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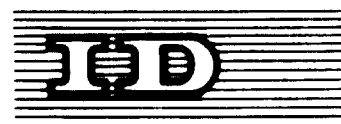
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PROBLEMS OF FINANCING OF INDUSTRIAL
INFRASTRUCTURE *

(with special reference to the
fertilizer industry)

prepared by
the secretariat of UNIDO

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BACKGROUND PAPER 3(d)

A. Introduction

1. The First Consultation Meeting on the Fertilizer Industry attached great importance to the establishment of infrastructure required for the production and distribution of fertilizers. The INIDO Secretariat has prepared such a detailed document with the help of consultants. This document has been prepared on the basis of a Background Paper (ID/WG.281/5) for the Second Consultation Meeting on the Fertilizer Industry (Innsbruck, Austria, 6 - 10 November 1978). The First Consultation Meeting felt that the demarcation must be so arranged as to reduce, as far as possible, capital costs in fertilizer projects and, consequently, production costs. It also recognized that conditions and practice different developing countries would not be identical and that the demarcation of the State's and project's areas of responsibility would therefore have to be adjusted to local conditions (paragraph 31 and 32 of the Report of the Meeting).

B. Infrastructure for a Fertilizer Plant

2. As regards the infrastructure required by a fertilizer plant, there are three types of infrastructure which have in the past made fertilizer projects in developing countries more expensive than those built in a developed country.

- (1) The first category includes "on-site facilities" which are required to maintain the plant; it is assumed that these on-site facilities must form part of the project cost.

- (ii) The second category contains a number of so-called "off-site facilities" which may nevertheless fall within the battery limits of the plant, that is, they are located within the site of the fertilizer plant. These so-called off-site facilities may include railway and road links and the link-up to public power and water supplies. It is suggested that although these items of infrastructure are located within the plant site, the cost of establishing them should wherever possible be financed by public authorities.
- (iii) The third category of infrastructure is the supporting infrastructure facilities, such as transport connexions outside the plant site, water supply, power supply outside the plant site, etc. Port facilities could be another major item; social infrastructure such as housing, schools and medical buildings all fall in this category. It is suggested that these items should clearly be the responsibility of the Public Exchequer. Most of these items benefit other users as well as the fertilizer plant and it is customary in developed countries for these to be made available free of charge to a fertilizer plant.

C. Distribution Infrastructure

3. As regards the infrastructure needed for the effective distribution of fertilizers to the farmers, the possible demarcation of responsibilities between (i) the fertilizer producer and (ii) the Government or public authorities is not so easy to make. It is suggested that a clear distinction can only be made when the entire distribution and marketing infrastructure is being established for the first time.

4. It is suggested that the fertilizer enterprise itself should be responsible for all investments made to store fertilizers at the plant site and to handle their shipment at the port of importation. The fertilizer enterprise should establish a central storage and district depots and it should be responsible for staffing the district depots. The transport vehicles (trucks or railway wagons) required to move

fertilizer from the plant to the central storage and district depots should also be the responsibility of the project.

5. It is suggested that the State and other public authorities should be responsible for establishing the necessary transport facilities (railways and roads, etc.) and for their maintenance, renewal and extension. The State and other public authorities should also be responsible for social infrastructure such as hospitals and schools, etc. The State should be made responsible for the provision of credit and subsidies on the price of fertilizers; it should run the agricultural extension service.

6. At the local rural community level, the local interests should be encouraged to establish the necessary infrastructure for the storage, handling and marketing of fertilizers. In developing countries, this is done by many different types of organization. It is suggested that where the local population cannot bear the cost, assistance by either the Government or the fertilizer producer should be given. The establishment of distribution facilities at the local, rural level is also seen as an area for international assistance, for example, by utilizing funds that are raised by selling fertilizer supplied as grant aid to the country.

7. At a second stage, it is suggested that the fertilizer storage depots at the district level and perhaps some at the central level should be taken over by local farmer organizations or co-operatives. In this way, the fertilizer project might be able to recover some of its earlier investment in establishing a distribution system. Otherwise, the demarcation of responsibility between the State and other public authorities and the fertilizer enterprise itself should remain the same as suggested in paragraph 6 above.

8. In this connexion, it is important to consider the costs which would be borne by the fertilizer enterprise and the State and other public authorities. For the distribution of 300,000 tons of fertilizer

material per year, the infrastructure requirements would be as follows:

- | | |
|---|------------|
| a) main storage at the port of fertilizer plant, plus 33 trucks, plus 110 rail wagons | US \$11.0m |
| b) three central storage depots plus 55 trucks, etc. | US \$10.0m |
| c) thirty district depots plus 60 trucks, etc. | US \$ 3.7m |
| d) 3,000 local depots at the rural level | US \$16.5m |
| e) 10 agricultural extension centres | US \$ 4.2m |

9. According to the demarcation suggested, the fertilizer enterprise would be responsible at a cost of about US \$25 million for the main storage depot, the three central storage depots and for establishing the district depots, plus the trucks and railway wagons needed to ship fertilizer to these various distribution points.

