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05339



Distr.
LIMITED

ID/WP.100/14
29 May 1973

ORIGINAL: ENGLISH

United Nations Industrial Development Organization

Seminar on Plastics Application
in Developing Countries

London, England, 18 - 27 June 1973

THE PRESENT STATUS AND FUTURE PLANS
FOR DEVELOPMENT OF THE PLASTICS INDUSTRY IN PERU
AND TECHNICAL ASSISTANCE REQUIRED 1/

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id.73-3908

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I. INTRODUCTION

Historical development of plastics in Peru

1. Peru, as a majority of under-developed countries, has been fulfilling a sequence of stages which can be identified in the process of development of a nation, within conditions presently prevailing on the world, from the export of raw materials up to the beginning of export of non-traditional goods.

2. Within that context, use of plastics in Peru starts in the 1950s but in minor amounts. A pre-course was celluloid, followed long after by bakelite. These materials entered to the market as substitutes of natural raw-materials in the fields of packaging, laminates, etc.

3. In the 60's a big expansion of plastics takes place, thermoplastics and thermosetting resins substitute a majority of uses for wood, glass, and some metals. Also some production is started on polymers; meantime usuary industry (manufacturing) grows in quantity and seeks for better quality, covering an even larger field of applications.

4. At present plastics transformation industry in Peru may be considered as one of the most important ones considering its relative size. Plans to install an integral thermoplastics production is well under way, with the conduction of the Government,

II. PRODUCTION OF PLASTIC RESINS

Installations of Plants in the last decade

5. Along the decade 1960-70 a few plants were installed to produce resins and related materials, with production totalizing 14,850 metric tons in 1971, as shown in Table I. However it must be said they represent only a minor portion of total consumption, as it is explained after. Although most of them do not work at full capacity, imports

continue to grow either for products which are not produced at present because of economical sizes required or for specialties that existing plants can not supply mainly because of economical reasons.

TABLE I (MT/Y)
PRODUCTION OF PLASTIC RESINS

<u>Plant</u>	<u>Capacity</u>	<u>Production (1971)</u>
PVC-suspension	6,000	5,800
Polyvinyl Acetate	4,600	2,700
Phtalates (DOP,DNP,DBP,BBP)	5,000	3,000
Stabilizers	800	500
Phenolic Resins	n.a	100
Aminoplasts (liquid)	4,000	2,200
Polyester Resins	n.a.	300
Polyurethanes	2,400	250
TOTAL		14,850

Ex-factory value is approximately 10 million dollars (1971)

Projections of production to 1975 and 1980

6. The Peruvian Government entrusted to its technical agencies, in 1970, to perform an integral study for the development of petrochemical industry in Peru. According to such study a program was devised to build a petrochemical complex which, among other plants included resins production as shown in Table II.

TABLE II (MT/Y)

PROJECTED PLANTS FOR 1975-1980

<u>PLANT</u>	<u>Capacity</u>	<u>Start-up</u>
PVC- suspension	20,000	1977
PVC-emulsion	10,000	1977
Low density Polyethylene	45,000	1978
High density Polyethylene	25,000	1979
Polypropylene	28,000	1979
Polystyrene	10,000	1979
ABS Resin	4,000	1979

7. Above-referred plants will cover substantially the needs of the plastics consumer industry in Peru and will also make possible to export within Andean Group, based on a sectorial program on petrochemistry, which is subjected to final decision. Total expected ex-factory value for these new plants will be approximately 55 million dollars.

Raw Materials

8. At present all plants in Table I import the raw material they consume, with the exception of PVC, which integrates a sugar-derivatives industrial complex. Imports come mainly from west Europe (Italy, Germany, England), and also from U.S.A. and Japan.

Technological Situation

9. Technologies have been imported from different sources (USA, West Europe, Japan), according to the origin of the enterprises. Most of these were installed as subsidiaries of foreign companies.

III. CONSUMPTION OF PLASTIC RESINS

Growth Rate during last decade

10. Significant figures are available from 1966 on. They are shown in Table III.

A nearly-explosive growth of 30% per annum can be observed between 1966-1971 which has been more accentuated in thermoplastics. This is, by the way, typical of a newly created market.

TABLE III (MT/Y)

PLASTIC RESINS CONSUMPTION

	Y E A R S						Figures: MT/Y	
	1966	1967	1968	1969	1970	1971	Rate 66-71%	Kg. per capita 1971
Thermoplastics	9,500	13,800	18,200	23,000	26,200	38,200	32.0	2.8
Thermosetting	2,000	3,300	2,400	3,400	3,800	5,800	23.7	0.4
TOTAL	11,500	17,100	20,600	26,400	30,000	44,000	30.6	3.2

In 1971, some 34% of the consumption was supplied by national production. The remaining 66% was imported. Per capita consumption reached 3.2 Kg. in 1971.

