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INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT
INTERNATIONAL DEVELOPMENT ASSOCIATION

INDIA'S EXPORT PROSPECTS

(in two volumes)

VOLUME II

EXPORT PROSPECTS OF PRIMARY AND QUASI-PRIMARY

CONTAINING:

- A. SA-17a - Exports of Jute Goods
- B. SA-18a - Exports of Marine Products
- C. SA-19a - Exports of Leather & Leather Products
- D. SA-20a - Exports of Iron Ore
- E. SA-21a - Exports of Cashew Kernels

May 27, 1971

South Asia Department

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The Indian Government financial year runs from April 1 through March 31.

This report is based on the findings of two missions which visited India, New York and European cities in 1970. The first mission (June/July 1970) which reviewed the export prospects of primary and quasi-primary products was composed of Messrs. Alberto di Capitani (economist, South Asia Department); Christian Ladonne, (Chief of mission, South Asia Department).

The second mission (October/December 1970) which reviewed the export prospects of industrial products was composed of Messrs. Earl Conne (marketing specialist consultant); Jack Derrick (production consultant); James Furma (economist, South Asia Department); Christian Ladonne, (chief of mission, South Asia Department) and Alexander Nowicki (deputy chief and industrial economist, Economics Department). For two weeks, the mission was joined in India by Mr. Timothy Lankester, economist, of the Resident Mission in New Delhi.

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INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT
INTERNATIONAL DEVELOPMENT ASSOCIATION

EXPORTS OF JUTE GOODS

INDIA

May 27, 1971

South Asia Department

INDIA

EXPORTS OF JUTE GOODS

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This report is based on the findings of a mission which visited India and European cities in June/July, 1970, composed of Messrs. Christian Ladonne and Alberto de Capitani.

INDIA

EXPORTS OF JUTE GOODS 1/

SUMMARY

1. It is impossible to dissociate the problems faced by the Indian jute industry from those faced by the Pakistani jute industry. In both countries production of raw jute has remained more or less stagnant during the last decade, and this factor has certainly pushed the importing countries to try to lessen their reliance on a commodity for which there is a growing need (especially for carpet manufacture) and to look for substitute materials.

2. Thanks to the bonus schemes granted to its exporters, Pakistan has been able gradually to price India out of the world market for sacking, so that India has virtually become a residual exporter. Except for some shipments to U.S.S.R. and U.A.R., India exports no more sacking. Following the building up in Pakistan of capacities for production of hessian goods, Indian exports of hessian in 1969 dropped to half the level reached five years before. In carpet backing, Indian exports have still continued to grow, at least up to 1969, but here also Pakistan has ambitious plans to develop this line of production with a threefold increase in capacity so that in the coming two years Pakistan's production capacity could reach about half India's capacity.

3. Nevertheless, up to now Pakistan's competition has not been a crucial factor in India's overall export performance, since India shifted to the production of jute carpet backing. If India's exports declined gradually from their peak level of 930,000 tons in 1964 to 570,000 tons in 1969, it is because the industry suffered from a shortage of raw jute and also because domestic consumption of sacking increased very rapidly from 137,000 tons in 1957 to 330,000 tons in 1968 and 280,000 tons in 1969.

4. World demand for sacking is decreasing rapidly; world demand for hessian has remained stagnant for the last 15 years. The only product for which demand is increasing rapidly is jute carpet backing. But now jute carpet backing is subject to steady inroads by synthetic backing promoted and marketed by petrochemical complexes. Five years ago, jute enjoyed a near monopoly in the U.S. primary carpet backing market; today, nearly 40 percent of the market has been lost to synthetic and other materials. In secondary backing, displacement of jute by man-made materials has also been quick, if less dramatic. Displacement of jute by synthetics materialized mostly during 1969 and the first half of 1970 at a time when there was a tremendous over-supply situation in the U.S. market for both jute and synthetic carpet backing.

1/ Problems and prospects of Indian exports of jute manufactures have been studied in depth by Mr. Bension Varon from the Economics Department (Report No. EC.168; January 1969). The purpose of this paper is therefore limited to the study of the most recent problems facing the Industry.

(ii)

5. Demand prospects for carpets in developed countries are such that carpet manufacturers are becoming increasingly reluctant to rely on uncertain sources of supply: lasting tensions between India and Pakistan, disturbances in Bengal and East Pakistan^{1/}, strikes in the Indian jute industry and dock strikes, etc., undoubtedly affect the regularity of supply to carpet manufacturers. Moreover, by relying on domestic supply, they can also by-pass another adverse factor: dock strikes in their own country. There is a clear evidence that the U.S. dock strikes in the fall of 1968 provided a big impetus to the manufacturers of synthetic backing. Furthermore, the closure of the Suez Canal and the large price fluctuations of jute goods did not help the jute industry.

6. New end uses of jute goods might of course be found, and there will always be a market for jute goods. However the jute world market is becoming increasingly uncertain. In the case of India - a residual supplier - prospects appear therefore rather dim.

^{1/} This report has been written before the events of March 1971 took place.

I. RAW MATERIAL PROBLEMS

1. Until Partition, undivided India was practically the world's sole producer of raw jute. At Partition, 75 percent of the jute-growing area went to Pakistan, while the bulk of the jute manufacturing industry remained in India. India had, therefore, to import a large quantity of jute from Pakistan under special trade agreements, but at the same time embarked on a vigorous drive to attain self sufficiency. This move has been largely successful and production of raw jute and mesta increased from 2 million bales^{1/} (360,000 tons) during the two years following Partition to over five million bales (900,000 tons) in 1952-53^{2/}. Thereafter production remained more or less stagnant at an average of 6 to 7 million bales a year. In spite of this increase, India has not become completely self sufficient and on an average the self sufficiency ratio of the industry varies from 80 to 90 percent depending on the local crop, which fluctuates widely^{3/} with the vagaries of the weather and jute/rice price ratio in the previous season. Therefore, the industry has to rely on imported raw materials, but these imports are inadequate so that the industry has very often to work under voluntary production curtailment programs.

2. Since the 1965 conflict, there has been no official import of raw jute from Pakistan. India has therefore to rely on imports of fibers from Thailand^{4/}, part of which are in fact Pakistani raw jute, and probably on smuggled fibers from Pakistan. On the average, India has to import half a million bales a year, but when the local crop is bad, imports are much higher: 1.3 million bales in 1966, 0.8 million in 1967, etc.

3. Roughly, 30 percent of Indian raw jute output consists of mesta, which is generally inferior to true jute. The raw material deficiency of India is mostly in superior quality true jute which is needed for the production of special products such as carpet backing, and there is a definite trend in Pakistan to withhold supplies of such quality of fibers to the benefit of its own manufacturers.

4. While Pakistan jute continues to be grown in traditional areas, jute production in India has spread outside the traditional areas of West Bengal to marginal lands, which explains the comparatively poor quality of the Indian fiber. Increase in production in India is entirely the result of the extension of the cultivated area. In Pakistan the area cultivated and production of raw fiber has remained relatively static. Yield per hectare is higher in Pakistan (1.5 kg.) than in India (1.2 kg.), but in both countries there has been no increase in productivity for the last 20 years - if there is a trend, it is a downward one. There are, of course, plans to increase the yield by using fertilizers and improved seeds and also to improve the quality of the fiber, through better retting facilities and better training.

^{1/} One jute bale equals 400 lbs., or roughly 181 kgs. net.

^{2/} Source: Indian Jute Mills Association - Department of Statistics.

^{3/} See Table I in Annex.

^{4/} Thailand produces mostly kenaf.

5. Unfortunately, the real economics of jute growing militates against such plans. Traditionally, when the industry has been able to pay a high price for the fiber, the growers sow more jute, and vice versa. The resulting price fluctuation is further aggravated by the speculative tendency of trade in raw jute, in which some jute mill owners are reported to be associated. The actual growers benefit only partially when the price is high, but are the major losers when the price is low. Sometimes, as in 1967/68, many cultivators were unable to obtain a price which covered the cost incurred in producing the fiber. Under these circumstances, it is most unlikely that the farmers, who are generally poor and in debt will invest to improve their cultivating practices. Even now for minimum investments in jute cultivation, they are obliged to rely on the raw jute traders who readily offer advances on high payment price and dictated terms. Apparently, the situation in Pakistan is similar.

6. As it is, it is improbable that India and Pakistan will increase their output of raw jute in the near future. It might even happen, if the "miracle" paddy seeds could be successfully introduced in jute growing areas, that farmers partly turn to rice growing on a long term basis.

7. Pakistan and India have a near world monopoly in the production of jute. If we now consider the total production of jute and allied fibers (mesta, kenaf, sisal, etc.), India and Pakistan account each for a third of world production, while Thailand with 14 percent and the U.S.S.R. and mainland China with 15 percent account for most of the remaining output.

II. COMPETITION FROM PAKISTAN

8. Since 1940, the number of looms in India has practically remained unchanged at about 75,000; in recent years however, the proportion of broad looms to the total has increased. For carpet backing, India has about 6,000 looms. In contrast, the Pakistani industry has developed rapidly: from about 4,000 looms in 1955 to about 22,000 at present. As of June 1969, the broad looms position for carpet backing in Pakistani mills was as follows: 900 installed, 600 ordered and 1,500 sanctioned but not ordered. In one year ahead from now, installed capacity could therefore be 3,000, i.e. half the Indian capacity, if the program is implemented.

9. On the world market, Pakistani exporters have definite advantages over their Indian counterparts: the availability of higher quality raw jute, preferential freight rates, tax rebates and chiefly the incentives offered through the bonus voucher scheme. Under this scheme, a variable percentage of the f.o.b. value^{1/} is received in the form of a bonus voucher which can then be sold in the open market for as much as 170 percent of its face value.

^{1/} Recently increased from 30 to 35 percent. Raw jute export has also received a bonus voucher of 10 percent.

10. In contrast, the effect of India's 57.5 percent devaluation on the price of jute goods was partly offset by heavy export duties levied by the government. The purpose of these duties was to raise export prices in terms of rupees, thus preventing a sharp fall in the dollar value of exports, and reaping part of the profit which might accrue to exporters. At the same time, the tax credit certificates which had been given to exporters were abolished ^{1/}. Moreover, devaluation raised the prices of imported raw jute by roughly 58 percent; the Government granted subsidies on imports, which were, nevertheless, far below the increased cost on imported raw jute. The effective exchange rate for jute goods increased from Rs 4.76-5.24 (depending on the product) to only Rs 5.30 compared to the new par rate of Rs 7.5 ^{2/}.

11. Estimated costs of production per metric ton by major products are as follows: ^{3/}

<u>India 1969</u>	Unit: in US\$			(US\$ = 7.5 Indian Rupee)		
	<u>Batch Cost</u>	<u>Conversion Cost</u>	<u>Total Cost</u>	<u>Adjustment ^{4/}</u>	<u>Margin</u>	<u>Selling Price</u>
Hessian	180	121	301	+ 26	+ 19	346
Sacking	144	77	221	-	+ 13	234
Carpet Backing	275	156	431	+ 80	+123	634
<u>Pakistan 1969</u>	Unit: in US\$			(US\$ = 4.8 Pakistan Rupee)		
Hessian	170	194	364	-124	+ 97	337
Sacking	126	137	263	- 89	+ 50	224
Carpet Backing	Data not available but estimated to be below India's selling price					

This table shows that not only can Pakistani exporters quote systematically lower prices than Indian exporters for goods of comparable quality, but at the same time work with a much higher margin. This systematic pricing policy of Pakistan has reduced India to the position of a residual supplier, which can sell only when Pakistan has no more goods to supply. Moreover, in India itself, jute manufacturers of sacking and hessian are not allowed to export at prices lower than those prevailing in the domestic market: this policy may prevent underinvoicing, but is, undoubtedly inimical to exports. This limitation does not apply to carpet backing, since the domestic market for this commodity is insignificant.

12. Except in the case of sacking, where there is stiff competition among the Pakistani exporters themselves, with the result that prices have sometimes been 20 to 30 percent lower than Indian quotations, Pakistani manu-

^{1/} In February 1965, the Government began granting tax credit certificates equal to 2% of the value of jute goods exported. In October 1965 the rate of tax credit on export of carpet backing was raised to 5%. These certificates were roughly worth twice their nominal rate.

^{2/} See B. Varon in Indian Export of Jute Manufactures, page 26, IBRD. Ec 168.

^{3/} Source: Survey of India's export potential of jute and jute products. Administrative Staff College of India, Hyderabad (January 1970).

^{4/} Adjustment includes export duty or bonus voucher where applicable.

facturers consistently match India's quotation minus a reduction by 2 to 5 percent. Moreover, Pakistan's goods are of fully acceptable quality.^{1/} There is also a more direct contact with importers and end-users. Pakistan has a faster system than India for dealing with claims: 1 month instead of up to one year in case of India.^{2/}

13. In the case of sacking, price differentials have been the following:^{3/}

F. O. B. Prices Prevailing in Export
Market for India and Pakistan

	Unit = (U.K. shilling)			
	<u>B. Twills per 100 Bags</u>		<u>Heavy lees per 100 Bags</u>	
	<u>India</u>	<u>Pakistan</u>	<u>India</u>	<u>Pakistan</u>
January 1968	227	193	227	193
April 1968	211	182	215	182
August 1968	247	175	247	175
December 1968	261	189	261	185
February 1969	284	178	284	178

As a result, India scarcely exports any more sacking. In 1957, India exported 430,000 tons, and in 1969 less than 50,000 tons. Except for a few specialized items like wool bagging to Australia, India exports sacking only to countries with which she has bilateral agreements, like USSR, UAR etc. All other markets have been practically lost. On the other hand, Pakistani exports increased from 60,000 tons in 1957 to 250,000 in 1969.

14. As we shall see later on, world demand for sacking is decreasing and this has led to overcapacity in Pakistan and in India. Indian capacities alone would be sufficient to take care of both the world consumption and the domestic consumption, which has increased steadily since 1956 from 150,000 to 330,000 tons in 1968. On the other hand, in planning the development of its sacking industry, Pakistan made an over-optimistic assessment of world demand, and over-invested heavily. For instance, in 1967, overproduction was such that competition between Pakistani exporters brought down the price of sacking to the price level of the raw jute. Since then Pakistan has been actively reorienting part of its sacking production capacities into production of hessian.

^{1/} Pakistani goods are on an average of the same quality as India goods. Pakistan has two main advantages over India: availability of raw jute of better quality and more modern equipment. On the other hand, India which has been engaged for a long time in manufacturing jute goods, has better expertise in managing the manufacturing process.

^{2/} Claims applied to less than one percentage point of total shipment.

^{3/} Source: Market information, Louis Dreyfus and Co. Jute Goods Market Report.

15. This new emphasis on production of hessian accordingly cut down the Indian export market for hessian. The following table will show how Pakistan systematically prices India out of the world market: ^{1/}

(Unit: U.K. shillings)

	Hessian per 100 yards 40" 10 ounces		Hessian per 100 yards 40" 7.5 ounces	
	<u>India</u>	<u>Pakistan</u>	<u>India</u>	<u>Pakistan</u>
January 1968	85/5	83/6	64	62
April 1968	9/8	76/6	54/8	57/6
August 1968	94/6	92	73/3	71/3
December 1968	108	109	82	82
February 1969	110	101	82/6	76

16. In 1957, India exported 400,000 tons of hessian and Pakistan 30,000 tons. In 1967, when Pakistan started investing heavily in hessian production, India was still exporting 380,000 tons, while Pakistan exported about 100,000 tons. Two years after, in 1969, Pakistan exported nearly 200,000 tons and Indian exports came down to about 250,000 tons. Pakistan has at present plans to increase its loom capacity substantially. Therefore, in a few years time, when Pakistan production would be enough to satisfy the entire world demand, India will be completely ousted from the world market except for a few specialized products and in the markets of centrally planned countries. The implication for the Indian industry will be much worse than in the case of sacking, because the rapidly growing home demand which increased from 22,000 tons in 1956 to 60,000 in 1968, is still very modest.

17. Perhaps the same story will occur in the case of jute carpet backings. In two years time, Pakistan capacity might be half Indian capacity and again India will become a residual supplier, who will export only after Pakistan has sold its entire production. Probably, the growth of world carpet backing requirements could have very easily accommodated production of both countries; unfortunately, the size of the carpet backing market is such and looks so promising that corporations in developed countries have tried and succeeded in developing synthetic substitutes. We will refer to this problem later on.

18. Under these circumstances the competition between India and Pakistan could become a very unhealthy one.^{2/} Jute and jute products account for 50 percent of total Pakistan exports and it is understandable that Pakistan wants to maximize its export earnings by selling processed products instead of raw

^{1/} Source: Market information, Louis Dreyfus and C. Jute Goods Market Report.

^{2/} We would like to stress again that up to now, competition from Pakistan has not prevented India exporting available jute goods. Exports have been limited only by the shortage of raw fibers.

jute, which increase at the same time income and job opportunities. To achieve this goal, Pakistan has devised an efficient scheme; however, the success of this scheme could be achieved in the near future at the cost of an equally poor country: India, whose jute exports account now for less than 16 percent of exports after having accounted for 32 percent in 1951. Against Pakistan's strategy, India is defenseless.

19. The G.O.I. has often been criticized for levying export duties on jute products; maybe the removal of these duties might have improved the profitability of the industry which has shown a steady decline for the last few years, but it must be realized that this would probably not have helped very much the export performance of sacking and hessian. For India to enter into a price war with Pakistan would be detrimental to her own interest. Except in sacking, India is, and will continue to be the price leader in the field of jute manufactures, as Pakistan quotes according to Indian prices. India's pricing policy should, therefore, be structured to meet the threat of synthetic and other substitutes rather than to attempt to win a higher market share from Pakistan through across-the-board price reductions.

III. WORLD DEMAND PROSPECTS: AN ASSESSMENT

20. As seen from tables VI, VII and VIII, world consumption of jute goods increased by 75 percent between 1937 and 1967, but international trade of jute goods scarcely increased. Therefore, most of the increase in consumption took place in producing countries, mainly in India and Mainland China, while consumption declined in non-producing Asian countries. Consumption in Latin America had increased from 1937 until 1965; rising most rapidly in the late 1950s. From a peak level of 220,000 tons in 1965, consumption had declined to a level of only 165,000 tons by 1967. This major decline has been due primarily to the bulk handling of wheat and sugar; furthermore, import requirements of those countries declined even more rapidly due to extensive usage of locally grown hard fibers for packaging. On the other hand, African countries increased their consumption from a level of 115,000 tons in 1937 to 180,000 tons by 1967.

21. Jute consumption in centrally planned countries of Europe was low in the 1950s but has doubled between 1955 and 1965. The growth in consumption in the U.S.S.R. has been extremely fast; from 103,000 tons in 1961 to 214,000 in 1967. The wide base of agricultural production in the U.S.S.R., together with the past relatively low consumption of jute goods, indicates a possibility of some increase, even a very large increase, if competition from synthetic materials comes slowly. (The latter is far from sure, since that country is interested in developing its petro-chemical industry.)

22. The centrally planned countries, both of Asia and Europe, have continued to contribute significantly to the total world consumption pattern. From a level of about 4 percent of world consumption in 1937, it has risen to a level of about 25 percent by 1967. The large consumption in the Peoples Republic of China is significant primarily in the global picture of world consumption as almost all of its production of fibers is consumed internally and is of little importance to world trade.

23. As far as the western developed countries are concerned, it should be noted that while they accounted for over 60 percent of world consumption in 1937 this percentage had declined to 39 percent by 1967.

24. Jute is a versatile fiber with many end-uses. However, its greatest use is concentrated in the realm of packaging and floor covering. World demand for sacking is decreasing, especially during the last few years: 1/ combined exports of Pakistan and India fell from 500,000 tons in 1957 to less than 300,000 tons in 1969. For the past 15 years, combined exports of hessian goods from Pakistan and India have remained even at around 500,000 tons per year.2/ The reasons behind the overall decline of demand for jute packaging material are well known:-

- i) bulk-handling in the U.S.A., Europe and Latin American countries;
- ii) tendency in certain countries, mainly in Africa and to a certain extent in Latin America, where it is possible to grow indigenous fiber, to meet requirements of packaging through indigenous production, even if it is not always economic to do so;
- iii) major inroads into the jute trade have been made in the developed countries both in paper and polyethylene. The movement towards smaller sized packages, the reluctance of laborers to handle heavy containers and consumer preference for attractive packaging have inhibited the use of jute as packaging in all but heavy duty items;
- iv) the long line of supply from Asia, the past indifference to normal trade procedures, erratic prices of jute and the relative cost of jute and other substitutes have encouraged this switch by end-users.

25. On the whole, it appears that world consumption of jute packaging materials will probably not change much in the coming few years, but exports are most likely to decrease. Decrease in demand from developed countries and Latin America will probably be offset by increased demand in Asia, chiefly in India and Mainland China, and to a lesser extent from the U.S.S.R.

26. India started exporting jute carpet backing in 1956 and the world demand for this commodity especially after 1965, increased in such a way, that India now exports 220,000 tons. 3/ Combined exports of India and

1/ See Table II in Annex.

2/ See Table III in Annex.

3/ We refer mostly to backing for tufted carpets. The status of jute in woven carpet backing is up to now apparently secure. But the importance of woven carpets is rapidly declining, because woven carpets are more than twice as expensive as tufted carpets. The present share of the carpet market is 5% for woven carpets and 95% for tufted carpets in quantity; in value the share is respectively 12 and 88%. Even in absolute terms, the production of woven carpets is expected to decline during the next few years.

Pakistan now amount to 250,000 tons. From 1965 to 1969 average yearly increase of exports has been 20 percent. The carpet backing market is expected to continue to grow at a rate of 15 to 20 percent a year in the developed countries. Unfortunately, for the jute producing countries, competition from synthetic backing is threatening their markets.

IV. COMPETITION FROM SYNTHETIC CARPET BACKING^{1/}

27. About five years ago, a U.S. firm started the production of man-made carpet backing; now about 10 firms have entered this line of production. Five years ago, jute had a near monopoly in the primary carpet backing market; in 1968 jute lost 16 percent of the market and now has lost a third of the market^{2/}, at a time when the supply of jute backing is plentiful. Over the years the quality of the man-made material has regularly improved so as to compare favorably with jute; competitiveness has also improved and now synthetic backing is less expensive than jute backing: 17 - 18 cents per square yard against 18.75 cents of jute. Five years ago, jute supplied 80 percent of the secondary backing market; now it accounts for 63 percent and most of the displacement took place during the first half of 1970. The reason behind this quick displacement is that rubber backing is becoming popular because it adheres well to the floor. Given the high cost of labor involved in fixing carpet with jute backing, the "do it yourself" rubber backing appeals to customers.

28. Because of its restrictive import policy, Europe is not a good market for jute goods. Except for a few quotes, the European industry mostly imports its raw jute from Pakistan and Thailand and processes its own end products. However for the last two years, raw jute requirements of the industry have been decreasing; in the UK, for instance, imports of raw jute averaged 40,000 tons a year during most of the 60s; in 1969, imports decreased to 34,000 and are not expected to be more than 27,000 tons in 1970. These decreasing requirements are due to two factors: demand for jute packaging materials continues to decline, while jute is rapidly losing its market to synthetic materials in carpet backing.

29. Jute manufacturers in Dundee have either partly or entirely shifted to the production of synthetic carpet backing^{3/}. In Germany, where demand for carpeting has increased from 15 million square meters in 1966 to 40 million square meters 1969 and in the Netherlands where the demand is now about 15 million square meters, the additional requirements for backing have not at all

1/ We refer mostly to backing for tufted carpets. The status of jute in woven carpet backing is up to now apparently secure. But the importance of woven carpets is rapidly declining, because woven carpets are more than twice as expensive as tufted carpets. The present share of the carpet market is 5 percent for woven carpets and 95 percent for tufted carpets in quantity; in value the share is respectively 12 and 88 percent. Even in absolute terms, the production of woven carpets is expected to decline during the next few years.

2/ See Table V in Annex.

3/ Demand for carpets in the U.K. is now about 65 million square meters a year

benefited jute; even in absolute terms, jute carpet backing production has decreased and according to the European Trade is bound to decrease further in the coming years. German and Dutch markets have grown sufficiently and are expected to continue to grow at such a rate (about 25 percent a year) that petrochemical corporations have inevitably been attracted. For instance, one big corporation has built up huge capacities^{1/} located near the Dutch-German border, to take care of the growing requirements of these two markets. In France, demand for carpets remains small (about 25 million square meters a year) and is not expected to increase in the next few years, due to the specific expenditure pattern prevailing in this country.

30. By and large, these developments in Europe will only partly affect exports from India, since this country sells only comparatively small quantities of jute goods (about 45,000 tons in 1968)^{2/}, but it will certainly affect exports of raw jute from Pakistan.

31. In the U.S. demand for carpet backing is expected to continue to rise at 12 to 15 percent per annum. The slowdown in the economy, and especially in the housing sector, may temporarily affect this growth in demand, but on an average this increase is expected to be sustained in the long run. Moreover the extreme mobility of U.S. citizens increases the rate of replacement and there is a huge reservoir of potential demand (schools, commercial establishments, churches etc.). At present, the carpet backing market is valued at about U.S. \$250 million a year and by 1975 this amount may have doubled^{3/}.

32. To assess the likely share of jute in the carpet backing market in the U.S. is a difficult task. There are obviously three possibilities:

- i) synthetic carpet backing will come in addition to jute backing, and both will grow more or less simultaneously;
- ii) synthetic carpet backing will grow rapidly but will leave some market to jute, which will have to be shared between Pakistan and India;
- iii) synthetics will gradually take over most of the carpet backing market.

Consumer Reaction.

33. A carpet with a synthetic backing is much lighter and may have a different feel from a jute backed carpet, especially if there is no secondary jute backing^{4/}. Until recently, it was thought that the lack of consumer acceptance might confine the use of synthetic to primary backing; however, the recent

^{1/} For the production of polyester carpet backing.

^{2/} See Table XI.

^{3/} The tufted carpet industry now ranks 10th in the U.S.

^{4/} 90 percent of carpets manufactured in the U.S. have double-backing.

introduction of high density rubber in secondary backing, which allows the private customer himself to fix the carpet on the floor has become popular. Moreover, it is quite possible that synthetic producers will improve their product to market competitively with jute in terms of performance in secondary carpet backing. There is no reason to believe that consumer reluctance will restrict the use of synthetic backing, if the price is attractive and the performance comparable with jute.

Dealer Reaction.

34. Dealers have obviously no specific preference. They will behave according to consumer reaction and they will obviously have to sell what the carpet manufacturers produce, which in turn would be determined by consumer preferences. Nevertheless, the marketing conditions prevailing in the U.S. market make it possible to a certain extent for manufacturers to influence the taste of consumers and overcome reluctance on their part.

Synthetics Manufacturers' Strategy.

35. Nothing precise is known about the past or future investment plans of the petro-chemical complexes regarding production of polypropylene. It is even more difficult to isolate in a plant what part of the production is utilized for the manufacture of carpet backing and for other purposes. It is nevertheless thought that capacity utilization of equipment for carpet backing production is far from complete. It is estimated by the trade that only 30 to 35 percent of U.S. capacity is utilized. There are at present about five major and seven medium sized producers: total capacity is probably around 1 billion square yards of carpet backing, out of which about one half can only be utilized for the production of carpet backing, while the other half can be diverted for the production of other goods. Despite his low utilization of carpet backing capacities, one major producer is contemplating substantial additional investments for production of carpet backing, which clearly indicates the optimistic assessment made by polypropylene producers regarding the development of the demand for synthetic carpet backing.

