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D02857



Distribution:
LIMITED

ID/WG.99/84
5 August 1971

United Nations Industrial Development Organization

Original: ENGLISH

Second International Fertilizer Symposium

Kiev, USSR, 21 September - 1 October 1971

New Delhi, India, 2 - 13 October 1971

Agenda item X/1

ANALYSIS OF RESPONSES TO UNIDO QUESTIONNAIRE ON PROBLEMS
OF THE FERTILIZER INDUSTRY IN DEVELOPING COUNTRIES

by

United Nations Industrial Development Organisation
Vienna Austria

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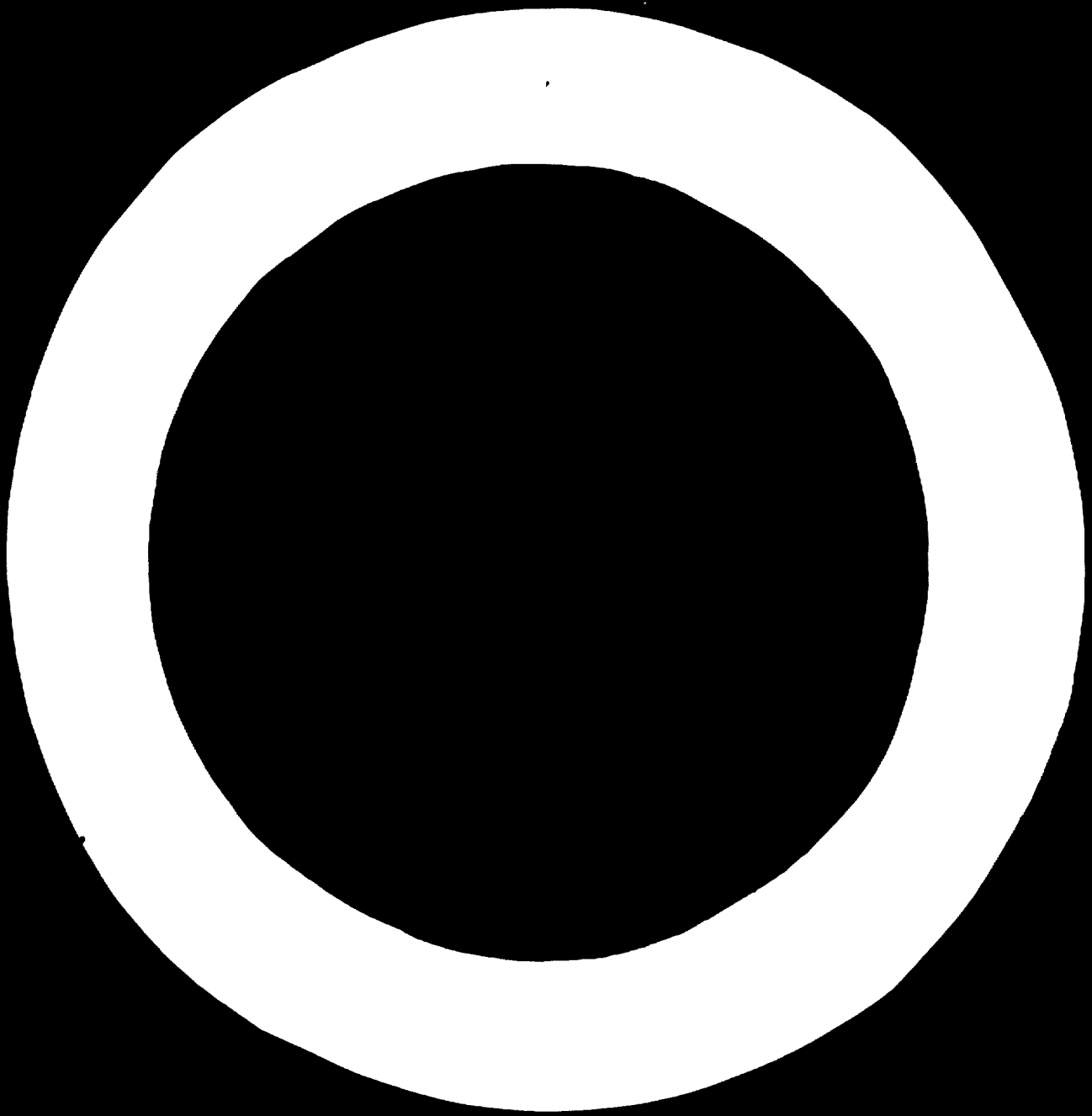
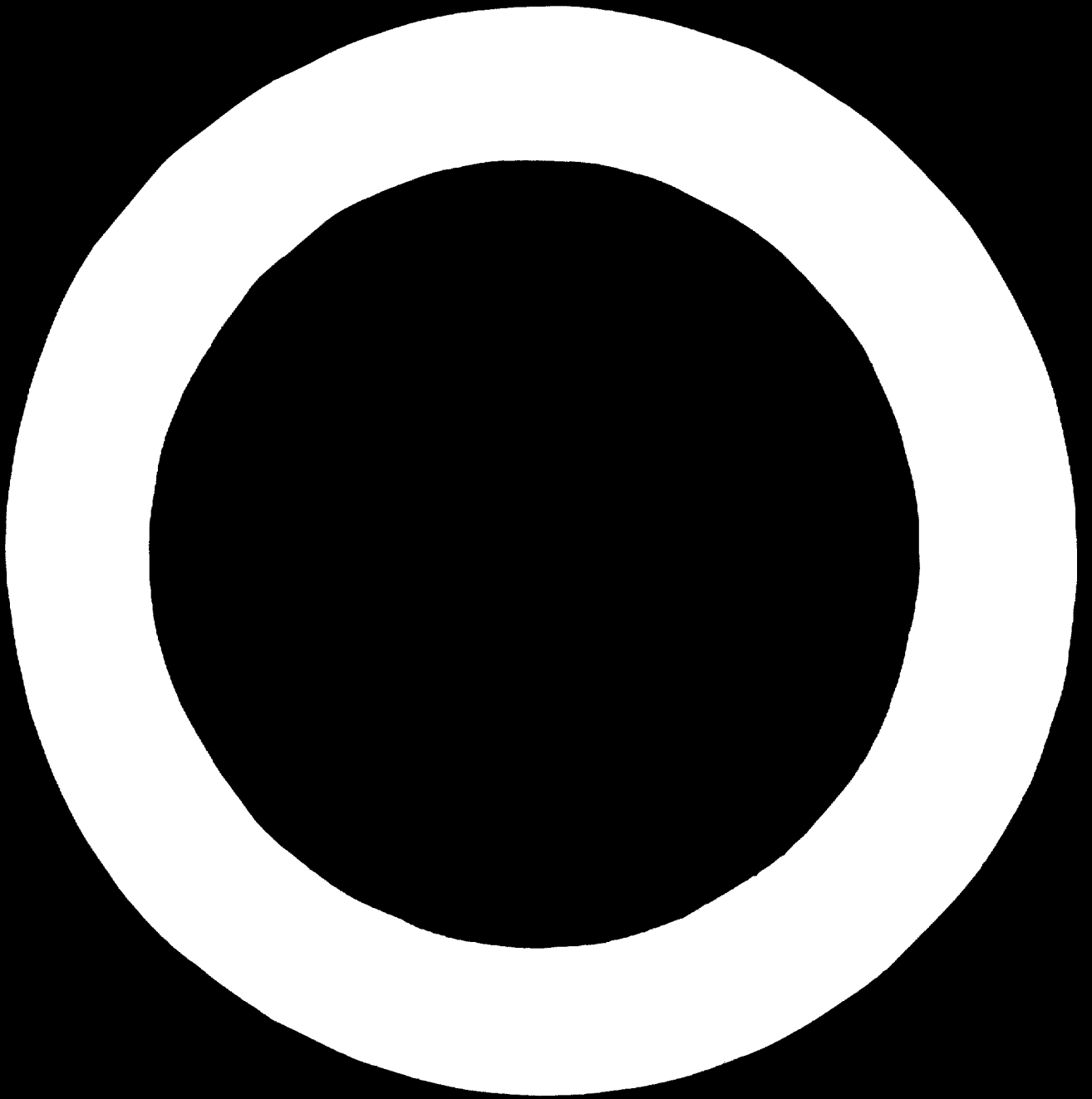


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Introduction

The fertilizer industries of the developing countries have been expanding more rapidly than the developed countries during the decade of the 1960's. However, most developing countries are still not meeting their fertilizer needs and have to import substantial quantities of fertilizers. These two points are illustrated by the following data (in million tons NPK):

	<u>Developing countries</u>	<u>Developed countries</u>
Production of fertilizers, 1959/60	1.8	27.2
Production of fertilizers, 1969/70	7.0	59.1
Annual rate of increase (last 10 years)	14.8 %	8.0 %
Consumption of fertilizers, 1959/60	3.3	24.5
Consumption of fertilizers, 1969/70	12.3	50.5
Annual rate of increase (last 10 years)	14.0 %	7.5 %
Surplus (or deficit), 1959/60	(1.5)	2.7
Surplus (or deficit), 1969/70	(5.3)	8.6
Annual rate of increase (last 10 years)	13.3 %	13.1 %

The fertilizer deficit of the developing countries of 5.3 million tons NPK in 1969/70 is expected to increase, according to UNIDO estimates, to 7.8 million tons NPK in 1975/76 and to 9.1 million tons NPK in 1980/81, if past trends continue.