Projections of consumption to 1975 and 1980

11. Before proceeding to project consumption figures, it is good to fix the outlines for the future behavior of plastics in Peru.

11.1 Plastics, as many other "Consumers' goods" undergo the characteristic

cyclic process of life from discovery to obsolescence, through a peak of maximum demand.

11.2 In Perú, plastics have gone through a first stage, with a characteristic high rate of growing and are entering now to a second stage, with a lower rate based mainly in new developments and substitutions, converting potential into actual demand. This stage is envisaged to last until 1980 approximately.

After that, a third or "mature" stage takes over and growth rates of take lines of constant slope.

12. According to above paragraph, projected figures for main plastics are shown in Table IV. They reflect, a total average rate of 9 %, up to 1980.

TABLE IV (MT/Y)

PROJECTED CONSUMPTION OF PLASTICS

<u>A. THERMOPLASTICS</u>	<u>1975</u>	<u>1980</u>	<u>Kg/p.c. 1980</u>
PVC-suspension	15,000	22,000	
PVC-emulsion,	1,500	2,000	
Low density Polyethylene	19,200	30,200	
High density Polyethylene	4,400	7,500	
Polypropylene	3,800	6,400	
Polystyrene	5,500	8,500	
ABS Resin	500	670	
Others	500	6,530	4.5
TOTAL	50,400	83,800	

<u>B. THERMOSETTING</u>	<u>1975</u>	<u>1980</u>	<u>Kg/P.C. 1980</u>
Phenolic Resins	750	980	
Amineplasts	1700	2200	
Others	2750	5120	
TOTAL B	5200	8300	0.5
TOTAL PLASTICS	55600	92100	5.0

V. THE USUARY INDUSTRY

Characteristics of the usuary industry

13. Main features of installed usuary of "transformation" industries are listed in Table V.

TABLE V
FEATURES OF THE USUARY INDUSTRY

Number of producing factories	196
Total investment	43 million US\$
Ex-Factory Production value	53 million US\$
Consumed Energy	39x10 ⁶ Kwh/año

Occupied Personnel

14. The personnel directly occupied is slightly over 6,000 people. Number of shifts laboured per day is 2 as a yearly average. The profile of distrubition is as follows:

Less than 15 people	93 enterprises
Between 16 and 50	63 "
Between 51 and 100	27 "
More than 100	<u>13</u> "
	196 "

15. The structure of personnel engaged in production activities is as follows: *

	<u>Number</u>	<u>0/o</u>
Engineers and Technicians	210	4.5
Qualified workers	670	14.2
Semi-qualified workers	1700	36.3
Non-qualified workers	<u>2100</u>	<u>45.0</u>
	4680	100.0

* Administrative workers sum 1320

Technological Situation

16. Existing machinery can be grouped as follows:

Injection	400	50.5
Compression	110	16.2
Extrusion	190	23.8
Blowing	60	7.5
Rotating	10	1.25
Vacuum Forming	<u>10</u>	<u>1.25</u>
	800	100.00

Its origin is varied and diverse.

Production: Past and Future

17. According to figures shown in Table VI, production of manufactured plastics has four-folded in the last seven years, averaging a 22 % of annual growth. This figure is slightly less than growing of raw materials, (plastic resins) which is due to the fact the latter have also other minor applications.

TABLE VI

PRODUCTION OF MANUFACTURED PLASTICS

<u>YEAR</u>	<u>PRODUCTION (TONS)</u>	<u>INDEX</u>
1964	10,700	100
1965	11,900	110
1966	12,800	120
1967	16,000	150
1968	20,600	193
1969	26,500	248
1970	30,000	281
1971	44,000	412

18. In order to get a more clear picture of situation, the structural distribution for main resins, is shown in Table VII.

(See next page)

TABLE VII

STRUCTURE OF CONSUMPTION OF MAIN PLASTICS (1971)

P V C	%	Polyethylenes	%	Polystyrenes	%
Plastic Shoes	13.8	Films	58.0	Industrial Assemblies	30.8
Vinyl Clothes	12.8	Blowing	29.0	Containers	25.6
Profiles and Rigid Pipes	53.2	Injection	6.5	Pens and heels	10.3
Cable Protection	8.5	Toys and Kitchen Ware	4.5	Toys and Kitchen Ware	15.4
Films, Hosts, Wicks	3.2	Others	2.0	Sheets	7.7
Toys	2.1			Others	10.2
Records and others	2.1				
Containers	4.3				

19. Considering the factors exposed for raw materials projections, plastic manufacturing industry is expected to grow slower than in previous years, this is, in the vicinity of 10 % per year for the period 1972-1980. This means, around 60,000 tons in 1975 and 100,000 tons in 1980.