36. The price of synthetic backing is now slightly lower than that of jute backing. It is likely that with better capacity utilization and technical improvement, prices will continue to decline.

37. Generally speaking, the costs of the woven polyolefin tape product tend to be lower than those of other woven fabrics due to four factors:

- a) raw material costs are low and tend to decline over the longer term due to processing experience, technical innovation and economies of large-scale production;
- b) the tape is produced by extrusion, and therefore eliminates the need for all the extensive pre-spinning and spinning operations which are required for jute;

- c) being a tape, its area of coverage in a woven fabric is greater than that of a fiber. As well as technical advantages in particular end-uses this means that less raw material is needed to produce the woven fabric, with consequent savings in raw material costs;
- d) the tape has considerably greater tensile strength than jute and can therefore be woven on higher speed looms, so that the output of woven cloth in any given period is greater than for jute.

38. Synthetics manufacturers built part of their capacities to fulfill contracts with the U.S. Administration regarding the supply of sandbags for U.S. forces in Vietnam. With the de-escalation policy, these capacities have been freed for other production, like carpet backing, at the end of 1968. Fortunately for the manufacturers, the longshoremen's extended strike in the fall of 1968 on the eastern seaboard of the U.S. completely disrupted the supply from Pakistan and India: within three months, polypropylene fabrics in the use of primary backing increased from 16 to 30 percent.

39. If the recent strikes of jute workers and dockers in Calcutta have not led to more substantial inroads by synthetics, it is only because there was a slowdown in the market and a resultant oversupply situation in both synthetic and jute backing. However one can be sure that if the market had been booming, one would have witnessed a very substantial increase in the share of the synthetics in the market. Nevertheless, it is alarming for the jute producers, that during the first half of 1970, at a time when supply of jute backing was plentiful, the market share of jute declined from 69 percent to 61 percent in primary backing and from over 76 percent to 63.0 percent in secondary backing.^{1/}

40. It is obvious that the strategy of U.S. business is to take over a \$250 million or so market, which is moreover expected to double every five years. Synthetics manufacturers are systematically hiring people from the jute business in the U.S. or elsewhere when they have extended connections in the carpet backing business; above all, they have huge resources at their disposal to achieve their goals. The apparent U.S. business strategy is to take advantage of every favorable situation (strikes in India, in Pakistan or in the U.S.) and especially of any "faux pas" of their jute competitors.

Carpet Manufacturers' motivations.

41. A carpet manufacturer is faced with stiff competition within the U.S. market, therefore he tends to try to minimize inventory costs and to rely on regular supply at regular prices. The long supply lines aggravated by the closure of the Suez Canal between Asia and the U.S. market have caused a problem

^{1/} See Table IX.

in disruption of supply, arising both from jute crop patterns in Asia, the fluctuations in the price of jute and labor unrest in producing countries. Moreover, the carpet manufacturer sees that production of raw jute is stagnant and is not likely to increase in the future: in the long run, jute carpet backing will cease to be able to take care of the growing requirements of the carpet market. Above all, the carpet manufacturer is told of the growing political uncertainty in both West Bengal and East Pakistan with recurrent strikes by the workers and/or the dockers, capital flight out of Calcutta, etc. All these factors threaten his sources of supply and he is naturally inclined to look elsewhere for alternative supplies of suitable carpet backing materials, most notably, products offered by synthetic companies. Moreover, this line of supply is next door, thus by-passing another hazard - dock strikes in the U.S., which the carpet manufacturers had to face in the fall of 1968.

Jute Producer's Possible Strategy

42. To remove the legitimate fears of the carpet manufacturers, jute producing countries have to devise a price policy, which will prevent the price of the commodity from fluctuating too widely; similarly they should build sufficient inventories in the U.S. in order to prevent any disruption of supplies. To counteract the synthetics manufacturers' strategy, jute producing countries must avoid any "faux pas". An example is the Indian export duty on jute carpet backing. These duties bring a significant amount to the exchequer and probably do not increase very much the price of the final carpet. But the psychological impact is more powerful than is usually thought: carpet manufacturers consider such export duties as an arbitrary "monopoly tax", and resent it as such, even if the reasons for them are completely different in nature. Bureaucratic procedures must also be simplified ^{1/}. Some quarters also have advocated some drastic cut in the price of jute carpet backing in order to prevent any further building of capacity by the propylene manufacturers, by making new investments in synthetics unprofitable ^{2/}. Such a step would be extremely difficult to implement and might lead to retaliation by manufacturers of synthetics.

43. Stabilization of prices, and building up of inventories in the U.S. market for jute backing would preferably require a common policy of both Pakistan and India ^{3/}. But given the present relations between the two countries, it will not be an easy task. Moreover, to be effective, this kind of arrangement has to come about quickly. Nevertheless, India who is by far the largest producer of jute backing could go along with such a scheme. Its implementation would of course imply a complete change in the structure of the economy of the jute industry.

^{1/} Examples of bureaucratic red tape: i) for some reasons, since January 1970, Indian manufacturers have not been able to pay their membership dues to the "U.S. Jute Carpet Backing Association", which is a powerful organization trying to resist inroads by synthetic. ii) Detroit produces ten million cars a year and each car requires five yards of burlap; for four months in 1969, shipments of this commodity have been held up by the customs in Calcutta, after discovering that jute exporters have tried to by-pass the spirit of the law and sent the first shipments of these goods without paying export duties. This was obviously an internal matter to be solved internally and importers were not at all concerned. This experience has not been forgotten by the automobile industry or by the synthetics manufacturers.

^{2/} The F.A.O. in its Commodity Bulletin Series, "Impact of Synthetics on Jute and Allied Fibers" (Rome 1969), advocated a price reduction of the order of 40 percent.

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43. Stabilization of prices, and building up of inventories in the U.S. market for jute backing would preferably require a common policy of both Pakistan and India ^{3/}. But given the present relations between the two countries, it will not be an easy task. Moreover, to be effective, this kind of arrangement has to come about quickly. Nevertheless, India who is by far the largest producer of jute backing could go along with such a scheme. Its implementation would of course imply a complete change in the structure of the economy of the jute industry.

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44. We have no absolute evidence that if nothing is done, jute would be more or less completely displaced from the carpet backing market: it is, nevertheless, our conviction based on the numerous contacts we had with the trade in India, in the U.S. and in Europe.

45. New end-uses for jute can of course be found, but at present they have little prospects. Indian exporters are for instance investigating the way jute could share a small part of the \$4 billion curtain and wall-covering U.S. market. Technical problems have been solved; ten mills in India have been set up or are being set up to take care of this market, but the marketing policy has not yet been decided. If successful, India exporters hope to catch one percent of the market, i.e. \$40 million at the retail level, which could mean an additional export of \$15 million for India. Some other uses could certainly be found, but on the whole these additional exports would not offset the decrease in exports of jute backing, if synthetics displace jute in the backing market.

V. CONCLUSIONS

46. The 1969-70 offtake of jute goods from India was U.S. \$288 million in 1969-70. The long-term position of jute is dismal. It is losing rapidly in sacking to woven polypropylene, paper and bulk handling: moreover India has been priced out of the external markets by Pakistan, except in the markets with which India has bilateral arrangements.

47. Packing materials are becoming more and more sophisticated to compete with hessian and here again India is going gradually to lose her external markets to Pakistan.

48. The growth in the industry has been in yarn and carpet backing cloth sustained by the U.S. tufted carpet boom and housing demand. Here again, Pakistani competition may be felt very soon; the most dangerous threat is however the growing and successful competition of woven polypropylene backing in primary backing and of other materials in secondary backing.

49. To retain a substantial share of the market, jute producing countries must cut their prices and fix them on a long term basis, because a fluctuating commodity will never be able to compete lastingly with a commodity whose prices are stable and might even decrease. Moreover, exporting countries must build up an adequate buffer stock in the U.S. so as to prevent any disruption of supply.

50. To implement such a scheme would be extremely difficult and costly; moreover it has to be implemented urgently before it is too late.

51. In developed countries and in Latin America demand for jute goods is bound to decrease; in Africa, the setting up of factories for processing local fibers will accordingly reduce requirements for imports; most of the increase in consumption will take place in Asia, chiefly in India. The U.S.S.R. is an unknown market but there is now no reason to believe that its import requirements would not increase.

52. By and large the situation is uncertain. In quantity, Indian exports have decreased considerably for the last five years; in terms of value, however, exports remained at a yearly average of \$300 million, because of the exports of more valuable commodities. Unfortunately, present developments lead one to believe that Indian exports, in value and quantity, are likely to decrease and might do so very sharply, if necessary steps are not taken in an urgent manner.

53. Even if adequate measures are successfully implemented by Asian producing countries it nevertheless appears that Indian and Pakistani programs regarding the future development of jute production and jute industry must probably be reviewed in the light of these new developments in the world market. If no adjustments are made to take them into account, there is a real danger of seeing scarce investment resources misdirected.

November 3, 1970

TABLE I

PRODUCTION OF JUTE AND MESTA IN INDIA

(in Million bales)

	1949/50	1955/56	1960/61	1961/62	1962/63	1963/64	1964/65	1965/66	1966/67	1967/68	1968/69	1969/70 ^{1/}
Jute	3.30	4.48	4.13	6.36	5.44	6.08	6.01	4.47	5.36	6.32	3.05	5.61
Mesta	<u>0.67</u>	<u>1.17</u>	<u>1.13</u>	<u>1.88</u>	<u>1.74</u>	<u>1.90</u>	<u>1.60</u>	<u>1.29</u>	<u>1.22</u>	<u>1.27</u>	<u>0.91</u>	<u>1.14</u>
Total	3.97	5.65	5.26	8.24	7.18	7.98	7.61	5.76	6.58	7.59	3.96	6.75

Source: Economic Survey 1969-70.

Note: These figures differ slightly from those published by IJMA, because the coverage and the period are different.

^{1/} Source: Official estimates of the Ministry of Food and Agriculture.

TABLE II

EXPORT OF SACKING FROM INDIA
AND PAKISTAN

(000 tons)

Year	India (1)	Pakistan (2)	Total (1)+(2) (3)	Indian share (1)/(3) (4) in %
1957	429.7	60.4	490.1	87
1958	345.8	78.5	424.3	81
1959	354.6	135.7	490.3	72
1960	312.9	123.8	436.7	71
1961	283.7	140.2	423.9	67
1962	292.2	164.5	456.7	64
1963	242.6	157.5	400.1	60
1964	234.9	157.6	392.5	60
1965	283.5	181.1	464.6	61
1966	173.3	234.6	407.9	42
1967	185.5	232.9	418.4	43
1968	93.6	242.7	336.3	28
1969	48.2	248.2	296.4	16

Sources: DCI&S - Calcutta
Pakistan Jute Mills Association

TABLE III

EXPORT OF HESSIAN FROM
INDIA AND PAKISTAN

(000 tons)

Year	India (1)	Pakistan (2)	Total (1)+(2) (3)	Indian Share (1)/(3) (4) in %
1957	399.1	29.7	428.8	93
1958	399.4	36.9	436.3	91
1959	430.5	50.7	481.2	89
1960	391.4	61.9	453.3	86
1961	357.9	61.4	419.3	85
1962	457.4	65.7	523.1	87
1963	463.8	71.4	535.2	86
1964	487.8	66.8	554.6	88
1965	448.1	79.5	527.6	85
1966	372.8	95.9	468.7	79
1967	382.3	103.0	485.3	78
1968	338.2	155.2	493.4	68
1969	251.7	195.2	446.9	56

Sources: DCI&S - Calcutta
Pakistan Jute Mills Association

TABLE IV

EXPORTS OF CARPET BACKINGS
FROM INDIA AND PAKISTAN

(000 tons)

Year	India (1)	Pakistan ^{1/} (2)	Total (1)+(2) (3)	Indian Share (1)/(3) (4) in %
1957	8.0	neg	8.0	100
1958	19.2	"	19.2	100
1959	30.1	"	30.1	100
1960	35.3	"	35.3	100
1961	41.6	"	41.6	100
1962	57.7	"	57.7	100
1963	88.3	"	88.3	100
1964	106.6	1.2	107.8	99
1965	100.0	6.5	106.5	94
1966	131.5	13.2	144.7	90
1967	141.6	19.4	161.0	87
1968	179.8	25.0	204.8	87
1969	219.3	29.2	248.5	88

1/ Except for 1969, refers to the jute year (July-June)

Sources: DCI&S - Calcutta
Pakistan Jute Mills Association

TABLE V

EXPORTS OF JUTE GOODS
FROM INDIA AND PAKISTAN

(000 tons)

Year	India (1)	Pakistan (2)	Total (1)+(2) (3)	Indian Share (1)/(3) (4) in %
1957	873.5	90.4	963.9	90
1958	806.2	115.8	922.0	87
1959	874.0	188.4	1062.4	82
1960	810.4	190.7	1001.1	81
1961	759.8	204.9	964.7	79
1962	874.4	233.1	1107.5	79
1963	874.6	234.2	1108.8	79
1964	931.2	234.2	1165.4	80
1965	929.2	282.4	1211.6	77
1966	746.1	361.8	1107.9	67
1967	768.5	370.7	1139.2	67
1968	671.4	454.0	1125.4	59
1969	569.9	484.9	1054.8	54

Sources: DCI&S - Calcutta
Pakistan Jute Mills Association

TABLE VI

Apparent World Consumption of Jute
by Major Countries 1963 - 1967

(000 metric tons)

	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>	
1. <u>Developed</u>						
EEC	802	270	278	204	284	Goods only
UK	172	174	170	162	161	
Other Europe	139	118	120	129	119	Goods only
USA	464	497	470	460	425	Includes Raw Jute
Canada	48	47	45	50	51	
Japan	74	62	80	81	113	
Oceania	<u>125</u>	<u>127</u>	<u>133</u>	<u>105</u>	<u>116</u>	
Total Developed	1,324	1,295	1,296	1,271	1,269	
2. <u>Developing:</u>						
A. <u>Other</u>						
Latin America	233	234	220	178	165	
Near East	37	34	28	34	44	
Africa	273	295	347	285	283	
Other Asia	<u>145</u>	<u>152</u>	<u>158</u>	<u>127</u>	<u>129</u>	
Total	688	715	753	624	621	
B. <u>Asian Producing:</u>						
India	429	358	512	505	424	Includes village consumption
Pakistan	114	90	140	137	108	
Thailand	46	70	54	60	70	
Nepal	<u>2</u>	<u>3</u>	<u>3</u>	<u>3</u>	<u>3</u>	
Total	591	521	709	705	605	
Total Developing	1,279	1,236	1,462	1,329	1,226	
3. <u>Centrally Planned:</u>						
USSR/EE	223	330	299	323	315	
Asian	<u>394</u>	<u>463</u>	<u>508</u>	<u>530</u>	<u>558</u>	
Total Centrally Planned	607	792	807	853	873	
<hr/>						
Uncorr. Total Cons.	3,210	3,323	3,565	3,453	3,368	
4. <u>Adjustments</u>						
Raw Jute EEC	+ 28	+ 45	+ 34	+ 41	+ 50	
Raw Jute:Other & Eur.	+ 10	+ 10	+ 10	+ 10	+ 10	
Waste (3%)	+ 95	+100	+105	+105	+100	
Total Corrected Cons.	<u>3,343</u>	<u>3,478</u>	<u>3,714</u>	<u>3,609</u>	<u>3,528</u>	

Source: Derived from FAO and country statistics including Industrial Fibres and European Jute Industries Statistics.

TABLE VII

Apparent World Consumption of Jute Goods by Areas: 1937 - 1967

(000 metric tons)

	<u>1937</u>	<u>%</u>	<u>Average</u> <u>1948-53</u>	<u>Average</u> <u>1954-59</u>	<u>63</u>	<u>%</u>	<u>64</u>	<u>65</u>	<u>66</u>	<u>%</u>	<u>67</u>	<u>%</u>
1. Developed	1253	(60)	926	1,138	1,324	(43)	1,295	1,296	1,271	(40)	1,269	(39)
2. Centrally Planned	85	(4)	230	384	607	(18)	792	807	853	(23)	873	(25)
3. Developing, as subdivided below:	678	(36)	722	900	1,279	(39)	1,236	1,462	1,329	(37)	1,226	(36)
Asia/Near East	360	(21)	387	518	<u>61-63 Avg.</u> 704 (24)		<u>64-66 Avg.</u> 819 (24)				778	(23)
Africa	115	(5)	131	150	197	(7)		244	(7)		283	(8)
Latin America	203	(10)	204	232	228	(8)		211	(6)		165	(5)
World Total	2,016		1,878	2,422	3,210		3,323	3,565	3,453		3,368	
Corrected Consumption					3,343		3,478	3,714	3,609		3,528	

Source: Derived from FAO and country statistics: data from year to year are not strictly comparable as there are often omissions in reporting wastage, stock holdings and raw jute consumed other than goods. The corrected consumption from 1963-1967 includes most of these factors and is comparable.

TABLE VIII

World Imports and Exports of Jute Goods

(000 metric tons)

	1937 %	1948-53 Average %	1954-59 Average %	1961-63 Average %	1964-66 Average %	1967 %
<u>IMPORTS</u>						
Developed Countries	689 (59)	500 (56)	579 (56)	758 (62)	848 (60)	864 (65)
Developing Countries	474 (40)	379 (42)	417 (41)	404 (33)	419 (29)	297 (23)
<u>1/ Centrally Planned</u>	<u>8 (1)</u>	<u>15 (2)</u>	<u>30 (3)</u>	<u>56 (5)</u>	<u>162 (11)</u>	<u>171 (12)</u>
Total Trade	1,171	894	1,026	1,218	1,429	1,332
<u>EXPORTS</u>						
India	1,029	815	859	865	928	769
Pakistan	-	-	78	227	289	383
Belgium	30	44	57	59	69	71
France	11	18	25	18	18	17
Portugal	-	-	1	5	15	14
UK	55	26	25	22	17	12
Other Europe	29	30	29	20	25	26
Rest of World	<u>49</u>	<u>24</u>	<u>41</u>	<u>34</u>	<u>48</u>	<u>38</u>
Total Trade	1,203	957	1,115	1,250	1,409	1,330

1/ Primarily USSR/EE until 1960s. Asian Centrally Planned trade insignificant.

Source: FAO 1969

TABLE IX

Consumption of Carpet Backing
(in millions of square yards)

	<u>First Quarter 1969</u>	<u>Second Quarter 1969</u>	<u>Third Quarter 1969</u>	<u>Fourth Quarter 1969</u>	<u>First Quarter 1970</u>	<u>Second Quarter 1970</u>
Primary Jute	109	117	109	126	110	112
Secondary Jute	73	77	72	87	73	68
TOTAL	200	294	210	241	208	213
Jute	143	169	149	174	139	131

Percentage-wise Use of Backing, in 1968, 1969
and the First Two Quarters of 1970

	<u>1968</u>	<u>First Quarter 1969</u>	<u>Second Quarter 1969</u>	<u>Third Quarter 1969</u>	<u>Fourth Quarter 1969</u>	<u>First Quarter 1970</u>	<u>Second Quarter 1970</u>
<u>Primary Jute</u>	80.4	67.4	65.8	65.7	69.0	65.0	61.1
Cotton	1.9	1.4	1.6	1.6	n.a.	n.a.	n.a.
Manmade	16.0	28.6	30.7	30.3	29.9	30.5	32.8
Others	1.7	2.6	1.9	2.4	n.a.	n.a.	n.a.
<u>Secondary Jute</u>	72.4	77.0	76.4	76.4	76.4	66.2	63.0
Foam H.D.R.	15.1	15.5	16.2	16.0	16.8	23.8	25.6
Other Foam Cushion - (Vinyl, etc.)	2.8	0.7	0.8	0.8	1.0	3.1	3.6
Other	9.7	6.8	6.6	6.8	5.8	7.0	7.8

Source: Current Industrial Reports - U.S. Department of Commerce - Bureau of the Census.

TABLE X
 PRODUCTION OF JUTE GOODS IN INDIA
 (000 metric tons)

(Calendar Year)

Year	Hessian	Sacking	Carpet Backing	Cotton Bagging	Others	Total	Equivalent Jute Consumption
							100,000 bales
1957	420.9	557.5			68.0	1,046.4	61.52
1958	413.6	591.7	5.1*	12.3	56.0	1,078.7	61.45
1959	465.2	511.9	16.3	25.1	50.0	1,068.5	61.27
1960	429.0	549.5	23.1	35.8	46.8	1,084.2	62.36
1961	355.7	483.7	27.3	41.6	62.0	970.3	54.58
1962	482.7	551.8	44.6	39.5	68.2	1,186.8	67.35
1963	528.6	507.1	87.5	42.9	70.1	1,236.2	71.01
1964	536.6	514.6	94.6	48.8	76.8	1,271.4	73.81
1965	529.4	590.5	96.9	51.2	67.3	1,335.3	76.31
1966	427.0	503.2	107.3	20.5	61.6	1,119.6	64.19
1967	463.6	481.3	124.1	16.1	71.3	1,156.4	66.09
1968	398.0	427.2	170.6	18.5	70.6	1,084.9	62.75
1969	287.1	306.9	228.7	22.6	48.3	893.6	51.48

Source: Annual summary of Jute and Gunny Statistics - Indian Jute Mills

* 9 months

TABLE XI

EXPORT OF JUTE GOODS FROM INDIA BY COUNTRIES(000 metric tons)
(calendar year)

<u>HESSIAN</u>	<u>1956</u>	<u>1957</u>	<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>
U.K.	47.9	25.2	41.1	38.1	39.0	23.6	34.6	28.2
Rest of Europe	4.9	17.3	33.9	43.4	48.4	61.0	70.9	) 101.0
Near East	-	4.8	3.0	4.5	5.5	5.0	11.6	
Far East	4.7	8.7	8.5	12.8	17.4	5.3	5.7	7.6
Africa	9.8	23.4	13.7	19.1	21.9	23.2	25.1	22.4
U.S.A.	193.6	186.3	183.0	208.5	182.5	192.1	229.3	248.4
Canada	35.9	33.1	37.0	40.1	39.7	36.3	47.7	51.6
Argentina	36.4	65.3	62.7	52.3	35.5	13.0	45.6	42.9
Rest of America	11.5	15.6	11.8	15.5	10.2	14.5	15.8	17.2
Australia	13.9	16.6	15.1	15.8	16.6	14.7	16.5	19.7
New Zealand	3.0	6.2	6.1	4.4	4.5	3.8	4.1	4.4
Others	<u>47.5</u>	<u>4.6</u>	<u>2.7</u>	<u>6.1</u>	<u>5.5</u>	<u>7.0</u>	<u>8.2</u>	<u>8.7</u>
TOTAL HESSIAN	409.1	407.1	418.6	460.6	426.7	399.5	515.1	552.1
<hr/>								
<u>SACKING</u>								
U.K.	13.5	10.9	13.6	13.0	11.0	8.8	6.9	8.1
Rest of Europe	10.2	8.0	13.3	15.1	17.2	17.2	22.6	) 29.9
Near East	5.8	3.0	2.0	7.2	4.2	0.8	8.3	
Far East	78.7	92.3	58.1	119.9	79.1	47.2	53.9	30.1
Africa	81.9	113.9	85.8	64.2	60.9	84.6	91.1	54.5
U.S.A.	1.9	9.7	5.5	7.9	7.5	7.0	8.4	5.3
Canada	-	0.2	0.1	0.2	0.1	-	-	0.1
Argentina	-	2.3	1.9	2.0	2.3	1.2	1.0	0.5
Rest of America	68.3	80.2	64.3	45.3	52.8	57.2	41.4	46.5
Australia	93.6	82.7	67.5	57.4	57.4	36.6	38.7	33.4
New Zealand	10.3	10.9	13.5	10.9	12.5	11.7	9.2	10.1
Others	<u>51.3</u>	<u>15.6</u>	<u>20.2</u>	<u>11.5</u>	<u>7.9</u>	<u>11.4</u>	<u>10.7</u>	<u>24.1</u>
TOTAL SACKING	415.5	429.7	345.8	354.6	312.9	283.7	292.2	242.6
<hr/>								
ALL JUTE MANUFACTURES	876.8	873.5	806.2	874.0	810.4	759.8	874.4	874.6
<hr/>								

EXPORT OF JUTE GOODS FROM INDIA BY COUNTRIES

TABLE XI
(continued)

(000 metric tons)
(calendar year)

<u>HESSIAN</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>			
U.K.	28.2	37.0	27.6	19.2	29.0	18.8			
Rest of W. Europe	45.9	18.7	19.0	10.2	18.5	23.4			
U.S.S.R.	41.9	76.2	73.1	57.8	54.6	58.5			
Rest of E. Europe	13.2	17.4	19.2	19.1	20.3	18.0			
Far East	7.6	12.4	9.6	3.1	5.4	6.5			
Africa	22.4	28.7	39.6	18.9	20.0	16.4			
U.S.A.	248.4	256.0	242.8	154.0	149.6	123.0			
Canada	51.6	44.9	45.8	37.7	36.7	32.1			
Argentina	42.9	62.1	20.9	4.5	2.4	1.6			
Rest of America	17.2	16.0	15.8	13.6	8.4	7.2			
Australia	19.7	18.9	21.2	17.3	22.9	21.2			
New Zealand	4.4	3.7	5.5	3.8	4.4	3.9			
Others	8.7	2.4	8.0	13.6	10.1	7.6			
TOTAL HESSIAN	552.1	594.4	548.1	372.8	382.3	338.2			
							<u>CARPET BACKING</u>		
<u>SACKING</u>							<u>1966</u>	<u>1967</u>	<u>1968</u>
U.K.	8.1	9.7	5.6	2.8	4.4	0.9	0.5	1.1	0.2
Rest of W. Europe	21.8	8.5	8.5	4.0	7.5	1.2	1.8	5.7	6.9
U.S.S.R.	2.3	28.5	39.5	58.4	67.2	45.1	0.1	-	-
Rest of E. Europe	5.8	6.9	11.6	11.8	14.9	2.6	0.3	0.6	1.1
Far East	30.1	41.4	30.0	7.2	12.3	6.2	-	0.2	3.0
Africa	54.5	55.5	95.0	47.0	35.8	13.4	0.3	0.6	0.2
U.S.A.	5.3	2.9	6.0	4.9	3.4	3.1	117.7	121.6	152.0
Canada	0.1	0.1	-	-	-	-	7.4	7.4	10.6
Argentina	0.5	1.2	0.8	0.1	0.1	-	-	-	-
Rest of America	46.5	17.4	25.6	7.1	3.6	1.3	0.2	0.3	0.7
Australia	33.4	36.6	37.0	16.4	21.0	12.9	2.1	3.1	3.6
New Zealand	10.1	9.0	14.2	6.6	5.7	1.0	1.0	1.0	1.4
Others	24.1	17.2	9.7	7.0	9.6	5.9	0.1	-	0.1
TOTAL SACKING	242.6	234.9	283.5	173.3	185.5	93.6	131.5	141.6	179.8
ALL JUTE MANUFACTURES	874.6	931.2	929.2	746.1	768.5	671.4			

Source: I.J.M.A., Calcutta

RESTRICTED

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INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT
INTERNATIONAL DEVELOPMENT ASSOCIATION

EXPORTS OF MARINE PRODUCTS

INDIA

May 27, 1971

South Asia Department

INDIA

EXPORTS OF MARINE PRODUCTS

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This report is based on the findings of a mission composed of Messrs. Christian Ladonne and Alberto de Capitani which visited India and European cities in June/July, 1970.