It is clear that the developing countries as a group will need to speed up the development of their fertilizer industries during the next decade if they are to keep their fertilizer deficits at present levels and even more if they are to reduce their fertilizer deficits. An increase in growth rate of production from 14.8 per cent per year to around 20 per cent per year seems to be indicated if such goals are to be attained.

A few individual developing countries have achieved self-sufficiency in fertilizers during the past decade and a few have even become significant exporters of fertilizer to other developing countries, but these are the exceptions.

Rationale of the UNIDO questionnaire

In order to identify problems which are inhibiting the expansion of the fertilizer industry in the developing countries, UNIDO prepared a questionnaire embodying 87 possible problems under the following headings:

- I. Problems of production in existing plants
- II. Problems of construction of new plants
- III. Problems of research/development and central planning
- IV. Problems of importing fertilizers
- V. Problems of exporting fertilizers
- VI. Problems of consumption, marketing and distribution

Annexure A gives the complete questionnaire.

Respondents were asked to give one of the following ratings to each of the 87 problems in the questionnaire:

- 4 = Most important problem
- 3 = Very important problem
- 2 = Moderately important problem
- 1 = Small importance
- 0 = No importance
- X = Not relevant or not applicable

The questionnaire was sent to 70 governments through the United Nations Development Programme (UNDP) Resident Representatives in each country or through UNDP Regional Representatives in some areas. Also, the questionnaire was sent to 134 operating fertilizer companies in developing countries, including both private sector and public sector companies.

Out of the 70 governments to which questionnaires were sent, 38 returned usable questionnaires. A number of additional questionnaires were returned, but the responses were so incomplete that the questionnaires were not considered to be usable.

Out of the 134 operating fertilizer companies to which questionnaires were sent, 35 returned usable questionnaires. A number of additional questionnaires were returned, but the responses were so incomplete that the questionnaires were not considered to be usable.

Table I presents a summary of the responses in the 38 usable questionnaires

submitted by governments. Table II lists the 38 countries which submitted usable questionnaires, on which Table I is based.

A cursory examination of the 35 usable questionnaires returned by operating fertilizer companies showed a close correlation with the responses in the 38 questionnaires returned by governments. Therefore a summary of the results of the company questionnaires, similar to Table I, is not included in this paper.

Analysis of responses

Table I gives the actual numbers of respondents which gave ratings 0, 1, 2, 3 or 4 to each problem and, in the last column, the percentage of respondents which gave either of the two highest ratings (rating 3 or rating 4).

The percentages in the last column were calculated on the basis of the number of respondents which gave ratings of 0, 1, 2, 3, or 4 to each problem. It might have been more significant statistically to have used 38 respondents as the basis of calculation for all problems, regardless of how many respondents gave ratings to each problem. However, there were so many gaps in the questionnaire, i.e. no rating, that it was felt to be more consistent and more meaningful to use the actual numbers of respondents which gave ratings to each problem. For example, the first problem listed in Table I, Section I, had a score of 2-1-10-12-4 for a total of 29 respondents out of a total of 38 questionnaires being analyzed. Therefore the percentage of respondents giving the two highest ratings was calculated as $16/29 = 55$ per cent.

The results summarized in Table I may be summarized even further as follows:

	<u>Per cent of respondents giving two highest ratings</u>		
	<u>Less than 25 % of respondents</u>	<u>25-50 % of respondents</u>	<u>Over 50 % of respondents</u>
Section I	12 problems	16 problems	1 problem
Section II	5 problems	12 problems	10 problems
Section III	- 0 -	2 problems	2 problems
Section IV	5 problems	3 problems	- 0 -
Section V	3 problems	1 problem	4 problems
Section VI	<u>- 0 -</u>	<u>6 problems</u>	<u>5 problems</u>
Total, all sections	25 problems	40 problems	22 problems

A detailed picture of which problems are considered to be of various degrees of importance by the responding countries can be obtained by study of Table I.

Section I - Problems of production in existing plants

The highest importance among the problems cited in Section I was accorded to:

High cost of production of fertilizers 55 per cent

This problem is obviously related to one of the highest rated problems in Section VI, namely:

High prices of fertilizers 56 per cent

The high price of fertilizers is a problem in many developing countries and in some cases at least, this is directly related to the high production cost of fertilizers in existing plants.

To return to Section I, some other problems which received ratings of high importance were:

High cost of raw materials 48 per cent

Supply of spare parts 38 per cent

Inadequate supply of potash 43 per cent

Inadequate supply of phosphate rock 42 per cent

Existing plants too small 41 per cent

Shortage of qualified personnel 40 per cent

The shortages of potash and phosphate rock cited above and in Table I probably refer to indigenous sources since there is no shortage of these minerals on the world market.

Section II - Problems of construction of new plants

The highest importance among the problems cited in Section II was given to:

No production of locally fabricated equipment 71 per cent

Following this, the next problems in order of importance were:

High cost of fertilizer plants 59 per cent

Shortage of fertilizer plant designers 58 per cent

Lack of process know-how 58 per cent

High cost of imported equipment 57 per cent

Need to provide infrastructure 55 per cent

High royalty charges on foreign process know-how	52 per cent
Shortage of local capital	52 per cent
Shortage of foreign capital	50 per cent
Lack of demand for fertilizers	50 per cent

It is quite clear that the responding countries accord generally higher importance to "Problems of construction of new plants" than they do to "Problems of production in existing plants".

The last problem listed above, "Lack of demand for fertilizers", is fundamental. Many of the developing countries have such a small demand for fertilizers that these countries cannot support even one fertilizer plant of a minimum economic size, if the plant starts with the basic raw materials. The concept of "satellite plants" based on intermediates, such as ammonia, phosphoric acid and ammonium phosphates, which has been discussed in several papers in this Symposium, is very important for countries with small present demand for fertilizers.

Section III - Problems of research/development and central planning

The two problems of highest importance in Section III were:

Lack of engineering organizations for the planning, process development and design of new fertilizer plants	66 per cent
Lack of research/development organizations for the development of new fertilizers and new production processes	59 per cent

The other two problems cited in Section III were accorded much lower importance by the respondents.

Section IV - Problems of importing fertilizers

The three problems of highest importance in Section III were:

Shortage of foreign exchange and/or credit	43 per cent
High prices of imported fertilizers	36 per cent
Importing fertilizers in bags because of lack of bulk handling facilities	35 per cent

However, the highest ratings in Section IV were much lower than highest ratings in Sections I, II and III.

Shortage of foreign exchange and/or credit for purchase of fertilizers, as well as for purchase of other commodities and capital equipment, is a chronic

problem in many of the developing countries.

High prices of imported fertilizers is, of course, a relative concept. Ex-factory prices of fertilizers from the developed countries are at the lowest levels in history, but this is offset in many cases by increased transportation costs. Ex-factory prices of fertilizers can hardly go any lower without bankrupting some producing companies. Also, it is significant that delivered prices of fertilizers are usually lower than the cost of domestic production in most developing countries, but nevertheless many developing countries prefer to produce their own fertilizer, even at higher cost than imports.

Section V - Problems of exporting fertilizers

Four problems stand out as of the highest importance in Section V:

Competition from other countries	89 per cent
Fluctuations in world prices of fertilizers	68 per cent
High cost of shipping fertilizers	67 per cent
Lack of sales representatives in foreign countries	57 per cent

Competition from other countries is, of course, undesirable from the standpoint of exporting countries, but that is the "name of the game" in international trade.

Fluctuations in world prices of fertilizers have been downwards for the past three or four years, and this is naturally undesirable from the standpoint of exporting countries, but on the other hand this is desirable from the standpoint of importing countries.

