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07825



United Nations Industrial Development Organization

Distr.
LIMITED
ID/WG.265/1
5 January 1978
ENGLISH

Expert Group Meeting of Regional
Co-operation among Developing
Countries in the Fertilizer Industry,
Vienna, 8-10 February 1978

REGIONAL CO-OPERATION IN THE FERTILIZER INDUSTRY:
THE EXPERIENCE AND POTENTIAL OF THE ANDEAN GROUP OF COUNTRIES *

by

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id.78-045

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Part A: EXPERIENCES IN COOPERATION

I. EXPERIENCES WITHIN THE ANDEAN GROUP

1. Proposal for an Andean Fertilizer Program

1.1 Background information on the Andean Group

The Cartagena Agreement is a treaty, signed on May 16, 1969 in Cartagena, Colombia by representatives of the Governments of Bolivia, Colombia, Chile, Ecuador and Perú, which laid out the basis for the creation of an economic community known as the Andean Group. The Government of Venezuela adhered to the Agreement on February 13, 1973 and the Government of Chile withdrew its participation on October 30, 1976.

Anticipating the need for a regional development bank to finance new undertakings in the Andean Group, the Member Countries created Corporación Andina de Fomento (CAF) on February 7, 1968 with an initial capital of US\$ 100 million which has subsequently been increased to US\$ 400 million.

The economic magnitude of this community is best expressed through the following figures:

<u>Member Countries</u>	<u>Population</u>					<u>Gross National Product</u>				
	(million inhabitants)					(1968 US\$ per capita)				
	<u>1970</u>	<u>1975</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1970</u>	<u>1975</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>
Bolivia	4,8	5,4	6,2	7,0	8,0	263	301	352	417	489
Colombia	22,1	25,9	30,2	35,0	40,3	465	533	589	577	783
Ecuador	6,0	7,1	8,3	9,7	11,2	370	504	594	719	882
Perú	13,5	15,7	18,2	20,4	24,4	525	589	696	887	1060
Venezuela	10,6	12,2	14,1	16,3	18,7	1089	1195	1437	1792	2253
Andean Group	57,0	66,3	77,0	88,4	102,6	568	647	751	915	1105

On the basis of figures taken from International Financial Statistics (International Monetary Fund, August, 1977) the purchasing power of the Andean Group population in 1975 was equivalent to that of nine million Americans.

The Cartagena Agreement established four institutional bodies responsible for its implementation, two of which are relevant to this presentation: the Commission and the Board.

The Andean Market Board (Junta del Acuerdo de Cartagena - JUNAC) is the technical secretariat. One of its main functions is to propose joint industrial programs whose salient feature is allotment of the rights to produce certain products to one or more Member Countries.

The Commission then decides if the proposed program is acceptable or not. If it is, the proposal becomes an Industrial Program of the Andean Group.

One such program deals with fertilizer production.

1.2 Agreement to develop an Andean Fertilizer Program

This was the first experience in cooperation in the fertilizer industry amongst the Andean Group member countries.

The Cartagena Agreement refers in several of its clauses to the joint formulation of Industrial Development Sectoral Programs of the Andean Group.

Decision 25, issued during the Third Period of Extraordinary Sessions of the Commission, 14-21 December, 1970 designated those industrial products whose manufacture would be included in the various Sectoral Programs. All fertilizers were part of the list, which meant that fertilizer production would be the subject of an Andean Industrial Program.

1.3 Proposal 67 - preparation

From January, 1971 thru 20 March 1974, JUNAC's own staff made several studies of the fertilizer industry in the Andean Group. This in itself was another experience in ANDEAN cooperation as JUNAC is mostly staffed by Andean professionals.

In addition to these studies, JUNAC requested that the UN's Economic Commission for Latin America - ECLA, prepare two documents on the Andean demand for fertilizers and on the Andean fertilizer industry outlook for 1980-1985. These two studies were finalized in 1973. Various Andean government entities and private companies cooperated with ECLA's personnel supplying the required information for a mutually beneficial purpose. Lastly, in June, 1973 an ad-hoc group of Andean government experts met in Lima to discuss the basis for the Andean Fertilizer Program.