INDIA

EXPORTS OF MARINE PRODUCTS

SUMMARY

1. India's fisheries, the eighth largest in the world, are characterized by small coastal fishing vessels and traditional fishing practices. Development is under way, however, and India's fishing industry faces in the long run both a challenging and a promising future.
2. One of the most significant developments in Indian fisheries has been the unquestionable success of India's shrimp industry in moving dynamically into major world markets. In 1951 the first freezing plant was opened in Cochin; commercial shipments began in 1953, with 13 tons of exports; by 1965, India had become the second largest exporter of shrimp to the United States, and it has since maintained the position. In 1969, exports of shrimps amounted to about 24,000 tons. From US\$5 million in 1951, export earnings of marine products rose to US\$44 million in 1969. This spectacular development took place mostly thanks to the initiative of small entrepreneurs.
3. The shrimp market is a seller's market and the imbalance between supply and demand is expected to worsen in the coming decade to the benefit of producing countries. For the time being, India exploits only a fringe of her tremendous natural resources potential. In the coming five years, increase in production will come mostly through more intensive exploitation of the eastern coastal waters, as the southwestern coast is now fully exploited and probably overfished. However, off-shore fishing development, as contemplated by the Fourth Five Year Plan, will probably not materialize because it requires different sets of measures, like the building of infrastructure, availability of adequate financing for purchase of trawlers, training of crews, the choice of an adapted import policy, etc., which have to be defined in a comprehensive way. Nevertheless, it is expected that at least 30 big trawlers (up to 86 feet in length) operated by Indian and US Corporations will be commissioned during the Fourth Plan period.

I. INDIAN FISHERIES

1. From time immemorial, but in a very limited manner, India has been engaged in fishing along its 3500 mile-long coast. The world's oceans have an estimated fishery potential of 118 million tons against which the total marine catch in 1968 stood at 64.0 million tons. The average yield per square kilometer of the Atlantic, Pacific and Indian oceans has been placed at 0.17, 0.14 and 0.03 tons, respectively, during 1966/68.^{1/} The major reason for the low yield of the Indian Ocean has been ascribed to inadequate exploitation and fishing restricted to the inshore areas up to ten fathoms, ^{2/} instead of offshore and deep sea fishing beyond 10 fathoms and 40 fathoms, respectively.
2. With a labor force of over one million, India currently exploits only a small portion of the fishery potential of the Indian seas. Out of the present marine fish landings, estimated at over 1.5 million tons in 1968, about three-quarters are landed on the west coast of India, although investigations and studies have indicated vast potential on the east coast. Various exploratory surveys have revealed that a potential of 8 to 12 million tons exists in the Indian Ocean, including offshore and deep sea resources.
3. Whereas marine fish landings of the world have increased from 33.2 million tons in 1958 to 64.0 million tons in 1968 ^{3/} i.e. at a yearly growth rate of 6.9 percent, those of India increased at an annual ^{4/} rate of only 3.5 percent from 1.06 million tons to over 1.5 million tons. As mentioned earlier, the major factor responsible for the slower rate of increase has been under exploitation of the rich potential of the Indian seas and especially the offshore and deep sea regions of the Arabian sea and the Bay of Bengal, owing, among others, to meagre infrastructural arrangements, such as fishing harbors and landing and berthing facilities, non-availability of large fishing vessels for deep sea and high sea operations and lack of storage and processing capacity. The result of these poor environmental conditions is that not only are catches low, but the prices are extremely high, which limits the local demand to high-income groups and prices India out of the world market except for a few products like shrimps. For instance, there is a good world demand for canned tuna, which is already processed in India, but she cannot export this product because its price is three times the world market price. This is all the more unfortunate since the Indian Ocean is one of the few areas where tuna fishing could still be increased. **Another inhibiting factor is the high price of canning materials.**

^{1/} Source: Survey of India's export potential of Marine Products. Indian Institute of Foreign Trade (1970).

^{2/} A fathom is a unit of length equal to 6 feet used for measuring the depth of water.

^{3/} Source: Yearbook of Fishery Statistics - 1968 - FAO

^{4/} Source: Yearbook of Fishery Statistics - 1968 - FAO

4. An idea of the structure of the marine products industry in India as of 1968 can be had from the following estimates: 1/

<u>Fishing Fleet</u>	<u>Nos.</u>
Indigenous craft	94,000
Small mechanized boats (6m. to 12 m.)	7,600
Large vessels (13.0m to 27m)	49

Of these a large number of indigenous craft operate off the coast of Tamil Nadu (30,000), Andhra Pradesh (21,000), Kerala (22,600), and Maharashtra (8,300). The major concentration of small mechanized boats is, however, to be found on the coasts of Maharashtra (2,400), Gujarat (1,700), Kerala (1,700) and Tamil Nadu (1,000).

Processing Sector

	<u>Units</u>	<u>Annual installed capacity</u>
Freezing	48	59,000
Canning	42	11,440

Of the total freezing and canning capacity as much as 83 percent and 85 percent, respectively, is concentrated in Kerala. Of the 168 exporters, as many as 114 are also situated in Kerala. Ninety export firms in Kerala are responsible for 89 percent of the total seafood exports. Other centers of importance in respect of freezing, canning and exports are Bombay, Mangalore and Madras.

5. A rational exploitation of the huge potential of marine resources will undoubtedly take a very long time to materialize. Some limited progress has already taken place and in the few areas where the fishing industry has been properly organized, the economy of fishing villages has been drastically changed. However, the problems are of such a magnitude that an answer to them cannot be expected overnight. Gradual mechanization of the fleet, proper financing channels, construction of harbors, of storage and processing facilities and chiefly the training of a skilled manpower will certainly take quite a long time. It is all the more regrettable, because if the market was properly organized, demand for fish in India from a protein-hungry population could be tremendous, and the export potentials could be important.

1/ Survey of India's export potential of Marine Products IIFT.

6. Except for a very small part of the population which refuses to eat meat, and even eggs, there is absolutely no inhibition against fish eating. Marine fish are at present consumed in coastal areas, in urban centers and in "traditional" areas like Bengal. Nevertheless, fish is not an unknown product for people living in inland areas. Apart from rivers, there are 1.0 million hectares of cultivable water areas (village tanks and ponds), of which only 60 percent is utilized. At existing average yields, if the entire fresh water area was cultivated, the annual production would be of the order of 600,000 tons. If the reclaimable water areas (about 650,000 hectares) were also used, production could well exceed 1 million tons. With improved cultural practices, total yield could be over 5 million tons. 1/ Some panchayats in Andhra Pradesh, in Madhya Pradesh, and in Uttar Pradesh already derive most of their income from pisciculture. 2/ Under these circumstances it would not be difficult to create demand for marine fishes nearly everywhere in India, provided that a good market organization were to be set up and that the products were low-priced.

7. In addition, an organized fishing industry could greatly improve the economy of the fishermen who generally are extremely poor and indebted, and could provide job opportunities in a big way. But in India, resources are scarce and priorities numerous, so that the Fourth Plan, which is well aware of the huge potential benefits of the development of marine fisheries, could not allocate more than Rs 830 million as outlay on fisheries for the five year period.

8. If the general performance of the fishing industry appears to be poor and if its medium-term prospects are not too bright, there is however a success story, par excellence, to be told: that of the shrimp industry.

II. INDIAN SHRIMP INDUSTRY

9. Until the early 1950s India's surplus of shrimp was dried, salted or pickled and sold in nearby countries. It was in 1951 that the first freezing plant was opened in Cochin: it was a joint venture with a U.S. firm, which provided marketing facilities, but the capital was Indian. Commercial shipments began in 1953. Initial conditions were poor for the export trade; catches were spread over wide areas of coast, transport facilities to plants were poor, no electricity was available (refrigeration equipment was run with diesel engines), no trained employees were available, no suitable packaging material was available, and steamers with frozen food storage were few in number. Gradually plate freezers were installed, flake ice plants constructed, packaging improved and other problems overcome. In 1956 the big expansion occurred and several freezers began operations in the business.

1/ Source: Fisheries Development - FAO - Rome 1969.

2/ Source: International Conference on Investment in Fisheries - FAO

10. Fifteen years ago, India was not on the map in the international shrimp trade. Now India is the world's third largest producer of shrimps, exceeded only by the United States and Mexico. In 1967, India's catch represented over 12 percent of the world's shrimp catches. ^{1/} By 1965, India had become the second largest exporter of shrimp to the United States, after Mexico. In 1961, India provided 2.6 percent of the total United States import requirements; in 1969, despite the fact that United States requirements increased by over 50 percent, India supplied 18 percent of U.S imports. The most remarkable feature of this development is that it took place in a spontaneous manner with scarcely any concerted plans; still more remarkable, the Indian shrimp processing industry is still characterized by small independent firms.

11. The shrimp industry in India has thus been primarily a development operated by private capital and private initiative, without much government interference. However, the government has assisted the industry by waiving duties on essential import items needed to develop it. It also introduced quality control in the industry: preshipment inspection and approval by a government authority of all goods for export has been compulsory since early 1965, and this was a major step in the way to improve export performance. Moreover, in cooperation with the industry, the government formed the Marine Export Promotion Council, located in Ernakulam, Kerala. This organization promotes new markets, new products, and new processes for its members and represents the industry in its contacts with federal agencies

III. PRODUCTION PROBLEMS

12. Shrimping is done along all of India's coast. However, the lack of ports is a limiting factor in the growth of the industry in many areas. The major producing area is the southwestern coast. Cochin is the center of the industry. Other important areas on the west coast are Bombay and the Gulf of Kutch. The east coast shrimp industry, centered in the Visakhapatnam area, is not yet as important as the west coast fishery but has equal potential and is developing rapidly.

13. According to the central Marine Fisheries Research Institute, shrimp catches have increased very slowly since 1962. FAO statistics show a similar trend. However, as shown in the following table, export figures differ somewhat:

^{1/} Bureau of Commercial Fisheries - United States Department of Interior.

	<u>Shrimp landings</u> (in tons of life weight)		<u>Exports of Shrimps</u> <u>3/</u> (in tons of meat weight)
	<u>1/</u>	<u>2/</u>	
1960	70,600	---	4,200 (1958,FAO)
1961	62,800	---	---
1962	83,200	84,200	6,100
1963	81,600	83,600	8,000
1964	94,900	99,300	9,800
1965	77,300	82,000	9,800
1966	90,900	94,500	13,300
1967	91,600	99,400	14,800
1968	99,800	105,800	18,000
1969	n.a.	n.a.	24,000

14. It is probably difficult to accept the figures pertaining to shrimp landings at their face value, but one probably can more or less accept the trend they show. In 1962, figures of catches and exports strongly suggest that collection of shrimps for processing purposes was extremely poor and this situation prevailed up to 1966. However, the incentives provided by the devaluation of the rupee in June 1966 4/ brought a definite change. With the prospects of substantial profits on their export sales, processors did their best to improve the rate of collection by promoting better marketing facilities and by offering higher prices to fishermen. The result was that in 1965, exports represented scarcely one-fourth of total catches 5/ as recorded in the official statistics, and accounted for more than one-third in 1968. In 1969, this proportion has probably stepped up considerably (between 40 to 50 percent). How this rate of collection could be increased in the future is difficult to say. About a third of the shrimp catch has no commercial value; being very small crustaceans they are consumed in production centers. A part of the catch with commercial value is also either consumed on the spot for lack of processing units in the region, lack of coastal feeder roads and freeze trucks or is sent to urban centers where marketing facilities exist. However, in Kerala, where 80 to 85 percent of the industry is concentrated, the rate of collection cannot possibly be increased, except in a very marginal way.

1/ FAO Catch and Landing Statistics

2/ Central Marine Fisheries, Research Institute.

3/ D.G.C.I. and S - Calcutta.

4/ The Indian Rupee was devaluated by 57.5 percent, in terms of \$.

5/ The rate of conversion of life weight to processed shrimps is about 2 to 1.

15. There is, indeed, definite evidence that the upper limit of production from southwestern coastal waters - the main production center - has been reached. A downward trend in individual shrimp catches has been noticeable in Cochin since 1963, and this has created a steadily growing problem for processors and exporters. Many of the processing plants in Cochin are working at only 25 percent of capacity because of shortage of raw materials and processors are compelled to compete for the raw material by offering higher prices to the small fishermen^{1/}. This has led to an unhealthy multiplication of small boats. As a result, since 1963 the total catch has increased, but the catch per boat is falling. Moreover the size of shrimps caught is also decreasing, a sign that overfishing is probably leading operators to net them before they are fully grown. The cost of netting one kilogram of shrimp is rising to the point where the margin of profit for fishermen using traditional methods^{2/} could become very small.

16. In the Gulf of Kutch and Bombay coastal waters, shrimp catches and the rate of collection by the industry can be increased provided that enough processing plants are installed. Coastal waters centered around Visakhapatnam are becoming gradually more intensively exploited; processors are also starting to invest around Bhubaneswar. According to the trade, Andhra Pradesh and Orissa coastal waters have a potential equal to the Kerala waters. It is therefore likely that, in the coming few years, increases in production will come mostly from eastern coast. Again, the development which is taking place is a spontaneous one, resulting from the initiative of small private entrepreneurs.

17. Another source of supply, which is likely to slightly decrease in the future due to land reclamation, is shrimp fishing in the rice paddies. Pond shrimping and rice-paddy shrimp fishing are well developed in Kerala State, producing around 4,000 tons per year. About 11,000 acres are used for shrimping. Fields adjacent to the sea are the most productive, with an average shrimp yield of 460 kg per acre. Fields connected indirectly to the sea by the ponds are the least productive, 160 kg per acre. Rice paddy fields are filled with brackish water at high tides, the water containing a large number of shrimp eggs and larvae. These thrive in warm water and the rotting vegetation makes for good feeding. Upon reaching commercial size, usually in a few months, the sluice gates are opened and the shrimp netted in fine-meshed nets, as the water filters out.

^{1/} Most of the processing plants have their own fleet (generally a few mechanized boats, 32 feet long) which is, however, too small to meet their raw material requirements. They have therefore, also to rely on the catches of the small fishermen.

^{2/} In spite of the advance of mechanization in the last ten years (there are more than 1,200 motor-driven fishing boats operating from Cochin today against two or three in 1958 and the demand for more is ahead of supply), most of the 5,000 boats engaged in fishing at this center are dugout canoes or consist of three logs lashed together with rope, which cannot be mechanized. The rest are sailboats, some of which could take engines.

18. The shrimp belt now commonly fished is between 5 and 15 fathoms deep, but research carried out by the Indo-Norwegian fisheries development project has revealed large new grounds with seven different varieties, including rich resources of cold water or pink shrimp, which fetches a high price in the world market. But these grounds are beyond the reach of most of the vessels belonging to the Cochin fleet and ocean-going trawlers have, therefore, become an urgent necessity to keep the industry expanding. At present there are only 12 trawlers which operate both in deep waters and offshore. These trawlers belong to New India Fisheries, Ltd., an Indo-Japanese venture started in 1955. This firm in which the Taiyo Fishery Company of Japan has a 49 percent interest, is Cochin based. These trawlers, of Japanese make, can remain at sea up to 20 days at a time. Daily average shrimp catch is three-quarters of a ton but during the monsoon this goes up to two or three tons.

19. In the Fourth Five Year Plan, "it is proposed to introduce 300 fishing trawlers to be operated by private companies, cooperatives and State fisheries corporations. To assist this program, the Indian Development Bank of India has agreed to provide deferred payment facilities for the indigenous trawlers. Assistance will be available from Plan funds by way of subsidy towards the cost of such trawlers so that these are able to compete with imported trawlers" (Page 203, para. 8.41). Unfortunately, these dispositions do not generally please the prospective buyers for reasons explained hereafter.

20. Mechanized boats are locally produced, but building of trawlers, especially those of 72 feet of length, is a new activity for the Indian shipyards. Therefore, after lengthy discussions with the trade, the government has agreed to the import of trawlers, provided that for every three trawlers, one at least has to be Indian-made. Price of an imported trawler is about 800,000 rupees, but no special arrangements are now available to help the financing of imported trawlers and, being generally small entrepreneurs, prospective buyers find difficulties in securing loans from commercial banks, because they cannot offer enough collateral. Moreover, buyers would like to receive subsidies of no less than 25 percent of the price of imported trawlers. If there is no obvious reason why buyers should be subsidized, it is nevertheless true that financing facilities must be provided for the purchase of imported trawlers.

21. On the other hand, locally made trawlers^{1/} are costlier (1 million rupees than the imported one, but government subsidies will equalize the prices of both local and imported. However, despite adequate financing facilities, buyers are reluctant to pass orders to Indian shipyards, being afraid of delivery delays, inadequate plate freezers and, chiefly, of inefficient engines. Perhaps, most of the buyers' reluctance could be overcome by allowing, at least, imports of engines.

^{1/} The government assisted in the formation of two consortia: Western India Shipbuilders Consortium and Eastern India Shipbuilders Consortium.

22. Quality problems of locally made trawlers and financing problems for the imported boats are not the only ones which stand in the way of the Fourth Plan Program. At present, there is scarcely any skilled labor to operate a trawler and the training of such a labor force is time consuming. With the help of two vessels, a gift from Sweden, and under the supervision of a master fisherman from Iceland, whose services have been obtained from FAO, a training programme has been already underway for the last eighteen months. Nevertheless, at least at the start, most of the skippers and other technicians would have to be hired from abroad to train Indian skippers, mates, engine drivers, gear technicians, marine engineers, shore mechanics, wireless operators, etc. The idea is to "import" the crew along with the boat for at least a one year's training period. Up to now, nothing is known about the financing of such expensive schemes.

23. Another problem is the infrastructural environment. One of the major handicaps is undoubtedly the absence of ports and port facilities, ranging from repair shops and slipways to proper landing jetties, processing facilities and marketing arrangements. The need for fisheries harbors, with all their various ancillary services, was recognized at a very early stage of the modernization process in India's fisheries. The main problem is the early and efficient implementation of plans. The net results of partly internationally aided 1/ efforts in this field is that up to the end of 1968, eight fisheries harbors had been completed, 38 were under construction and an equal number had been selected for pre-investment surveys. It must be pointed out, however, that even for the existing fleet of mainly small mechanized boats, harbor and shore arrangements are still inadequate. Even in the few harbors where engineering work has been completed, repair facilities, supply of water and ice and also plants for handling and processing are either insufficient or dramatically lacking. In some cases where such facilities are available, there is insufficient coordination.

24. It therefore appears that the current development policies regarding the introduction of 300 trawlers are unlikely to materialize during the Fourth Plan period: inadequate financing, lack of trained manpower and poor infrastructure are not insurmountable problems, but it will take quite a time to overcome them. Existing facilities and work now in progress might nevertheless make possible the operation and the servicing of a small Cochin or Madras based fleet of trawlers during the Fourth Plan period. For the time being, since an individual buyer must at least order three trawlers (two imported plus one Indian-made) only big Corporations like Union Carbide India, Tata, etc.,... have shown interest in purchasing such trawlers. The GOI has already granted import licenses for 20 trawlers. Union Carbide India has already launched two U.S.-made trawlers (86 feet in length). It is therefore well possible that within the coming two years, 30 big trawlers might be in operation: this could mean an increase in exports of about 25% over the present level.

1/ Norway, Sweden, FAO, etc.

IV. EXPORTS

25. Shrimps are by far the leading fishery export for India, accounting for about 24,000 tons in 1969 or 80 percent of total fish exports in value. Total fish exports were valued at U.S. \$44 million in 1969, of which over U.S. \$38 million was shrimp.^{1/} The principal item is frozen shrimp,^{2/} amounting to 21,500 tons in 1969. Shipments to the United States took 71 percent of that total, but only 60 percent on the basis of value. Generally every U.S. importer has an agent in Cochin, whose main task is to assess the reliability of the firm in terms of financial soundness, quality of the end products, etc..., before the importer enters into a business relationship with it, but orders are passed directly by the importer to the processor. Shrimps are sold on a consignment basis and the exporter receives 80% of the value at the time of the shipment.^{3/} The U.S. market is a very interesting and convenient market since it can absorb all kinds of shrimp, including those of small size. On the contrary, Japan, which is taking an increasingly larger share of exports, purchases mostly jumbo shrimps; as a result India sold on the basis of quantity, 25 percent of her total exports to Japan, but 35 percent in terms of value. For the time being, the industry is not interested in developing new markets for frozen shrimp (except in Australia), because it cannot now fill the orders it gets through its foreign agents in the United States and Japan.

26. The trade in U.S. rates the quality of frozen shrimps from India as good and the quality is found to be improving over the years. Nevertheless a few Indian firms are still exporting products of uneven quality, which are partly responsible for the lesser price Indian shrimps of comparable category and grade are fetching in the U.S. market compared with say Mexican shrimps. The main reason is, however, that it takes a long time to build a reputation, and this applies also to countries like Thailand, Pakistan, Brazil^{4/}, etc.... There is no apparent reason to believe, as some Indian exporters do, that prices of Indian shrimps are artificially depressed by U.S. importers, which would take advantage of the fact that exports are made on consignment basis. We, at least, found no evidence of this.

^{1/} See in Annex Table I and Table II.

^{2/} See in Annex Table III.

^{3/} When for one reason or another, the price at which the U.S. importer sells shrimp falls below 80% of the price at the time of the order, the importer experiences difficulty in obtaining reimbursement of the difference from the exporter: this is at least the contention of one importer in the U.S.

^{4/} We have been told, that it took about 2 years of sustained effort for an outstanding Brazilian firm, processing lobster tails, to see the price offered for its products moving from the Brazilian average to the Mexican average.

27. U. S. importers would like to see exports of shrimps from India undertaken in a more regular and even manner, which implies the building up of inventories during the peak season for sale during the off-season. Under the present circumstance, the arrival of Indian shrimps in huge quantities in the U.S. at certain periods of the year is depressing the whole market.

28. There is also room for improvement in the packaging of Indian shrimps, in terms of quality and attractiveness. However, this problem is rather complex. If for instance, one Indian exporter is spending 3 more cents per package, he will not receive one more cent for its product, the price of which will be as quoted in the "green sheet" 1/; it may eventually take two or three years, before the consumers would be ready to pay a premium in addition to the "Indian" price, to get shrimp with this particular package.

29. Canned shrimp (U.S. \$3 million) are exported mostly to the U.K., the U.S. and France. Frozen lobster tails (U.S. \$1.5 million) are entirely exported to the U.S. Another relatively important export item is frozen froglegs. India started developing this industry about ten years ago and has now become the world's largest producer. A dozen or so of highly modern small plants have been set up around Cochin, Mangalore, Goa and Bombay, which process frogs caught during the previous night with the help of torches in surrounding marshlands. Exports of froglegs amounted over 850 tons in 1969 and were valued at U.S. \$1.5 million: major markets are the U.S., France and Belgium. India is also exporting a traditional item: dried fish, to Ceylon valued at from U.S. \$1.5 to \$2 million a year; following foreign exchange difficulties, Burma, another traditional importer of dried fish, stopped importing in 1962. 2/

30. The international shrimp market is a seller's market and will remain so in the future, as the catch rate is expected to remain behind the fast growing demand in high-income countries, especially in Japan and Western Europe, whose incomes have reached a level where the income elasticity of demand is probably the highest. 3/ Between 1958 and 1968, consumption in the U.S. nearly doubled: i.e. a yearly increase of about 7 percent. With the present reservoir of unfilled demand especially from medium income groups there is no reason to expect that the rate of consumption increase in the U.S. should slow down. There is also a distinct possibility that consumers

1/ Daily sheet published by the trade reflecting the market trend for shrimps, lobsters, etc..., originating from different countries.

2/ See in Annex Table IV.

3/ Between 1958 and 1968 total world consumption increased by 10 percent, while U.S. consumption increased by only 7 percent per year. In other words, developed countries other than U.S., increased their consumption by 26 percent per year during the past decade. Nevertheless, U.S. consumption during the first half of 1970 compared with the same period in 1969 increased by no less than 15 percent; supply was abundant and prices slightly lower.

demand might shift to higher quality products (i.e. large-size shrimps). The U.S. trade thinks that the prices of shrimps will continue to fluctuate sharply in the short run, but in the long run they will continue, as in the past, to show an upward trend.^{1/}

31. Between 1958 and 1968,^{2/} world production of crustaceans increased from 150,000 tons to 380,000 tons, i.e. by nearly 10 percent a year; during the same period, exports increased from 66,000 tons to 118,000 tons, i.e. by 6 percent a year, which implies that production increased faster in consuming countries than in exporting countries.^{3/} In terms of value, exports increased from U.S. \$87 to \$236 million, an increase of over 10.5% a year: in a decade, the per unit value of crustacean exports increased by 4.3% a year, but most of the increase in prices took place after 1965. Between 1965 and 1968, prices increased by about 8 percent a year, which clearly indicates that demand is accelerating at such a rate, that the imbalance between supply and demand is growing steadily. If we consider, the change in prices in the U.S. market in Indian shrimps, it appears that increase in prices are probably mostly due to the changing preference of consumers towards high quality products which are scarce. Jumbo shrimp prices increased by 13.3% a year between January 1966 and January 1969; medium-sized shrimps by 10 percent a year; small-sized shrimps recorded scarcely any price increase.

32. In a recent survey conducted by the Indian Institute of Foreign Trade (study commissioned by the USAID), it has been found that export of marine products from India could be stepped up to U.S. \$80 million in 1973/74 and U.S. \$155 million in 1978/79: however these forecasts are based on the assumption that 330 large vessels would be commissioned in 1973/74 and 68 others in 1978/79, which is more than doubtful. Nevertheless, our expectations are that exports of marine products in 1973/74 might reach a level not too far from IIFT's estimates, but for different reasons. This increase in exports will probably take place not because investment programs will proceed as planned in the Fourth Plan, but because of the spontaneous initiative of small entrepreneurs, who will probably exploit the untapped resources of the eastern coastal waters sooner than expected and also because of the interest shown by Indian and foreign Corporations in exploiting - in a limited way - off-shore and deep sea resources.

^{1/} See in Annex Table V.

^{2/} Yearbook of Fishery Statistics (FAO 1968).

^{3/} See in Annex Table VI.

V. CONCLUSIONS

33. In assessing the remarkable past performance of Indian shrimp exporters, it must not be forgotten that the devaluation of 1966 1/ was a major factor behind this success story. This also partly explains why there is some overinvestment in export-oriented activities. Of course, the main reason is that there is a ready market abroad for shrimps and allied products, while inadequate marketing facilities prevent the supply of fish for local consumption on a large scale. In India, both processing and marketing are chiefly in the hands of private sector, which naturally operates along lines which are most profitable. This involves giving preference to marketing of prime species and militates against an extensive supply of animal protein to the lower income groups of the population in the form of lower-priced varieties.

34. If the modernization of the fleet and the building of infrastructure is too lopsided because of their emphasis on shrimp exports, part of the benefits of such investments would be lost. Development of domestic marketing has also a high priority in a country where most of the people suffer from a lack of protein. Broadening the economic base of the fishing industry would moreover mean a substantial increase in income for the fishermen and the creation of millions of jobs.

35. It must, nevertheless, be recognized that the development of the shrimp industry is an easier task, because there is a ready and profitable world market. Development of domestic marketing is a far more difficult task and a particularly time-consuming one; it is therefore obvious that the development of the shrimp industry has not to be slowed down, but conceived in such a way as to become, when times are ripe, a multi-purpose industry, taking care of the export market as well as of the domestic market.

36. In terms of foreign exchange earnings and of generation of income, the fishing industry of India holds great promise; this is probably a field where a concerted approach from the GOI and International Organizations, like the FAO, UNICEF, IBRD, etc. and countries with experience in modern fishing could help promote fisheries development in India.

1/ No export duties were imposed after devaluation, so that the industry improved its rupee earnings by no less than 57 percent.

