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Expert Group Meeting on Fertilizer Plant Cost Reduction and Ways to Mobilize Sufficient Financing

Vienna, Austria, 11-14 April 1978

COST OF FERTILIZER PLANTS IN SPAIN, SOUTH AMERICA AND THE MIDDLE EAST

bу

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<sup>\*</sup> The views and opinions expressed in this paper are those of the author and do not necessarily reflect the views of the Secretariat of UNIDO. This document has been translated from an unedited original.

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### Summary

The paper provides up-to-date figures on costs within battery limits for plants producing LAP, NAC, TSP, phosphoric acid, sulphuric acid and NPK fertilizers in Spain, South America and the Middle East.

Spain began in 1960 to develop a powerful chemical and fertilizer industry, with the result that, starting almost from scratch, it has become the fifth largest producer in Europe and tenth in the world. The development was brought about by massive imports of technology, but also by promoting Spanish engineering and contractors. Spanish technology began to develop from 1970; as a result it has been possible to begin exporting fertilizer plants in recent years.

The most characteristic feature of the Spanish process is that, since the industry developed in such a short space of time, many of the problems encountered in Spanish export operations are familiar because they occurred recently in Spain, and the same companies and personnel that solved the problems in Spain are those that have to solve them in other countries.

Some economic data are given below on the costs of fertilizer plants in the experience of ESPINDESA and other associated companies. The costs have been updated to the first half-year of 1978 to make them comparable, and have been divided into three tables covering plants in Spain, South America and the Middle East respectively, since the differences between the three groups are considerable.

For a correct interpretation of the tables, the following points should be taken into account:

- 1. The figures given are in millions of pesetas;
  1 United States dollar = 30 pesetas.
- 2. The figures relate exclusively to plants within battery limits and do not include any infrastructure work. Most of the figures are for plants that have been built or are being built in existing industrial complexes.
- 3. Spares and raw materials for initial operation are not included.
- 4. The value of land, taxes, all types of contingency reserves, personnel training, financing costs, etc., are not included.
- 5. In all cases, the engineering, plant and materials are Spanish.
- 6. The costs of commissioning and construction supervision refer exclusively to the licensor's technical personnel and consulting engineers specifically assigned to the job.
- 7. The items civil engineering, structures, etc., are based on local prices.

PATE

		DAP	MAC	TSP	Prosphoric soid	Sulpinizio acid (from	KFK
		700 tonnes/day	60C tonnes/day	760 36m103/3ay	(54% P205) 270 connes/day	i	100,000 tonnes/year
3.	Licences, basic and detail engineering	23	19	33	98 9	75	43
3.4.1	Plant, material and seller's experts	133	194	102	362	292	96
3,5.2	Catalysts	i	l	ı	ı	23	!
3.6	Transport	l	ı	I	ı	ţ	l
3.7.1	Civil engineering, structures and buildings, insulation and painting	78	7C	54	208	69	78
3.7.5	Installation, testing	Ð	40	20	13.5	134	22
3.9.6	Commissioning	5	4	4	10	ţ	٣
	Construction supervision	8	32	50	31	41	32
	Total	302	407	210	930	623	274

