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THE FERTILIZER SITUATION IN LATIN AMERICA AND  
POSSIBILITIES FOR CO-ORDINATED ACTION

Note presented by the ECLA secretariat at the  
Meeting of the Inter-American Committee for  
the Alliance for Progress (ICAP),  
Washington, 3 to 10 April, 1965

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## THE FERTILIZER SITUATION IN LATIN AMERICA AND POSSIBILITIES FOR CO-ORDINATED ACTION

Studies recently carried out by various inter-American and other international agencies have underlined the seriousness of the food situation in Latin America, the need for an energetic drive to improve agricultural production and the importance of more intensive use of fertilizers as one of the means to this end.

For some years back ECLA has been studying the fertilizer situation in Latin America, the findings of its research having been published in one of its major reports.<sup>1/</sup>

More recently, a group of experts from the public and private sectors, convened by ECLA and the United Nations Bureau of Technical Assistance Operations (BTAO) to consider the present status and future prospects of the chemical industries, devoted a good deal of attention to the fertilizer problem.<sup>2/</sup>

<sup>1/</sup> La industria química en América Latina, United Nations Publication, Sales No.: 64.II.G.7.

<sup>2/</sup> See the report of the Seminar on the Development of the Chemical Industry in Latin America (E/CN.12/719, available in Spanish only). The documents presented at this Seminar include the following papers relating directly to the fertilizer sector:

La industria de fertilizantes en América Latina (ST/ECLA/CONF.15/L.7)

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| Information document No. 5  | Banco Nacional do Desenvolvimento Econômico (BNDE), Brazil, <u>Mercado Brasileiro de Fertilizantes</u>   |
| Information document No. 17 | Juan Ayllon V. and Jorge Otero R., YPFB, La Paz, Bolivia, and L.C. Axelrod and B.G. Mandelik, N.W. Kellogg Company, New York, <u>Realization of Fertilizer Production in a Developing Country. The Case of Bolivia</u> |
| Information document No. 23 | Nacional Financiera S.A., Mexico, <u>Situación del sector de fertilizantes en México</u>   |
| Information document No. 27 | James W. Bradley, Arthur D. Little de México S.A. and Edward J. Wygard, Arthur D. Little Inc., United States, <u>The Latin American Fertilizer Industry</u>  |
| Information document No. 29 | Background document submitted by the United States Representative to the Second Meeting of ICAP, October 26-31, 1964, <u>Fertilizer development for South America</u>  |
| Information document No. 37 | Manuel Soberanes Moncada, Cámara Nacional de la Industria de Transformación, México, <u>La Industria de Pesticidas y Fertilizantes en Cifras</u>   |

/In addition,

In addition, the Joint ECLA/FAO Agriculture Division, in the course of a programme of work in which it enjoys the co-operation and active support of the Inter-American Development Bank (IDB), is carrying out a detailed study of agricultural inputs, including fertilizers and pesticides, in the AIALC countries.

In recent conversations between the ECLA and FAO secretariats and ICAP, it was suggested that the time was now ripe for practical action, and that the first step should be to evaluate the existing situation with regard to the use and manufacture of fertilizers in Latin America, after which the tasks in hand could be defined and allocated to specific agencies. The final goal would be to formulate a programme to develop this branch of the chemical industry commensurately with the requirements of agriculture in Latin America.

The object of the present memorandum is to give some account of the origins of this proposal, to discuss how it might be carried out through a Working Group on Fertilizers, whose terms of reference would be established in detail at an ad hoc meeting in Washington next May, and, lastly, to give some preliminary indication of the nature of the problems with which the Group would have to deal.

Once the general ideas set forth here were accepted and supplemented by any suggestions that the other inter-American organizations might make, an outline programme of work for the Group would be prepared for discussion at its first meeting in Washington, in May.

More recently, consultative meetings were held at which arrangements were made for the Inter-American Development Bank (IDB) to participate in the activities of the proposed Working Group.