Section VI - Problems of consumption, marketing and distribution

Five problems in Section VI were given highest importance by the responding countries:

Low prices of farm products	62 per cent
Difficulty of educating farmers to use optimum economic quantities of fertilizers	58 per cent
High prices of fertilizers	56 per cent
Inadequate supply of irrigation water	56 per cent
Shortage of credit for fertilizer purchases	50 per cent

Six other problems had percentages running from 46 per cent down to 27 per cent.

Low prices of farm products is, of course, fundamental. Farmers have to receive high enough prices for their products to make it economically attractive for them to use more fertilizer. However, demonstrations and field trials by the Food and Agriculture Organization and by other organizations during the past decade have shown value/cost ratios of 3, 4, 5 and even as high as 20 for the use of increased amounts of fertilizer on a wide variety of crops in many of the developing countries. The value/cost ratio is the value of additional product divided by the cost of the fertilizer needed to produce the additional product.

Therefore it would seem that "Low prices of farm products" is, in many cases, a matter of education for farmers as to the economic value of using more fertilizer, provided it is used in the right way at the right time on the right crops. This is the subject of the second problem cited above, "Difficulty of educating farmers to use optimum quantities of fertilizers".

"High prices of fertilizers" was discussed under Section IV. The same comments apply here.

Inadequate supply of irrigation water is also fundamental since it is generally true that fertilizers are much more productive and hence more economic when used in conjunction with an adequate supply of water, either from rainfall or by irrigation.

Besides fertilizers and water supply, the other key input for productive agriculture is good seed varieties. Seeds, water and fertilizer are the three key inputs of agriculture -- the triangular base on which agriculture rests. It is noteworthy that "Inadequate supply of improved seed varieties" received a composite rating of 36 per cent indicating that supply of seeds is less of a limiting factor in productive agriculture than fertilizer and water.

Shortage of credit for fertilizer purchases refers to shortage of credit to farmers. This is a chronic problem in many developing countries and one to which the national banks and finance ministries need to address themselves.

Conclusion

The obvious awareness of the importance of the problems in the questionnaire among the responding countries is encouraging because the identification of a problem is the first step in solving it.

The goal to be reached in every developing country is a fertilizer consumption level equal to or near the optimum fertilizer use which corresponds to each country's economic requirements and, at the same time, represents a firsthand prerequisite to economic fertilizer production. Here the relation between economic use of production capacity and the market demand has to be stressed.

Optimum fertilizer use is moreover a primary factor in creating purchasing power within the farming community allowing its members to become buyers of other industrial products besides agricultural inputs.

There is, of course, no doubt that in most cases the solution of the problems set forth in the questionnaire will need considerable time, funds and organization, as well as legal actions by the governments. These steps may require some years to a decade, if not a generation or more. Therefore it appears to be logical that thorough and realistic study of market conditions and prospects and the related elements should form the basis of priorities for investment in the fertilizer field and that investment in the creation of an effective fertilizer marketing and distribution system cannot be separated from the investment in fertilizer production.

Also the time factor for creating a fertilizer market should be carefully taken into consideration when deciding about priorities. This holds only for the developing, but also for the developed countries. The developed countries have been and are still leaving lessons regarding the relation of market demand and production capacity.

Most of the measures to be taken to solve the problems in the fertilizer field will have, as soon as they become effective, a beneficial influence on the national economy far beyond the fertilizer field (transport, reduced import of food, export of agricultural products, food processing industries, etc.)

Table I

Summary of Responses to UNIDO Questionnaire on Problems
of the Fertilizer Industry in Developing Countries

Responses from Governments

<u>I. Problems of production in exporting plants</u>	No. of respondents giving ratings <u>0-1-2-3-4</u>	Percent of respondents giving ratings <u>3 or 4</u>
High cost of production of fertilizers	2-1-10-12-4	55 %
* * * * *		
High cost of raw materials	5-2-8-11-3	48 %
Supply of spare parts	2-3-9-8-5	48 %
Inadequate supply of potash	4-3-5-6-3	43 %
Inadequate supply of phosphate rock	7-2-6-8-3	42 %
Existing plants too small	4-1-8-7-2	41 %
Shortage of qualified personnel	4-3-8-7-1	40 %
Low production of plants in relation to capacity	7-3-5-5-4	37 %
High maintenance costs	1-6-11-8-2	36 %
Inadequate supply of naphtha	4-3-0-4-0	36 %
Inadequate supply of sulphur	8-5-6-6-4	35 %
Shortage of skilled workers for maintenance	5-6-7-8-1	33 %
Shortage of maintenance personnel	3-7-8-5-3	31 %
Shortage of plant operators	4-7-8-6-1	27 %
Excessive down time of plants	7-3-7-3-3	26 %
Shortage of qualified managers	4-2-14-5-2	26 %
Shortage of qualified engineers	3-2-15-6-1	26 %
* * * * *		
High cost of electricity	6-3-13-5-2	24 %
Processes need modernization	7-4-8-3-3	24 %
Shortage of natural gas	11-2-1-2-2	22 %
Shortage of coal	2-2-3-2-0	22 %
Time required for repairs	7-7-7-4-2	22 %
Inadequate supply of electricity	9-10-2-4-1	19 %
Storage and despatch	14-10-3-6-0	18 %
Shortage of fuel oil	6-6-2-2-0	13 %
Inadequate variety of products	12-3-6-1-1	9 %
Quality control of products	11-12-1-2-0	8 %
High labour costs	9-8-8-1-1	7 %
Products not suitable	13-3-4-0-1	5 %

Table I (cont'd)

II. <u>Problems of construction of new plants</u>	No. of respondents giving ratings <u>0-1-2-3-4</u>	Percent of respondents giving ratings <u>3 or 4</u>
No production of locally fabricated equipment	1-4-2-8-9	71 %
High cost of fertilizer plants	2-3-7-7-10	59 %
Shortage of fertilizer plant designers	4-6-4-9-0	58 %
Lack of process know-how	5-7-1-7-11	58 %
High cost of imported equipment	2-3-8-10-10	57 %
Need to provide infrastructure	5-4-4-10-6	55 %
High royalty charges on foreign process know-how	2-7-6-7-9	52 %
Shortage of local capital	5-2-8-5-11	52 %
Shortage of foreign capital	3-4-7-6-8	50 %
Lack of demand for fertilizers	5-5-6-12-4	50 %
* * * * *		
Shortage of fertilizer plant construction engineers	5-9-4-9-6	46 %
High cost of locally-fabricated equipment	3-4-6-9-2	46 %
Shortage of potash	7-2-5-5-7	46 %
Shortage of sulphur	8-4-6-6-8	44 %
Lack of investment incentives for local capital	5-5-5-6-5	42 %
Shortage of naphtha	9-3-2-6-4	42 %
Shortage of phosphate rock	8-3-7-5-7	40 %
Poor quality of locally fabricated equipment	5-6-0-6-1	39 %
Shortage of natural gas	12-4-1-3-7	37 %
Shortage of coal	8-3-3-2-4	30 %
Need for housing and other amenities	6-7-8-7-2	30 %
Shortage of skilled construction workers	7-10-5-6-3	29 %
* * * * *		
Delay in supply of locally fabricated equipment	6-5-5-4-1	24 %
High import duties on imported equipment	14-6-1-5-1	22 %
Lack of investment incentives for foreign capital	5-5-5-6-5	21 %
Restrictive policies on foreign capital	10-5-5-3-1	17 %
Shortage of fuel oil	12-7-3-2-2	15 %

Table I (cont'd)

<u>III. Problems of research/development and central planning</u>	No. of respondents giving ratings <u>0-1-2-3-4</u>	Percent of respondents giving ratings <u>3 or 4</u>
Lack of engineering organizations for the planning, process development and design of new plants	3-3-6-13-10	66 %
Lack of research/development organizations for the development of new fertilizers and new production processes	2-4-7-6-13	59 %

Inadequate central planning and development institutions	5-10-3-7-4	31 %
Lack of research organizations supplying data on crop responses, soil analysis, soil classification, etc.	6-7-3-7-2	29 %
<u>IV. Problems of importing fertilizers</u>		
Shortage of foreign exchange and/or credit	8-4-5-7-6	43 %
High prices of imported fertilizers	10-7-3-8-3	36 %
Importing fertilizers in bags because of lack of bulk handling facilities	8-6-5-5-5	35 %

Inadequate transportation from ports	9-8-7-6-1	23 %
Lack of knowledge of type of fertilizers needed	10-7-5-2-4	21 %
Inadequate port facilities	13-5-6-5-1	20 %
Lack of policy decision to import fertilizer intermediates	10-5-5-5-0	20 %
Difficulty of making contact with foreign sellers of fertilizers	25-3-2-0-0	0 %
<u>V. Problems of exporting fertilizers</u>		
Competition from other countries	0-1-2-11-13	89 %
Fluctuations in world prices of fertilizers	3-0-5-9-8	68 %
High cost of shipping fertilizers	2-2-4-10-6	67 %
Lack of sales representatives in foreign countries	4-3-2-8-1	57 %

