OF FERTILIZER PLANTS

21. World fertilizer production capacity is expected to increase as follows in the period 1975/76 to 1981/82.

	Nitrogen millions tons N	Phosphate millions tons P ₂ O ₅
Developing countries:		
Market economy countries	12.0	5.4
Centrally planned economy countries	4.0	0.2
Developed countries:		
Market economy countries	8.3	2.6
Centrally planned economy countries	13.5	2.0
	<u>37.8</u>	<u>10.2</u>

Thus developing countries will account for 42 per cent of the new nitrogen fertilizer capacity and 53 per cent of the new phosphate fertilizer capacity.

22. In the short space of six years, the world's capacity to produce nitrogen fertilizers will increase by over 50 per cent. Between 120 and 150 new plants will be constructed and between 50 and 60 of these will be built in developing countries. In the period after 1982, developing countries are expected to continue to buy up to 10 new nitrogen fertilizer plants per year.

23. There is, then, an opportunity for developing countries to co-operate in the purchase of such plants. If a standard design were adopted by a group of developing countries, plant costs might be reduced, pools of spares could be shared, training of operating personnel would be facilitated and a higher proportion of the equipment needed might be manufactured in developing countries. The meeting might consider the possibility of initiating a joint approach to buying plants and the advantages that could thus be achieved.

24. Inexperienced buyers of plants need to learn what experience other buyers have had with fertilizer plants using an identical production process. At the stage of selecting a contractor, UNIDO has been asked to arrange for key personnel to visit such plants in other countries^{1/}. The meeting might consider what mechanism is needed to make available a continuing analysis of experience with new fertilizer plants that could be made available to enquirers.

25. Inexperienced buyers of fertilizer plants in developing countries have used the assistance of experienced buyers in other developing countries (a) for preparing feasibility studies; (b) for selecting contractors; (c) for evaluating bids; (d) for supervising erection of plants and (e) for examining the fertilizer marketing and distribution network required. Such co-operation has been particularly appreciated when it covers less familiar technologies such as plants based on lignite, coal and coal-gasification processes. And in the future, it may extend to provision of engineering services for plant design and construction.^{2/}

^{1/} Draft Report of Technical Seminar on Contracting Methods and Insurance Schemes for Fertilizer and Chemical Process Industries, Lahore Pakistan, 25-29 November, 1977 ID/WG.259/26/Rev.1

^{2/} Co-operation amongst Developing Countries in the Fertilizer Industry: the Experience of India ID/WG.265/6

26. Training of operating personnel and assistance with initial operations and maintenance is another possible area of co-operation as the number of experienced operators in developing countries grows in the future. Perhaps a focal point needs to be established where requests for such assistance could be matched with plant operators willing to provide such training facilities and assistance.
27. The Consultation Meeting suggested consideration be given to the establishment of regional fertilizer development centres. It is suggested that a regional centre for Arab countries should (a) make studies of special problems of the industry, (b) offer specialized training programmes, (c) undertake research and development on problems of common interest.^{1/} The need for and objectives of such centres in other regions and ways of financing them warrant consideration by the meeting.
28. In addition to the establishment of this regional centre, the Arab fertilizer producers are considering the establishment of a central services company and a company to manufacture catalysts and auxiliary chemicals. Developing countries in other regions may wish to consider the need for this type of co-operation.
29. Finally, there is the opportunity for developing countries to make increasing use of machinery and equipment manufactured in developing countries. The capability of India to supply equipment for chemical process plants has been described in detail;^{2/} other countries, such as Brazil and Mexico, may provide similar information at the meeting and in detail at a later date. The issue for consideration is how the availability of such equipment should be brought to the attention of buyers of new plants in developing countries and their contractors.
30. It may be recalled that the Consultation Meeting recommended that UNIDO should provide more consultancy services to developing countries requesting them in: preparation of feasibility studies, the preparation of specifications for tenders, the evaluation of bids, the negotiation of contracts, the commissioning of plants, trouble-shooting, the development of maintenance programmes, marketing, and operational management. The Meeting for that purpose recommended that a panel of experts should be established.
31. In this connexion, Technological Advisory Services have been initiated by UNIDO to provide independent and impartial advice to developing countries, on a trial basis in 1978, covering a number of sectors including fertilizers. These services will be primarily directed at the time of negotiation of technology contracts. They will consist of a combination of assessment of process, technology, plant layout, machinery, and particularly, the terms and conditions on which they are acquired. For each project, and at the request of the government and in accordance with established procedures of UNIDO, a highly qualified team of technologists, licensing and contracting, legal and financial experts will be provided by UNIDO for a short period of time. On the basis of a specific request, such services may also cover the pre-negotiation phase, namely