TABLE I

GROWTH OF EXPORTS OF INDIA'S MARINE PRODUCTS

(1951 - 1961)

Year	Quantity (Tonnes)	Value ('000 Rs.)
1950-51	19,651	24,559
1951-52	22,174	32,863
1952-53	24,841	38,700
1953-54	30,851	44,033
1954-55	28,641	46,675
1955-56	23,972	39,219
1956 (April to December)	18,140	37,201
1957	22,778	45,861
1958	30,683	58,647
1959	30,990	61,332
1960	16,337	40,216
1961	17,297	41,318

Source: D.G.C.I. & S.

(1962 - 1969)

Year	Quantity (Tonnes)	Value ('000 Rs.)
1962	11,619	37,475
1963	17,908	58,646
1964	21,458	68,489
1965	15,458	69,237
1966	19,153	135,246
1967	21,764	199,286
1968	24,810	220,846
1969	30,504	330,731

Source: Customs Daily Lists Compiled by M.P.E.P.C.

TABLE II

India's Export Pattern of Marine ProductsQ: - Quantity in Tonnes
V: Value in Rs. '000

Items		1962	1963	1964	1965	1966	1967	1968	1969
1. Frozen Prawns	Q:	2238	3967	5870	7028	8784	11173	14397	21441
	V:	10820	21204	31518	41422	88792	129808	156349	262945
2. Frozen Lobster Tails	Q:	40	53	41	112	81	128	297	529
	V:	226	313	371	1274	1474	2357	6684	11224
3. Frozen Froglegs	Q:	391	514	332	443	557	786	452	854
	V:	2299	3192	1650	2694	5576	8817	4891	11890
4. Frozen Fish	Q:	23	11	3	8	2	2	5	16
	V:	49	37	12	30	25	12	50	119
5. Canned Prawns	Q:	970	1231	1074	1148	1523	2200	2238	1661
	V:	6559	7576	6989	9506	18656	31243	26156	22104
6. Canned Fish	Q:	(144)*	—	...(273)*	—	...(155)*	.. (402)*	...(147)*	.. (231)*
	V:	2	—	3	—	1	2	1	1
7. Dried Prawns	Q:	3068	2809	3009	1702	1163	1540	1411	835
	V:	8944	9325	8997	5447	5271	8961	7259	4830
8. Dried Fish	Q:	4330	8704	10174	4431	6553	5147	5388	4329
	V:	4873	13721	15787	6522	13246	13238	14045	11658
9. Shark Fins and Fish Maws	Q:	350	342	378	244	139	296	331	214
	V:	3442	3051	2882	2032	1340	3709	4690	4551
10. Other Items	Q:	209	277	577	341	351	492	291	705
	V:	261	227	280	310	865	1139	730	1399
All	Q:	11619	17908	21458	15457	19153	21764	24810	30584
	V:	37475	58646	68489	69237	135246	199286	220846	330731

... Negligible.

* Kilograms.

Source: M.P.E.P.C. Cochin, February 1970

TABLE IV

		INDIA'S EXPORTS OF MARINE PRODUCTS BY REGION							Q: Quantity in Kgs.	V: Value in Rs.
Exported to		1962	1963	1964	1965	1966	1967	1968	1969	
1. Africa	Q:	2,88,377	2,26,944	2,95,541	1,39,028	90,004	1,83,328	2,98,870	1,92,674	
	V:	6,57,822	7,50,129	7,68,956	4,89,093	4,13,059	9,82,125	10,29,812	7,75,719	
2. North America	Q:	32,95,886	52,00,491	56,70,553	67,41,715	81,40,347	93,76,081	1,20,69,618	1,68,46,405	
	V:	1,74,81,838	2,82,70,485	2,93,71,784	4,01,76,764	8,11,98,952	9,77,23,048	12,05,41,463	18,16,13,029	
3. Latin America	Q:	—	930	—	49	—	—	3,397	1,200	
	V:	—	11,710	—	381	—	—	21,709	19,526	
4. Other American Countries	Q:	3,430	12,535	19,847	27,933	28,735	34,102	33,629	26,399	
	V:	27,057	85,678	1,52,908	2,13,250	2,27,999	3,56,307	3,16,829	2,50,129	
5. E. C. A. F. E. Countries	Q:	74,35,593	1,19,85,712	1,48,92,828	74,19,106	94,23,866	1,00,13,145	1,05,57,561	1,11,65,126	
	V:	1,50,68,899	2,58,91,332	3,42,79,757	2,04,73,537	3,66,87,519	7,23,21,794	7,84,49,358	12,27,19,836	
6. Other Asian & Ocean Countries	Q:	1,67,898	1,12,211	1,48,551	1,18,963	66,415	1,24,202	1,16,329	1,91,580	
	V:	3,35,644	3,61,940	4,32,301	2,84,141	2,19,171	6,25,153	4,01,509	3,65,833	
7. East European Countries	Q:	3,274	7,876	36,581	5,953	4,841	70,932	47,867	48,109	
	V:	36,290	94,496	3,98,605	1,37,500	91,072	11,67,579	6,89,260	8,21,393	
8. European Common Market (E. C. M.)	Q:	1,91,548	1,70,974	1,61,497	5,65,728	7,85,106	10,38,841	7,59,452	14,54,549	
	V:	11,14,952	13,41,892	12,23,465	39,08,398	94,53,731	1,40,30,368	90,36,813	1,49,02,592	
9. European Free Trade Area (E. F. T. A.) Countries	Q:	2,31,456	1,89,496	2,28,395	4,34,671	6,08,368	8,87,929	9,17,252	6,55,079	
	V:	27,33,236	18,29,371	18,27,560	34,96,463	68,91,618	1,17,47,735	1,02,64,370	92,25,200	
10. Other European Countries	Q:	1,920	930	3,768	4,431	5,678	35,728	6,267	2,789	
	V:	18,762	9,017	33,413	57,433	63,101	3,31,399	95,114	38,000	
Total	Q:	1,16,19,382	1,79,08,099	2,14,57,551	1,54,57,577	1,91,53,360	2,17,64,288	2,48,10,242	3,05,83,890	
	V:	3,74,74,500	5,86,46,050	6,84,88,749	6,92,36,960	13,52,46,222	19,92,85,508	22,08,46,237	33,07,31,257	

Source: M.P.E.P.C. Cochin, February 1970

TABLE V

Monthly Average Whole Sale price For Indian Shrimps in the U. S. Market
(Peeled & Deveined) Price in U. S. Cents/lb.

Grade	Year	Jan.	Feb.	Mar.	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Un/15	1966	—	—	—	—	—	—	—	—	—	—	—	—
	1967	—	—	—	—	—	—	145	142	—	—	—	—
	1968	145	150	150	—	—	—	—	—	—	180	179	—
	1969	—	—	—	—	—	—	—	—	—	—	—	—
16/20	1966	115	—	115	115	118	119	124	126	130	130	130	130
	1967	132	131	133	134	132	135	138	136	140	143	142	140
	1968	141	143	142	145	148	150	150	150	159	164	167	167
	1969	167	165	168	168	166	168	166	163	162	163	165	165
21/25	1966	107	—	108	114	113	117	119	120	125	125	125	125
	1967	127	126	128	129	129	129	130	132	127	133	136	135
	1968	136	138	139	140	140	140	140	140	144	150	153	155
	1969	156	153	158	158	158	160	158	154	153	154	155	155
26/30	1966	103	98	103	109	109	114	116	119	120	117	120	120
	1967	122	121	123	124	125	125	127	122	126	129	129	128
	1968	131	131	133	134	134	136	136	137	141	146	148	149
	1969	149	149	151	150	147	150	149	145	143	143	145	145
31/35	1966	98	93	96	108	106	108	110	113	115	114	115	115
	1967	116	116	116	118	118	120	120	117	118	119	118	118
	1968	118	118	118	118	118	118	118	117	123	130	130	131
	1969	132	135	136	133	132	132	132	131	131	131	131	131
36/40	1966	93	90	95	104	102	103	107	108	111	110	110	110
	1967	111	111	112	112	111	114	109	109	113	113	113	113
	1968	113	113	113	114	114	114	114	113	118	122	123	127
	1969	126	128	130	128	126	127	124	120	119	119	120	121
41/50	1966	89	87	92	103	99	102	104	105	105	106	105	105
	1967	105	106	109	109	106	103	100	97	100	101	102	101
	1968	102	102	102	101	100	97	94	91	99	104	106	109
	1969	110	113	115	115	112	114	114	113	113	114	115	115
51/60	1966	84	83	89	99	95	97	99	100	100	100	101	101
	1967	101	106	104	104	101	99	96	89	93	94	94	92
	1968	92	94	94	92	89	88	85	84	90	98	99	102
	1969	103	106	106	106	104	105	105	104	105	105	105	105
61/70	1966	80	80	86	94	92	93	94	95	95	97	93	95
	1967	96	96	97	100	93	89	86	82	84	84	84	84
	1968	84	84	85	82	82	76	75	73	80	83	83	86
	1969	88	96	97	97	97	98	98	97	98	99	100	100
71/90	1966	77	77	83	89	88	88	89	88	90	90	88	88
	1967	89	89	90	91	86	82	74	68	69	67	67	67
	1968	68	69	68	68	67	67	65	64	70	74	76	79
	1969	80	82	83	85	84	85	86	84	86	86	87	88
91-110	1966	72	74	82	86	86	86	86	86	86	85	—	—
	1967	—	—	—	—	—	76	68	60	63	60	62	65
	1968	64	64	63	64	62	62	62	61	65	69	70	73
	1969	74	78	79	80	79	80	81	79	80	81	81	83
111-130	1966	69	72	80	84	82	75	—	—	80	—	—	—
	1967	—	—	—	—	—	69	65	57	56	56	56	57
	1968	57	57	56	55	54	54	54	53	59	65	68	70
	1969	71	76	76	77	76	77	77	74	77	77	77	78
130/up	1966	68	72	78	81	77	72	68	61	56	57	60	59
	1967	59	57	55	53	51	47	44	43	42	40	39	41
	1968	44	44	44	44	44	44	46	48	55	62	65	57
	1969	68	71	73	74	72	72	69	66	65	63	62	62
Titi:	1969	—	69	69	70	67	65	57	54	54	55	55	55

Source: M.P.E.P.C., Cochin, February 1970

TABLE VI

MAIN SHRIMP PRODUCING COUNTRIES

(in 000 tons)

	1958	1968
U.S.A. (shrimps)	35.8	61.0
Mexico (")	31.3	35.6
India (")	5.2	15.3
Japan (")	3.1	3.7
Pakistan (crustaceans)	0.4	10.8
Thailand (" ")	3.6	79.0

Source: Yearbook of Fishery Statistics - 1968.

TABLE VII
IMPORTS OF SHRIMPS (OF ALL TYPES) INTO U.S.A.
(1961-1969)

(In Tonnes)

Imported from:	1961	1962	1963	1964	1965	1966	1967	1968	1969
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
MEXICO	35,916 (62.7)	35,230 (54.9)	34,706 (50.5)	32,714 (46.7)	27,187 (36.8)	31,169 (38.5)	31,960 (37.8)	27,192 (31.6)	25,511 (29.0)
INDIA	1,461 (2.6)	2,547 (4.0)	4,512 (6.6)	4,641 (6.6)	6,487 (8.8)	7,484 (9.2)	8,362 (9.9)	10,039 (11.7)	15,585 (17.7)
PANAMA	4,487 (7.8)	4,589 (7.2)	4,653 (6.8)	5,498 (7.8)	4,656 (6.3)	4,415 (5.5)	5,047 (6.0)	4,867 (5.7)	4,503 (5.1)
GUYANA	1,590 (2.8)	1,872 (2.9)	2,499 (3.6)	2,486 (3.6)	3,616 (4.9)	3,983 (4.9)	4,287 (5.1)	3,787 (4.4)	3,699 (4.2)
ECUADOR	2,125 (3.7)	2,323 (3.6)	2,554 (3.7)	2,612 (3.7)	2,376 (3.2)	2,571 (3.2)	2,715 (3.2)	2,853 (3.3)	4,037 (4.6)
VENEZUELA	1,120 (2.0)	2,876 (4.5)	2,626 (3.8)	3,585 (5.1)	5,769 (7.8)	1,307 (1.6)	2,165 (2.6)	2,451 (2.9)	2,654 (3.0)
PAKISTAN	765 (1.3)	1,431 (2.2)	1,673 (2.4)	2,183 (3.1)	2,987 (4.0)	3,716 (4.6)	3,382 (4.0)	2,484 (2.9)	2,453 (2.8)
EL SALVADOR	3,671 (6.4)	3,246 (5.1)	3,025 (4.4)	2,855 (4.1)	2,439 (3.3)	3,154 (3.9)	3,050 (3.6)	2,105 (2.4)	2,280 (2.6)
JAPAN	827 (1.4)	1,779 (2.8)	1,852 (2.7)	1,311 (1.9)	1,136 (1.5)	1,198 (1.5)	424 (0.5)	627 (0.7)	577 (0.7)
OTHER COUNTRIES	5,313 (9.3)	8,238 (12.8)	10,632 (15.5)	12,220 (17.4)	17,277 (23.4)	21,992 (27.1)	23,008 (27.3)	29,531 (34.4)	26,581 (30.3)
Total	57,275 (100.0)	64,131 (100.0)	68,732 (100.0)	70,115 (100.0)	73,910 (100.0)	80,989 (100.0)	84,400 (100.0)	85,936 (100.0)	87,880 (100.0)

Note:- figures inside the brackets indicate the percentage share of the column total.

Source: U.S. Trade Statistics

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INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT
INTERNATIONAL DEVELOPMENT ASSOCIATION

EXPORTS OF LEATHER
AND LEATHER PRODUCTS
INDIA

May 27, 1971

South Asia Department

INDIA

EXPORTS OF LEATHER AND LEATHER PRODUCTS

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This report is based on the findings of a mission which visited India and European cities in June/July, 1970, composed of Messrs. Christian Ladonne and Alberto de Capitani.

INDIA

EXPORTS OF LEATHER AND LEATHER PRODUCTS

SUMMARY

1. Contrary to what is often believed, the ratio of cattle (bovine) population to human population in India is much smaller than in many other countries; moreover the economic basis of India's present cattle population is extremely weak. For the goat and sheep population this ratio is well below the world average. On the whole, compared with the main countries, developed or developing alike, which export leather, India has inadequate resources of livestock. Nevertheless, India is an important exporter of leather, because, being a poor country, the domestic consumption of leather footwear is very low.
2. Over 800,000 persons are employed in the leather industry, mostly in the household sector. There are not more than 50 partly mechanized tanneries in the large scale sector. In 1967, the industry processed about 69 million hides and skins valued at about Rs. 1.4 billion. Production of leather footwear is estimated to be around 180 million pairs, valued at about Rs. 1.4 billion (\$186 million).
3. Since 1957, exports have more than doubled and amounted to \$132 million in 1969/70; however, most of the increase took place after the 1966 devaluation. World demand prospects are good especially for goat and sheep skins, for which demand is likely to be buoyant during the decade. However, due to the limited supply of raw hides and skins, the industry will, after a few years, experience difficulty in meeting the growing requirements of both the export and home markets. Therefore, the quantum of export is unlikely to grow very much during the second half of the decade; however, by switching gradually from export of tanned but unfinished hides and skins to the export of finished leather and leather goods, India will most likely be in a position to maximize her export earnings.

EXPORTS OF LEATHER AND LEATHER PRODUCTS

I. INDIAN LIVESTOCK

1. Contrary to what is often believed, Indian resources of livestock are basically not adequate to provide a continuous exportable surplus of leather and leather goods. If India is at all on the map of international trade in hides and skins, leather and leather goods, it is because being a poor country, the domestic consumption of leather and leather goods, especially footwear, is small.

2. In 1964-65 the world livestock population^{1/} per 100 persons amounted to 31 heads of cattle, 4 heads of buffaloes, 31 heads of sheep, 11 heads of goats and 17 heads of pigs. The livestock population of India per 100 persons is above the average in respect of cattle (39), buffaloes (11), and goats (14); the population of sheep (9) and pigs (1) are however much below the world average. It must be pointed out, that major exporting countries have very large livestock population of certain species^{2/}, which give these countries a real basic exportable surplus while other countries like centrally planned countries and Japan have a low livestock population, which depresses the world average. Moreover, the management of the cattle and buffalo population in India is so poor, that for roughly the same per capita availability of cattle, per capita availability of hides and skins is about 3.5 times less in India than in developed countries.

3. Cattle

According to the livestock censuses in 1956, 1961 and 1966^{3/}, the cattle population did not grow at all during the quinquennium 1961-1966, after having increased by over 10 percent during the previous quinquennium.

1/ Source: F.A.O. Production Year Book (1966)

2/ See Table I in Annex.

3/ Data regarding the number of livestock are collected through a Census conducted quinquennially. Primary data are collected through tax revenue agencies where they exist, or through other staff, then forwarded to Departments of Agriculture in the different States and finally consolidated returns are furnished to the Directorate of Economics and Statistics, Ministry of Food and Agriculture. These data must not be taken at their face value but, hopefully, represent a corrent "guesstimate" of the trend.

<u>Year</u>	<u>Youngstock</u> <u>(0-3 Years)</u>	<u>Adult Stock</u>		<u>(in Million)</u> <u>Total</u>
		<u>Male</u>	<u>Female</u>	
1956				158.7
1961	48.9	72.5	54.2	175.6
1966	47.9	73.0	54.6	175.5

The stagnation of Indian cattle population, the declining young stock and the much smaller female adult stock in comparison with the male adults are three features which have appeared without practically any rationally organized slaughter. Officially, less than 3.5 percent of the deaths of cattle in India are due to slaughter, but we have the strongest suspicion that the real rate of slaughter is considerably higher; the remaining deaths are due to so-called "natural" causes which are much influenced by the economics of feeding unproductive stock.

4. Improvement of roads and expansion of motor transport are displacing the bullock in the sphere of transport. The introduction of diesel engines and recently the extension of electric power to rural areas and consequent introduction of electric motors are even more rapidly substituting mechanical power for bullock power for the purpose of irrigation, oil-crushing, cane-crushing, etc.. Cultivation is still done predominantly with bullock power, but tractors are already beginning to appear. Hence, it seems that the predominance of bullocks in Indian agriculture will gradually diminish.

5. In India, cows are maintained primarily for breeding bullocks^{1/}. Whether the number of cows is too high for breeding an even population of bullock, and therefore the excess youngstock is neglected and allowed to starve, or whether, due to the high mortality rate among the youngstock, this number of cows is justified, is debatable: obviously, this is a chicken and egg problem. Annual survival rate for the youngstock is approximately 70 percent, which means that 35 out of 100 newly born calves will survive the third year and reach adulthood; there is no evidence that the mortality among young females is higher than among young males. This may appear strange as the male adult population out numbers the female adult population by about 40 percent. Many partial explanations can probably be given: the expected higher mortality among cows, the fact that many underfed cows might become barren and also a

^{1/} Milk yield per lactation period is at the most 400 kg. Moreover, cow milk is less appreciated than buffalo milk, because of its lower fat content.

micro-economic factor. There is, indeed some economic logic for a small farmer, who wants to breed a new pair of bullocks to maintain a cow for this purpose for 3 or 4 years and thereafter leave it to its own devices to find food for itself, decreasing therefore its chance of survival.

6. Whatever the real logic of cattle breeding in India is, one fact remains: if through proper feeding, mortality of calves were reduced from the present 30 percent per annum to say 10 percent, out of 100 newly born calves, 73 percent would reach adulthood. This means that in order to breed the same number of adult stock, only half the number of calves would need to be born and the number of cows might be reduced to half their present number.

7. Buffaloes

Like the cattle population, the buffalo population too has remained more or less stagnant.

<u>Year</u>	<u>Youngstock (0-3 Years)</u>	<u>Adult Stock</u>		<u>Total</u>
		<u>Male</u>	<u>Female</u>	
1956	-	-	-	44.9
1961	18.5	7.7	25.0	51.2
1966	18.5	8.2	26.1	52.8

The imbalance between the two sexes is much greater than in the case of cattle and it goes in the opposite direction. This is because buffaloes are bred and maintained primarily for milk (950 kgs. per year of milk per she-buffalo per lactation) and it is only rarely that the he-buffalo is used for draught in agriculture and in transport. As it is uneconomic to feed and not possible to slaughter^{1/}, there is no alternative but to allow the youngstock to starve to death. Mortality among the youngstock of ages 0-2 is as high as 57 percent per annum among the male and 36.5 percent among the female stock. The economic logic is obvious. On the other hand, the mortality for adult stock is only 8.5 percent per annum. As a consequence, 13.2 million buffaloes die every year, out of which 80 percent are youngstock.

^{1/} According to official estimates, less than 3.5 percent of the deaths of buffaloes are due to slaughter. Again, we are under the impression, that this is a gross underestimate. At any rate, social and religious inhibitions against buffalo slaughter are certainly less strong than in the case of cattle slaughter.

8. Sheep and Goats:

The following table gives the sheep and goat population, according to the last three censuses:

(in Million)

<u>Year</u>	<u>Sheep</u>	<u>Goats</u>
1956	39.3	55.4
1961	40.2	60.9
1966	42.0	64.5

For the last ten years, the sheep and goat population has been on the increase. As both, sheep and goats, are bred and maintained mainly for meat and as there is no inhibition against their slaughter, most of the deaths, almost 95 percent, are due to economic slaughter. The slaughter rates are comparable with those in other countries: 50 percent for sheep and 60 percent for goats. However, the slaughter houses are extremely primitive and most of the by-products^{1/} of the slaughter house, except the skins, are wasted.

II. INDIAN PRODUCTION OF HIDES AND SKINS^{2/}

9. Official estimates of production of hides and skins in 1961 have been the following:

	<u>Population in 1961</u>	<u>Fallen hides/skins recovered</u>	<u>Slaughtered hides/skins</u>	<u>Total Hides/skins</u>
Cattle	175.64	16.51	0.88	17.39
Buffaloes	51.22	5.17	0.46	5.63
Sheep	40.23	1.30	17.69	18.99
Goats	60.90	2.57	26.30	28.87

This table implies that 90 to 95 percent of sheep and goat skins from fallen and slaughtered animals are recovered. The situation in respect of cattle and buffaloes is quite different. Estimated mortality rates suggest that only 65 percent of fallen hides of cattle are recovered; in the case of buffaloes

^{1/} Goat hair; animal casings; bones, horns and hoofs; glue and gelatin; animal fats; pharmaceuticals of animal origin.

^{2/} Generally speaking, "hides" come from adult cattle and buffaloes, while "skins" come from smaller animals like calves and buff-calves, goats, sheep, snakes, lizards, crocodiles, etc.

the rate is still lower: 40.5 percent. Field inquiries^{1/} in 13 districts of eight different States indicated that the rates of recovery of fallen hides and skins have been found as follows: bullocks 63 percent, cows 56, calves 32, he-buffaloes 71 percent, she-buffaloes 80 percent, buff-calves 69 percent. This shows that the rates of recovery of cattle hides might be less than generally assumed, while in case of buffalo hides it might be the other way around. Admittedly, these results are based on too limited an enquiry to be accepted; but they show nevertheless that the assumed economics (even the numbers) of livestock in India are based on probably unreliable data.^{2/}

10. This low rate of recovery of hides from fallen animals is due to the fact that naturally dead cattle fall in widely dispersed places. Consequently, the expeditious transport of the carcass to the flaying center becomes physically difficult and entails considerable financial cost. Moreover, only certain castes are entitled and willing to look after fallen animals, and therefore, for various reasons a number of carcasses remain unattended. Only the Khadi and Village Commission has paid some attention to all these problems by setting up a number of carcass recovery and flaying centers.

11. While hides and skins recovered from slaughter-houses are on an average of a rather good quality, hides recovered from fallen animals suffer from numerous physical defects, which greatly affect the quality of the hides, and therefore the prices offered from them. However, according to some manufacturers in Kanpur,^{3/} the ratio of hides recovered from fallen animals compared with those from slaughtered animals is very different from the aggregate one we mentioned earlier. For the Kanpur trade, 80 percent of the hides it receives comes from slaughtered animals, against scarcely 6 percent for the official all-Indian figures. Good quality hides fetch up to 25 rupees for a hide recovered from a fallen animal and this constitutes a strong economic incentive for slaughtering animals. Moreover, there are important beef consuming minorities in the Kanpur area. Of course, what applies to Kanpur areas does not necessarily, far from it, apply to other areas. Nevertheless, and as stated earlier, we are under the impression that the official rate of cattle and buffalo slaughtering is an underestimate, because it does not take into account clandestine slaughter of healthy animals for meat, and secondly, for hides, and of dying animals for hides.

^{1/} Organized by the Gokhale Institute of Politics and Economics, Poona; Central Leather Research Institute, Madras; and Agro-Economic Research Centers (1969).

^{2/} These unreliable data have led the FAO to refrain from making any forecast of production for the LDC's in the "Agricultural Commodities - Projections for 1975 and 1985."

^{3/} Kanpur, located in Uttar Pradesh, is the main processing center of hides and skins in North India - U.P. accounted in 1961, for respectively 15 percent and 21 percent of the total Indian population of cattle and buffaloes.

III. INDIAN LEATHER INDUSTRY AND LEATHER-GOODS INDUSTRY

12. Roughly speaking, hides and skins recovered from animals are first either salted or, to lesser extent, dried; at this stage, they are in the "raw" or "undressed" form. They are then put in an acid bath for preserving and cleaning; the "pickled" skins are thereafter tanned through a vegetable tanning process and another full tannage will be required to produce "finished leather". There is also a mineral tanning process, which is becoming more and more widespread: to be converted into finished leather, "chrome-tanned" hides and skins require a much less intensive final tannage. At present, most of the Indian exports are vegetable-tanned and, to a lesser extent, chrome-tanned hides and skins.

13. It is extremely difficult to estimate the value added to raw hides and skins through the processing of tanned materials and of finished leather goods. We have no specific information relating to the differential value added between vegetable and chrome-tanned hides and skins; nor have we information on the value added in the production of finished leather, because there is scarcely any production of goat and sheep finished leather and the production of cattle and buffalo finished leather is mostly made in the footwear industry, where it cannot be isolated as an output. However, from the Annual Survey of Industries (1962/63) some rough "guesstimates" relating to the value added (output-leather input ratio) can be drawn:

	(Index of Value)
Hides and skins, undressed:	100
Tanned hides and skins, (mostly vegetable tanning)	150
Footwears and other finished leather goods (cattle leather)	200

There is no doubt that this index of value would be much higher in the case of chrome-tanned hides and skins and in the case of goat and sheep finished leather.

14. The leather industry of India, which has centuries-old tradition, is still largely based on a process of light bark tanning known as "East Indian (E.I.) tannage", and carried out in about 500 small and medium scale tanneries. Mechanized large-scale tanneries producing vegetable-tanned^{1/} leather numbered 32 in 1966, while mechanized large-scale tanneries producing chrome-tanned leather numbered only 12. In addition, some 250 small and medium scale tanneries currently use the chrome tanning process. (See in Annex, Table II, "Sectorial distribution in 1961" and Table III, "Fixed and working capital employed in the Industry").

^{1/} Vegetable-tanned leather represented in 1968/69 two-thirds of total production, while chrome-tanned leather represented the remaining one third.

15. Nearly half of the fixed capital consists of plant and machinery. Another 10 percent consists of tools, transport equipment and other fixed assets. The remaining 40 percent of the fixed capital consists of land and building. Roughly speaking one-third of the large and medium scale factory sector is mechanized, but at the present level of capacity, full mechanization of the industry would require machinery worth about Rs. 30 million. Such a comparatively small amount does not probably justify an import substitution policy for the manufacture of most of the machines needed by the tanning and leather finishing industry in the country. At present, capacity utilization^{1/} of the industry appears to be low: at least 30 percent of its capacity for vegetable - tanning and 40 percent of its capacity for chrome - tanning of hides is underutilized.