Table I (cont'd)

V. <u>Problems of exporting fertilizers(cont'd)</u>	No. of respondents giving ratings <u>0-1-2-3-4</u>	Percent of respondents giving ratings <u>3 or 4</u>
Inadequate marketing information and marketing know-how	5-1-10-8-2	39 %

Lack of storage facilities at ports	7-3-8-5-0	22 %
Difficulties in exporting due to balance of payments	2-6-3-3-0	14 %
Inadequate quality control of products	10-5-5-2-1	13 %
VI. <u>Problems of consumption, marketing and distribution</u>		
Low prices of farm products	3-3-8-15-8	62 %
Difficulty of educating farmers to use optimum economic quantities of fertilizers	1-6-8-11-10	58 %
High prices of fertilizers	4-7-6-11-9	56 %
Inadequate supply of irrigation water	1-4-7-15-4	56 %
Shortage of credit for fertilizer purchases	8-1-9-12-6	50 %

Inadequate facilities for marketing farm products	6-4-3-10-6	46 %
Lack of storage facilities for fertilizers in consuming areas	6-4-10-12-3	43 %
Inadequate agricultural extension services for farmers	4-6-12-12-2	39 %
Inadequate supply of improved seed varieties	7-5-11-12-1	36 %
Inadequate transportation of fertilizers	4-6-12-10-2	35 %
Short supply of fertilisers	10-10-4-8-1	27 %

TABLE II

COUNTRIES WHICH SUBMITTED USUABLE QUESTIONNAIRES*

Argentina	Libya
Bolivia	Mexico
Brazil	Morocco
Ceylon	Nigeria
Chile	Panama
China, Rep. of	Pakistan
Congo (Brazzaville)	Paraguay
Ecuador	Peru
Guatemala	Philippines
Haiti	Poland**
India	Senegal
Indonesia	Syrian Arab Republic
Iran	Tanzania
Israel	Trinidad and Tobago
Ivory Coast	Turkey
Jordan	Uganda
Korea, Rep. of	United Arab Republic (Egypt)
Kuwait	Uruguay
Lebanon	Yugoslavia**

*/ These questionnaires submitted by the governments of the above 38 countries were the basis of the responses tabulated in Table I.

**/ Poland and Yugoslavia are not generally classified as developing countries but were included in the tabulation anyway. Other East European countries were sent questionnaires but did not respond.

ANNEXURE A

QUESTIONNAIRE

on

PROBLEMS FACING THE FERTILIZER INDUSTRY IN DEVELOPING COUNTRIES

QUESTIONNAIRE

ON

PROBLEMS FACING THE FERTILIZER INDUSTRY IN DEVELOPING COUNTRIESThesis

Nearly all developing countries, with only a few exceptions, are not producing enough fertilisers to supply their own needs nor are they using enough fertiliser to promote the "green revolution" to its maximum economic potential.

Basic questions

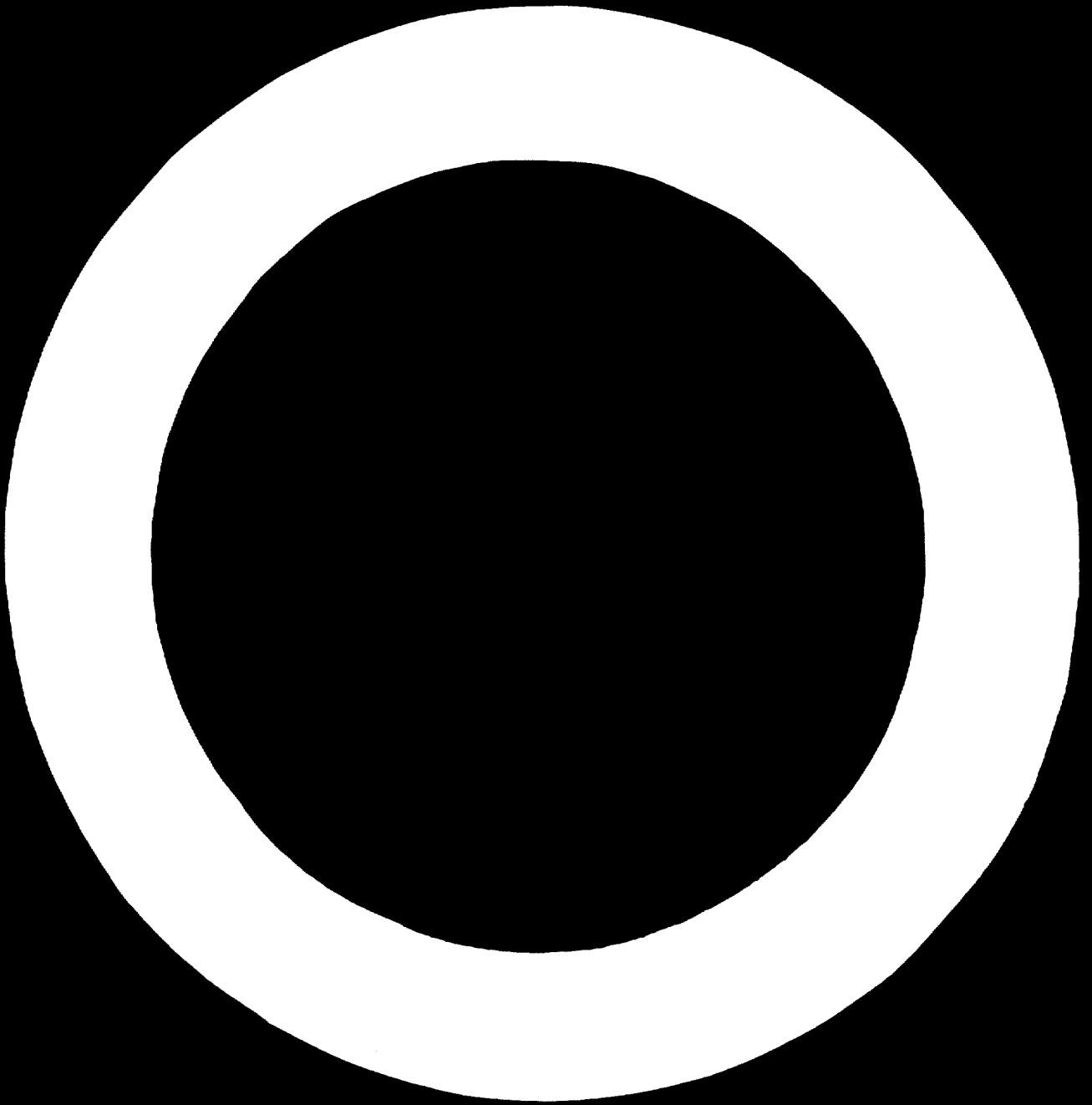
1. What are the problems inhibiting the development of fertiliser manufacturing industries in the developing countries, wherever this is economically feasible?
2. Is supply of fertilisers a problem? If so, what are the factors limiting the supply?
3. What are the important problems inhibiting the greater use of fertilisers in agriculture?

Evaluation

Please evaluate each of the problem areas listed below, on the basis of experience in your country using the following scale of ratings:

- 4 = Most important problem
- 3 = Very important problem
- 2 = Moderately important problem
- 1 = Small importance
- 0 = No importance
- X = Not relevant or not applicable

Please put a numerical rating or X in every space.