10. It is assumed that the local depots would be established by the local rural community, probably with assistance from the State or other public authorities. The 10 agricultural extension centres would be the responsibility of the Government and not the fertilizer enterprise. Thus the Public Exchequer would contribute infrastructure costing about US \$20 million.

D. Financing the Infrastructure required for the Production of Fertilizers

11. As regards infrastructure required for the production of fertilizers, the most important items examined are port facilities, railways, roads, power, water, site for the plant and the creation of a township and social infrastructure. Clearly if these are included in the total project cost (as they have been in the remote location example examined in the World Bank paper), then financing for them will need to be arranged at the same time as the project is financed.

12. The main issue on financing the infrastructure associated with the production of fertilizer is whether it should be considered separately and whether it should be financed on commercial terms or on soft terms. It would seem that the Public Authorities should finance most of this type of infrastructure. In such cases, and in the case

1/ The estimates of a staff member of the World Bank are given in Investment and Production Costs for Fertilizers: a paper prepared by W.F. Sheldrick for the FAO Commission on Fertilizers, Rome, 27-30 September 1977 which considers the cost of a plant at three sites: (a) in a developed country, (b) in a developing country with some existing infrastructure, and (c) in a developing country at a remote location.

where the project itself has to bear the cost of such infrastructure, the argument for the financing being made available on soft terms has been clearly stated by the Expert Group Meeting Report quoted above:

"As regards interest rates, it was noted that fertilizer plants, like other revenue earning projects, were commonly subjected to a commercial rate of interest by the Government as onward lender, even when the resources had been obtained on concessionary terms. The fact that in many countries fertilizer sales were subsidized by the Government was seen as a reason for making an exception to this general practice; a direct subsidization of plant construction would be simpler and more efficient. Certainly fertilizer plants, which provided the main input for agriculture, should not pay a higher rate of interest than other agricultural projects." (Paragraph 25 of ID/WG.274/17/Rev.1)

13. A further argument is that in most locations such infrastructure will serve other development purposes as well as the fertilizer plant itself.

E. Financing the Infrastructure required for the Distribution of Fertilizers

14. The financing of infrastructure for the distribution of fertilizers has so far been included in the financing arrangements for a fertilizer project only on the case of a number of projects. When a fertilizer plant is established in developing countries arrangements for financing the infrastructure should be made at the same time. However, in order to make such arrangements, there must be a clear demarcation of responsibility between (i) the State and Public Authorities and (ii) the enterprise itself as regards establishing the various items of infrastructure. It is perhaps this lack of demarcation that has made it difficult to consider the financing of distribution infrastructure as part of the total project in the past.

15. The infrastructure for the distribution of fertilizers is seen by some developing countries as an agricultural project and it has therefore been argued that such infrastructure should be financed on the same terms as agricultural projects, that is, on soft terms.

16. Just as the cost of infrastructure for distribution may double the investment required to establish a fertilizer plant, so the delivered price of fertilizer to a farmer in a rural area can often be double the price at which it leaves the factory. Since the Government wishes to supply fertilizer to the farmer as cheaply as possible and to avoid subsidizing the cost to the farmer wherever possible, then it is clear that if the distribution infrastructure can be financed by a grant or on soft terms, this need for subsidies will be reduced on a permanent basis. This is a very desirable result when one considers that fertilizer use in developing countries needs to expand rapidly on the basis of a regular supply of low cost fertilizers.

F. Terms and Conditions of External Sources of Financing

17. In the case of the nine plants examined, financing from both public and private sources has in the past cost of the order of 10 per cent to 12 per cent per annum. The terms and conditions on which international financial institutions and bilateral donors have provided external financing for either fertilizer plants or the infrastructure associated with them have not been considered so far.

18. However, when the Expert Group Meeting in April 1978 considered the financing of fertilizer plants, it found:

"Some problems might arise from inappropriate terms and conditions of finance. Currently, there was a lack of comparative data to assess the advantages and disadvantages of different sources of finance in relation to fertilizer projects and it was concluded that UNIDO might study this problem." (Paragraph 23 of ID/WG.274/17/Rev.1)

"So far as the formal terms of financing were concerned, the most serious problems arose from inadequate grace periods before repayment of loans commenced. Various banks had developed a number of technical solutions to this problem. UNIDO should make a comparative assessment of the experience gained of such devices as seen from the borrower's point of view." (paragraph 24 of ID/WG.274/Rev.1)

19. Further discussion of the terms and conditions of external financing arrangements might be provided by participants at the present Expert Group Meeting on Industrial Financing, distinguishing between financing provided (i) for the plant itself, (ii) for production infrastructure, and (iii) for the distribution infrastructure.