All of which resulted in JUNAC's Proposal 47 for an Andean Program, which was submitted to the member countries on 20 March, 1974.

1.4 Proposal 47 - agreements

While this proposal does not contain any provision for fertilizer production allocations, it does incorporate a consensus of opinion on certain fields of cooperation amongst the member countries.

Thus, it has been agreed in principle:

- a) To keep mutually informed about new investment programs
- b) To try to coordinate said investments
- c) To adopt collective measures to secure financing for the new plants
- d) To promote the establishment of multinational corporations under the rules established in Decision 46 (Andean Multinational Corporations)
- e) To promote the creation of the necessary mechanisms for the joint search and negotiation for technologies available in the international market, as well as to promote the adoption of measures for the utilization and development the technological infrastructure of the Subregion.
- f) To promote the creation of mechanisms for joint purchases of fertilizers not produced in the Subregion, as well as raw materials and other elements required for fertilizer production.
- g) To promote the adoption of measures concerning the creation and rationalization of systems required for the adequate commercialization of raw materials and finished fertilizers.
- h) To devise mechanisms for financing fertilizer trade in the Subregion.

- 1) To establish a permanent system of mutual assistance and interchange of information concerning research, promotion and use of fertilizers in the Subregion.

As the proposal lacked provisions for plant allocations, it has been the subject of much discussion in work groups designated by the Commission but has not been put to the vote in the Commission.

This led gradually to the conclusion that it was necessary to write a new proposal that would satisfy all Andean Group member countries.

2. Development of an Andean Fertilizer Model.

JUNAC decided at this point that it was necessary to compare the least cost of fertilizer delivered to the farmer at key distribution centers in the Andean Group with the cost resulting from the unilateral implementation of national fertilizer production plans, in order to have a quantitative measure of the effect of either production allocations or plant construction coordination amongst the member countries versus no coordination. As this is a complex task, JUNAC turned its attention to the World Bank Fertilizer Model, which had been used for the cases of Egypt and the ASEAN countries.

A joint program for action was set up, in early 1977, between JUNAC, the Inter American Development Bank and the World Bank for the purpose of adapting the model to conditions prevailing in the Andean Group.

More than a simple adaptation, this effort resulted in writing a new set of equations, i.e./a ^{developing} new model, and writing the corresponding program for the computers available to JUNAC in Lima. The definition of the new equations and the preparation of a manual for collecting field data to be used as inputs to the program was done by JUNAC's staff and Andean consultants, with technical assistance of World Bank personnel.

JUNAC, then, hired five Andean consultants to gather the required field information, which amounted to a detailed survey of the Andean fertilizer industry. In all cases, the local government entities and fertilizer companies helped the Andean consultants do their job, which was another experience in cooperation.

3. Seminar on the Andean Fertilizer Industry and use of the Andean Fertilizer Model

After collecting the data that was easily accessible to JUNAC's consultants, JUNAC organized a seminar in Lima to explain the use of the Andean Fertilizer Model to representatives of the Member Countries and to discuss with them the information developed so far. In addition to which, JUNAC requested the help of the participants to provide its consultants the additional, more difficult to get information still needed to use the model.

The aftermath of this seminar, held on 6-8 July, 1977 was that the Andean entities and companies involved in the fertilizer industry increased their cooperation with JUNAC's personnel and consultants facilitating their access to company files and to the various fertilizer plants.

4. Formulation of a new proposal

The Commission decided that the new proposal for a Fertilizer Program should be submitted to the Member Countries on December 31, 1977.

As of this date, work is progressing on running the fertilizer model program and writing into the proposal clauses leading to specific projects involving the cooperation of the Andean Countries.

5. Joint ventures for the production of fertilizers
(Colombia/Venezuela)

5.1 Monómeros Colombo Venezolanos S.A.

This company makes caprolactam and NPK fertilizers in Barranquilla, Colombia. The company was incorporated in 1968 and began producing in 1973. Its shareholders are:

(Venezuela)	Instituto Venezolano de Petroquímica - I.V.P.	35.46%
	Empresa Nacional de Salinas, C.A. - ENSAL	10.45%
(Colombia)	Instituto de Fomento Industrial - IFI	25.51%
	Empresa Colombiana de Petróleos - ECOPELROL	20.40%
(Holland)	Nederlandse Staatsmijnen, N.V. - DSM	<u>8.18%</u>
		100.00%

All of the shareholders are government entities. The complex at Barranquilla features

- a) a 50 TPD*caprolactam plant whose byproduct ammonium sulfate is used in the fertilizer plant,
- b) a 226 TPD nitric acid plant for digestion of phosphate rock in the fertilizer plant;
- c) a 200,000 TPD NPK granular fertilizer plant.