V. CONCLUSIONS

20. Plastics industry in Perú occupies today an important place with in manufacturing sector because of both its volume of production and liaison to many other industries with a high utilization of man power. However, because of a non-planned development, this industry is characterized by its fractionation and diversity, which creates difficulties to future growing as it is required.

21. Above situation reinforces the need to accelerate the development of a petrochemical industry, able to supply the necessary raw materials -polymers and related products-

VI. RECOMMENDATIONS

22. Future growth of plastics manufacturing industry in Peru must be planned to pursue optimum levels of efficiency. This can be achieved through rationalization of production techniques, standarization of quality and specialization.

23. The establishing of petrochemical production -mainly thermoplastics- must carefully consider the adaptation of usuary industry to these local supplies, as well as the involved control of quality and technical service in the future.

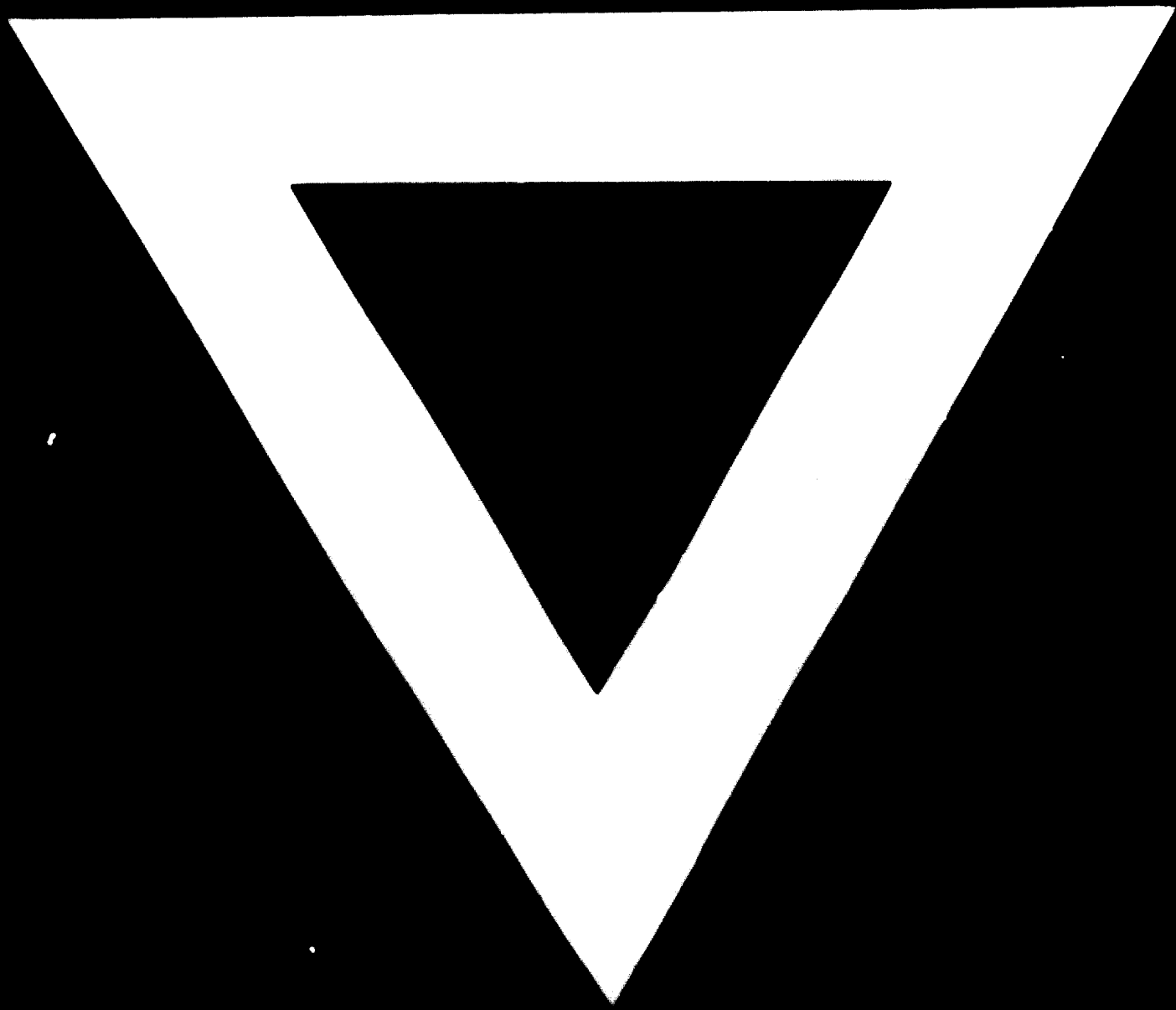
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