# SOUTH AMERICA

and seller's         (50)         760         760         (54% Po 2)         sulphur)         sulphur)         sulphur)           and seller's         (11)         77         35         99         91           and seller's         140         202         107         378         279           g, and seller's         108         96         74         287         95           gintlings, ainting         25         80         40         266         268           sting         25         80         40         266         20           ervision         37         59         37         1,173         899			DAP	NAC	4ST	Phosphoric acid	Sulphuric acid (from	NPK
Licences, basic and detail engineering to material and seller's and experts  Catalysts  Catalysts  Civil engineering, structure- and buildings, insulation and painting  Commissioning  Commissioning  Construction supervision  Therefore, basic and details and seller's and buildings, insulation and painting  Commissioning  Commissioning  Therefore, basic and seller's an			700	009	760	(54% P205)	sulphur) 850	100,000
Plant, material and seller's experts         140         202         107         378           Catalysts         -         -         -         -         -           Transport         21         32         16         66           Civil engineering, structures and buildings, insulation and painting         108         96         74         287           Installation, testing         25         80         40         266           Commissioning         10         8         8         20           Construction supervision         37         59         37         57           Total         402         554         317         1,173	3.	Licences, basic and detail engineering	tonnes/day	TT TT	35	66	91	49
Catalysts         -	3.4.1	Plant, material and seller's experts	140	202	107	378	279	101
Transport         21         32         16         66           Civil engineering, structures and buildings, insulation and painting         108         96         74         287           Installation, testing         25         80         40         266           Commissioning         10         8         8         20           Construction supervision         37         59         37         57           Total         A02         554         317         1,173	3.5.2	Catalysts	l	ı	ı	ı	24	ı
Civil engineering, structures and buildings, insulation and painting       108       96       74       287         Installation, testing       25       80       40       266         Commissioning       10       8       8       20         Construction supervision       37       59       37       57         Total       402       554       317       1,173	3.6	Transport	21	32	16	99	47	16
Installation, testing         25         80         40         266           Commissioning         10         8         8         20           Construction supervision         37         59         37         57           Total         402         554         317         1,173	3.7.1	Civil engineering, structures and buildings, insulation and painting	108	96	74	287	95	108
Commissioning         10         8         20           Construction supervision         37         59         37         57           Total         402         554         317         1,173         8	3.7.2	Installation, testing	25	&	40	566	268	44
37 59 37 57 402 554 317 1,173 8	3.9.6	Commissioning	10	œ	ω	50	8	9
402 554 317 1,173		Construction supervision	37	59	37	57	75	59
		Total	402	554	317	1,173	899	383

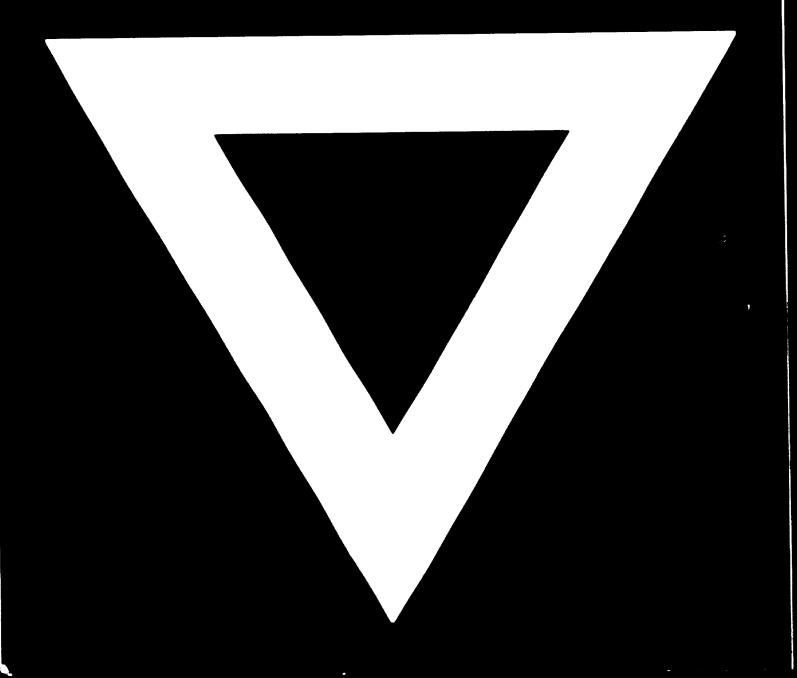
## MIDDLE EAST

Licences, basic and	DAP 700 tonnes/day	MAC 600 tonnes/day	TSP 760 tonnes/day	Phosphoric acid (54% P <sub>2</sub> 05) tonnes/day	Sulphuric acid (from sulphur) 850 tonnes/day	NPK 100,000 tonnes/year
detail engineering  Plant, material and seller's experts	61 48	77 206	37.	99 388	91 287	105
	i	ţ	l	ı	24	,
	25	38	50	62	56	<del>7</del>
Civil angineering, structures and buildings, insulation and painting	234	210	162	624	207	234
Installation, testing	20	160	8	532	535	88
Commissioning	20	16	16	40	40	12
Construction supervision	54	98	54	84	111	98
Total	592	793	478	1,846	1,352	592

### SUMMARY AND CONCLUSIONS

- 1. If the average cost of a plant in Spain is assigned the value 1, the cost in South America is 1.40 and in the Middle East 2.12.
- 2. The main reasons for the higher costs are local costs, sometimes because of the shortage of skilled labour and sometimes because of the added costs due to saturation of local workshops and subcontractors, etc.

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