Anhydrous ammonia for both caprolactam and fertilizer production is supplied by Venezolana del Nitrógeno, C.A. - NITROVEN, from its El Tablazo plant at Lake Maracaibo, Venezuela.

The corporation was set up to complement the economies of Colombia and Venezuela, since Venezuela has big hydrocarbon resources while Colombia has larger textile and agroindustrial markets.

5.2 Venezolana del Nitrógeno, C.A.

This corporation makes ammonia and urea at El Tablazo, Venezuela.

Production began in 1974. Its shareholders are:

(Venezuela)	Instituto Venezolano de Petroquímica - IVP	90%
(Colombia)	Instituto de Fomento Industrial - IFI	10%
		<hr/>
		100%

This complex features two 900 TPD ammonia plants and two 1,200 TPD urea plants. The ammonia plants feed is natural gas. Part of the ammonia is shipped to Barranquilla, Colombia to feed Monomeros Colombio Venezolanos caprolactam and NPK fertilizer plants.

6. Financial assistance provided by Venezuela

On February, 1975 Venezuela placed US\$ 500 million under the trusteeship of the Inter American Development Bank. The IADB can use this fiduciary fund to finance projects which contribute to develop the natural resources of the less developed Bank Member Countries, of those with limited markets and of those of intermediate degree of development.

* Tonnages are expressed in metric tons throughout this paper.

While the use of this fund is not limited to the Andean Group Member Countries, it can be used by them for fertilizer projects as they contribute to the development and utilization of natural gas, phosphate and potassium resources. Venezuela being the owner of the fund, this constitutes another example of subregional cooperation in the fertilizer industry.

II. EXPERIENCES INVOLVING OTHER LATIN AMERICAN COUNTRIES

1. SELA's Committee for Action on Fertilizer Production

SELA (Sistema Económico Latino Americano - Latin American Economic System) is a regional, Latin American organization, established in Panamá on 17 October, 1975 for the purpose of making possible permanent consultations, coordination, cooperation and joint promotion of economic and social initiatives. .

In order to fulfill its purposes, SELA has established Committees for Action on various fields, one of which is the production of fertilizers. This Committee, whose headquarters are in Mexico City, shall make studies on Latin American fertilizer production and trade and recommend regional agreements regarding these subjects. Since two Andean Group member countries - Perú and Venezuela - are members of this Committee, JUNAC and SELA have begun a process of coordination of their activities to avoid duplicating efforts and eventual interference with Andean Group fertilizer agreements.

2. Negotiations between Bolivia and Brazil regarding the production of ammonia and urea in Bolivia

On 22 May, 1974 the governments of Bolivia and Brazil signed at Cochabamba, Bolivia an agreement on industrial cooperation and complementation which includes the construction of a natural gas fed ammonia/urea complex in Bolivia and the compromise of Brazil to buy part of the urea production.

The complex will be located at Puerto Suárez, adjacent to the Brazilian border. Ammonia capacity will be 1,000 TPD and urea capacity 1,600 TPD. Brazil has agreed to buy 100,000 tons of urea each year.

During the visit of Bolivia's President Banzer to Brazil in August, 1977 the two governments ratified the 1974 Cochabamba Agreement and laid out the basis for the implementation of this fertilizer project in reversal notes dated 17 August, 1977.

In addition to purchasing 100,000 tons of urea, Brazil has agreed to trade a minimum of 100,000 and a maximum of 200,000 tons of urea per year to be used at Corumbá, close to the urea plant, for an equal amount of urea to be made available to Bolivia at a coastal site in Brazil for sales overseas.