16. The industry is mostly concentrated^{2/} in Uttar Pradesh (45 percent of total employment), in Tamil Nadu (31.5 percent) and to a lesser extent in Bengal (7.1 percent). Its output increased by about 4 percent a year between 1960 (index = 100) and 1966 (index = 120.9), but if we are to believe the Annual Survey of Industry (1964), this increase took place mostly in the Census Sector (i.e. large scale factories), the output of which increased in 1964 by 66 percent over 1961. This increase is largely accounted for by the increase in goat skins processed from less than 5 million in 1961 to over 10 million in 1964 and in buffalo hides from 1.1 million to 1.6 million. As the supply of raw hides and skins has increased only marginally since 1964, the number of hides and skins processed has probably not much changed since then. It is estimated (see Table IV in Annex) that in 1967 the number of hides and skins processed in India was about 69 million: 20 million goat skins, 23 million sheep skins, 25 million cattle and buffalo hides and skins and 1 million of reptile skins and other skins. Value of raw hides and skins processed in India was estimated to be Rs. 609 million 1962/63 and Rs. 618 million in 1967 at 1962/63 prices. On this basis^{3/} production of semi-tanned, tanned and finished leather in 1967 may be estimated to be Rs. 1.4 million at 1967 prices.

17. Out of the total of about 810,000 persons employed in the leather and leather goods industry, about 78 percent (631,000 persons) are employed in the footwear industry. The footwear industry being predominantly in the household sector, 73.72 percent of the employment is in this sector, while 25.81 percent is in the small scale factory sector and only 0.47 percent in the other two sectors. Therefore, next to nothing is known about the capital structure of the industry except in the large and medium scale sector. Apparently, there is no under-utilization of capacity in these two sectors: in 1963, installed capacity^{4/} for western type footwear was about 8.5 million pairs per annum and the production 8.3 million pairs.^{5/} Apparently, no additional capacity

^{1/} In tanneries, installed capacity is calculated on a partial three shifts basis.

^{2/} Source: Statistical abstract of the Indian Union C.S.O. (1966)

^{3/} See paragraph 13.

^{4/} In the footwear industry, installed capacity is calculated, as in other countries, on a one shift basis.

^{5/} Sources: Monthly Statistics of production.

has been built since then, but nevertheless the production reached 10.5 million pairs in 1967. In fact, factories have found it more economical to supply leather to independent workers and to buy the ready footwear from them which they sold under their trade mark.

18. In 1964 production in the large and medium scale sector was 7.8 million pairs of western type and 6.0 million pairs of indigenous type. In 1967 the reported production was 10.5 million and 7.3 million respectively. Very lengthy calculations led the Gokhale Institute, Poona, to believe that the total output of the footwear industry in 1967/68 should be estimated at 181.6 million pairs valued at about Rs. 1.4 billion. Output of other leather manufactures amounted to around Rs. 110.0 million.

IV. WORLD TRADE: PAST PERFORMANCES AND PROSPECTS.

19. World production of hides and skins. For the past ten years, world production of hides has probably been rising by about 25 percent i.e. less than 2.5 percent a year.^{1/} Developed countries as a whole are estimated to have expanded their output by about the same amount. The U.S. with an annual output of almost 35 million cattle hides is the world's largest producer. Other principal producers in developed countries are Australia, F.R. of Germany, France and U.K. with about 5 million hides per annum each. In the U.S.S.R there was an estimated (1966) output of about 23 million hides (including calf skins) which is about one-third more than that in 1956. Although developing countries have 60 percent of the world cattle population they account for only 40 percent of total output of hides. This is due to the lower slaughter rates and low rates of recovery of fallen hides. Nevertheless, India with 24 million hides a year is the world's second largest producer. Argentina (12 million), Brazil (8 million) and Pakistan (7 million) are other important producers.

20. World production of calf-skins is decreasing rapidly due to a growing preference for beef in all the main producing countries. Sheep-skins are mainly produced by wool growing countries, Australia and New Zealand accounting for about half of the output of developed countries. Spain and U.K. are other important producers. In IDC's as a whole, goat slaughtering has been on the increase. All the main goat skin producing regions of the Far East, specially India and mainland China, Africa and Latin America increased their production during the past decade.

21. World imports and exports.

World exports increased at an annual rate of 11.7 percent between 1957 and 1966, which implies that India lost a substantial part of her market share:

	<u>1957</u>	<u>1965/66</u>	<u>1966</u>
World Exports ^{2/}	100		271
Indian Exports ^{3/}	100	138	

^{1/} Source: FAO Commodity review and outlook. 1968-1969.

^{2/} Source: Commodity Trade Statistics (U.N.) 1957-66.

^{3/} Source: Indian Foreign Trade Statistics.

In 1957, India's share in the world market was 8.9 percent and this dropped to 4.5 percent in 1966. We have no accurate figures for the world export in 1969, but it is probable that India had regained some of her share in the world market or, at least, no further decline took place.

22. O.E.C.D. countries account for 95 percent of the world imports of hides, skins, leather and leather goods and for over 80 percent of the world exports. Even in respect of hides and skins undressed, except for India and Brazil, the developed countries are the important exporters and they buy almost the whole of world imports. In respect of leather, except for India, which was the largest exporter in 1957, 1959 and 1960, and the second and third in the remaining years, the developed countries are the important exporters. Again, they buy almost the entire world imports of leather. In respect of footwear and leather manufactures, the world trade is largely confined to the developed countries.

23. World demand prospects. In the past, world trade in raw hides and skins has increased by some 4 percent annually. International trade in leather rose by almost 10 percent per year, due to expanding demand for special types of light leathers for fashion shoes and leather goods in U.S.A., Federal Republic of Germany and EFTA countries, and for garment leather in Federal Republic of Germany, and to the growing practice of exporting hides and skins from developing countries in a processed rather than in the raw state. World trade in leather footwear grew at an estimated 40 percent per year. Spain, France and above all, Italy, exporting increasing quantities of fashion shoes to the U.S. and EFTA countries.

24. Demand prospects are hard to estimate, because it is extremely difficult to assess the future impact of synthetic substitutes (new poromerics) on the markets for leather. However, the FAO^{1/} worked out a tentative assessment of the likely consumption in high income countries, based on different assumptions regarding the impact of new poromerics.^{2/}

(in 000 tons)

	<u>1965-67</u>	<u>1975</u>	<u>1985</u>
Cattlehides and calfskins	2,600	2,848 to 3,084	3,181 to 3,444
Sheep and Goat skins	340	375 to 435	420 to 486

1/ "The world hides, skins, leather and footwear economy (May 1970)."

2/ At present, shoes with poromerics upper can rarely be distinguished from shoes with leather uppers, but they are considered as being less comfortable in wear.

25. The FAO assessment of supply prospects in high-income countries is based chiefly on existing projections of meat production and runs as follows:

(in 000 tons)

	<u>1965-67</u>	<u>1975</u>	<u>1985</u>
Cattlehides and calfskins	2,312	2,201	3,277
Sheep and Goat skins	239	288	317

26. These tentative estimates of prospective demand and supply indicate that by 1975 demand for cattlehides and calfskins in high-income countries may exceed production by about 150,000 to 385,000 tons annually. By 1985, this excess may still amount to some 175,000 tons provided demand increases sufficiently to reach the upper limit of the prospective range; should demand fail to rise beyond the lower limit of this range, it could fall short of supply by approximately 95,000 tons. While the U.S.S.R. and eastern Europe will probably remain substantial net importers, other developed countries, whose aggregate consumption currently matches production, are likely to become considerable net exporters. High income countries are thus likely to develop sizeable net import requirements of cattlehides and calfskins during the next few years. These may be met by exports from developing countries probably in the form of rough tanned leather. However, after 1975, net imports will contract, and long term prospects for exports from LDC's are therefore much less favorable.

27. In the case of sheep and goat skins, consumption in high-income countries is likely to exceed production through the 70's and 80's: the excess could range from 88,000 to 148,000 tons in 1975, and from 103,000 to 169,000 tons in 1985. The outlook appears therefore very promising for exports from developing countries, especially for goat skins. Prospects for goat skins export from LDC's will also largely depend on future production and consumption trend in China (Mainland), which was a major exporter during the 50's and the 60's.

28. In view of the fact that no assessment could be made of demand and supply prospects in developing regions, it is virtually impossible to indicate whether prospective market trends point to a world shortage or a world surplus of hides and skins. It is therefore difficult to assess a probable price trend. Moreover, a world surplus might limit further inroads of synthetic materials; a world shortage would no doubt facilitate the lasting penetration of synthetic materials.

V. INDIAN EXPORTS: PAST PERFORMANCE.

29. Indian export of hides, skins, leather and leather goods have been the following:^{1/}

^{1/} See also Table V in Annex.

	<u>Exports</u> (in \$ Million)	<u>Index</u> <u>Earning in \$</u>
1957	66	100
1959	89	136
1965/66	92	138
1966/67	117	176
1967/68	93	141
1968/69	116	175
1969/70	132	199

Source: Monthly Statistics of Foreign Trade in India. The 1969/70 figure does not include certain small items.

The year before devaluation^{1/} (1965/66), exports reached about the same level as in 1959, six years before; after devaluation, exports picked up sharply and continue to do so, except for a set back in 1967/68, so that in 1969/70 rupee and dollar earnings were respectively 3 and 2 times higher than in 1957. There is no doubt, that devaluation provided a strong incentive to exporters.

30. Except for goat skins, part of which is exported undressed^{2/} (Rs. 84.4 million in 1969/70) and for exotic skins, there is a practical embargo on the exports of all raw hides and skins. Therefore, most exports are in the form of leather (semi-processed hides and skins, finished leather and leather goods). Compared with 1957, the value of leather exports^{3/} in 1968/69 was 2.76 times as large, and this was achieved by multiplying the quantum of exports 1.50 times and exports prices reaching, on an average, 1.84 times their level in 1957. If we now compare the export performance in 1968/69 with the predevaluation year (1965/66), the index increased two times in terms of rupee value, but by only about 27 percent in terms of dollar value. It so appears, that three years after the devaluation, India could earn 27 percent more foreign exchange from leather by exporting 34 percent larger quantity but at dollar prices 5.5 percent below their predevaluation level. Commodity wise the situation has been the following in 1968/69:

(1965/66 = 100)

<u>Category</u>	<u>Index of</u> <u>U.S. \$ earnings</u>	<u>Index</u> <u>of Quantity</u>	<u>Index of</u> <u>the \$ prices</u> <u>of Exports</u>
Goat skins	129.84	141.10	92.02
Sheep skins	129.01	129.61	99.54
Cattle and buffalo hides	141.92	135.30	104.89
Finished leathers	51.54	48.40	106.49
Leather goods	111.86	140.44	79.65
Exotic skins	<u>129.59</u>	<u>177.76</u>	<u>110.05</u>
Total	126.82	134.12	94.56

^{1/} The rupee was devalued on 6th June 1966 from U.S. \$=Rs. 4.76 to U.S. \$=Rs. 7.50

^{2/} Goat skins in the raw are exported on a quota basis. The exports quota was 35 percent of total production in 1967 and 20 percent in 1969. It is proposed progressively, but eventually, completely to ban the export of raw goat skins in a few years time.

^{3/} See Table VI in Annex.

31. U.K., U.S.S.R., Italy, France, U.S.A., West Germany and Japan^{1/} are the major importing countries of India's leather and leather goods. They accounted for over 80 percent of India's exports in all the year from 1957 to 1968/69. Thus the major importers have been and continue to be the leading developed countries in the world.

VI. INDIAN EXPORTS: PROSPECTS

32. Much of the future performance of Indian exports of leather will depend to a large extent on the availability of raw hides and skins. Two sets of estimates of livestock population in 1973-74 and 1978-79 have been respectively worked out by the Development Council for Leather and Leather Goods Industries and the Gokhale Institute. However, we shall only consider the Gokhale Institute's estimates, which appear to be more likely to materialize.

(in Million)

	% Rate of Growth Assessment Per Annum	Estimated Population		
		1968/69	1973/74	1978/79
Cattle	Nil	175.5	175.5	175.5
Buffaloes	0.6	53.5	55.1	56.8
Goats	1.2	66.1	70.1	74.5
Sheep	0.9	42.7	44.7	46.8

33. In future, increased supply of hides will not come from an extension of the cattle and buffalo population but by improving the ratio of recovered hides to population. To achieve this, it would be necessary to set up a large number of carcass recovery centers in rural areas. Expanding slaughterhouse facilities in the country and modernizing the existing ones could be helpful, but it must be born in mind that many States have laws prohibiting cow slaughter. However, growing home and external demand might push up the prices of raw hides and as a result improve somewhat the rate of collection. At present the ratio of cattle hides to cattle population is about 10 percent; it is probably feasible to increase this ratio to 12 percent in 1973/74 and to 15 percent in 1978/79. Similarly the ratio of buffalo hides, which is at present 17.0 percent, might increase to 18 percent in 1973/74 and to 20 percent in 1978/79.

^{1/} See Table VII in Annex.

34. As regard prices, mention must be made of the present export-import policy. To encourage processing in the country, export of raw hides has been banned; on the other hand, imports of raw hides are unrestricted. Such a policy might appear to be appropriate under the present circumstances, but would probably have to be progressively modified, because it keeps the internal prices of hides permanently depressed and would thus defeat any efforts towards better collection of the hides and improvement in their quality.

35. Due to possible better management of the stock, the ratio of goat skins to goat population might improve slightly: 55 percent in 1968/69, 57.5 percent in 1973/74 and 60 percent in 1978/79, and therefore reach the world average. For sheep, the present ratio of 48 percent might marginally increase to 50 percent in 1978/79.^{1/}

36. India has well established markets for her exports of tanned but unfinished hides and skins. Hence, given supplies, there should be little difficulty in being able to maintain and somewhat expand the present exports. If we assume that the ratio between exports and production will remain the same in 1973/74 as in 1968/69 exports could be the following:

<u>Item</u>	<u>(in million rs.)</u> <u>(1968/69 prices)</u>		
	<u>1968/69</u> <u>(actual)</u>	<u>1973/74</u>	<u>% increase</u> <u>1973/74-1968/69</u>
Raw skins	43,971	-	
Vegetable - tanned hides and skins	495,063	541,100	9.30
Chrome - tanned hides and skins	<u>179,296</u>	<u>277,098</u>	<u>54.55</u>
Total	718,330	818,198	13.90

37. One individual item, which has extremely good prospects for export is wet blue goat skins, the export of which increased from Rs. 123 million in 1967/68, to Rs. 169 million in 1968/69 and Rs. 240 million in 1969/70, mainly to the U.S.S.R. Nevertheless it is clear that on the whole, India's production of hides and skins cannot sustain any greater exports. Hereafter, India can only increase her export earnings by switching from export of tanned but unfinished hides and skins to the export of finished leather, footwear and other leather goods.

^{1/} See in Annex Table VIII. "Estimated production of Hides and Skins in 1973/74 and 1978/79."

38. India's present exports of finished leather are small. In recent years, exports of finished leather of cattle and buffalo hides and calf skins have declined and the reason appears to be India's limited supplies, which are almost entirely used for internal consumption. ^{1/} On the other hand, India has large supplies of goat and sheep skins and, at present, they are being exported mostly unfinished: it should be therefore possible to export more finished leather of goat and sheep skins. Moreover, tanning is a distasteful and dirty job, and developed countries find it increasingly difficult to recruit manpower and are inclined, whenever possible, to rely on supplies of goods at a more advanced stage of processing from LDC's. However, the market for India's finished leather is as yet quite uncertain. Nevertheless, over the years, India has been able to develop her technical expertise and she is now in a position to produce goods quite competitive in terms of quality with equivalent goods processed in industrialized countries. Moreover, in terms of price, her lower labor costs will provide her with a definite advantage over her competitors. Goat and sheep skins being mostly used for upper shoes, gloves and garments, end-uses very sensitive to fashion, India must probably take two steps if she wants to be successful in exporting skins in finished form. Firstly, shipment of goods must be made by air, because the goods must reach the processor in developed countries before the fashion is over, and secondly, imports of dyeing materials must be allowed without restriction, at least at the beginning. For instance, in brown skins there are no less than 43 shades and taste in colors changes extremely rapidly, so that at the start, it would be difficult for India to manufacture in time and in sufficient quantities her own dyeing materials for exporting finished skins. In terms of foreign exchange, subsidies for air freight and free import of tanning materials would prove to be positive: compared with semi-finished skins, finished skins fetch a price at least 60 percent higher. It seems that India could rather easily increase her exports of finished skins from their present level of Rs. 16 million to Rs. 50 million.

39. As shown in Annex (Table IX) the footwear and other leather goods manufacturing industry in India will have only 10 percent more leather in 1973/74 than in 1968/69, which will allow the industry to grow at no more than 2 percent per year. With the increase of population, increase in per capita income, and increasing urbanization, it seems reasonable to assume that domestic consumption of footwear will increase by at least 10 percent in the next five years: this is probably an underestimate, but it must be borne in mind that India is producing in increasing quantities polyvinyl shoes. Nevertheless, it seems possible to increase production of leather footwear from the present level of Rs. 70 to 80 million a year to over 100 million.

40. Given the world demand and the good competitive position of Indian manufacturers, prospects for export of other leather goods, mainly saddlery and uppers and legs of footwear, appear good. Present export is about Rs. 6 million; exports worth Rs. 20 million in 1973/74 is a feasible target.

^{1/} It is also possible that the world demand has been sluggish, due to growing competition of synthetic materials for shoe-soles.

41. There is also a good market for exotic skins, but the supply of these is uncertain as it is as yet not properly organized. Moreover, indiscriminate slaughter of crocodiles and other reptiles threaten certain species with extinction.^{1/} Exports of crocodile skins had to be completely banned a few years ago to preserve the species. Establishment of farms for raising snakes, lizards, crocodiles and fur-bearing animals would be required, in order to take advantage of world market opportunities.

42. India's exports of leather and leather goods amounted to Rs. 870 million in 1968/69. The Gokhale Institute estimated feasible a 4 percent annual export growth up to 1973/74, i.e. Rs. 1050 million (U.S. \$140 million). On the other hand, the Leather Development Council suggested that a 7 percent increase is possible, i.e. Rs. 1150 million (U.S. \$153 million). Taking into account, that in 1969/70 exports have already crossed the one billion mark (U.S. \$133 million), the latter target is probably within reach. If some bottle-necks were to develop on the supply side of raw hides and skins, more reliance on imports to satisfy both home and external demand might temporarily relieve the shortage. Given the percent underutilization of industrial capacities, just marginal additional investments appear to be needed.

VII. CONCLUSIONS

43. The remarkable performance of Indian exporters since the devaluation is by no means an accident. It shows that given proper financial incentives,^{2/} exporters are responding quickly; as a matter of fact, during the four years after devaluation i.e. up to 1969/70 exports increased by no less than 45 percent in terms of dollar.

44. Government policy towards the leather industry has been a flexible one. Exporters and manufacturers never complained seriously about eventual difficulties in getting their imported inputs, like tanning materials and raw hides. However, it appears that some delays, but not unduly long, occurred in the procurement of some imported machinery.

45. Short-term prospects for exports appear fairly good. In the longer run, however, industry will probably experience difficulties on the supply side to be able to satisfy both a growing demand at home and abroad. Nevertheless India can maximize her export earnings, with the same quantum of exports, by selling goods at a more advanced stage of processing and we think that this switch is now well under way.

^{1/} According to Reuter (August 17, 1970), "the World Wildlife Fund has given a grant to India to help set up a snake park to preserve species threatened by slaughter for clothes. The park in Tamil Nadu will include a reptile research center."

^{2/} Following devaluation, export duties on hides and skins and leather tanned and untanned all sorts were fixed at 10 percent. There are no export duties on finished leather and leather goods.

46. Indian livestock economy is an economy of wastage. However, the problems are of such a magnitude that no solution can be expected overnight and the difficulties encountered by the government in tackling the problem have to be fully appreciated. With her limited resources, India has to concentrate on actions which will provide the highest return. Long-term world demand prospects show that goat and sheep skins will probably have very good potential markets. What is needed is, therefore, the building of modern slaughterhouses or the improvement of the existing ones, in order to make possible the recovery of skins of better quality and also of other very valuable by-products, with good markets abroad or in the country, which are presently allowed to go nearly completely wasted.

47. In the case of cattle and buffalo, apart from other considerations, building of slaughterhouses would not make much economic sense, except in beef-consuming areas. What is badly needed is to improve the collection rate of hides: the setting up of a large number of carcass recovery centers in rural areas might be part of the answer. However, before implementing such schemes, careful studies would have to be made to find out whether such investments would prove economical. Perhaps it could well be more efficient and much less costly if some subsidies were granted to the collectors; these subsidies should be arranged in such a way as to encourage the quick processing of fallen animals and therefore the collection of hides of better quality.

48. Ways and means of improving the management of India livestock are well beyond the scope of the present report. But it is worth mentioning that if Indian cattle and buffalo population were rationally managed, India could become an important importer of cattle hides. However, such a prospect is very remote. As it is, export of leather will probably continue to grow in the next few years, but might level off at the end of the present decade in terms of volume due to the competition of the home market. Earnings can, however, be expected to continue to increase, as more and more leather will be exported in finished form. Besides maximizing its export earnings, the leather industry could provide important job and income opportunities.

TABLE I
WORLD LIVESTOCK POPULATION PER 100 PERSONS IN SELECTED COUNTRIES.
(1964-65)

	Cattle (including buffalo)	Goats	Sheep
Argentina	209	23	207
Australia	165	-	1,502
Brazil	103	-	-
Denmark	70	-	-
Ethiopia	112	80	110
Iran	-	56	138
Mexico	79	34	-
New Zealand	258	-	2,036
Nigeria	-	35	-
South Africa	-	30	214
Turkey	-	67	103
<u>India</u>	<u>50</u>	<u>14</u>	<u>9</u>
<u>World average</u>	35	11	31

Source: FAO Production Year Book (1966)

TABLE II
SECTORAL DISTRIBUTION IN 1961

	<u>Curing, tanning and finishing of hides and skins and preparation of finished leather</u>		<u>Manufacture and repair of leather footwear</u>		<u>Manufacture and repair of leather products other than footwear</u>	
	<u>No. of Units</u>	<u>No. of persons employed</u>	<u>No. of Units</u>	<u>No. of persons employed</u>	<u>No. of Units</u>	<u>No. of persons employed</u>
Large scale factory sector	50	10,298	6	1,242	3	259
Medium scale factory sector	363	8,420	65	1,739	38	794
Small scale factory sector	n.a.	19,847	n.a.	162,930	n.a.	18,663
Household industry sector	<u>n.a.</u>	<u>91,478</u>	<u>n.a.</u>	<u>465,413</u>	<u>n.a.</u>	<u>30,057</u>
Total	n.a.	129,043	n.a.	631,324	n.a.	49,773

Sources: Annual Survey of Industries 1961 and the Census of India 1961.

Note: The A.S.I. consists of two parts: the Census Sector enumerating factories employing 50 or more workers using power and 100 and more without power; (i.e. large scale factories) and the Sample Sector which covers factories employing 10-49 workers using power and 20-99 workers without. (i.e. medium scale factories). By deducting the employment from large and medium scale factories from the non-household sector of the Census of India, we arrive at the small scale factories. The Census gives also figures for the household industry sector.

TABLE III

FIXED AND WORKING CAPITAL
EMPLOYED IN THE INDUSTRY (1962-63)

<u>Sector</u>	<u>Output</u> (Million Rs)	<u>Fixed Capital</u>	<u>Working Capital</u>	<u>Per Rs 1,000 worth of output</u>	
				<u>Fixed Capital</u> (Rs)	<u>Working Capital</u> (Rs)
Large scale factory sector (Tanning industry)	161.077	12.298	29.657	76	184
Large scale factory sector (Footwear industry)	22.775	1.731	4.191	76	184
Large scale factory sector (Other leather-goods industry)	0.201	0.053	0.129	76	184
Medium scale factory sector (Tanning industry)	177.415	8.462	21.679	48	122
Small scale factory sector (Tanning industry)	361.454	9.036	22.109	25	75
Household industry sector (Tanning industry)	<u>197.600</u>	<u>1.976</u>	<u>4.940</u>	<u>10</u>	<u>25</u>
All sectors	921.600	33.561	87.705	36	95

Source: "Survey of India's export potential of leather
and leather products". Goldale Institute Poona

TABLE IV
ESTIMATES OF NUMBER OF HIDES
AND SKINS PROCESSED IN THE COUNTRY (1967)

<u>Item</u>	<u>Estimates of</u> <u>production (1967)</u>	<u>Imports</u> <u>(1967-68)</u>	<u>Exports</u> <u>(1967-68)</u>	<u>Total hides</u> <u>and skins</u> <u>processed (1967)</u>
	(Million number)			
Cow and other cattle hides	9.34	0.05	-	9.39
Cow calf skins	6.75	-	-	6.75
Buffalo hides	3.92	0.19	-	4.11
Buffalo calf skins	4.67	neg.	-	4.67
Other hides	-	-	-	0.29
Goat skins	30.69	0.06	7.32	23.43
Sheep skins	19.74	0.10	neg.	19.84
Reptile skins	-	-	-	0.41
Other skins	<u>-</u>	<u>-</u>	<u>-</u>	<u>0.06</u>
Total				68.95

Source: Gokhale Institute Poona (October 1969)

TABLE V

Exports of Hides, Skins, Leather and Leather Goods

Year	Total Exports of Categories in Million Rs.	Index of Rs. Earnings (1957 = 100)	U.S. \$ in Million	Index of U.S. \$ Earnings (1957 = 100)
1957	315.036	100.00	66.184	100.00
1958	275.269	87.38	57.830	87.38
1959	427.596	135.73	89.831	135.73
1960-61	380.825	120.88	80.005	120.88
1961-62	366.922	116.47	77.084	116.47
1962-63	364.675	115.76	76.612	115.76
1963-64	399.310	126.75	83.889	126.75
1964-65	408.351	129.62	85.788	129.62
1965-66	435.559	138.26	91.504	138.26
1966-67	825.914	262.16	116.867	176.58
1967-68	701.872	222.79	93.583	141.40
1968-69	871.694	276.70	116.226	175.61
1969-70	992.172	314.93	131.949	199.36

Source: Monthly Statistics of the Foreign Trade of India.

TABLE VI

EXPORTS OF LEATHER BY COMMODITIES

<u>Category</u>	<u>1957</u>	<u>% of total</u>	<u>1968/69</u>	<u>% of total</u>
<u>Goat skins</u>	140.2	45.09	428.3	49.97
Index (Current prices)	100.0		305.0	
Index (Volume)	100.0		165.0	
<u>Sheep skins</u>	63.4	20.38	165.9	19.36
Index (c.p.)	100.0		262.0	
Index (Volume)	100.0		145.0	
<u>Cattle and buffalo</u>				
<u>Hides</u>	62.2	19.99	124.1	14.47
Index (c.p.)	100.0		199.0	
Index (Volume)	100.0		99.0	
<u>Finished Leather</u>	13.4	4.32	10.8	1.26
Index (c.p.)	100.0		80.0	
Index (Volume)	100.0		46.0	
<u>Leather goods</u>	27.5	8.84	93.3	10.89
Index (c.p.)	100.0		339.0	
Index (Volume)	100.0		252.0	
<u>Exotic skins</u>	4.3	1.39	34.7	4.05
Index (c.p.)	100.0		806.0	
Index (Volume)	100.0		153.0	
Total	311.0	100.0	857.1	100.0
Index (Current prices)	100.0		276.0	
Index (Volume)	100.0		159.0	

Source: Foreign Trade Statistics.