1/ Regional Co-operation in the Fertilizer Industry: The Experience of the Arab Federation of Chemical Fertilizer Producers, page 4. ID/WG.265/2

2/ Co-operation amongst Developing Countries in the Fertilizer Industry: the Experience of India, ID/WG.265/6

evaluation of bids and selection of technology. The advice of these experts will be confidential and they would, in general, assist and augment the bargaining capacity of the weaker partner, namely the developing countries, prior to and during negotiation, but not actually participate in the negotiation as it will be primarily the responsibility of the country or agency concerned. From UNIDO's limited experience, it has been possible to reduce the total project outlays resulting in substantial savings to the project.

32. The meeting is invited to comment on this new approach of UNIDO and suggest ways and means of implementing these services effectively to the benefit of developing countries.

IV. INSTITUTIONAL ARRANGEMENTS NEEDED TO IMPLEMENT CO-OPERATION AMONGST DEVELOPING COUNTRIES

33. The view is expressed in the papers prepared for UNIDO that more should be done to permit fertilizer enterprises in developing countries to keep in touch with each other and to be informed of current world trends and developments which affect the fertilizer industry.

Institutional arrangements for co-operation at the sub-regional level

34. The experience of the ANDEAN and ASEAN Groups of countries will be considered at the meeting. Other existing sub-regional economic groupings can provide the institutional framework for co-operation in the fertilizer industry at the sub-regional level. The meeting could, therefore, concentrate on suggesting the essential elements of an agreement that are needed to establish co-operation in the fertilizer industry at the sub-regional level.

Institutional arrangements for co-operation at the regional level

35. At present federations of fertilizer producers exist for the Arab and Latin American countries but not for other regions.^{1/}

36. In Asia and the Pacific, the establishment of a Regional and Information and Advisory Service has been proposed; financing by UNIDO, FAO and ESCAP has still to be arranged. One phase of the project would aim to improve the distribution, marketing and use of fertilizers in ESCAP countries; another phase would cover co-operation among ESCAP countries in the production of and trade in fertilizers, intermediates and raw materials.^{2/} The meeting could consider the potential contribution of such projects to co-operation amongst developing countries and recommend to the Second Consultation Meeting alternative ways in which the required financial support could be obtained.

Institutional arrangements for co-operation amongst all developing countries

37. Various arrangements for co-operation at the interregional level have been suggested. UNIDO could call an annual meeting of representatives of fertilizer enterprises in developing countries; this meeting could then be

1/ ADIFAL maintains liaison with the SELA Action Committee on Fertilizers and Raw Materials.

2/ Report of the Expert Group Meeting on the Organization of a Regional Information and Advisory Service on Chemical Fertilizers, held at Bangkok 12-16 September 1977 E/ESCAP/AD/RIASCF/1.

divided into sub-committees on operation, maintenance, manpower and trade. This suggestion should take into account UNIDO's plan to convene a second consultation meeting on the fertilizer industry in November 1978, open to participants from all countries.

38. It is suggested that an association of developing countries' fertilizer producers might be established. Some objectives for the Association have been suggested.^{1/} In reaching a decision as to whether a new association is needed for fertilizer enterprises from developing countries, full account should be taken of the existence of ISMA, the International Phosphate Industry Association, which welcomes qualified organizations as members from any part of the world.^{2/}

39. Another suggestion is that UNIDO might publish regularly a newsletter on fertilizers and their raw materials. The newsletter could be based on information submitted by individual enterprises and regional federations of fertilizer producers in the developing countries. It has been suggested that the newsletter be published four times a year in the main languages used in UNIDO (English, French, Spanish and Arabic). UNIDO is prepared to consider this proposal; if it is to be initiated in 1978 or 1979, funds outside UNIDO's Regular Budget will need to be provided.