III. EXPERIENCES INVOLVING THIRD COUNTRIES

1. Joint venture for the production of fertilizers in Colombia (Colombia/Venezuela/Holland)

This is the case of Monomeros Colombo Venezolanos, in which DSM, of Holland holds 8.18% of the total shares (see Part A, II.5.1)

2. Joint venture for the production of fertilizers in Perú (Perú/Spain)

Perú wishes to utilize its phosphate and potash resources. The government, represented by Empresa Minera del Perú - MINERO PERU, has agreed with Instituto Nacional de Industrias of Spain - INI, to form a joint venture corporation for making phosphate fertilizers and potash salts at Bayóvar, Perú if the economic prospects of this venture seem adequate to both entities.

Empresa Nacional Adaro de Investigaciones Mineras - ENADIMSA - a subsidiary of INI, will develop the required information. ENADIMSA shall finish the feasibility study in 10 months, beginning October 14, 1977.

If the results satisfy both MINERO PERU and INI, a joint venture corporation will be formed in which MINERO PERU will hold 51% of the shares and INI 49%.

It has been agreed that completion of all formalities regarding the constitution of the joint venture corporation shall take no more than 330 days after the feasibility study is submitted to both partners, that is no later than July, 1979.

While product mix and plant capacities are yet to be determined, the following figures have been mentioned:

Captive phosphoric acid	200,000	TPY P ₂ O ₅
MAP/DAP	150,000 - 180,000	TPY
TSP	300,000	TPY

Part B. POTENTIAL FIELDS OF COOPERATION

I. COOPERATION WITHIN THE ANDEAN GROUP

1. Already agreed on fields of cooperation

- (1) Permanent exchange of information on status of new fertilizer projects
- (2) Coordination of new plant construction
- (3) Joint actions regarding obtaining financing for the new plants
- (4) Promotion of the establishment of Andean multinational corporations for fertilizer production and trade
- (5) Joint search and negotiations for fertilizer technology and joint measures to utilize and increase the utilization of existing engineering and equipment manufacturing capabilities in the Member Countries
- (6) Establishment of a purchasing pool for fertilizers not produced in the Andean Group and their raw materials
- (7) Joint efforts to create and rationalize fertilizer loading, transportation and unloading systems as well as for their raw materials
- (8) Joint efforts for securing financing for inter-Andean fertilizer trade transactions
- CAF, IADB
- (9) Establishment a permanent system of mutual assistance and exchange of information on research, production and use of fertilizers in the Andean Group.
- (10) And finally, as is usual in all Andean Industrial Programs, there is the implementation of the double compromise of establishing a common tariff protection barrier and eliminating duties on fertilizers traded within the Andean Group.

Agreement to cooperate in these matters has been reached in principle, not as a binding agreement, since the original Proposal did not become a Decision (i.e. a Fertilizer Program).

2. Areas of mutual cooperation

The following have been suggested as possibilities:

- (1) Establishment of a joint fertilizer transportation system
 - possibly vessels purchased by CAF and leased to the Andean fertilizer producers
 - relaxation of national regulations on the use of chartered ships
- (2) Joint antidumping measures to further protect Andean fertilizer producers
- (3) Establishment of commercial agreements regarding inter-Andean trade in fertilizers and their raw materials
 - political decisions
 - pricing policies
- (4) Permanent exchange of information on tonnages and prices of imported fertilizers and their raw materials
- (5) Arranging visits to operating plants and to plants under construction of personnel in charge of new plant planning to help them assess the features of the various processes in use and experiences gained in the acquisition of technology and implementation of the projects
- (6) Operator and management training in acid plants
- (7) Establishment of a fertilizer export pool to LAFTA, CARICOM and other countries
- (8) Joint efforts for securing financing of purchases of fertilizer raw materials and intermediate products
- (9) Agreement to supply the Member countries before exporting surplus production
- (10) Establishment of a training program for operators and managers of fertilizer plants abroad
- (11) Examination of the possibilities of using similar production processes to improve plant operations in the Andean Group.
- (12) Establishment of tripartite trade transactions as a common compensatory practice.
- (13) Establishment of long term fertilizer supply contracts

II. COOPERATION WITH OTHER COUNTRIES OR REGIONAL GROUPS

1. SELA

SELA's Committee for Action on Fertilizers has already programmed a series of studies meant, primarily, to shed light and make recommendations on Latin American fertilizer trade and production.