#### Background data

1. At the second session of ICAP, held at Washington in October 1964, the representative of the United States of America on this inter-American agency, Mr. W.W. Rostow, presented a paper entitled Fertilizer Development for South America. In it, mention was made of the region's inability to expand food production commensurately with the growth of its population; after pointing out the responsibility incumbent upon the programme of the Alliance for Progress in relation to the urgent task of applying modern production and fertilizer techniques, as the most direct means of solving Latin America's food problem over the short term, the author analyses existing natural resources, current production capacity and the recent development of the fertilizer sector in the countries of the region. The topical interest of the problem induced ECLA to consider the desirability of a co-ordinated effort to tackle the work involved in regional-scale promotion of the use and production of fertilizers.

/2. Concurrently,

2. Concurrently, the ECLA secretariat had collected data on the fertilizer industry, incorporated in some of the papers prepared for discussion at the Seminar on the Development of the Chemical Industries in Latin America, convened for 7-12 December 1964 at Caracas (Venezuela). Permission was requested from the author and from ICAP to include the paper presented by Mr. Rostow in the list of information documents submitted to the Caracas Seminar (on which it appears as No. 29); in the course of consultative meetings held by the Executive Secretary of ECLA, the President of ICAP, and Mr. Rostow, ECLA suggested that ICAP should send observers to the Caracas Seminar. It was attended by Mr. E.R. Fried, from the Office of the Representative of the United States on ICAP, and Mr. E. Miller, from the Administration of the Agency for International Development (AID).

3. In the consultative contacts between ECLA and ICAP, it was also agreed that in the course of the Seminar consideration should be given to the possibility of forming, at an early date, of a Joint Working Group made up of experts from the various Latin American agencies that are engaged on the study of any aspect of the fertilizer problem. In one of the ECLA documents prepared for the Seminar (Las industrias químicas y la integración económica regional, ST/ECLA/CONF.15/L.8, pp. 38-40), the setting-up of working groups, by groups of commodities, is suggested as one of the possible means of paving the way for regional integration in the development of the chemical industries that were submitted to the consideration of the participants; "... an appropriate procedure might be to set up, in every branch of the chemical industry, joint working groups composed of representatives from the different agencies and inter-American organizations with experience in the field, in order to review and evaluate existing information and to complete it systematically and in the shortest possible time, thereafter formulating specific programmes which would be submitted to panels of experts on the lines of the present Seminar and then to the Latin American Governments and Latin American or inter-American institutions concerned with integration, financing and development programming". After referring to the studies on demand and on supply in course of preparation by the Joint ECLA/FAO Agriculture Division and under the Joint ECLA/INST/IADB Programme on Integration of Industrial Development, respectively, the document concludes that "fertilizers (phosphatic, potassic and nitrogenous) would be a suitable choice for the first practical test case to determine the effectiveness of the suggested Working Group procedure. The Working Group on Fertilizers might be set up by ICAP, FAO and ECLA, in consultation with IADB, ALALC and the Central American Common Market. Its functions would be to prepare a preliminary outline for the integrated development of the fertilizer industry on a regional scale, due regard being paid to demand in relation to the agricultural development plans under way or to be prepared in the next few years, and to supply in relation to natural resources and market size in each country, as well as to factors such as transport costs, other chemical industries already in existence, etc. ...The Working Group's final report would be transmitted to ICAP, which would take the necessary steps for discussing and approving the corresponding programme, make

/arrangements for

arrangements for feasibility studies to be carried out by specialized firms of consultants and obtain the necessary funds both for undertaking the studies and for implementing the programme".