40. Bearing in mind their growing contribution to world fertilizer supplies, the developing countries themselves might play a more active role in the preparation of regional estimates of demand and supply of fertilizers that form part of the estimates of world demand and supply that are discussed and published by the UNIDO/FAO/IBRD Working Group on Fertilizers. It is suggested that information be collected by UNIDO and be disseminated to all developing countries in the form of subregional and regional forecasts of demand and supply.

41. UNIDO has discontinued publishing its directory of fertilizer producers in developing countries. The country coverage of regional federations existing at present is not complete. It may therefore be useful to resume this activity. If deemed so by participants, they should indicate what information about each enterprise should be published.

^{1/} Regional Co-operation in the Fertilizer Industry: Experience and Opportunities in Latin America; by Ing. Eduardo Gutierrez-Salgado ID/WG.265/4 page 4.

^{2/} ISMA members include over 300 organizations in 54 countries. Nearly 200 of these produce phosphate rock and/or phosphate fertilizers accounting for two-thirds and one-half of the total world output of these commodities respectively. Over half of the countries represented in ISMA are developing countries.

WORLD NITROGEN FERTILIZER INDUSTRY

Demand and supply capability
million metric tons N

	ACTUAL			FORECAST			FORECAST
	Cons	1975/76 Prod	Bal ^{1/}	Cons	1981/82 Prod	Bal	1985/86 Cons
<u>DEVELOPING COUNTRIES</u>							
Africa	0.44	0.17	-0.27	0.96	0.69	-0.27	1.40
Latin America	2.03	1.25	-0.78	3.49	2.56	-0.93	4.50
Near East	1.30	0.98	-0.32	2.32	2.91	+0.59	3.10
Far East	<u>3.81</u>	<u>2.85</u>	<u>-0.96</u>	<u>7.53</u>	<u>7.00</u>	<u>-0.53</u>	<u>10.00</u>
	7.58	5.25	-2.33	14.30	13.16	-1.14	19.00
Asian CPE Countries	<u>5.03</u>	<u>3.56</u>	<u>-1.47</u>	<u>7.28</u>	<u>6.75</u>	<u>-0.53</u>	<u>10.00</u>
Total	<u>12.61</u>	<u>8.81</u>	<u>-3.80</u>	<u>21.58</u>	<u>19.91</u>	<u>-1.67</u>	<u>29.00</u>
<u>DEVELOPED COUNTRIES</u>							
North America	9.95	10.18	+0.23	12.70	12.50	-0.20	14.00
West Europe	8.10	9.29	+1.19	10.24	11.56	+1.32	11.70
Others	<u>1.13</u>	<u>2.08</u>	<u>+0.95</u>	<u>1.57</u>	<u>2.48</u>	<u>+0.91</u>	<u>1.90</u>
	19.18	21.55	+2.37	24.51	26.54	+2.03	27.60
USSR, East Europe	<u>11.51</u>	<u>13.51</u>	<u>+2.00</u>	<u>17.00</u>	<u>21.00</u>	<u>+4.00</u>	<u>21.50</u>
	<u>30.69</u>	<u>35.06</u>	<u>+4.37</u>	<u>41.51</u>	<u>47.54</u>	<u>+6.03</u>	<u>49.10</u>
WORLD TOTAL	<u>43.30</u>	<u>42.87</u>	<u>+0.57</u>	<u>63.09</u>	<u>67.45</u>	<u>+4.36</u>	<u>78.10</u>

- ^{1/} Cons = Actual Demand or Forecast Consumption
 Prod = Actual Production or forecast capability to supply, defined as climbing to 70 per cent of capacity after 3 years
 Bal = Balance of demand and supply or forecast consumption and capability to supply at above assumed rates of capacity utilization.