JUNAC is engaged in similar activities within the confines of the Andean Group and will continue to do it once the Andean Fertilizer Program becomes operational, sometime during 1978.

It is conceivable that an exchange of information and studies and cooperation in matters of mutual interest to SELA and the Andean Group will take place once the Andean Fertilizer Program becomes effective.

2. Exchange of studies and information

Considerable time, effort and money has been spent and will continue to be spent by countries, regional groups and multinational financial institutions, as well as by various agencies of the United Nations in making studies and developing information on the fertilizer industry.

Most of this material remains unknown to others who might profit by having access to it and, certainly, keeping it in their owner's files represents a waste, whereas exchanging it might benefit all concerned.

At least the Center for Industrial Studies on the Maghreb Countries, the Andean Group, the Inter American Development Bank, the World Bank and UNIDO have developed this kind of material, and so does the Tennessee Valley Authority. Probably IDCAS and the ASEAN Countries have substantial information, too. It seems appropriate to suggest in this meeting on cooperation in the fertilizer industry that those parties willing to exchange their information and studies communicate this willingness to UNIDO and arrange thru UNIDO the interchange of documents.

As a complement to which it is also appropriate to suggest that UNIDO act as a permanent repository and agent for the dissemination of specific information on actual import/export fertilizer prices, cost of transportation, plant investment and process failures, as this is perhaps the kind of information most relevant for fertilizer production plans and the most difficult to obtain.

PART C. BACKGROUND PAPERS

1. JUNAC's Proposal 47

The full text is not available as a separate document because JUNAC considers it has been fundamentally superseded by the new proposal.

2. JUNAC's new Proposal and detailed study of the Andean fertilizer industry

Both the text of the new Proposal and a report on the Andean fertilizer industry are available from the Andean Market Board on request through UNIDO.

3. JUNAC's practices in the administration of Andean Industrial Programs.

These practices are best illustrated by the administration of the Andean Petrochemical Program, ratified by the Member Countries in Decision 91 of the Commission of the Cartagena Agreement. Full implementation of this Program will demand new investments on the order of three billion dollars.

The Andean Petrochemical Program became effective on 29 August, 1975. Attachment I of this paper presents, in summary form, the actions taken by JUNAC towards the timely implementation of this Program, up to December, 1977.

These actions, i.e. the administration of the Petrochemical Program, will be paralleled by those to be taken towards the implementation of the Fertilizer Program, once it becomes effective, and illustrate the general administration practices of all Andean Industrial Programs.

In practice, agreeing to develop an industrial sector according to a subregional program, alone, has proven to be not enough in the Andean Group. Therefore a plan for managing each program and acting according to such a plan is essential for success.

As the same might apply in the case of other regional agreements, it may be useful to refer to the experiences described in Attachment I.

ATTACHMENT I

ADMINISTRATION OF THE ANDEAN PETROCHEMICAL PROGRAM

The managers

The Commission of the Cartagena Agreement, foreseeing the need to manage this Program, wrote into Decision 91 a clause creating a Petrochemicals Committee to perform this function. The Committee members are official representatives of each Member Country and its Permanent Secretary is a JUNAC staff member. In addition, CAF has the right to be represented as an observer in the Committee sessions.

Besides which, Decision 91 defines a number of tasks to be performed by JUNAC itself. This, in effect, means that a substantial part of the administration of the Program is carried out by JUNAC as a co-manager.

The plan

(1) Decision 91 imbeds in its text a series of actions to be carried out at various dates or when given situations occur.

(2) The by-laws governing the Petrochemicals Committee also contain a clear mandate to perform various tasks regarding the timely implementation of the Program.

(3) In addition to the sets of mandatory actions referred to in (1) and (2), JUNAC proposed, and the Member Countries accepted, a coherent set of voluntary joint actions, denominated Support Actions Program, designed to help the individual countries implement their petrochemical plans and coordinate their efforts.

A detailed description of all actions mentioned in (1), (2) and (3) would exceed the length allowed for this paper. Therefore, only a summary enumeration of what has been done so far will be presented below. However full details can be obtained from JUNAC on request through UNIDO.