4. The Caracas Seminar welcomed the procedure proposed.<sup>3/</sup> The conclusions reached in this respect by Mr. Fried and Mr. Miller, the observers sent to Caracas as a result of the talks between ECLA and ICAP, have been transmitted to ECLA through Mr. Rostow. They support the idea of setting up an ECLA/FAO working group to make recommendations to ICAP on the measures that should be taken to intensify the use of fertilizers in the region. In view of this consensus of opinion, ECLA drew up a preliminary work programme, and proposed that an informal meeting be held in Washington between representatives of ECLA and FAO and members of the ICAP and IDB secretariats, at which ECLA and FAO will discuss a crash programme in the light of a preliminary report. Once ICAP has approved the main lines of the programme, the relevant studies will be begun immediately and used as a basis for formulating a specific programme for the co-ordinated development of the fertilizer industry throughout the region, which will be submitted to ICAP, ECLA, FAO and IDB, as well as to the agencies with responsibility in the field of economic integration, ALALC and the Central American Common Market, for whatever action they deem expedient.

#### The nature of the problem

5. At informal meetings held in Caracas outside the Seminar itself between Mr. Fried and Mr. Miller, the ICAP observers, Mr. Wygard and Mr. Delaplaine, the ECLA consultants, and members of the ECLA secretariat it was suggested that the criterion for expansion should not be limited to the level indicated by estimates of future demand, and that the whole question of use and production should be restated in much broader terms in relation to the inadequacy of food production and the serious repercussions of this inadequacy over the medium and long term (1970-80). This point of view, which was put forward at the Seminar meetings on the question of fertilizers, was accepted by the majority of the participants, who made a number of suggestions with respect to ways and means of expanding fertilizer utilization, the need to explore the benefits to be obtained from an increase in the development and capacity of the industry and the incidence of such factors as transport costs, the availability of farmers' credits, etc. It was recognized a priori that potential demand might prove many times greater than the consumption estimates given in the working papers, according to which, for instance, 2.44 million tons of

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3/ The report of the Seminar (E/CN.12/719), which contains a detailed account of this topic, is being reproduced, and is scheduled for distribution in early April 1965.

nitrogen, phosphorus and potash would be needed in 1975.<sup>4/</sup> If these requirements were to be translated into a real increase in fertilizer consumption, intensive action would of course have to be taken in relation not only to demand but also to production capacity, which should be encouraged to expand more rapidly than at present, the first step in this direction being the meeting of the proposed expert working group.

6. The study of agricultural inputs undertaken by FAO and ECLA under a special programme financed by IDB will be completed in the first half of 1965 and will enable a plan of action to be drawn up for increasing agricultural productivity. It includes a searching examination of the question of fertilizers and pesticides, among other agricultural inputs, and attempts to identify the factors that determine the extent to which fertilizers are used in Latin America, establish consumption targets and calculate the requirements they imply in terms of fertilizer production.

The studies on Argentina, Chile, Mexico, Paraguay and Peru are ready, and by April or May it is expected that a first draft of the document will have been prepared, covering, in addition, Brazil, Ecuador, Venezuela and Uruguay.

These studies will indicate to what extent fertilizer consumption, and, therefore, production, should be expanded in the next five to ten years, and outline the measures that the region might take to attain those targets.

#### Work programme

7. The work programme to be discussed at the Washington meeting will be based on an up-to-date knowledge of the fertilizer situation, obtained partly from the country papers presented at the Caracas Seminar and partly from whatever preliminary conclusions may be drawn from the IDB/ECLA/FAO studies on agricultural inputs, which are due to be completed shortly afterwards. Any gaps in existing information will also be explored, together with ways and means of filling them, and the particular share of the workload to be assumed by each agency will be discussed. A suitable date for the meeting would seem to be immediately after ECLA's eleventh session at Mexico, i.e. in May. This would give time for reviewing the preliminary conclusions reached in the inputs study carried out under the IDB/ECLA/FAO programme, and for evaluating the data assembled in Caracas

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<sup>4/</sup> In aggregate estimates based on population growth, the need for more food and the practical impossibility of making immediate use of other agricultural production factors (mechanization and advanced techniques, irrigation, etc.), the volume of fertilizers required for Latin America is thought to be much larger, being estimated at about 5 million tons for 1980 (talk by Mr. Raymond Ewell, State University of New York, Buffalo, during a meeting of the American Chemical Society at Chicago, Illinois, reproduced in Chemical and Engineering News, 14 December 1964).

on the present capacity and future plans of the Latin American fertilizer industry. By mid-April the report to be submitted by ECLA for consideration by the working group in Washington should thus be well advanced.