I - PROBLEMS OF PRODUCTION IN EXISTING PLANTS

_____ 1. Low production of plants in relation to design capacity

_____ 2. High cost of production of fertilisers

_____ Raw materials

_____ Electrical energy

_____ Labor costs

_____ Maintenance costs

_____ Excessive down time

_____ 3. Inadequate supply of raw materials

_____ Hydrocarbon raw materials

_____ Natural gas

_____ Naphtha

_____ Fuel oil

_____ Coal

_____ Others _____

_____ Phosphate rock

_____ Sulphur (in any form)

_____ Potash

_____ 4. Inadequate supply of electrical energy

_____ 5. Problems of maintenance and repair of plants

_____ Supply of spare parts

_____ Skilled workers

_____ Time required for repairs

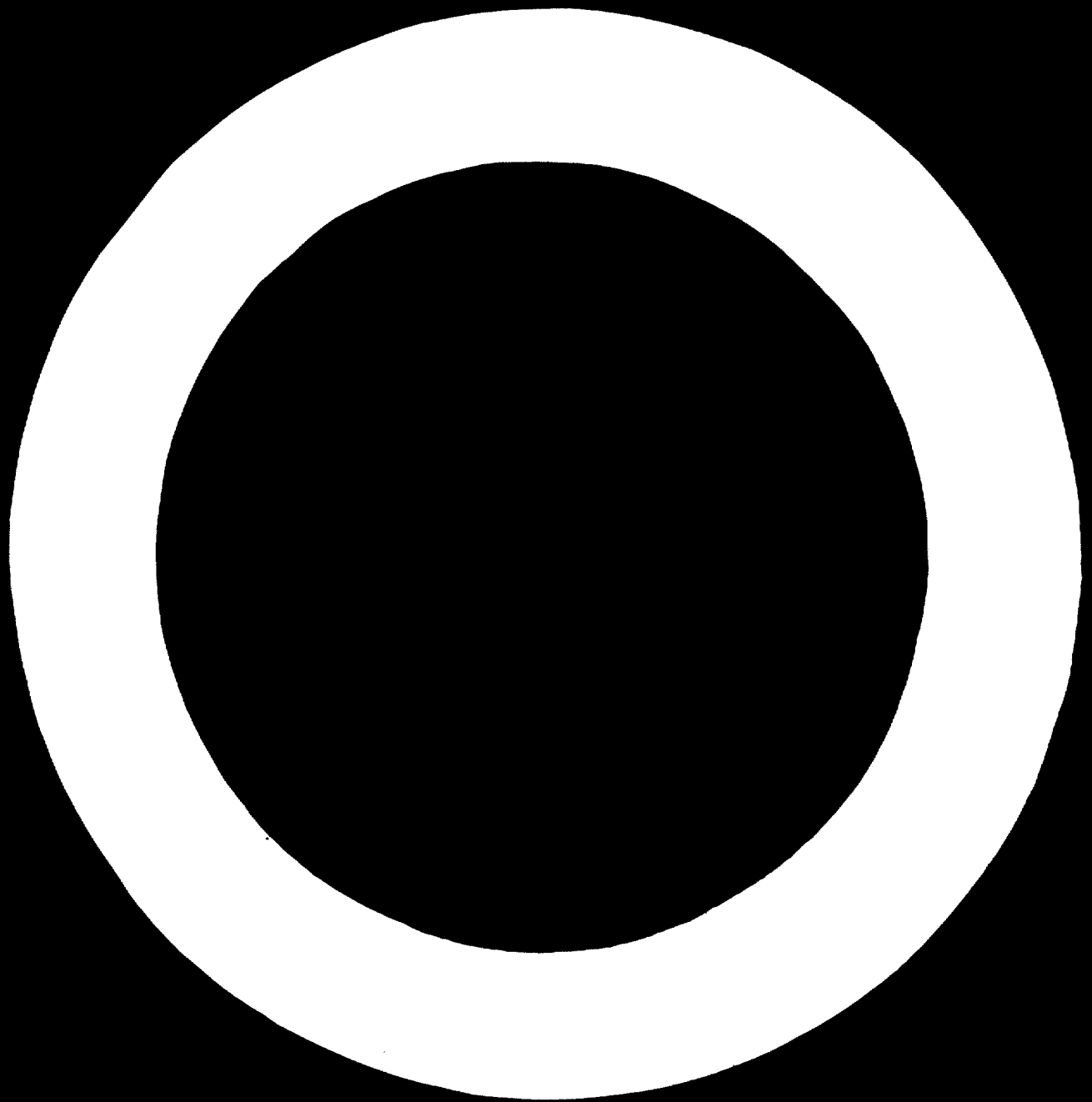
_____ 6. Shortage of qualified personnel