Sources: UNIDO/FAO/IBRD Working Group on Fertilizers, June 1977

WORLD PHOSPHATE FERTILIZER INDUSTRY

Demand and supply capability
million metric tons
P₂O₅

	ACTUAL			FORECAST			FORECAST
	1975/76			1981/82			1985/86
	<u>Cons</u>	<u>Prod</u>	<u>Bal</u> ^{1/}	<u>Cons</u>	<u>Prod</u>	<u>Bal</u>	<u>Cons</u>
DEVELOPING COUNTRIES							
Africa	0.37	0.42	+0.05	0.65	2.23	+1.58	0.90
Latin America	1.51	0.86	-0.05	2.67	1.66	-1.01	3.40
Near East	0.68	0.55	-0.13	1.31	1.53	0.22	1.70
Far East	1.11	0.60	-0.51	2.25	1.41	-0.84	3.05
	<u>3.67</u>	<u>2.43</u>	<u>-1.24</u>	<u>6.88</u>	<u>6.83</u>	<u>-0.05</u>	<u>7.05</u>
Asian CPE Countries	1.48	1.46	-0.02	2.38	2.36	-0.02	3.30
	<u>5.15</u>	<u>3.89</u>	<u>-1.26</u>	<u>9.26</u>	<u>9.19</u>	<u>-0.07</u>	<u>12.35</u>
DEVELOPED COUNTRIES							
North America	5.26	7.31	+2.05	6.18	8.83	+2.65	7.20
West Europe	5.10	5.09	-0.01	6.60	7.37	+0.77	6.40
Others	1.84	1.81	-0.03	2.67	3.21	+0.54	2.85
	<u>12.20</u>	<u>14.21</u>	<u>+2.01</u>	<u>15.45</u>	<u>19.41</u>	<u>+3.96</u>	<u>16.45</u>
USSR, East Europe	6.69	6.77	+0.08	10.40	8.41	-1.99	12.80
	<u>18.89</u>	<u>20.98</u>	<u>+2.09</u>	<u>25.85</u>	<u>27.82</u>	<u>+1.97</u>	<u>29.25</u>
WORLD TOTAL	<u>24.04</u>	<u>24.87</u>	<u>+0.83</u>	<u>35.13</u>	<u>37.03</u>	<u>+1.90</u>	<u>41.60</u>

- 1/ Cons = Actual Demand or Forecast Consumption
 Prod = Actual Production or forecast capability to supply defined as climbing to 80 per cent of capacity after 3 years in developing countries; (90% developed).
 Bal = Balance of demand and supply or forecast consumption and capability to supply at above assumed rates of capacity utilization.