Actions already taken(1) Issuing from mandates of Decision 91.

- The Petrochemicals Committee was created on 19 November, 1975
- Capacities of existing petrochemical plants have been verified by JUNAC in the Subregion
- Guidelines for the submission of technoeconomic information on the various petrochemical projects have been prepared by JUNAC and sent to the Member Countries.
- JUNAC has also prepared an evaluation report on progress achieved in the implementation of the Program during 1976 and submitted it to the Member Countries on 28 February, 1977.
- Regarding cooperation in certain areas stated in Decision 91, partial actions have been taken on:
 - (a) Financing the new plants: the pros and cons of various forms of financing petrochemical investments were analyzed during a JUNAC organized Seminar on Petrochemical Technology Transfer in Bucaramanga, Colombia, September 30 - October 2, 1976; international financing of petrochemical plants was explored in great detail during a Seminar (organized by JUNAC) on International Financing and Promotion of Petrochemical Projects in Lima, Peru on September 26 - 29, 1977.
 - (b) Search for technology: in 1976, JUNAC contracted a study on the prospects of the Andean Petrochemical Program with B.E.I.C.S.P. which included a comprehensive investigation of technologies available for each of the 56 petrochemicals whose production is allocated in the Program and for their precursors; previously on 7 - 10 April, 1976 JUNAC organized a Seminar on the Production of Olefins and Aromatics, in Lima, in which eleven of the world's most prominent engineering companies discussed their processes and their economics.
 - (c) Exports of Andean petrochemicals: JUNAC has defined the terms of reference for a detailed survey of export possibilities, to be financed by CAF, and implemented in the near future.

(2) Issuing from the mandates included in the by-laws governing the Petrochemicals Committee:

- The Committee carries out a continuing analysis of the program of the Petrochemical Program in each Member Country. This is achieved mainly by having

country status reports presented at the various seminars organized by JUNAC and in some of the meetings of the Committee.

- Thru the Committee, JUNAC has received further official information on the status of the Program in each Member Country for the preparation of the first annual evaluation of progress achieved in the implementation of the Program and contributed to its analysis.

- Thru the Committee, the Member Countries have kept updated the statistics on supply and demand in each country for nearly one hundred petrochemicals.

- Concerning the joint actions, i.e. regional cooperation, enunciated in the by-laws, partial actions has been taken on the various fields of cooperation by the Committee:

(a) Maximum use of Andean equipment in the plants: JUNAC contracted Instituto Chileno del Acero (Chilean Institute for Steel) - ICHA in 1976, to conduct a survey of the Member Countries capability for making petrochemical process equipment.

(b) Negotiation of petrochemical technology: a first step in this direction was taken in the Seminar on Petrochemical Technology Transfer already mentioned. The existence of the Committee contributed to its success because thru the action of the Committee members, Colombia solved the logistical problems of the seminar and Colombia and Venezuela contributed thru speakers from these countries much valuable information on the conduction of petrochemical technology negotiations.

(3) Issuing for the Support Actions Program:

Most actions taken regarding various parts of the Support Actions Program have already been mentioned under (1) or (2), as there is a certain degree of overlapping of the various fields of action. However, others belong here:

- Support Actions on Information: JUNAC contracted B.E.I.C.I.P. primarily for developing an updated, well rounded outlook of the world petrochemical industry as it relates to the Andean Petrochemical Program.

- Support Actions on International Promotion of the Programs:

(a) JUNAC has been offered the sponsorship of the European Economic Community for holding a Promotion Seminar of the Andean Petrochemical Program in Brussels and has already organized in full detail this event.

(b) Similarly the United States Agency for International Development has offered its sponsorship for a promotion seminar to be held in the U.S. JUNAC has already defined in detail the structure of the seminar.