_____ Managers

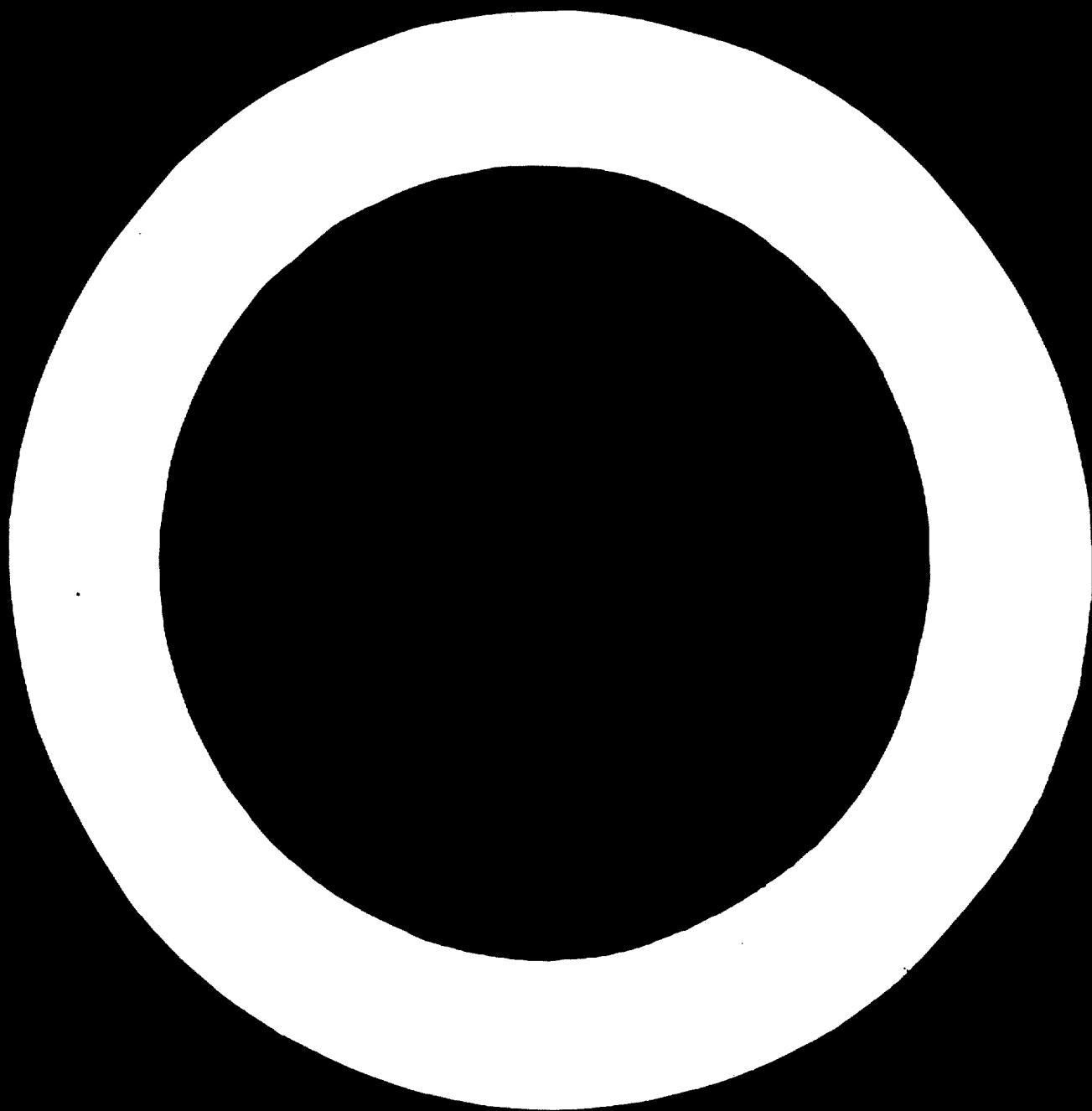
_____ Engineers

_____ Operators

_____ Maintenance personnel

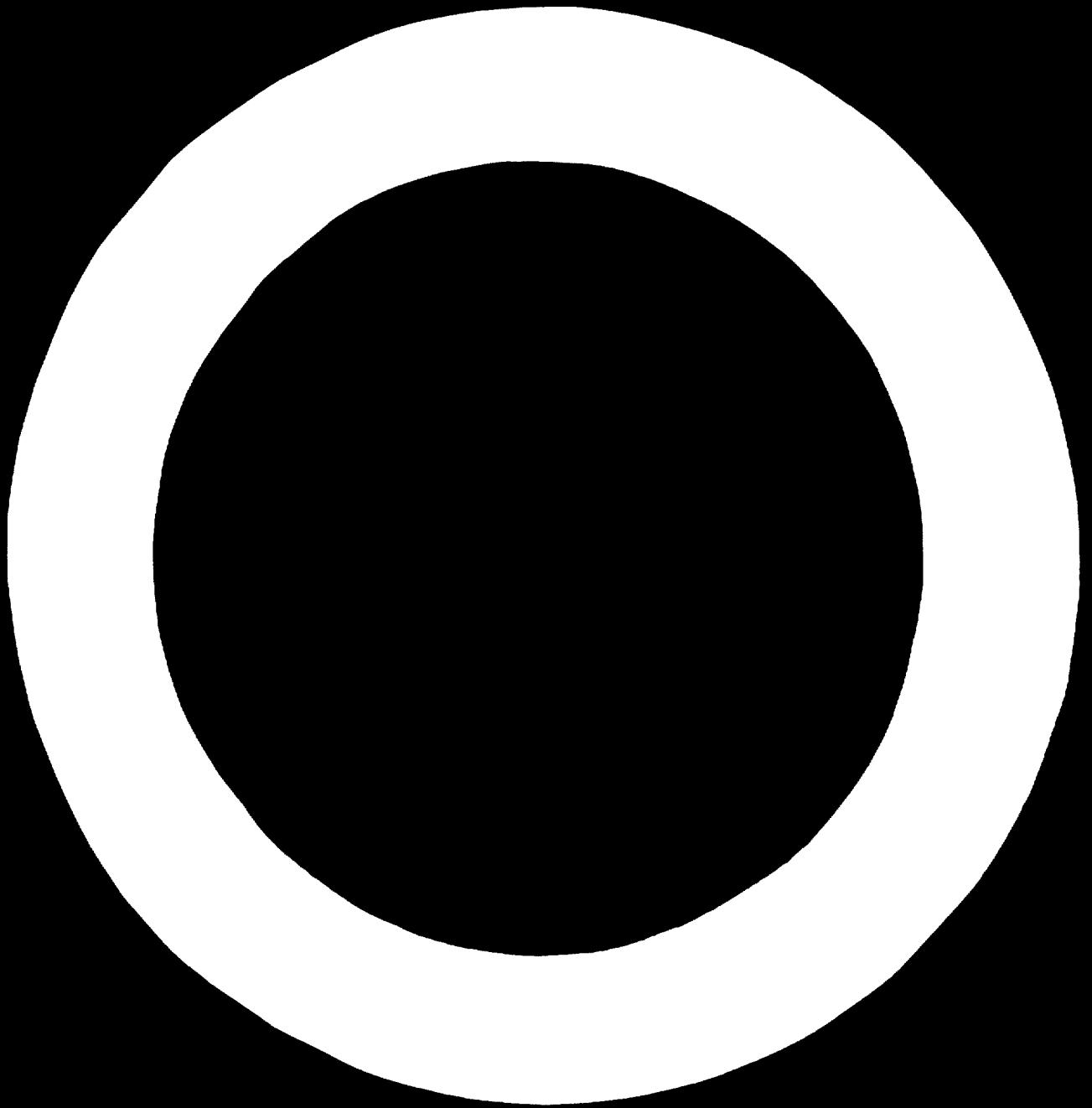


- 7. Quality control of products
- 8. Storage and despatch
- 9. Services (fuel, water and steam)
- 10. Problems of obsolescence
 - Existing plants too small
 - Processes need modernisation
 - Products not suitable
 - Inadequate variety of products
- 11. Other problems (use space below)



II - PROBLEMS OF CONSTRUCTION OF NEW PLANTS

- 1. Shortage of local capital
 - Lack of investment incentives for local capital
- 2. Shortage of foreign capital
 - Lack of investment incentives for foreign capital
 - Restrictive policies on foreign capital
- 3. Shortage of qualified personnel
 - Fertilizer plant designers
 - Fertilizer plant construction engineers
 - Skilled construction workers
- 4. Availability and quality of locally fabricated equipment
 - No production of locally fabricated equipment
 - Poor quality of locally fabricated equipment
 - Delay in supply of locally fabricated equipment
- 5. Shortage of raw materials
 - Hydrocarbon raw materials
 - Natural gas
 - Naptha
 - Fuel oil
 - Coal
 - Others _____
 - Phosphate rock
 - Sulphur (in any form)
 - Potash
- 6. Lack of process know-how
 - High royalty charges on foreign process know-how
- 7. Lack of demand for internal consumption or export



_____ 8. High cost of fertiliser plants

_____ High cost of imported equipment

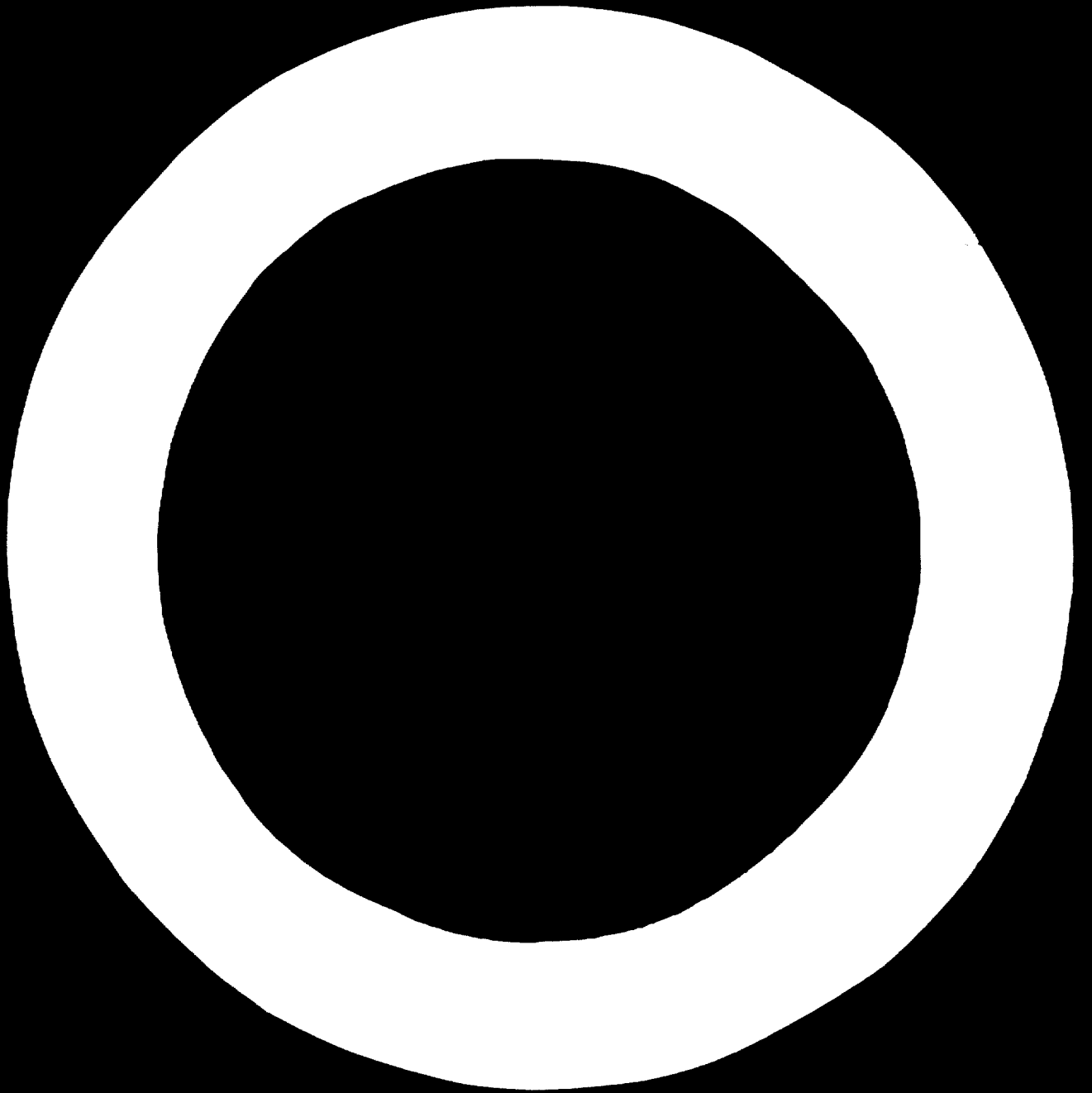
_____ Import duties on imported equipment