TABLE VII

Percentage Shares of Selected Countries in India's Exports of
Hides, Skins, Leather and Leather Goods: 1957-1968-69
(Value in million Rs. Figures in brackets are percentages of total Indian Exports)

Year	- Selected Importing Countries -							Total
	U.K.	U.S.S.R.	Italy	France	U.S.A.	West Germany	Japan	
1957	160.955 (51.75)	38.427 (12.36)	6.171 (1.98)	8.666 (2.79)	25.819 (8.30)	24.377 (7.84)	10.551 (3.39)	274.966 (88.41)
1958	125.428 (46.09)	32.942 (12.11)	5.561 (2.04)	10.473 (3.85)	27.607 (10.15)	23.625 (8.68)	7.505 (2.76)	233.141 (85.68)
1959	192.698 (45.78)	67.899 (16.13)	7.698 (1.83)	11.261 (2.68)	40.403 (9.60)	39.343 (9.35)	9.323 (2.21)	368.625 (87.58)
1960-61	151.807 (40.31)	56.110 (14.90)	8.741 (2.32)	14.391 (3.82)	36.871 (9.71)	40.636 (10.79)	11.693 (3.11)	320.249 (84.96)
1961-62	142.437 (39.47)	33.444 (9.27)	9.282 (2.57)	17.609 (4.88)	42.373 (11.71)	44.068 (12.21)	15.093 (4.18)	304.306 (84.29)
1962-63	126.417 (35.29)	60.419 (16.87)	12.533 (3.50)	17.073 (4.77)	40.958 (11.46)	24.103 (6.73)	14.001 (3.91)	295.504 (82.53)
1963-64	139.099 (35.11)	69.460 (17.53)	20.089 (5.07)	18.583 (4.69)	46.022 (11.68)	25.674 (6.48)	17.337 (4.38)	336.264 (84.94)
1964-65	128.258 (31.76)	69.527 (17.21)	21.374 (5.29)	22.878 (5.66)	42.965 (10.63)	32.317 (8.00)	17.334 (4.29)	334.653 (82.84)
1965-66	119.779 (27.92)	84.624 (19.73)	23.922 (5.58)	30.594 (7.13)	61.507 (14.34)	38.053 (8.87)	13.165 (3.07)	371.644 (86.64)
1966-67	190.293 (23.26)	252.943 (30.92)	66.396 (8.12)	49.541 (6.06)	55.080 (6.73)	59.827 (7.31)	24.732 (3.02)	698.812 (85.42)
1967-68	164.179 (23.73)	165.995 (24.00)	66.895 (9.67)	39.102 (5.65)	64.672 (9.35)	43.249 (6.25)	26.189 (3.78)	570.281 (82.43)
1968-69	199.668 (23.29)	186.145 (21.71)	88.036 (10.27)	65.375 (7.63)	65.645 (7.66)	52.347 (6.11)	32.790 (3.83)	690.006 (80.49)

Source: Monthly Statistics of the Foreign Trade of India.

TABLE VIII

ESTIMATED PRODUCTION OF HIDES AND SKINS

	<u>1968/69</u>	<u>1973/74</u>	<u>1978/79</u>
Cattle	17.550 (10)	21.060 (12.0)	26.325 (15.0)
Buffaloes	9.095 (17)	9,922 (18)	11.360 (20)
Goats	36.359 (55)	40.348 (57.5)	44.690 (60)
Sheep	20.529 (48.0)	21.917 (49.0)	23.390 (50.0)

Note: Estimates in million pieces. Figures in brackets are percent ratios of hides/skins to corresponding population.

These estimates are based on the assumption that the government will pursue in future an active program of recovery of carcass and that it will implement the setting-up of modern livestock processing plant for goats and sheep.

TABLE IX

UTILIZATION OF HIDES AND SKINS IN 1968/69
AND THE POSSIBLE UTILIZATION IN 1973/74

(in million Rs valued at 1968/69 export prices)^{1/}

	Production		Exports		Used in Domestic Production of Footwear	
	<u>1968/69</u>	<u>1973/74</u>	<u>1968/69</u>	<u>1973/74</u>	<u>1968/69</u>	<u>1973/74</u>
<u>Cattle and buffaloes and calf skins</u>						
Tanned but unfinished	507	425	124	147	383	328
Finished	295	450	7	9	288	441
Total	802	925	131	156	671	769
<u>Goat Skins</u>						
Tanned but unfinished	362	454	384	450	-	4
Finished	9	30	5	25	4	5
Total	371	484	389	475	4	9
<u>Sheep skins</u>						
Tanned but unfinished	208	211	166	200	42	11
Finished	7	20	4	16	3	4
Total	215	231	170	216	45	15
<u>All hides and skins</u>						
Tanned but unfinished	1,077	1,140	674	797	425	343
Finished	311	500	16	50	295	450
Total	1,388	1,640	690	847	720	793

Source: Gokhale Institute - Poona.

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Report No.

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INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT
INTERNATIONAL DEVELOPMENT ASSOCIATION

EXPORTS OF IRON ORE
INDIA

May 27, 1971

South Asia Department

INDIA

EXPORTS OF IRON ORE

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EXPORTS OF IRON ORE

SUMMARY AND CONCLUSIONS

1. In 1950 Indian exports of iron ore amounted to less than 100,000 tons and accounted for a negligible percentage of total export earnings. In 1968/69 they reached a level of 16 million tons, earning US\$118 million of foreign exchange (6.5% of total exports). Provided that certain basic conditions are fulfilled, this growth is expected to continue in the next few years. While the Fourth Plan objective (31 million tons by 1973/74) may be on the high side, a target of 26-27 million tons can be considered feasible at this time. Assuming that the relative price stability of the past few years will persist, this would imply that the value of Indian exports of iron ore will increase to about \$190 million by 1973/74.
2. It does not seem that the growth of the domestic market will place substantial restraints on the expansion of Indian export capacity, even if the current projects of mine mechanization and development are not completely realized. Neither is India going to face any serious problem of physical availability of iron-bearing materials, meeting the required specifications. Moreover, given the state of technology and the structure of relative prices, it seems unlikely that the degree of substitution between steel and alternative materials (aluminum, plastics, concrete, etc.) will increase substantially in the short run, except perhaps in very special manufacturing activities.
3. A major unknown is the future rate of growth of the Japanese steel industry; major both because of the heavy dependence of Indian iron ore exports on that market (80% in 1968/69) and because of the impact that any variation in Japanese demand might have on international prices. As for the required degree of ore beneficiation, the present tendency to use less and less unprepared ore in blast-furnaces has to be weighed against the building up in Japan of a massive internal capacity of sintering and pelletizing. So, the final effect on the composition of ore demand will depend, among other things, upon the relative cost of ore beneficiation at home and abroad. Reportedly, air pollution considerations could influence the choice.
4. Given Japan's policy of diversifying its sources of supply and the stiff competition from Australia and South America, it does not seem an easy task for India to maintain her share of that market. It is a rather alarming fact that over the past few years while Japan has become an increasingly important market for India's exports of iron ore, India has become a diminishingly important source of supply for the Japanese steel industry. In the long run, the Indian bargaining position could improve, if the European steel industry adopted a diversification strategy more similar to the Japanese one. However, at this moment only a few signs seem to point in that direction.

5. In the medium term, the major bottleneck to the improvement of India's competitive position is transportation. Land transport costs are extremely high in terms of total f.o.b. costs because of the geographical distribution of deposits, the lack of road and rail facilities (including loading and unloading devices) and the inadequate quality of ports. In order to accommodate the new large ore carriers and to maximize the economies achievable through their use, massive investments are required in some of the major Indian ports. From this point of view, the speed of loading seems to be as much an important factor as the tonnage of the vessels that can be accommodated, since ship delay costs are an increasing function of ship size and may represent a substantial portion of freight costs.

6. So far, no integrated mine-rail-port system of the type successfully experimented with in other countries has been developed in India. The institutional changes involved in and the benefits stemming from such a solution have been studied by the National Mineral Development Corporation and are now being considered by the Government. While it is not yet clear whether and when this proposal will be implemented, it seems unlikely that it can have any substantial impact during the Fourth Plan period.

I. THE WORLD MARKET FOR IRON ORE

Background

1. Over the last twenty years, Indian exports of iron-ore have been increasing faster than any other traditional or quasi-traditional commodity. While in 1950/51 they amounted to less than two million rupees, accounting for a negligible percentage of total exports, in 1968/69 they reached a level of \$118 million, representing more than 6.5% of export earnings. This growth is expected to continue in subsequent years. A number of economic and technological factors provided the framework for these developments and may influence the future pattern of growth. A summary assessment of these factors is attempted here. The impact of new technologies on iron-ore mining and trade and the evolution of the world market for iron ore are briefly discussed in this section. The trends in Indian production and "apparent consumption" of iron-ore and some basic data on Indian reserves of ore by regions and by chemical properties are considered in Section II. The micro-economics of iron ore mining in India is introduced rather cursorily in Section III, which contains also some rough quantitative estimates of production costs. An overall assessment of the past performance and perspectives of Indian exports of iron ore is attempted in Sections IV and V. The target year of the Fourth Plan (1973/74) is assumed throughout as the forecast year.

The Impact of New Technologies

2. The world market for iron ore has undergone profound changes since the Second World War, with respect to the volume and the geographical pattern of trade, the quality of the ores traded and the prices. Some complicated interrelationships between economic changes and technological innovations lie behind these developments ^{1/}.

3. The rapid increase in the world demand for steel, stemming from reconstruction requirements and then stimulated by the rapid growth of the main developed countries, induced a considerable depletion of the traditional sources of high grade ores. The growing expensiveness of quality ores and the rapid exhaustion of supplies of wartime scrap stimulated the research for new sources of supply and for new techniques of mining, beneficiation and smelting.

4. In the meanwhile, as a result of a number of scientific and technological advances during the war, many areas became accessible which were still barely penetrable a few years before. Systematic geological surveys were carried out in many parts of the world. New photographic and magnetic techniques were perfected. It became economical to apply geophysical methods, which so far had been employed only for more valuable minerals. Many governments of developing countries (including India) encouraged these efforts, realizing the possibility of developing their iron-ore resources, both as an export industry and as the basis of a national steel industry.

^{1/} This section relies heavily on E.C.E., The World Market for Iron Ore, (New York, 1968).

5. The so-called "transportation revolution" accelerated this process. Traditionally, overseas ore mines could export economically only if they were located along the main "tramping" routes. The ships were slow and not adapted to carry bulk cargoes. The shortage of loading and unloading facilities was a further cause of prohibitive freight costs. After the Second World War, new shipbuilding techniques, developed to replace the war losses, were applied to the construction of large carriers of special design. The savings in terms of manufacture and operation costs and, at the same time, the improvements in ports and port facilities contributed to reduce the freight costs to a level at which they were no longer an absolute obstacle to the long distance transportation of higher grade ores.

6. As the supply of imported high-grade ores increased, the demand for domestic low-grade ores, difficult to beneficiate, began to decline. New steel plants were built on the coasts to take maximum advantage of imported ores. On the other hand, the growing scarcity of better grade coking coal stimulated the research for new techniques of iron-ore preparation.^{1/} Sintering and later on pelletization^{2/} were developed to upgrade the quality of available ores, to utilize the fines arising during transportation and to avoid the wastage of natural fines contained in the newly discovered deposits. In some cases, low-grade ore bodies became again economical to mine (this happened, for instance, in Canada, in the U.S.A., in U.S.S.R. and in Sweden).

7. The availability of concentrates (sinter, pellets) with regular physical and chemical characteristics and of high-grade natural ores made it possible to control blast-furnace burdens to an extent impossible before. The average size of blast furnaces increased and their productivity improved. In turn, this stimulated or favoured the introduction of new smelting techniques, such as fuel-injection, high top pressure, oxygen blowing^{3/} etc.

^{1/} U.N., Economic Aspects of Iron-Ore Preparation, (Geneva, 1966).

^{2/} The sintering process consists of heating a bed of ore on a grate, together with coke fine and various materials designed to give the sinter the required qualities. Sintering provides blast-furnaces with materials which are well-sized, but of uncertain shape and varying dimension. In pelletizing, the shape and dimensions of the particles are more strictly defined (pellets are usually less than one-half inch diameter). For more details, CFR. U.N., Economic Aspects cit.

^{3/} In the case of oxygen blowing, the main factor was the availability of cheap oxygen.

World Resources of Iron-Ore

8. The results of the intensive research for new supplies of iron-ore are reflected in the rapid increase in the estimated world reserves. A United Nations survey of iron-ore resources ^{1/}, made in 1954, estimated world reserves of ore at 84,500 million tons, containing some 41,700 million tons of iron. A new estimate, made by E.C.E. in 1967 ^{2/}, indicates a level of "reserves", i.e. mineral masses immediately exploitable, of 248 billion tons and a stock of about 205 billion tons of "potential ores", i.e. ore deposits exploitable under more favorable technological, economic or local conditions than those existing. It is possible that these estimates are to be revised upward, taking into account the result of further explorations and the upgradings induced by the economic and technical progress.

Table 1: World Iron Ore Resources by Regions
(situation: January 1966)

	(billion tons)	
	<u>Reserves</u>	<u>Potential Ores</u>
Western Europe	20.0	5.3
Eastern Europe (incl. USSR)	104.3	14.2
North America	52.9	93.0
Latin America	41.8	42.1
Africa	12.6	13.9
Far East and Middle East	8.4	29.5
Oceania	8.2	7.0
TOTAL WORLD	248.2	205.0

Source: E.C.E., The World Market for Iron-Ore (New York, 1968)

World Demand for Iron-Ore

9. The aggregate world demand for iron-ore shows, in general, a fairly strong statistical correlation with world steel production, which in turn reflects rather closely the general growth of world manufacturing output.

^{1/} U.N., Survey of World Iron Ore Resources, (New York, 1954)

^{2/} E.C.E., World Market cit. The meaning of these statistics is however somewhat limited, because the reliability of national sources is probably not homogeneous and because to a certain extent they are based on subjective assessment of the economic and technological situation in each country.

The residual variance reflects the presence of factors such as:

- changes in stocks and in stock policy
- consumption of waste and scrap
- changes in methods of ore preparation
- substitution between steel and alternative materials (aluminum, plastics, concrete, asbestos-cement, timber, etc.)

10. It should be noticed that the general term "iron-ore" actually covers a wide variety of materials, which differ in the degree of preparation^{1/}, in chemical composition and in physical characteristics. All these factors (and others, that will be mentioned below) affect the "metallurgical value" of an ore, i.e. the possibility of substituting one ore for another in production. A simple, although ambiguous, index of the metallurgical value of an ore is the percentage of iron content. While this index may be useful as a first approximation, it must not conceal the fact that the "world market for iron ore" is actually a system of distinct, although interrelated, markets of differentiated products. This character of "monopolistic competition" is further accentuated by the high incidence of transportation costs in the cif price.

Trends in Production and Apparent Consumption

11. Since 1950 world steel production and pig iron production have shown a fairly consistent long-term growth rate of about 5-6% p.a. Steel production increased from 191 million tons in 1950 to 513 million tons in 1968, while pig iron output rose from 133 million tons to 372 million tons. During the same period, the world production of iron ore (actual tonnage) increased from 244 million tons to 632 million tons^{2/}, i.e. at a comparable rate of growth. However, since the average iron content rose as well from about 45% in 1950 to over 50% in recent years, the world output in terms of iron content increased faster (at 6.6% p.a.), reflecting a decline in the proportion of scrap used. Because of the factors mentioned above, the volume of international trade has grown at a much higher rate than the production of ore or steel, from 26 million tons in 1950 to about 226 million tons in 1967. On the other hand, the average iron content of exports has increased faster than that of world output, the tendency being to import ores of higher grade and to consume leaner ores close to the mines, in order to minimize the transportation cost per unit of iron.

^{1/} This term refers to processes like crushing, screening, roasting, agglomeration, concentration etc., which can be carried out at any point between the mine and the steel works.

^{2/} These figures refer to the marketable output and not to the quantities actually mined (the difference being represented by fines that cannot be sold).

Table 2 World Production of Iron Ore, Pig Iron and Steel
(million tons)

	<u>Iron Ore</u> ^{1/}	<u>Pig Iron</u> ^{2/}	<u>Steel Imports</u> ^{3/}
1950	243.6	131.9	191.6
1957	427.9	209.2	292.5
1960	513.6	255.8	346.5
1961	502.6	256.4	351.6
1962	507.8	265.2	360.2
1963	523.4	281.5	387.0
1964	581.3	317.6	438.0
1965	617.3	335.1	459.3
1966	635.0	347.0	476.1
1967	625.4	355.6	493.0
1968	632.0	371.9	512.6

1/ Actual tonnage

2/ Including ferro-alloys

3/ Including castings

Source: E.C.E. op. cit. Page 40; World Metal Statistics, June 1970.

12. Although there are insufficient reliable data on which to base a precise assessment, it seems that the proportion of fines and concentrates with respect to lump ores has been increasing over the past few years, while the exports of ore with high phosphorus content have increased by much less than the total volume of exports. The first trend may be expected to continue in the near future. On the other hand, it seems too early to determine what will be the effect of the new technique of oxygen blowing on the market for phosphoric ores.

The Changing Pattern of Trade

13. Because of the widely different degrees of self-sufficiency of the main steel-producing countries, regional variations in the rate of growth of steel output have had a major impact on the pattern of world trade.^{1/} On the whole, the degree of self-sufficiency of the main consuming regions (excluding U.S.S.R.) has been declining since the beginning of the fifties. In Japan, almost the whole of the tremendous expansion of steel output had to rely on imported ores. Western Europe is now supplying only about one-half of the

^{1/} UNCTAD, Problems of the Iron Ore Market (1969).

Table 3 World Exports of Iron Ore, 1950-1967
(million tons, iron content)

	<u>Annual Data</u>						<u>Growth Rates p.a.</u>	
	<u>1950</u>	<u>1957</u>	<u>1960</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1950-1960</u>	<u>1960-1967</u>
World	21.8	64.1	80.6	121.2	123.7	132.9	14.0	7.4
Developing Countries	6.2	27.8	37.4	62.5	64.8	65.9	19.7	8.4
Developed Market Economy Countries	13.9	30.9	35.6	46.6	45.8	52.7	9.8	5.8
U.S.S.R.	1.6	5.4	7.6	12.1	13.1	14.3	16.7	9.5

Source: UNCTAD, Problems of the iron ore market (Geneva 1969) p.11.

increase in its iron ore requirements, compared with nearly three-fourth in 1950. In the U.S.A. the proportion of total needs met by domestic production has remained roughly constant in the past few years at about two-thirds, while it was over four-fifths in 1950. Only in U.S.S.R. has production grown at a rate sufficient to supply not only the whole of its own requirements, but also the bulk of the import requirements of the Eastern European countries. Analogous changes have occurred on the supply side. The share of Western Europe in the world market has decreased sharply, from 50% in 1950 to 16% in 1967. By contrast, exports from the Far East countries (mainly, India, Malaysia, and Australia) have increased from less than 2% of world exports in 1950 to about 13% in 1967. Latin America's share more than doubled between 1950 and 1960, declining somewhat in recent years, under the pressure of the rapid expansion of African exports.

Trend in Prices

14. A substantial portion of the world trade in iron ore consists of shipments from "captive mines" to steel plants under common ownership or is covered by long-term contract, extending in some cases for periods of more than 20 years.^{1/} This circumstance and the fact that iron ores are widely differentiated in terms of quality and geographical location of deposits make it difficult to give a precise assessment of trends in prices.

^{1/} A rising portion of Japanese imports is covered by such agreements. In their most usual form, they stipulate a given annual quantity with a certain margin of flexibility in favour of the buyer. The price is either given as a fixed figure or is expressed in terms of a basic value, which can vary from year to year according to an agreed formula. In some cases, the price is negotiated each year. Cfr. E.C.E., op cit., p. 88.

Table 4 Development of Statistical f.o.b. Unit Values of Iron Ore Exports From Selected Countries - 1950 to 1965(US\$ per ton of iron content)

	<u>Sweden</u>	<u>Canada</u>	<u>Brazil</u>	<u>Chile</u>	<u>Peru</u>	<u>Venezuela</u>	<u>Liberia</u>	<u>Malaysia</u>
1950	9.9	11.8	10.9	4.0	-	-	-	10.4
1951	11.9	11.8	14.5	4.6	-	-	-	12.2
1952	17.5	12.8	21.6	6.7	-	-	-	12.9
1953	19.0	14.0	21.0	8.1	-	-	-	11.6
1954	16.3	14.4	19.3	7.1	10.9	9.9	-	11.2
1955	16.4	14.8	17.4	7.6	7.8	11.1	16.0	11.5
1956	18.0	15.4	18.8	9.3	9.2	11.1	16.0	11.7
1957	19.8	16.8	20.0	10.6	10.6	12.3	16.5	12.1
1958	20.2	16.8	20.5	10.0	11.6	12.3	16.0	12.5
1959	17.4	16.5	16.4	10.0	9.7	12.3	16.0	13.2
1960	17.1	17.4	15.4	10.5	11.2	14.2	10.4	12.6
1961	16.8	17.0	14.4	11.0	12.2	14.2	10.4	12.6
1962	16.0	16.2	13.6	12.0	11.0	15.0	13.5	12.8
1963	14.4	17.2	12.8	12.5	10.3	13.1	11.1	13.2
1964	14.3	17.7	12.6	11.8	9.9	13.4	10.3	12.7
1965	14.4	17.5	12.3	11.0	12.0	13.3	9.8	12.0

Source: E.C.E. op. cit. pp. 69-73

15. The most usual indicator of iron ore prices is the "statistical unit value", i.e. the value obtained by dividing the actual f.o.b. price per ton of iron ore exported by the average iron content of the ore. The arithmetic mean of the statistical unit values (expressed in US\$) for some of the major exporting countries, shows two periods of peak prices in 1952-53 and in 1957-58 and a downward trend after 1958, with only a slight rise in 1960 (Table 4). The fluctuations in the market appear to be fairly small, at least compared to those of other "traditional commodities" (+ 10% at most from one year to another) and the dispersion around the mean seems to decrease rather regularly, possibly in connection with the improvement in the degree of competition brought

about by the decline in transportation costs. If the mean is weighted according to the tonnages of ore exported, the basic pattern is not very much affected. The only major difference is that the weighted values are always slightly higher, perhaps because of the commercial advantages of the large exporters over the small ones.

16. Cif prices, of course, are strongly affected by freight costs; though to the extent that the market brings about a tendency to price equalization, this is much more apparent in the case of cif prices than for f.o.b. prices. The analysis of the statistical cif unit values for a sample of importing countries shows in general a declining trend since 1950, partially explained by the decline in the proportion of freight to the total cif cost. During the two peaks of 1952 and 1957, the increase in cif prices was greater than that in f.o.b. prices, because of the shortage of ore carriers. On the other hand, between 1953 and 1955 the decline in average f.o.b. prices was partially compensated by the rise in freight rates.

Table 5 Development of Statistical cif Unit Values of Iron Ore Imports into Three Major Countries 1950 to 1965 (US\$ per ton of iron content)

	<u>United Kingdom</u>	<u>Western Germany</u>	<u>Japan</u>
1950	13.8	---	---
1951	18.3	---	---
1952	28.2	26.2	32.0
1953	27.2	25.2	25.5
1954	25.4	22.6	22.4
1955	25.8	23.2	25.2
1956	27.7	25.4	32.8
1957	29.4	27.8	34.6
1958	27.3	26.4	26.9
1959	25.6	23.4	21.9
1960	24.4	23.2	22.6
1961	24.4	23.2	23.4
1962	24.2	22.2	23.4
1963	22.0	19.9	22.7
1964	20.9	18.3	21.9
1965	20.9	18.1	21.7

Source: E.C.E. op. cit. p.87.

17. A comparison of estimated export capacities and import needs of various countries in 1975 and 1980, attempted by the E.C.E. four years ago, indicated a strong probability of excess capacity and declining prices up to 1975 and a more balanced growth after that year.^{1/} Recent developments in the

^{1/} E.C.E., op. cit., Chapter X.

Japanese market have shown that the growth rate of world import requirements had probably been much underestimated. Therefore, even taking into account the tremendous growth of Australia's export capacity, it seems now that there is some possibility of substantial price stability, at least in the near future. Some observers would even envisage some price increase after 1975.^{1/}

II. INDIAN SUPPLIES OF IRON ORE

Indian Reserves and Potential Ores

18. India possesses large resources of iron ore. The most recent estimates place "reserves" (measured, indicated or inferred) at 7.2 billion tons and "additional potential ores" at 21.3 billion tons. This represents about 6% of total world resources of iron ore, about 3% of world reserves and more than 10% of world potential ores. Among the countries possessing the largest reserves, India ranks the seventh, after U.S.S.R. (103.6 billion tons), U.S.A. (41.9 billion tons), Brazil (37.8 billion tons), Canada (11.0 billion tons), South Africa (8.6 billion tons) and Australia (7.5 billion tons).^{2/}

Inventory of Indian Resources, by Regions and by Types

19. According to the geological origin, the iron ore deposits in India can be divided into three major groups:

a. Ferruginous formations of pre-cambrian age, similar to those of Brazil, Venezuela and U.S.A. (Lake Superior). Most of the large deposits belong to this group.

b. Lateritic ore (concentration of hydrated oxides of iron with oxides of aluminum, manganese and titanium). These ores contain only 25-35% Fe and are not likely to be exploited in the near future.

c. Other types, such as titaniferous magnetites of the Taberg type.

^{1/} This opinion is shared by MMTC officials.

^{2/} E.C., op. cit., p. 26. Mainland China's reserves are scarcely known. The amount indicated for Australia is to be revised after the recent discovery of large new deposits.

20. The composition of Indian iron ores resources by type is the following:

	<u>Reserves</u> (million tons)		<u>Potential Ores</u>
Hematites	5,817	(80.4%)	17,630
Magnetites	922	(12.7%)	1,670
Limonites	500	(6.9%)	2,000
TOTAL	7,239	(100.0%)	21,300

Hematitic ores have in general a high metallurgical value, because of their high iron content and because of their freedom from sulphur and phosphorus 1/.

21. The Indian deposits of iron ore are not concentrated in one district as are those of Australia and Peru, but occur in widely separated areas: mainly in Bihar, Orissa, Mysore, Madhya Pradesh and in the Goa territory. This is a major disadvantage, in terms of required investments in basic infrastructure. Table 6 gives the state-wise distribution of reserves and potential ores.

22. Typical analyses of iron ore samples taken from various deposits in India (Table 12) confirm the average good quality of Indian iron bearing materials, in terms of iron content and with respect to the percentages of phosphorus and sulphur. On the other hand, most Indian ores contain a very high percentage of alumina and the silica-alumina ratio is considered too low. This may cause serious disadvantages for transportation, crushing and screening, since the fines may become very sticky when the moisture content is increased 2/.

1/ G. S. Brady, Materials Handbook, (New York, 1947).

2/ U.N., Economic Aspects, cit., p. 166.