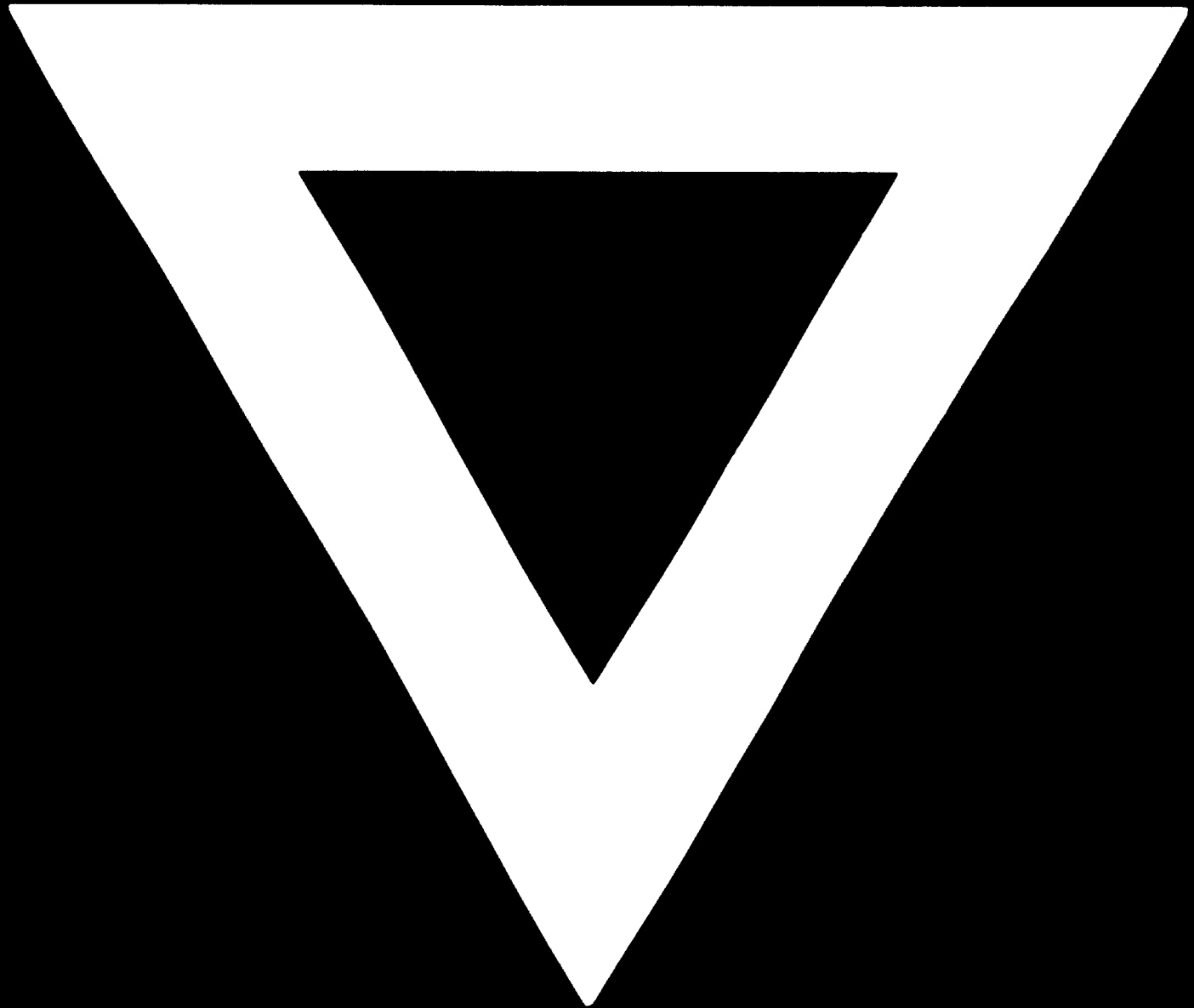
(c) In addition, ways and means to best promote the Andean Petrochemical Program were analyzed during the Seminar on International Financing and Promotion of Petrochemical Projects mentioned above.

- Support Actions on Transportation of Andean Petrochemicals: JUNAC has prepared the detailed terms of reference for a study on transportation and intermediate storage of Andean petrochemicals to be financed by CAF and implemented in the near future.

It is hoped that this summary account of how the Andean Countries conduct the administration of an Andean Industrial Program illustrates the need to complement regional agreements with an adequate mechanism to follow them up and also the type of concrete measures which have to be considered. All of which will parallel what needs to be done in fertilizer regional agreements involving cooperation among several countries.



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