_____ High cost of locally-manufactured equipment

_____ Need to provide infrastructure

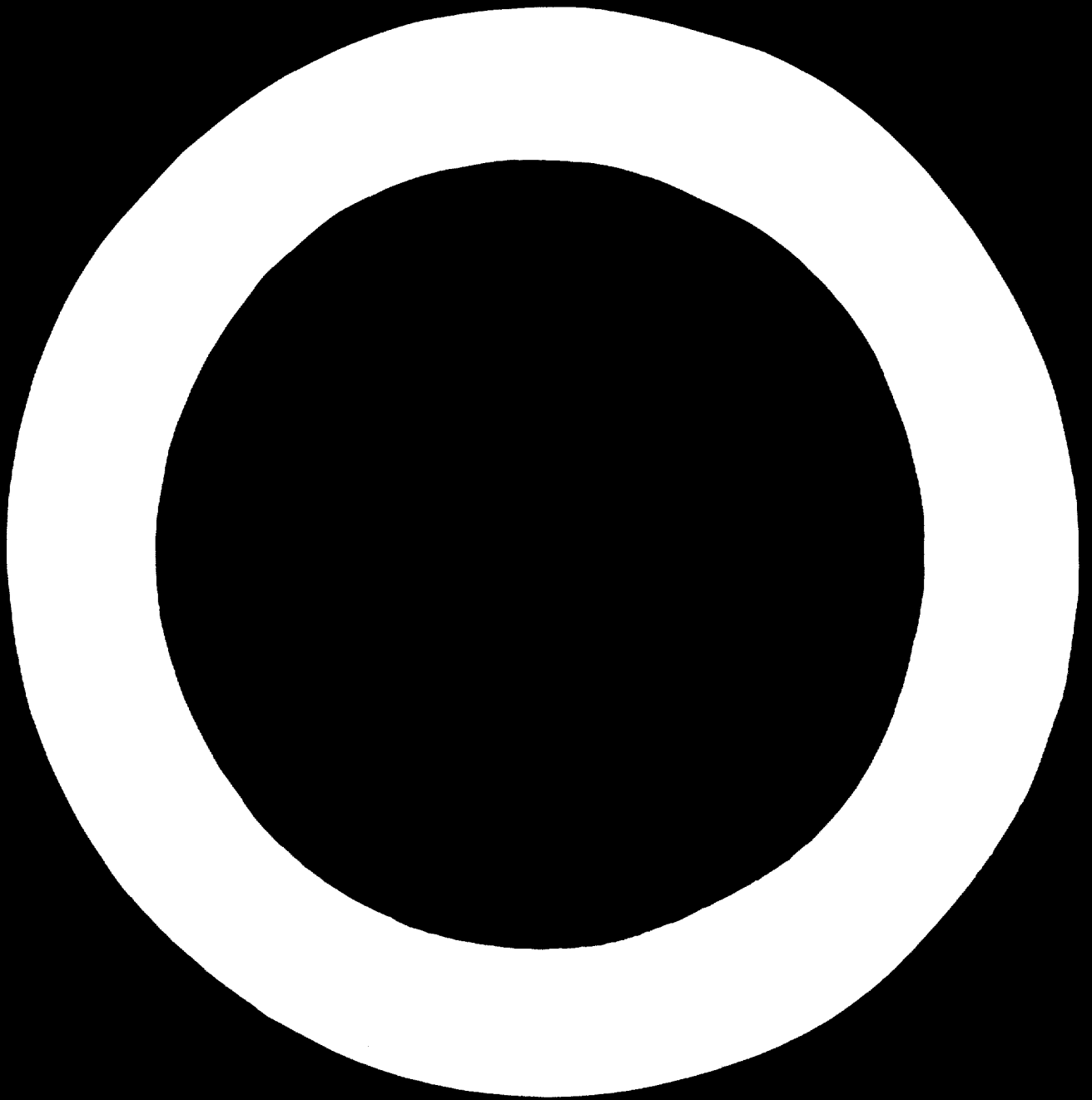
_____ Need for housing and other amenities

_____ 9. Other problems (use space below)



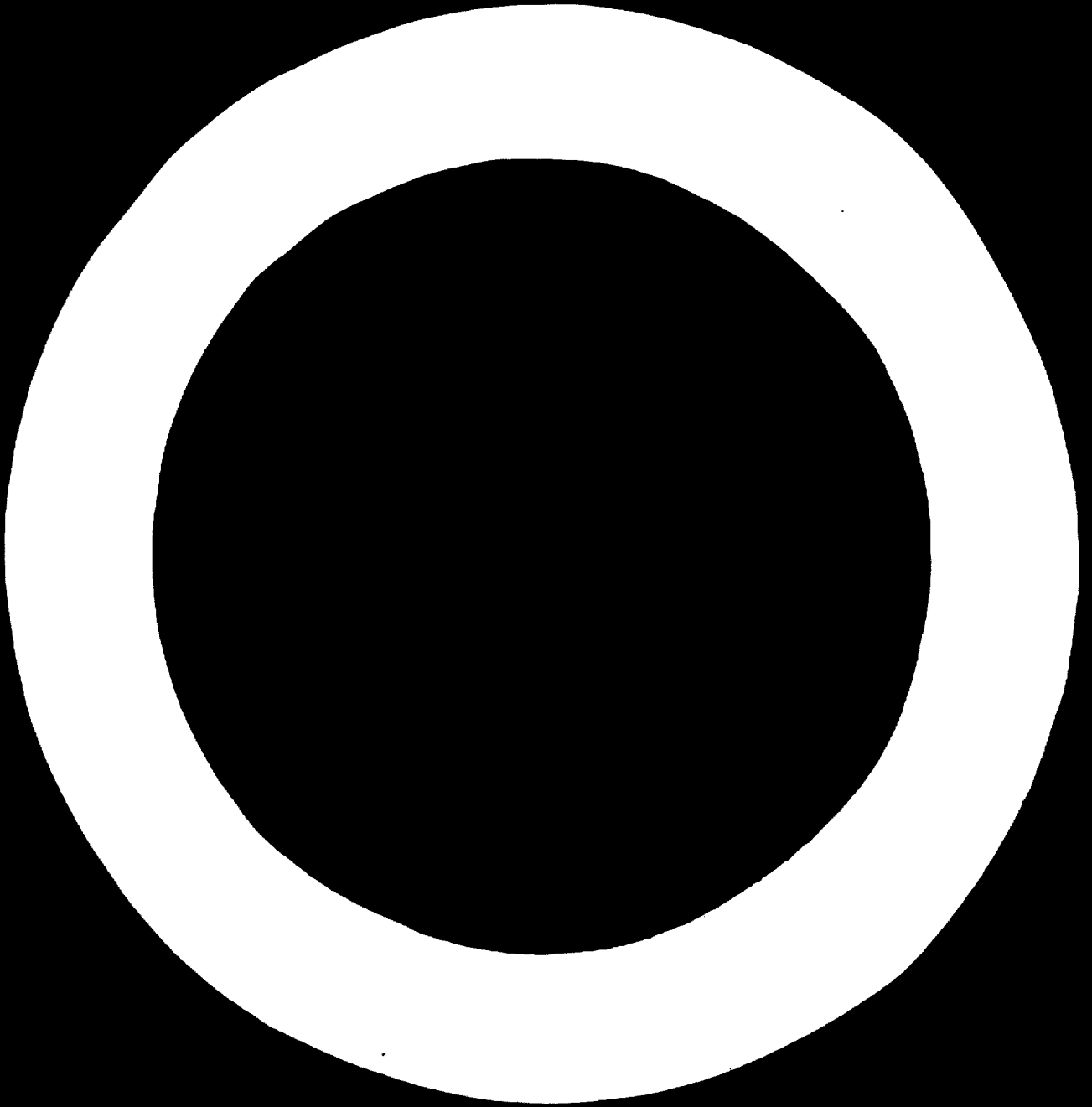
III - PROBLEMS OF RESEARCH/DEVELOPMENT AND CENTRAL PLANNING

- _____ 1. Lack of research and development organisations for the development of new fertilisers and new production processes
- _____ 2. Lack of engineering organisations for the planning, process development and design of new plants
- _____ 3. Lack of research organisations supplying data on crop responses to fertiliser use, soil analysis, soil classification etc.
- _____ 4. Inadequate central planning and development institutions
- _____ 5. Other problems (use space below)