Table 6 Indian Iron Ore Resources, by States
(million tons)

<u>States</u>	<u>Reserves</u>		<u>Potential Ores</u>
	<u>absolute amount</u>	<u>% of total</u>	
Bihar-Orissa	2748	38.0	8000
Madhya Pradesh	1586	21.9	7000
Mysore	1109	15.3	2800
Goa	535	7.4	--
Bengal	500	6.9	--
Madras	308	4.2	1000
Andhra Pradesh	304	4.2	50
Himachal Pradesh	60	0.8	60
Hyderabad	37	0.5	2060
Bombay	30	0.4	300
Kashmir	5	0.1	--
Uttar Pradesh	10	0.1)
Rajasthan	5	0.1	) 30
Patiala (Punjab)	2	---)
TOTAL	7239	100.0	21,300

Source: E.C.E., op. cit.

Indian Production of Iron Ore

23. Stimulated by the rapid increase in external demand and by a growing internal market, Indian production of iron ore rose from about 3 million tons in 1950 to 28.3 million tons in 1969, i.e. at an average rate of growth of 12.4% p.a. This growth is partially due to the integration of the territory of Goa, whose production of iron ore represents about one fourth of the total Indian output; and partially to the opening-up of new mines and to increases in productivity.

Table 7 Indian Iron Ore Production 1950-1969
(million tons, actual tonnage)

	<u>India</u> (excluding Goa)	<u>Goa</u>	<u>All India</u>	<u>% Fe</u>
1950	3.0	0.1		61.3
1957	5.2	2.9		59.2
1960	10.7	5.8		60.0
1961	12.3	6.4		59.9
1962	13.3	6.4		59.4
1963	15.0	6.1	21.1	58.2
1964	14.9	6.0	20.9	58.9
1965	17.2	6.6	23.8	60.9
1966	20.1	6.7	26.8	61.2
1967	19.1	6.8	25.9	61.4
1968	20.6	6.9	27.5	n.a.
1969	21.3	7.0	28.3	n.a.

Source: Mineral Trade Notes (1965-1970)

24. The average iron content of the ore produced in India has remained more or less constant at the 1950 level (about 60-61%) well above the world average. The following table shows, for 1963, the Indian iron-ore production (excluding Goa) broken down by grades and areas:

Table 8 Indian Iron Ore Production in 1963 by Grades and Areas
(thousand tons, actual tonnage)

<u>States</u>	<u>Grades (% Fe)</u>						<u>TOTAL</u>
	<u>+67%</u>	<u>65-67%</u>	<u>63-65%</u>	<u>60-63%</u>	<u>58-60%</u>	<u>-58%</u>	
Andhra Pradesh	--	34	106	75	16	1	232
Bihar	--	1	1408	1811	168	82	3470
Maharashtra	--	3	--	368	26	--	397
Madhya Pradesh	--	110	1	--	2232	--	2343
Mysore	338	1645	135	176	77	119	2490
Orissa	108	119	1510	539	3386	334	5996
Punjab	--	--	--	3	--	--	3
Rajasthan	--	--	25	38	4	--	67
TOTAL	446	1912	3185	3010	5909	536	14,998

Source: E.C.E., op. cit.

25. The distribution of iron ore production by states in 1955, 1960 and 1965 shows a continuing decline in concentration. This seems to have increased the structural disadvantages connected with a widely scattered mining industry.

Table 9 Indian Iron Ore Production by States 1955-1965
(% of total output)

<u>State</u>	<u>1955</u>	<u>1960</u>	<u>1965</u>
Andhra Pradesh	8.3	3.0	0.9
Bihar	41.0	26.6	25.2
Madhya Pradesh	0.2	13.6	16.5
Maharashtra	1.0	3.0	2.3
Mysore	7.8	17.5	17.2
Orissa	40.2	35.0	37.8
Punjab	0.5	0.1	--
Rajasthan	1.0	1.2	0.1
TOTAL (Excluding Goa)	100.0	100.0	100.0

Source: Statistics for Iron and Steel Industry in India (HSL, 1966)

Trends in Domestic Consumption

26. Indian "apparent consumption"^{1/} of iron ore is fairly well correlated to the domestic production of pig iron, both showing a long-term rate of growth of about 8.5% p.a. Occasional deviations from the trend reflect changes in stock policy or (what amounts to the same) lags in the induced demand for ore. The average rate of increase in crude steel output since 1950 has been slightly higher (9.2% p.a.), apparently because of a more intensive use of scrap and waste and also in consequence of increases in physical productivity due to the introduction of more advanced smelting techniques. The three time-series are summarized below:

^{1/} Apparent consumption is defined as domestic production of ore plus imports less exports.

Table 10 A Comparison of Indian Apparent Consumption of Iron Ore, Production of Pig Iron and Production of Crude Steel 1950-1969

	<u>Iron Ore Apparent Consumption</u>		<u>Pig Iron Output</u>		<u>Crude Steel Output</u>	
	Quantity (mil. tons, iron content)	Index (1950=100)	Quantity (mil. tons)	Index (1950=100)	Quantity (mil. tons)	Index (1950=100)
1950	1.9	100	1.7	100	1.5	100
1957	2.0	105	1.9	112	1.7	113
1960	4.6	242	4.3	253	3.4	227
1961	5.3	279	5.1	300	4.3	287
1962	6.3	332	6.3	371	5.4	360
1963	6.7	353	6.6	388	5.9	393
1964	6.0	316	6.7	394	6.1	407
1965	7.0	368	7.1	418	6.5	433
1966	8.1	426	7.0	412	6.6	440
1967	7.6	400	6.9	406	6.3	420
1968	n.a.		7.2	424	6.5	433
1969	n.a.		7.3	429	6.7	447

Source: Statistics for Iron and Steel Industry in India (HSL, 1966), GOI, Economic Survey, 1969/70.

Table 11 Analyses of Iron Ores from Various Deposits in India
(percentages)

<u>Ore and Area</u>	<u>Iron</u>	<u>Phosphorus</u>	<u>Sulphur</u>	<u>Silicon</u>	<u>Aluminum</u>	<u>Titanium</u>
<u>Hematites</u>						
Bihar-Orissa	55-59	0.03 - 0.38	0.01-0.05	1.0 - 6.5	0.9 - 6.4	---
Mysore	55-68	0.02 - 0.08	---	0.6 - 14.0	0.2 - 5.3	---
Madhya Pradesh	59-66	0.047-0.156	0.03-0.44	0.9 - 3.4	---	---
Goa	55-65	0.02 - 0.06	---	5.0 - 6.0	5.0 - 6.0	---
<u>Magnetites</u>						
Bihar-Orissa	65-69	0.005-0.015	0.009-0.031	0.68-5.54	0.26-1.10	0.13-0.50
Madras	29-40	0.01 -0.19	---	36-57	0.2 -3.9	---
<u>Limonites</u>						
Bengal	39-48	0.01 - 0.58	---	16-21.8	4.0 -12.5	---

Source: E.C.E., op. cit., p. 282.

III. THE STRUCTURE OF INDIAN IRON ORE COSTS

The Structure of the Indian Mining Industry

27. The Indian iron ore industry is widely scattered not only from a geographical point of view but also with respect to the size and structure of costs of its operating units. Unfortunately, the lack of updated information on many mines and the state of flux of the industry preclude a comprehensive analysis of the main elements of iron ore costs in India. Therefore, what follows is intended to suggest some elements for a broad qualitative assessment rather than a precise quantitative description of the current situation.

28. The structure of the Indian iron ore industry, despite its rapid transformation in recent years is still characterized by a very low degree of mechanization and by the presence of many small-scale producers. On the other hand, a small number of larger mines is producing an increasing proportion of total output. The following table relating to 1963 classifies Indian mines by output:

Table 12 Indian Mines by States and Output
(thousand tons per year)

State	<u>-25</u>	<u>25-50</u>	<u>50-100</u>	<u>100-500</u>	<u>+500</u>	<u>Total</u>	<u>Mechanized*</u>
Bihar-Orissa	34	9	12	9	5	69	7
Madhya Pradesh	1	-	-	1	1	3	1
Mysore	112	9	12	5	-	138	1
Punjab							
Rajasthan	13	-	-	-	-	13	-
Maharashtra	3	1	1	2	-	7	-
Andhra Pradesh	33	-	1	-	-	34	-
TOTAL	196	19	26	17	6	264	9

Source: NCAER, Cost price structure of iron-ore (1965).

* The term "mechanized" applies to mines in which two out of the three operations of drilling, loading and transport are done by mechanical means.

By classifying Indian iron ore output in 1963 by size of mine (thousand tons output per year), the following results are obtained:

	<u>-25</u>	<u>25-50</u>	<u>50-100</u>	<u>100-500</u>	<u>+500</u>	<u>Total</u>
Percentage of total production	8.1	4.7	12.7	20.8	53.7	100.0

29. More details on some of the major mechanized or semi-mechanized mines are given in the following table.

Table 13 Mechanized or Semi-Mechanized Iron Ore Mines (1966)

<u>Mine</u>	<u>State</u>	<u>Owner</u>	<u>Capacity Output*</u> (million tons p.a.)
Noamundi	Bihar	Tata	2.1
Rajhara	Madhya Pradesh	Hindustan Steel	4.0
Barsua	Orissa	Hindustan Steel	3.0
Donimalai	Mysore (Hospet)	NMDC	5.0
Kiriburu	Bihar	NMDC	2.0
Central Block			
Kiriburu	Bihar	NMDC	4.0
Meghahatuburu	Bihar	NMDC	5.5
Bailadila 14	Madhya Pradesh	NMDC	5.5
Bailadila 5	Madhya Pradesh	NMDC	2.7
Daiteri	Orissa	Orissa Mining Corporation	2.0

Source: Statistics for Iron and Steel Industry in India, cit. p. 175.

* After completion of development or mechanization works. The capacity output is calculated for 350 working days a year.

The Components of F.O.B. Prices

30. Compared to the cost structure in other countries, the f.o.b. cost structure of the iron ore mining industry in India seems to be characterized by a very low relative incidence of mining costs (including profits) and by a smaller percentage of taxation and royalties charges. On the other hand, transportation costs and port charges are much higher. A study on the cost price structure of iron ore, prepared by the NCAER in 1965 ^{1/} gave the following results:

^{1/} NCAER: op. cit., page 22. E.C.E. op. cit., page 97, gives the following percentages, relating to a sample of mines which have come into production in different countries since the war, with outputs between 5 and 10 million tons a year: Mining and Beneficiation: 23.0-45.2% f.o.b. costs; Transportation: 19.1-24.8%; Port Charges: 3.3-6%; Financial Charges, taxation and royalties: 27.4-54.6%.

Table 14 Structure of F.O.B. cost of Iron Ore in India
(% of total cost)

<u>Element of f.o.b. cost</u>	Goa	Bellary-Hospet	Orissa-Bihar	Chitradurga Tumkur	Other:
Mining and Beneficiation	24.6	4.3	9.2	5.9	14.2
Transportation:	47.4	70.7	50.6	68.9	61.6
of which: road	24.3	27.7	12.5	31.7	19.2
rail	3.8	43.0	36.7	37.2	42.4
river/canal	19.3	-	1.4	-	-
Loading at ports	16.1	19.7	33.1	21.0	17.0
Taxation and Royalties	11.9	3.6	4.5	4.1	4.2
Others	-	1.7	2.6	0.1	2.9
Total f.o.b. cost	100.0	100.0	100.0	100.0	100.0

31. The variables mentioned do not measure the efficiency or the profitability of the industry as a whole, since under competitive conditions the structure of production and the level of output of each mine tend to adapt to those conditions. As a matter of fact, the level of "normal profits" sufficient to keep in business the marginal producers seems to be quite low, according to NCAER estimates.^{1/} On the other hand, this does not give any indication about the rate of "excess" profits of non-marginal suppliers and about the total amount of profits in the industry. However, the variables mentioned may give some elements for a broad assessment of the main problems facing the industry in its process of growth.

Mining Costs

32. The relatively low incidence of mining costs is due to three factors:

a. Favorable local conditions. Nearly all mines in India are open-pits: ceteris paribus, underground mining costs would be much higher.^{2/}

b. Low costs of labor. Despite the fact that the physical productivity per capita is abysmally low, the costs of production in some mechanized operations are still very much higher than those performed by hand.

^{1/} NCAER, Structure, cit. p. 21.

^{2/} However, as the depth of working increases, the amount of waste per ton of ore raised and the cost of raising increase more than proportionately. This is fairly obvious, since open-pits have the shape of a V, the angle depending on the hardness of the rock and on the stability of the ground.

c. Low degree of ore beneficiation. At present, there is only one pelletization plant in Goa, with a capacity of 0.6 million tons. Most sintering plants work only for the internal market. The small mines are sometimes described as "pick and shovel mines", all beneficiation being reduced to some preliminary screening and crushing. Of course, this is hardly an advantage, since the present tendency is to use less and less unprepared ore in blast-furnaces. Moreover, the value added during the processing in the consumer country tend to be discounted from the f.o.b. price of ore.

The Problem of Transportation

33. The causes of the extremely high incidence of transportation costs are various, some of them being related to the geographical distribution of iron ore deposits and others to the lack or to the inadequate quality of basic infrastructures. The following table gives some data on the average length of haul from the source of supply to the steel plants in India:

Table 15

<u>Name of Steel Plant</u>	<u>Mines from Where Iron Ore Supplies are Taken</u>	<u>Whether Captive</u>	<u>Distance from Works (in Kms)</u>
Bhilai	Rajhara	Yes	90
Durgapur	Bolani & Others	No	420
Rourkela	Barsua	Yes	80
	Barajamda	No	225
	Banspani	No	225
	Noamundi	Yes	125
IISCO	Gorumahisani	Yes	64
	Joda	Yes	150
IISCO	Goa	Yes	350

Source: Statistics for iron and steel industry, p. 174.

Because of the shortage of adequate ports and port facilities, the average length of haul to ports used for ore export is much higher:

Table 16

<u>Area</u>	<u>Average Length of Haul</u>	<u>No. of Loading Stations</u>	<u>No. of Ports Used for Ore Exports</u>
Goa	62	-	1
Bellary-Hospet	626	5	7
Orissa-Bihar	424	3	2
Redi	13	1	1
Chitradurga-Tumkur	574	2	2
Punjab	582	17	7

Source: NCAER, op. cit., p. 19.

34. Of three forms of transport, river, rail and road in use now, the first is practically confined to the Goa and Redi areas. In other areas the movements are made by rail and/or road. Despite the fact that road costs are lower only for very short hauls (say, 20Km. or less), in all areas except Orissa/Bihar much longer road hauls are used. This is done either to avoid transshipment from one rail gauge to another or because of lack of rail facilities. In addition, the average size of trucks is still very low, the medium capacity being less than 10 tons ¹/₂. No integrated system mine-rail-port has been so far developed specifically for iron ore exports.

35. The special problem of Indian ports is discussed in more detail in Section V below.

IV. INDIAN EXPORTS: PAST PERFORMANCE

The Institutional Framework

36. The Indian export trade in iron ore was completely private until 1956, when the Government constituted the State Trade Corporation of India, which was subsequently put in charge of the entire ore export trade for India. In 1963 the Corporation was split into two separate organizations. Since then iron ore exports from all India (except Goa) have been canalized through the Minerals and Metals Trading Corporation (MMTC). The MMTC buys ore on f.o.b. basis at designated railway loading points in the mining areas. Where rail facilities are not available the purchases are made at ports, the transportation being the responsibility of the mine owner. The Corporation sells ore through straight trade, preferably under long-term contracts or barter agreements (East European countries). In Goa the trade is still in the hands of private exporting firms

¹/₂ NCAER op. cit., p. 27.

(some of which are foreign), which in most cases receive the ore from their own mines and buy from other mines only the amounts necessary to supplement their production. The MMTC is active also in Goa, especially to support the smaller mines that have no export organization.

The Volume and Geographic Pattern of Trade

37. Since 1950 Indian exports of iron ore have increased from nearly nothing to about 17 million tons in 1969/70. Reportedly, India is likely to export more than 20 million tons during the current financial year.^{1/} While in 1950 the export earnings from iron ore were less than 2 million rupees, representing a negligible percentage of total exports, in 1963/69 they amounted to 884 million rupees (US\$117.8 million), equivalent to 6.5% of Indian exports. According to the first estimates, this percentage has increased further during the last year. Including Goa, the average growth rate of the actual tonnage exported since the beginning of the sixties has been more than 7.7% p.a. As the rate of increase in total output during the same period has been substantially less, the percentage of export to production has increased from 31.8% in 1960 to 60.1% in 1969. Of course, the integration of Goa, whose production is largely exported, accelerated this trend.

Table 17 Indian Production and Exports of Iron Ore 1950-1969*
(million tons, actual tonnage; million rupees)

	<u>Production</u> Quantity	<u>Exports</u>		<u>Exports as a % of Production</u> (in terms of quantity)
		Quantity	Value	
1950	3.0	0.06	2.0	2.0
1957	5.2	2.3	117.6	44.2
1960	10.7	3.4	172.8	31.8
1961	12.3	3.4	174.4	27.6
1962	13.3	3.8	198.2	28.6
1963	21.1	9.9	363.8	46.9
1964	20.9	10.6	372.1	50.7
1965	23.8	12.3	421.0	51.7
1966	26.8	13.4	695.7	50.0
1967	25.9	13.7	747.8	52.9
1968	27.5	15.6	884.2	56.4
1969(**)	28.3	17.0	937.5	60.1

* Goa is included from 1963 onward.

** Provisional.

Source: ECAFE, Statistical Yearbook 1968; GOI, Economic Survey 1969/70.

^{1/} This figure was supplied by a MMTC official in Delhi.

38. In 1950 the Indian share of the world market for iron ore was negligible. Ten years later, Indian exports of iron ore represented about 6.6% of the world trade. Since then, despite the growing competition from South America and Australia, India has been able to maintain her position. (See Table 18 below).

Table 18 Indian Share in the World Market for Iron Ore
(million tons, iron content)

	<u>India's Exports*</u>	<u>World Trade</u>	<u>Indian Exports as a % of World Exports</u>
1950	0.1	21.8	0.5
1957	2.9	64.1	4.5
1960	5.3	80.6	6.6
1965	7.5	121.2	6.2
1966	8.3	123.7	6.7
1967	8.3	132.9	6.2

* Including Goa

Source: UNCTAD op. cit., p. 11.

39. The geographical distribution of Indian iron ore exports is partially predetermined, since the freight costs are still a substantial, although declining, portion of cif prices. In the early fifties the only feasible markets for Indian iron ores were Japan and, to a lesser extent, Europe (mainly Western Germany and Italy). The closure of the Suez Canal severely impaired the competitiveness of Indian ores in the Western European markets; since then the percentage and after 1960 even the absolute amount of Indian exports of iron-ore to Western Europe have been declining. The decline was more than compensated by the increase in exports to Eastern Europe. However, since 1960 the Eastern Europe's share has declined sharply. The bulk of the increase in Indian production and exports of iron-ore has been absorbed by Japan. In 1967/68 exports to Japan represented more than 80% of Indian trade in iron ore. And this percentage is expected to increase even more in the next few years.

The table below shows the evolution in the geographical pattern of Indian trade from 1950/51 to 1967/68.

Table 19 Indian Exports of Iron Ore, by Countries
(% of total exports)

	<u>1950/51</u>	<u>1957/58</u>	<u>1960/61</u>	<u>1967/68</u>
Japan	100.0	61.5	51.9	80.7
Western Europe:	-	23.1	8.0	3.6
EEC	-	19.3	7.3	
UK	-	-	•••	
Others	-	3.8	0.6	
Eastern Europe	-	<u>15.4</u>	<u>40.1</u>	<u>15.7</u>
Total	100.0	100.0	100.0	100.0

The Japanese Market

40. It should be noticed that while Japan is becoming a more and more important market for Indian exports of iron ore, India is becoming a less important source of supply for the Japanese steel industry. This evolution is clearly due to Japan's policy of diversifying its sources of supply. While in the short run this may be of some advantage for some suppliers (including India), since it brings about a non-perfect equalization of cif prices, in the long run it may be a considerable disadvantage, in the sense that it may accentuate the "monopsonistic" character of the market.

The following table shows the origin of iron-ore imports into Japan since 1950.

Table 20 Sources of Iron-Ore Imports Into Japan
(percentages based on iron content)

	<u>1950</u>	<u>1957</u>	<u>1960</u>	<u>1964</u>	<u>1969(*)</u>
Canada	-	3.0	6.6	5.7	2.3
USA	-	11.1	5.2	6.1	5.3
Chile	-	-	1.7	18.0	12.0
Peru	-	4.4	4.4	11.6	10.1
<u>India</u>	6.6	29.8	30.0	21.5	18.9
Malaysia	36.5	30.9	35.7	21.2	4.1
Australia	-	-	-	•••	25.4
Others	56.9	20.8	16.4	15.9	21.9
Total	100.0	100.0	100.0	100.0	100.0

* January-June 1969; percentages based on values.

Source: ECE op. cit., p. 67; UN, Directions of Trade (1970).

Changes in the Quality of Indian Ores Entering International Trade

41. It is difficult to assess the quality of Indian iron ore exported. By definition, the metallurgical value of an ore depends on how much it costs the consumer to convert this ore into steel compared with the costs when using other ores. Other things being equal, this depends both on the chemical and physical characteristics of the ore (iron content, percentage of impurities, degree of preparation, etc.) and on the pattern of production in the consumer country. Since most blast furnaces operate on a blend of various ores, the metallurgical value of each ore depend on the characteristics of the others. Moreover, the other circumstances being equal, this value depends also on the availability and quality of the coke, of other fuels and of fluxes^{1/}. The technology of the steel plants is also an important variable.^{2/} It is clear, therefore, that the metallurgical value of an ore cannot be defined unequivocally, but will vary from one consumer to another.

42. Of course, under the pressure of competition both the pattern of production in exporting countries and the pattern of utilization in consumer countries tend to adapt to changing external conditions. However, this process is necessarily slow, because of the length of gestation periods and because both the mining and the steel industry require considerable capital investments, which cannot or cannot easily be adapted to new technologies. Incidentally, this explains one of the reasons why it may be difficult for an exporting country to enter new markets.

43. The Table 22 below shows that the average iron content of Indian exports has steadily increased from about 55% in 1950 to 61% in 1967. To the extent that the metallurgical value of an ore is an increasing function of the iron content, the time-series shows a progressive improvement in the quality of Indian exports. The table indicates also that, at least in recent years, the quality of Indian ores can be compared rather favorably with that of ore exported by some of her major competitors in the Japanese market.

^{1/} If the coke is very pure, a higher sulphur content may be acceptable. If cheap gas or oil is available, the cost of the extra heat required to smelt a poorer ore may be negligible. For more details see: UN: The Economics of Ore Preparation, cit.

^{2/} For instance, a fully integrated steel plant with adequate sintering capacity can accept ore containing a very high proportion of fines. On the other hand, small steel plants equipped with limited capacity furnaces will require high-grade ores, since they cannot handle large amounts of slags.

Table 21 An International Comparison of Iron Content of Exports
(percentages)

	<u>India*</u>	<u>Peru</u>	<u>Chile</u>	<u>Brazil</u>	<u>South Africa</u>
1950	55.0	...	60	68	60
1957	57.0	60.0	60	67	60
1960	60.0	60.0	61	65	60
1964	60.0	62.0	62	64	60
1965	61.0				
1966	61.9				
1967	60.6				

* Including Goa

Source: ECE op. cit., p. 60; UNCTAD, op. cit.

Trend in Prices of India Ores

44. As it was mentioned before, because of the ambiguities in the definition of the metallurgical value of an ore, it is rather difficult to follow the evolution of iron ore prices. The "unit value" of iron-ore exports, obtained by dividing the total value of exports by the amount exported, is a biased statistic, which tends to lump together quality variations and price changes. The "statistical unit value", calculated by dividing the unit value of exports by their average iron content, at least enables us to isolate one of the factors that influence the metallurgical value. According to this indicator, the following results were obtained for India.

Table 22 Trends in Prices of Indian Iron Ore

	<u>F.O.B. Price of India Exports*</u> <u>Per Ton of Iron Content</u> <u>(US\$)</u>	<u>Index</u> <u>(1963=100)</u>
1950	9.4	71.8
1957	18.7	142.7
1960	18.7	142.7
1961	18.4	140.5
1962	18.7	142.7
1963	13.1	100.0
1964	12.0	91.6
1965	12.0	91.6
1966	11.9	90.8
1967	12.0	91.6
1968	12.1	92.4
1969	12.1	92.4

* Including Goa

Source: ECE op. cit., p. 71.

The two peaks in 1957 and in 1962 and the downward trend in prices during the fifties reflect quite closely the evolution of the world market. After the drop in 1963, a period of remarkable stability has followed. The most recent indicators seem to point toward some slight increase rather than in the opposite direction.

V. INDIAN EXPORTS: PERSPECTIVES

Indian Export Capacities in the Fourth Plan Period

45. Given the level of Indian iron ore reserves, there will be no problem of physical availability of iron bearing materials for many decades ahead. As a matter of fact, the reserves so far identified could sustain a volume of production double the current one for at least one century. The main problems on which the future course of Indian production and exports of iron ore will depend are problems of investments, costs and demand.

46. Indian output of iron ore in 1968/69 was about 28 million tons (actual tonnage). The Fourth Plan envisages an expansion of production capacity of 23 million tons to reach a level of about 51 million tons in 1973/74. Out of this, some 20 million tons are expected to be produced by the captive mines of the steel plants and about 14 million tons by the public sector mines. The capacity output of Goa is anticipated to be around 8 million tons at the end of the Fourth Plan period.

47. The production required for export is expected to be met from Bailadila 14 and 5 (Madhya Pradesh), Barajamda (Orissa and Bihar), Daitam (Orissa), Bellary-Hospet (Mysore) and Goa. The Kiriburu ore, which is now being exported to Japan, will be diverted to the Bokaro plant and its export commitments will be transferred to Bailadila 5. The total export capacity in 1973-74 is expected to reach a level of about 31 million tons.

Internal Requirements of Iron Ore

48. While it is by no means certain that the current schemes of mine mechanization and development will be realized on schedule, it is even less certain that the domestic expansion of the steel industry will absorb the indicated proportion of the total increase in iron ore output capacity. As a matter of fact, most observers would now agree that under the most favorable circumstances, the steel industry cannot be expected to produce more than 8 million tons of ingot steel and 6 million tons of finished steel by 1973/74.^{1/} This would represent a substantial curtailment (say between 20% and 25%) in the expected rate of increase of domestic requirements of iron ore, which, in turn, would make less difficult the achievement of the expected rate of growth of export capacity, even if the output expansion projects were not completely realized.

^{1/} Economic Report, p. 65.

49. A major unknown is represented by the quality of this expansion, in terms of production costs. This would be decisive in the stiff competition with Australia and South America on the Japanese market and in the longer run it will also condition the possibility of entering new markets (especially in Europe).

Transportation Costs

50. As was mentioned above, in India even more than elsewhere it is true that the economics of the iron-ore industry is the economics of transportation. The NCAER estimated that, purely by reduction of the length of haul from mine to port, costs could be reduced from 48-70% of the f.o.b. price to 32-48%, without any reduction in the railway freight structure.^{1/}

Fourth Plan Provision for Ports

51. However, the possibility of reducing land transportation costs depends not only on the availability of adequate railway facilities, but also on the geographical distribution and the quality of ports. Because of insufficient rail and port capacities, iron ore exports are now canalized through a number of routes (some of which incredibly tortuous) to some seventeen ports, none of which can accommodate vessels of more than 35,000 dwt. The Fourth Plan strategy is to concentrate most of the iron ore exports in a few ports with adequate loading facilities and the possibility of accommodating larger carriers, from a minimum of 35 - 40,000 dwt., (Paradip) up to 100,000 dwt. (Visakhapatnam). The following table give the current and expected distribution of iron ore exports, by ports of shipment.

^{1/} NCAER op. cit., p. VII.