Sources: UNIDO/FAO/IBRD Working Group on Fertilizers, June 1977

WORLD POTASH INDUSTRYDemand and supply capability

million metric tons

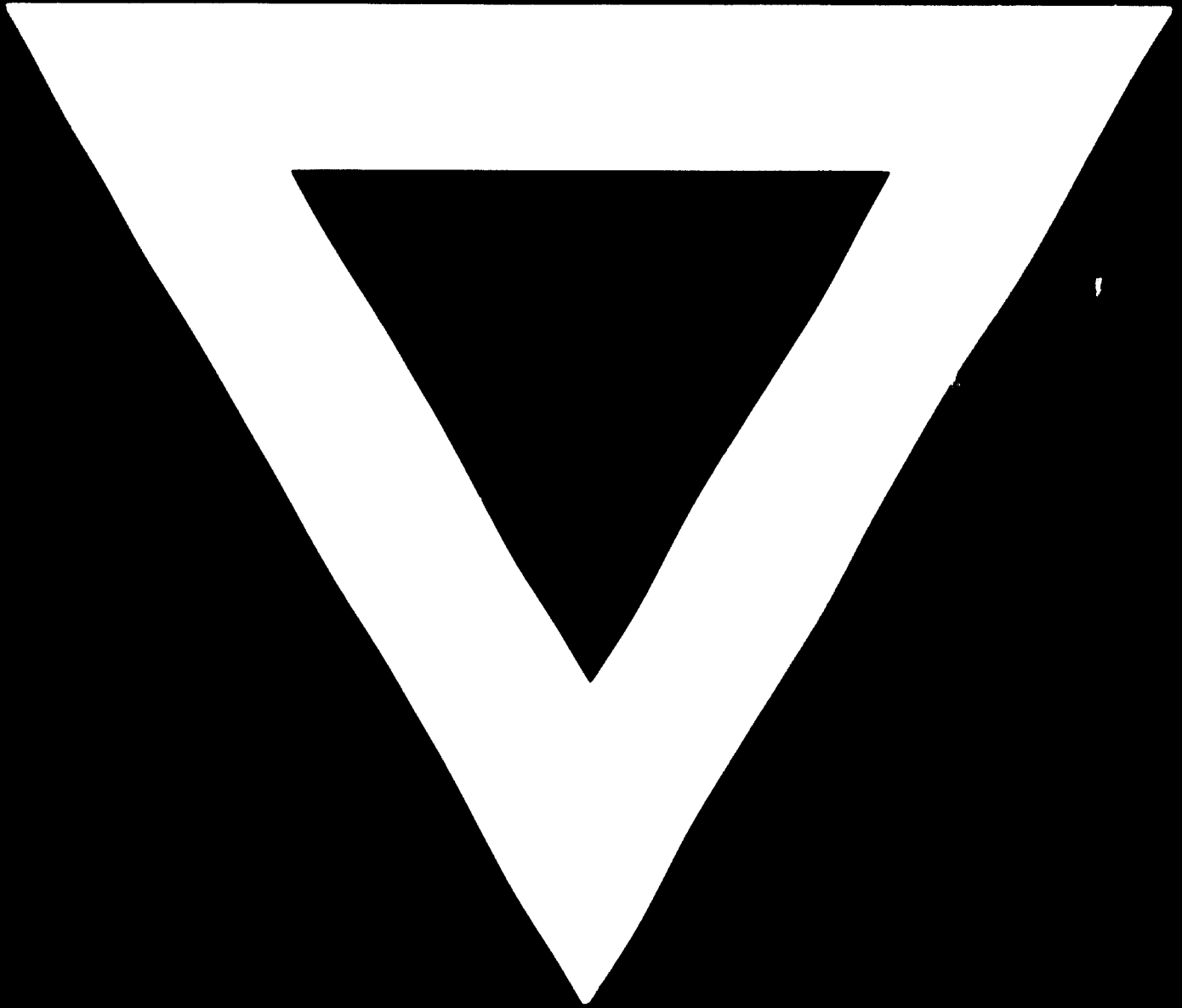
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	ACTUAL			FORECAST			FORECAST
	Cons	1975/76 Prod	Bal ^{1/}	Cons	1981/82 Prod	Bal	1985/86 Cons
<u>DEVELOPING COUNTRIES</u>							
Africa	0.21	0.28	+0.07	0.36	0.36	-0.06	0.48
Latin America	0.95	0.01	-0.94	1.84	0.03	-1.81	2.52
Near East	0.03	-	-0.03	0.07	-	-0.07	0.09
Far East	0.67	-	-0.67	1.43	-	-1.43	1.85
	1.86	0.29	-1.57	3.70	0.33	-3.37	4.95
Asian CPE Countries	0.48	0.30	-0.18	0.77	0.45	-0.32	0.92
Total	2.34	0.59	-1.75	4.47	0.73	-3.69	5.67
<u>DEVELOPED COUNTRIES</u>							
North America	4.49	6.94	+2.00	6.25	9.25	+3.27	7.57
West Europe	4.66	4.27	-0.39	6.30	6.30	-	6.80
Others	0.85	0.71	-0.19	1.33	0.80	-0.53	1.50
	10.45	11.92	+1.47	13.88	16.62	+2.74	15.87
USSR, East Europe	8.54	10.96	+2.42	11.29	15.10	+3.81	14.53
	18.99	22.88	3.89	25.17	31.72	6.55	30.40
WORLD TOTAL	21.33	23.47	+2.14	29.64	32.50	+2.86	36.27

- 1/ Cons = Actual Demand or Forecast
 Prod = Actual Production or forecast capability after deducting processing, transportation, handling and storage losses from production.
 Bal = Balance of demand and supply or forecast consumption and capability to supply, at above assumed rates of capacity utilization.

Sources: UNIDO/FAO/IBRD Working Group on Fertilizers, June 1977

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