It is thought that the report should comprise three basic items:

(a) The conclusions of the IDB/ECLA/FAO study on fertilizer demand, with special reference to the factors that are currently hampering the expansion of demand, absolute requirements estimated in relation to the recommended level of agricultural development and the type of action that should be taken to increase fertilizer utilization;

(b) The conclusions to be drawn from ECLA's review of the present state of the fertilizer industry, with due regard for the major raw materials problems that are impeding the development of some of its branches (phosphates, potash) and the short-term repercussions to be expected purely from the impact of the industrial development plans that are being applied in the region;

(c) Lastly, brief estimates of the relations between the population, food requirements and fertilizer requirements projected up to 1970-80. This would be a means of confirming that wide gaps exist between the estimates in question and established forecasts for the normal growth of fertilizer demand.

8. It is hoped that the meeting of experts at Washington will be followed by the co-ordinated preparation of a practical programme for the rapid development of fertilizer production and utilization. This work, which will be primarily entrusted to a working group consisting of representatives of ICAP, IDB, FAO and ECLA, will include a review of raw material resources, a study of the optimum structure to be achieved by the industry in the context of regional integration and a number of specific proposals for effecting the necessary expansion. At the same time, ways and means of intensifying national plans for increasing the use of fertilizers would be outlined. The Working Group should probably meet once more to assess the progress of the work assigned to each organization before holding a final session to discuss and approve the programme of action to be proposed to the inter-American agencies.

In all aspects of the work relating strictly to industry, including the inventory of natural resources, ECLA should play a direct part through the Joint ECLA/INST/IDB Programme for Industrial Integration. To this end, it would be necessary for the present chemical industry unit in the Joint Programme to be supplemented by the appointment of a few consultants. The studies envisaged would take about six months, a final report being completed some time in November or December for transmission to the organizations concerned.

/To sum

To sum up, the Joint ECLA/INST/IDB Programme should clarify the following points:

1. Present and estimated future capacity of the fertilizer industry in Latin America;
2. General inventory of raw materials suitable for utilization on a very large scale, particularly potassic and phosphatic resources, with an indication of the special programmes to be applied for that purpose;
3. Most favourable possibilities for the region as regards new nitrogenous and phosphatic fertilizer plants to be set up after 1965, in the light of the increase in requirements foreseeable by 1970-75;
4. Economic implications of the efforts made to develop the fertilizer industry, and ensuing cost and price conditions in Latin America.

Point 2 will entail engaging the services of one or two specialists to prepare, in not more than three months, an inventory of the known mineral resources (phosphates and potassium salts) available in the different countries. For points 3 and 4, the present team would have to be strengthened by the addition of a consultant with previous experience in the major Latin American countries.

#### Some observations on the programme

9. The programme outlined in the previous paragraphs can be reviewed very broadly, in the light of current information on the Latin American fertilizer industry, to determine the type of research and action involved.