ANNEX

TABLE 1. CHECKLIST OF THE INFRASTRUCTURE REQUIRED FOR THE PRODUCTION AND DISTRIBUTION OF FERTILIZERS

INFRASTRUCTURE REQUIRED FOR THE PRODUCTION OF FERTILIZERS

1. Utilities

- Captive power supply
- Connexion to public power supply
- Water supply
- Drainage and effluent disposal system
- Site for fertilizer plant
- Communications system

2. Workshop facilities for heavy maintenance

3. Transportation infrastructure

- Roads
- Railways including marshalling yards
- Port and unloading/loading facilities
- Road vehicles, railway rolling stock, ships for transporting raw materials

4. Raw materials infrastructure

- Treatment facilities for raw materials such as beneficiation plant for phosphate rock or gas treatment facilities
- Pipeline for supply of gas, fuel oil or naphtha
- Off-site facilities for handling and storing raw materials

5. Human infrastructure

- Basic education facilities
- In-plant and on-the-job training
- External training courses in plant operation and maintenance

6. Social infrastructure

- Houses
- Schools
- Hospital and medical facilities
- Other public buildings and recreational facilities

INFRASTRUCTURE REQUIRED FOR THE DISTRIBUTION OF FERTILIZERS

7. Marketing infrastructure

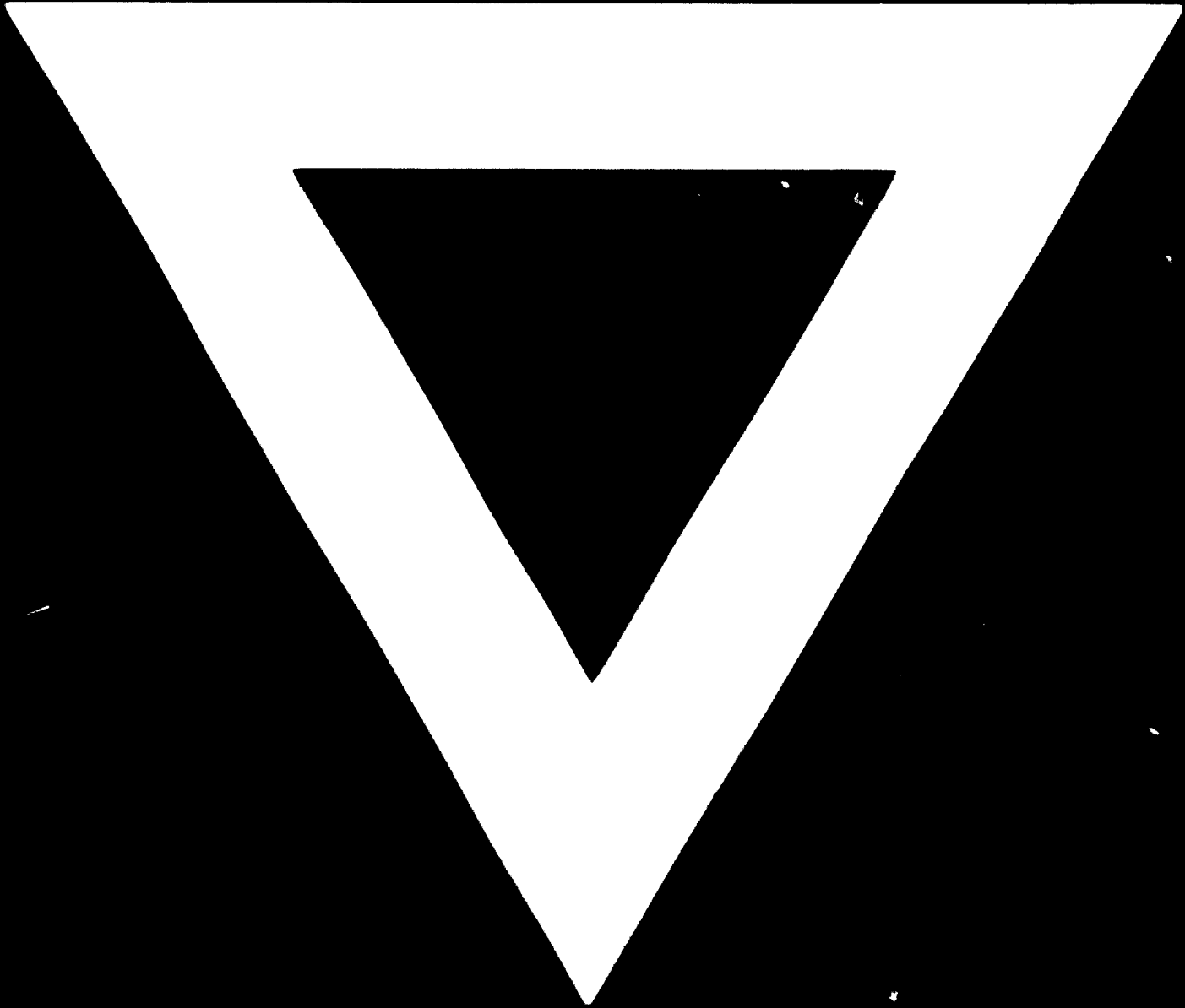
- Storage facilities for distribution to farmers
- Local blending plants
- Storage facilities for fertilizer for exports

Road vehicles, railway rolling stock, ships for distributing fertilizers

8. Agricultural extension infrastructure



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