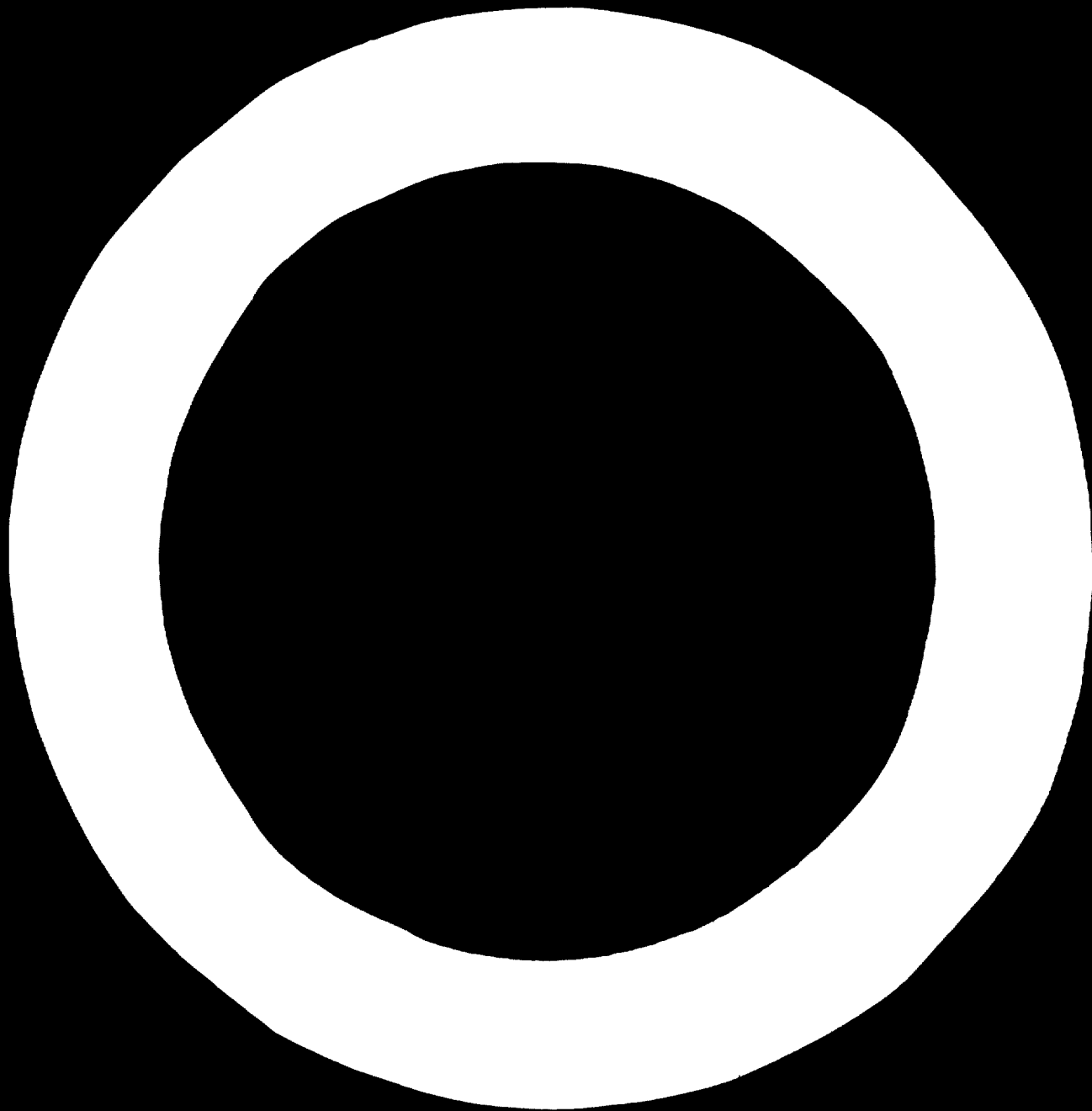
IV - PROBLEMS OF IMPORTING FERTILIZERS

- _____ 1. Shortage of foreign exchange and/or credit
- _____ 2. Difficulty of making contact with foreign sellers of fertilizers
- _____ 3. Inadequate port facilities
- _____ 4. Inadequate transport from ports to inland areas
- _____ 5. High prices of fertilizers offered for sale by foreign sellers
- _____ 6. Lack of knowledge of type of fertilizers needed
- _____ 7. Lack of policy decision to import fertilizer intermediates
- _____ 8. Importing fertilizers in bags because of lack of bulk handling facilities in ports or for other reasons
- _____ 9. Other problems (use space below)



V - PROBLEMS OF EXPORTING FERTILIZERS

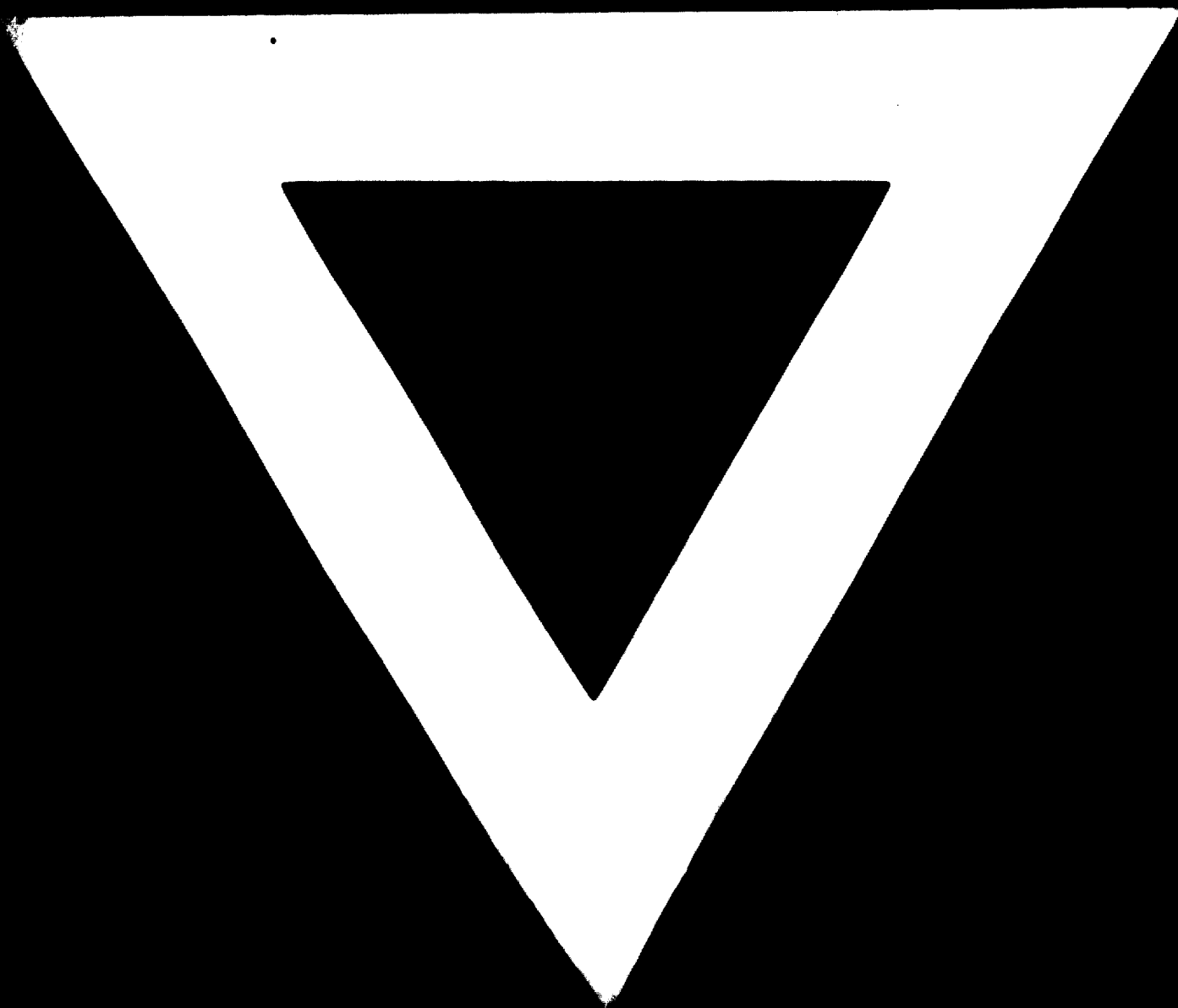
- _____ 1. Competition from other countries
- _____ 2. Inadequate marketing information and marketing know-how
- _____ 3. Lack of sales representatives in foreign countries
- _____ 4. Fluctuations in world prices of fertilizers
- _____ 5. High cost of shipping
- _____ 6. Lack of storage facilities at ports
- _____ 7. Inadequate quality control of products
- _____ 8. Difficulties in exporting due to balance of payments
- _____ 9. Other problems (use space below)



VI - PROBLEMS OF CONSUMPTION, MARKETING AND DISTRIBUTION

- _____ 1. Difficulty of educating farmers to use optimum economic quantities of fertilizers
- _____ 2. Short supply of fertilizers
- _____ 3. High prices of fertilizers
- _____ 4. Shortage of credit for fertilizer purchases
- _____ 5. Inadequate supply of irrigation water
- _____ 6. Inadequate supply of improved seed varieties
- _____ 7. Inadequate agricultural extension services for farmers
- _____ 8. Inadequate transportation of fertilizers from factory or seaport to consuming areas
- _____ 9. Lack of storage facilities in consuming areas
- _____ 10. Low prices of farm products
- _____ 11. Inadequate facilities for marketing farm products
- _____ 12. Other problems (use space below)





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