In the first place, it should be explained why current levels of fertilizer consumption are considered to be far below those that would be desirable for the region. By 1963/64, Latin America's total consumption of nitrogen, phosphorus and potash has reached about 1,000,000 tons, an amount that far exceeds the volume of 450,000 tons applied in 1954/55. The efforts made in some of the Latin American countries such as Chile, Mexico, Peru and, to a certain extent, Venezuela, have led to particularly marked increases in demand. The methods adopted to bring about this improvement have varied from one country to another, but have one feature in common: a policy of direct or indirect subsidies on the use of fertilizers. This takes such form as a bonus paid to the farmer on his purchases of fertilizers, credits with special maturity and interest terms for such purchases, sales at less than cost price by State production enterprises or even merely importing agencies, or purchases of certain agricultural commodities (e.g. sugar beet) at guaranteed prices subject to the systematic use of fertilizers supplied by the purchasing agency itself. In Argentina, and, to a certain extent, Brazil, special conditions have made it difficult to achieve a substantial increment in consumption

/through such



through such means. If measures of this kind were extended to other Latin American countries as well as being maintained in the countries now applying them, real demand for plant nutrients in 1975 would probably be about 2.4 million tons. This is the estimate that has been used as a working hypothesis for analysing production capacity requirements. A detailed knowledge of agricultural soils and of their positive reactions to the different fertilizers is essential for drawing up a rational scheme for intensive fertilizer application. Knowledge of these matters is still rather rudimentary, as the information contained in the IDB/FAO/ECLA study on inputs will probably confirm.

Thus the question of determining the ideal targets for fertilizer application to be attained in a relatively short space of time immediately comes up against a technical stumbling-block. A partial and temporary solution to the problem would be to reduce the calculation to a correlation between food production and the mere effects of fertilizer application.<sup>5/</sup> It may be necessary for a closer analysis of agricultural inputs to be undertaken so that the problem can be evaluated in more precise quantitative and qualitative terms. This might form part of the work of the group to be set up.

Given that the hypothesis of a deficit on this scale is provisionally accepted, and assuming that effective steps will be taken to see that fertilizer demand is created in agriculture, the relevant projections on the function of crops, land, climate, etc. will have to be formulated for every area requiring the principal plant nutrients. The results of various fertilizer tests indicate that phosphatic potassic fertilizers will probably account for two-thirds of the total, and nitrogenous fertilizers for the remainder.

Although, for the nitrogenous fertilizers, the problem of supplies is simply a question of the relations between the raw materials available (natural gas, fuel, coal), processes employed, investment, and size and possibility of establishing new chemical conversion plants, for the phosphatic and potassic fertilizers the main difficulty is precisely one of natural resources, and calls for a searching investigation of those available. This naturally entails research at the regional level, or, at the very least, a compilation of the studies on the location and use of such resources that have already been made in the different countries.

Consequently, it would be desirable to bring in to the definitive work programme experts on the agronomic aspects of fertilizer utilization, who are currently taking part in the studies of the IDB/FAO/ECLA agriculture

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5/ In Mr. Ewell's talk, referred to in footnote 4/, the coefficient used was 1 ton of plant nutrients (N, P, K) for every 8 tons of additional food to be obtained. Hence, it is essential for 3 million tons of N, P, K to be applied in Latin America in 1970 and 5 million tons in 1980.

group; experts on raw materials, especially potassic resources (in respect of problems ranging from exploration for new deposits to the more intensive exploitation of those already in use); and, lastly, experts in the strictly industrial questions relating to the production of chemical fertilizers, i.e., nitrogenous (ammonia and derivatives), phosphatic (conversion of natural phosphates to intermediate agents and final products), complexes (N, P, K), and possibly, potassic (conversion of potassium chloride to sulphate). These activities would fall more particularly within the province of the existing chemical group in the ECLA/INST/IDB Programme, after the addition of one or two consultants, since the work would be facilitated by the data already compiled on the structure of the chemical sector in Latin America, its technology and the economic aspects of the processes applicable, etc.

10. Provided that the necessary funds for consultants are available under the programme, the final report can be completed by the end of the current year if a start is made on it by May/June at the very latest. The additional expenditure involved, apart from the payment of three consultants for three to four months each, would probably include four trips through the major countries: one to gather information concerning investigation of resources (2 persons), and another to consult on the spot the agencies responsible for the development policy of the fertilizer industry, the principal enterprises in the sector and local experts on fertilizer problems (2 persons).