Table 23 Indian Iron Ore Exports by Port of Shipment
(million tons, actual tonnage)

<u>Source of Ore</u>	<u>Port of Shipment</u>	<u>1968-69</u>	<u>1974-75</u> (IV Plan Projection)
Barajamda	Calcutta	0.5	-
"	Haldia	-	3.0
"	Paradip	1.2	2.5
Daitari	"	...	2.0
Kiriburu	Visakhapatnam	1.8	-
Bailadila	"	1.6	8.0
Bellary-Hospet	Madras	2.0	5.0
"	Marmugao	0.4	1.0
Goa	"	7.3	9.0
Various sources	Minor ports	<u>1.2</u>	<u>0.5</u>
	Total	16.0	31.0

52. The economies achieved through the use of large size vessels are very sensitive to the type of port handling facilities. For a 65,000 dwt. carrier, the total daily cost in port is more than 75% of the total cost at sea and may be around \$4,000 a day^{1/}. The table below shows the maximum loading rates of some of the major ports in India, Chile, Peru and Australia as of mid-1966. India's comparative disadvantages in this field seem to be substantial.

^{1/} ECE op. cit., p. 114.

Table 24 A Comparison of Iron Ore Loading Capacity in India, Chile, Peru and Australia
(situation: mid-1966)

<u>Ports</u>	<u>Maximum Loading Rate Capacity</u> (tons per hour)
INDIA:	
Marmugao	600
Madras	600
Visakhapatnam	2650
Paradip	2500 (potential)
AUSTRALIA:	
Koolan Island	3000
Port Hedland	3000
Dampier	6000
Whyalla	2500
PERU:	
San Nicolas	3600
San Juan	2000
CHILE:	
Cruz Goaupe	3000
Coquimbo	3000
Guayacan	3500
Huasco	2500

Source: ECE op. cit., p. 114.

53. The total amount of investment required for the development of ports and port facilities along the lines indicated by the Fourth Plan is estimated at Rs. 280 crores (about US\$ 373 million), of which about one third is expected to be contributed by the Port Trusts from their own resources. Recent developments (Mormugao port) seem to indicate that full implementation of the plan may take longer (and perhaps greater investments) than expected.

The Future Growth of the Japanese Market

54. Given the evolution of export capacities and production costs, the future of Indian exports of iron-ore will depend on the development of the world demand. In the medium term, this implies that the growth of the Japanese steel industry will be the crucial variable.

55. Since 1960 the Japanese production of crude steel has increased at an average rate of 13.0% p.a., from 22.1 million tons in 1960 to 66.9 million tons in 1968. During the same period, the growth rate of the apparent consumption of iron-ore has been about 16.0% p.a., the bulk of the increase coming from imports. The expected production of crude steel in 1975 is about 150 million tons. Assuming that the ratio scrap/iron-ore will remain roughly constant and that the domestic production of ore will remain at the same level of the sixties (in fact it is slowly declining), this implies that the Japanese requirements of iron ore in 1975 will be about 140-150 million tons. If India succeeds in maintaining her share of the Japanese market at the current level, her exports of iron ore to Japan could increase by 11.5-12% p.a., reaching a level of about 22 million tons at the end of the Fourth Plan and of 27-29 million tons by 1975.

Some Tentative Estimates

56. Assuming that the amount of exports to Eastern Europe will remain constant at the current level (2.2 million tons) and that the exports to Western Europe will increase, as envisaged, from 0.5 to 2.0 million tons, it follows that, under the most favorable conditions, Indian exports of iron ore cannot be expected to be more than 26-27 million tons by 1973/74^{1/}. It must be emphasized that this forecast is conditional upon the fulfillment of the conditions mentioned above.

57. According to the EEC forecast, the total world requirements of iron ore are likely to increase less than the total production capacity until 1975, while the trend could be reversed during the late seventies. Accordingly, there should be a strong probability of a general decline in prices at least until 1975. The recent development of the Japanese market seem to indicate that this forecast is somewhat too pessimistic, even considering the substantial increase in Australia export potentialities. At present, the odds seem to be in favour of the stability of f.o.b. prices, at least in the near future. The outcome of the "battle of freights" still being uncertain, it seems extremely difficult to forecast the future developments of cif prices.

58. Provided that the f.o.b. prices remain roughly constant, the total value of Indian exports of iron ore should increase from 880 million rupees (\$117 million) in 1968/69 to about 1.400 million rupees (\$188 million) in 1973/74, i.e. at an average rate of growth of about 10% p.a. While this rate falls short of the rate of increase projected in the Fourth Plan (17% p.a.), it is still higher than the long term trend envisaged for the period 1968/69 to 1980/81.^{2/}

^{1/} This estimate is consistent with those contained in USAID projections, both being 4 million less than the level indicated in the Fourth Plan.

^{2/} Fourth Five Year Plan 1969-74, p. 43.

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INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT
INTERNATIONAL DEVELOPMENT ASSOCIATION

EXPORTS OF CASHEW KERNELS
INDIA

May 27, 1971

South Asia Department

INDIA
EXPORTS OF CASHEW KERNELS

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This report is based on the findings of a mission which visited India and European cities in June/July, 1970, composed of Messrs. Christian Ladonne and Alberto de Capitani.

INDIA

EXPORTS OF CASHEW KERNELS

SUMMARY AND CONCLUSIONS

1. A few years ago, the cashew industry in India, which is said to employ some 100,000 workers, enjoyed a near monopoly in the processing of raw cashew nuts into finished kernels. About two-thirds of these raw nut requirements were met by imports, mainly from Tanzania and Mozambique. During the past two years, gross export earnings averaged \$75 million, but the net foreign exchange was about half this amount, since the added value on imported raw nuts is around 35 percent. The two main export markets are the U.S.A.; over 50 percent in 1965 and about 37 percent in 1969, and the U.S.S.R.; 24 percent in 1965 and 42 percent in 1969.
2. However, following the building up in East Africa of its own processing facilities, India's relative importance as a processor has decreased from 95 percent in 1960 to 78 percent in 1968 and her main sources of supply of raw cashews are now being threatened: East African producing countries have, indeed, ambitious plans to process, as quickly as possible, their entire production of raw nuts through mechanical methods while, at the same time, the growth of Indian production of raw cashew will probably not be more than marginal in the next few years.
3. It is probable that by 1975, export of raw nuts from East Africa to India will decrease somewhat from their present level and at the end of the present decade, it is likely that East African countries will process their own production themselves; in a few years' time, India will have then to rely solely on her own local production. It is therefore extremely urgent for India to take necessary steps now to increase her own production.
4. Forecasts are indeed extremely difficult to make. Nevertheless, it appears that, by and large, the future world demand for cashew nuts and for other nuts would easily accommodate a substantial increase of cashew output, from both Africa and India, without affecting the profitability of the cashew industry in producing countries.

INDIA

I. SALIENT FEATURES OF CASHEW PRODUCTION AND PROCESSING

1. The cashew tree flourishes in even the poorest of soils in wasteland and forest, and cashew has, therefore, the advantage of being grown on marginal lands which otherwise would lie fallow. It has the added advantage of acting as a good binder in soil conservation measures. As a matter of fact, the cashew tree which originally came from Brazil, was introduced into India by Portuguese traders in the 16th century for the purpose of checking erosion on the coasts. Its introduction and history in East Africa are similar. The cashew tree begins to bear fruit after 4 to 5 years of growth and attains maximum fertility only after 12 years. The fruit of the cashew tree consists of the nut with a "false" fruit; yet it is extremely difficult to use the whole fruit commercially as the "apple", which could be used for jam making or fruit juices, ripens before the nut. Therefore, only the nuts, which consist of the following elements, are commercially utilized:

Kernel - about 22/25 percent by weight
Cashew Nut Shell Liquid - about 24 percent
Shell - about 50 percent
Skin - about 2 percent.

2. At present, cashew is treated as a wasteland crop and it receives generally no or very little cultural or protective treatment. Therefore the yield rate of nuts per tree is very low: 1.5 lbs. to 4.5 lbs. in Goa and 20 lbs. in Kerala; in East Africa, average yields are said to be between 10 lbs. and 15 lbs. However, yields of about 100 lbs. and over per tree under plantation cultivation have not been unheard of; but plantation cultivation of cashew is rare. Ordinarily, the cashew with nuts attached fall from the trees when ripe and are gathered from the ground, the nuts removed by hand and the "apples", for the most part, discarded.

3. Cashew is a typical, well adapted and profitable smallholder crop that requires little care throughout the year with the exception of the two months harvesting period. As fruits get spoiled when left on humid ground for more than two days, a big labor force is required to harvest each tree at short intervals. It is precisely this seasonal labor force requirement that makes it difficult to run large plantations or industrial blocs economically. (A plantation of 1,000 hectares would require some 25,000 man-days within a two months' period). This labor force problem applies however more in Africa than in India, where the labor force is plentiful. Moreover, cashew harvesting seasons in India take place between the Kharif and Rabi season, when demand for agricultural labor is low. The return on the farm investment of a plantation in Africa is about 20 percent. A lot depends, however, on the material plantations are established with, the method of planting and the care the young plants get. For instance, reforestation programs with cashew trees are only advocated for timber purposes, since their nut yield is negligible, as the following figures illustrate:

Ordinary cashew plantation, selected seed, at maturity - 2,000 Kg/ha.
Grafted, well looked after experimental plantation at
maturity - 4,300 Kg/ha.
Reforestation program with cashew (Dahomey) - 80 Kg/ha.

4. Hand-processing of cashew nuts is a highly unpleasant job. In India, the nuts are roasted in drums (Goa) or in oil baths (Kerala). Generally, most of the caustic oil in the shell is dispelled by the heat. The whole process is intensely disagreeable due to spurting oil and the fumes which are irritating to the eyes, nose, throat and skin. Further, after roasting the nuts must be rubbed with sand or ashes to remove residual oil that would otherwise be harmful to the hands of the shellers. Shelling is almost entirely a hand operation. It is usually done on stones embedded in the ground and by squatting women using wooden mallets. It is customary to dip the hands frequently in lime, ash, linseed oil or castor oil to protect them from any trace of shell oil remaining, especially after the more primitive methods of roasting.

5. In Africa the principal deterrent to processing has been the difficulty of recruiting manpower for such unpopular work and also the conviction that African countries could not successfully compete with India where the processing is performed by plentiful, low-cost and skilled female labor. However, the higher price for exports of shelled nuts after 1962 stimulated efforts to discover effective mechanical decortication techniques. Portugal made first an unsuccessful attempt; the Italian company, Oltremare, came afterwards with machinery of much better performance; more recently a Japanese firm had successfully experimented machinery using a freezing process, to facilitate the shelling and peeling of the cashew nuts.

II. LOCAL PRODUCTION OF RAW NUTS

6. In India, cashew trees are to be found mostly in wasteland, under private, communal or public property, or in departmental forests; organized plantations are very rare. In most cases, harvesting of nuts is farmed out to private collectors. Next to nothing is known about the acreage under cultivation; estimates of production are also divergent. For example, the Fourth Five Year Plan Draft (1969/74) estimated the present production at 160,000 tons, while the final version of the Plan revised is downwards to 131,000 tons. These figures are most likely inflated and this is extremely misleading, because it gives the impression that the problem is more on the collection side than on the production side. For all practical purposes, the local production of raw cashew available for processing is about 70,000 to 80,000 tons a year ^{1/}, the Indian traders think that most of the production is collected; they consider that perhaps 10,000 to 20,000 tons might remain unharvested or be directly consumed.

^{1/} These estimates from the Indian Trade are consistent with those of Gill and Duffus and of the International Trade Center (UNCTAD-GATT) study on "Cashew Marketing". The London Company, Gill and Duffus Ltd. is one of the most prominent firms in the world marketing edible nuts.

7. For the last ten years, local supply of raw cashew to the processing units has remained more or less stagnant at about 70,000 to 80,000 tons a year, thus meeting about one-third of the total requirement of the cashew industry in India. Since the beginning of the Third Plan, the GOI has been anxious to develop local production, and schemes have been initiated to encourage small farmers to cultivate cashew trees along with their other crops and seeds have been provided to them free of cost. In general, however, the results have been extremely poor; farmers have been reluctant to cultivate cashew because the tree requires 4 to 5 years of growth before it begins to bear fruit and attains maximum fertility only after 12 years of growth.

8. The Fourth Plan is seeking to achieve 76,000 additional tons of production through various developmental measures both in the State and Central sectors of the Plan - "The State Sector of the Plan contains provisions for bringing new areas under cashew. The target is 207,200 hectares. This will include 91,600 hectares under departmental plantation. In the Central Sector, prime importance has been given to organizing a cashew package program. The components of this program include organization of about 1,500 demonstration plants; coverage of 24,768 hectares of non-departmental plantations and 12,328 hectares of departmental plantations by plant protection measures. It is also proposed to propagate and distribute high-yielding planting material. About 275,000 cashew airlayers will be sought to be produced and distributed every year in Kerala, Mysore, Andhra Pradesh and the Union Territory of Goa" (Fourth Five Year Plan, page 171, paragraph 7.161). However, it must be remembered that even if these programs were successfully implemented during the Fourth Plan period, the corresponding increase in output will take place gradually, not before the 1975/85 period. Considering what was probably achieved during the 60's in terms of increases in acreage and in yield, no more than a marginal increase of output over the present level of 70,000 to 80,000 tons can be expected during the Fourth Plan period.

9. The Plan made no provision for private investments in the field of cashew nut development. However, there is at least one proposal by Peirce Leslie 1/. For the past 18 months, this firm has been trying to obtain the agreement of the Government of Orissa to the establishment of a 100,000 hectares plantation in forests belonging to the State government. If accepted, it will take 10 years for this scheme to be implemented: each year 10,000 hectares will be planted. Total investment would amount to about 18 crores or US\$24 million (scarcely any foreign exchange would be involved). The output of the project, when fully mature, would be about 70,000 tons of raw cashew a year, i.e. equal to the total present Indian production made available to the processing plants. This firm does not intend to introduce mechanical shelling and peeling facilities. It does not seem at present that this scheme will be sanctioned. Nevertheless, Peirce Leslie has been able to be given lease of 2,000 acres in forests (totalling 20,000 acres) belonging to the Jaganath Temple in Orissa.

1/ The following figures are quoted from memory.

III. MAIN CASHEW NUT PRODUCING COUNTRIES

10. As stated earlier, India has to import about two-thirds of her requirements of cashew nuts but in some years, as in 1968 and 1969 (season October/September), India has imported more than three-fourths of her needs. For the past nine years the situation has been as follows ^{1/}:

Sources of Raw Cashew for Processing
(in 000 tons)

<u>Year</u>	<u>Estimated Local Processing</u> (1)	<u>Local Production for Processing</u> (2)	<u>Imports for Processing</u> (3)	<u>(3)/(1) as %</u> (4)
1961	194.8	66.0	128.8	66
1962	180.9	66.0	114.9	63
1963	231.7	76.2	155.5	67
1964	267.2	81.3	185.9	70
1965	245.4	82.0	163.4	66
1966	218.6	65.0	156.6	70
1967	208.4	70.0	138.4	66
1968	238.3	60.0	178.3	75
1969	277.6	70.0	207.6	75

11. The heavy reliance on imports is of course dangerous, as is explained later on, but it has at least one advantage: as the harvest periods in East Africa fall in successive months, India can minimize inventory costs and storage damage. The harvest seasons in some selected countries are as follows:

India - March to May, with a small crop in October to November
Mozambique - November to January
Tanzania and Kenya - October to November

12. For India, the two main sources of imports of raw cashews are Mozambique (72,000 tons in 1969/70) and Tanzania (79,000 tons in 1969/70), and to a lesser extent Kenya (11,000 tons in 1969/70).

^{1/} Sources: Edible Nut Statistics, Gill and Duffus (March 1970); ITC (UNCTAD-GATT) Cashew Marketing (Geneva, 1968); Indian Foreign Trade Statistics.

13. In Mozambique, the cashew exports have been as follows (in tons) 1/:

<u>Year</u>	<u>Raw Seeds</u>	<u>Kernels 2/</u>	<u>Apparent Production of Raw Seeds</u>
1949	42,200	neg	42,200
1960	55,950	1,350	62,025
1961	83,250	1,050	87,575
1962	79,250	1,850	87,575
1963	117,350	2,650	129,275
1964	122,350	3,450	137,875
1965	97,100	3,950	144,875
1966	76,000	5,650	101,425
1967	53,300	7,950	91,075
1968	130,090	10,200	175,075
1969	n.a.	n.a.	140,000

14. Commercial exploitation of cashew trees, which were introduced into Mozambique in the sixteenth century, started in the 1920's when India began importing cashew nuts. Almost 90 percent of the cashew nut harvest is accounted for by small peasants, most of whom gather fallen nuts from uncultivated trees. 3/ Cashew trees are also grown by non-African farmers, mainly on small and medium sized farms along with other crops. Production by large agricultural companies is still limited.

15. In Tanzania, the situation has been the following (in tons) 1/:

<u>Year</u>	<u>Raw Seeds</u>	<u>Kernels</u>	<u>Apparent Production of Raw Seeds</u>
1949	3,550	nil	3,550
1960	36,700	nil	36,200
1961	39,950	nil	39,950
1962	59,000	nil	59,000
1963	42,550	nil	42,550
1964	55,800	50	56,000
1965	63,650	50	63,900
1966	71,100	575	73,200
1967	69,800	1,450	76,325
1968	78,400	1,350	84,425
1969	n.a.	n.a.	105,000

As seen in the above table, output has increased tremendously since 1949. During the 1960's the rate of growth averaged 12 percent a year.

1/ Source: Edible Nut Statistics, Gill and Duffus, March 1970.

2/ Roughly 4-1/2 tons of raws are required per ton of kernels.

3/ "Area Handbook for Mozambique"; study published by the American University, Washington, D.C. Foreign Area Studies (February 1969).

16. In Kenya, increases in production were also spectacular: from less than 1,000 tons a year in 1955 to over 11,000 in 1969. There was no processing of raw seeds in Kenya up to 1967. Brazil is another important producer: 10,000 tons in 1961 and 20,000 tons in 1969. All the production of raw seeds is processed in the country through semi-mechanical methods. Other countries, like Ivory Coast, Dahomey Republic and Madagascar are marginal producers (less than 2,000 tons altogether), which export their output to India.

IV. FUTURE SUPPLY 1/

17. The State Trading Corporation (STC) has recently been asked by the Government of India to take over the import of cashew. One of the reasons behind this take over is that individual Indian importers of raw cashew were at a considerable disadvantage in dealing with exporting countries, particularly Tanzania and Kenya which have Government agencies doing the sole selling. During 1969/70, there were complaints regarding bad quality of nuts supplied by the Tanzanian and Kenyan Boards. Claims for compensation have not been honored by those Boards and as a result, cashew imports stopped totally for a period of four months last year.

18. On September 1, 1970, the Cashew Corporation of India, a wholly-owned subsidiary of the STC was set up for the purpose of importing raw cashew nuts. Indian authorities expect that this new government agency will improve the bargaining position of India; ensure a smoother flow of imported nuts; and thus minimize disturbances to the industry and to exports.

19. The pricing and distribution policy will be determined by the Cashew Corporation in consultation with the Ministry of Foreign Trade. The headquarters will be in Cochin. The Board of Directors will have representatives from Ministries/Departments and will also include representatives of the Government of Kerala and of the Cashew Export Promotion Council. In addition, there will also be Advisory Committees where representation will be given to the trade and industry. The authorized capital of the Corporation is Rs 20 million and the issued capital of the Corporation, which has been wholly subscribed by the STC, is Rs 5 million. The present policy of the Government is that the Cashew Corporation will distribute the raw nuts directly to the actual user.

1/ Forecasts of future production of raw cashew in India and Africa rely on extremely weak statistical evidence. Given the characteristics of cashew cultivation, very little is known about present acreage and yields or about past and future investments. Estimates of future output in Section IV are based on Governments' forecasts and corrected by trade's "feelings" and "guesstimates" and by other sources (Research Institutes, International Organizations, etc.).

20. Importers' feelings in the US and UK about the STC's take-over are mixed; some of them expressed the view that the move will accentuate the trend towards more processing by African countries; they, however, produced no evidence to back such an opinion. Other US and UK importers feel that the take-over by STC of imports is only the prelude to the take-over of exports and expressed some misgivings at such a prospect. If this second move were to materialize, it would be appropriate for the STC, or the Cashew Corporation of India, to dispell the fears of importers.

21. For the time being, and as mentioned earlier (see Section II), Indian processors cannot rely on more local supplies. Therefore, to tentatively assess Indian export prospects, it is necessary to review the production trends in countries which provide India with part of her raw nut supply and to try to determine the likely processing capacities these countries are going to build up in the future.

Tanzania

22. Output of raw cashew is expected to increase by over 10 percent a year from 78,000 tons ^{1/} in 1968 to 136,000 tons in 1974; on the other hand, processing capacities, which were of the order of about 10,000 tons a year in 1968, are assumed now to be of about 30,000 tons and might be expanded to 70,000 in 1974. Whether this expansion of processing capacities will take place as planned is still uncertain. Prospective foreign investors are, indeed, apparently not too happy with numerous governmental interferences and controls. Furthermore, they are afraid of future government policy regarding nationalization of foreign investments and of what they assess to be the growing influence of the Chinese. However, on the whole it appears that around 1975 it is possible that an export surplus comparable to the present level would still be available for the Indian processors. Obviously, it is impossible to forecast with any accuracy what will be the development of processing capacities in Tanzania during the second half of the present decade; nevertheless, it would be wise for India to expect a significant decline in the Tanzanian export surpluses of raw nuts during this period.

Mozambique

23. During the last decade production has risen dramatically but it must be noted that, in contrast with Tanzania, yearly fluctuations in Mozambique are particularly wide, because this country is very often affected by cyclones. This increase in output took place as a result of the efforts of previous Governments to promote the crop. Output is expected to continue to increase due to past investments by private plantations and from the increasing age of immature trees. According to official estimates, output is expected to rise from 180,000 tons in 1968 to 250,000 to 300,000 in 1975 and thereafter to remain more or less even.

^{1/} Economic Report on Tanzania (SA-11a, March 1970). The figures quoted by the Economic Report are somewhat lower than those estimated by Gill and Duffus, Ltd.

24. It has also been the definite policy of the authorities to build up sufficient capacities to process all the crop through large-scale mechanical methods. Reports from official sources ^{1/} indicate that by 1968 the cashew processing industry would be capable of absorbing more than the total crop of cashew nuts. In fact, in 1968, against a total crop of 175,000 tons, 50,000 tons only have been processed in Mozambique: probably this can be partly explained by the fact that it takes some time before a processing unit starts working at full capacity, but mostly because foreign investors hesitate to invest in Mozambique despite the incentives provided to them by the Government.

25. Under the existing Government policy no export permits for raw nuts are given until the requirements of the local processing plants have been satisfied. These factories buy at Government rates, fixed annually, which normally are much below export prices. The traders on the other hand hold back as much as possible and try to export their stock later. The fact remains that factories are thus guaranteed their raw product at a good price which together with other tax incentives is supposed to attract investment for new installations. The Government itself is not directly involved in the manufacturing process.

26. Due to the present political situation, however, these measures have not attracted as much foreign capital as expected. Nevertheless, processing facilities increased from 15,000 tons of raw cashew in 1964 to about 60,000 tons in 1969: this increase is substantial, but far behind the Government's target of 200,000 tons in 1968. This shortfall is mostly due to the reluctance of international private finance to invest in Mozambique, considering the present political situation. A factory is written off within five or six years of initial investment, but to some financial quarters this relatively short period appears still too long and they behave cautiously. Nevertheless, British and South African interests have already invested in Mozambique and apparently intend to do so in the near future, partly, especially in the case of UK investors, through reinvestments from accumulated earnings of companies operating already in Mozambique and Portugal. Local and Portuguese interests are also participating in these processing ventures.

27. Unless Mozambique is able to attract the needed capital for new investments (especially from South Africa) it is unlikely that the country would be in a position to process its entire production in 1975; common feeling among the trade is, however, that, other things being equal, processing capacities might amount to 125,000/150,000 tons of raw cashew a year in 1975, i.e. between two-fifths and one-half of the expected crop. In other words, this means that if these "guesstimates" regarding output and building up of processing facilities prove to be more or less correct,

^{1/} Op. cit. "Area Handbook for Mozambique" page 231.

export surplus to Indian processors would remain at about their present level (100 to 130,000 tons a year). Nevertheless it must be pointed out, that due to recurrent cyclones production fluctuations of the order of 40 to 50 percent are not unknown. In the past, such climatic accidents meant that Indian supply from Mozambique decreased by the same percentage; in the near future, it would mean that supply from Mozambique would almost completely stop, because Mozambique would first feed its own processing plants, leaving no exportable surpluses.

28. In 1967, Kenya had plans to process all its crop by 1971; latest trade figures showed that these have not as yet materialized. However, it can be reasonably expected that it may do so very shortly. Production of raw cashew is relatively small (about 12,000 tons) and the setting up of two medium-sized processing units of 6,000 tons each, involving a total investment of the order of \$2 to \$2.5 million would completely cut off exports to India.

29. Very little information regarding development of cashew cultivation in West Africa is available. Ivory Coast, Dahomey, Cameroon and Togo have suitable climatic conditions for growing cashew and these countries are showing interest in developing this line of production, which is still marginal. It is, however, obvious that these countries would develop their own processing facilities as soon as the size of the crop allows it: at the present level of prices, the setting up of a unit processing 3,000 tons of raw nuts a year makes an economic proposal and involves an investment of a little over \$0.5 million.

30. To sum up, it appears that by 1975 Indian supply of raw cashew from Tanzania will remain at about its present level, while supply from Kenya might dry up completely. Under normal climatic conditions, supply from Mozambique might be comparable to the present one, but climatic accidents might substantially cut its size. By and large, it is therefore probable that by 1975 India must expect some decline in her supply from East Africa. Furthermore, it must be realized that, whatever the political problems African countries are facing, they will sooner or later process themselves their entire output. Therefore it would be realistic, or at least prudent, for India not to rely on imported raw nuts for feeding her own processing industry after the end of the present decade.

V. MECHANICAL AND HAND PROCESSING

31. According to the Annual Survey of Industry, 1965, the number of persons employed in India in the processing of cashew was of the order of 96,000 1/, out of which 84,000 were women. For an output of roughly Rs 300 million, fixed capital was only Rs 11 million, while the annual

1/ The Indian Trade estimates that the Cashew Industry provides jobs for 200,000 to 250,000 persons a year.

payroll was about Rs 50 million. In 1965 the value added in the 196 factories covered by the ASI was over Rs 72 million, two-thirds of which originated from the labor. For each working day (241 in a year), workers earned Rs 2; each worker processed 2.5 tons of raw cashew per year.

32. In East Africa, investment for a processing unit 1/ of 3,000 tons of raw nuts a year amounts to about half-a-million dollars; for 12,000 tons, it is about US\$1.4 million. No precise information regarding salaries paid to African workers is available, but they are thought to be much higher than salaries paid to Indian workers. On an average, each worker processes about 10 tons of raw cashew a year.

33. According to the European trade, hand processing in India is much more profitable than mechanical processing in Africa for several reasons. Capital depreciation costs are high in Africa and during the peeling process many more kernels are degraded as a result of mechanical processing. It is estimated that through hand processing at least 60 percent of nuts are produced as "whole", while through mechanical processing, this proportion is not higher than 45/55 percent and in some units as low as 25 percent. The price differential between "whole" and "large white pieces" is important: during the first quarter of 1970 "Count 320" was quoted at 76 cents per pound in New York, while "Large White Pieces" was quoted at 38 cents per pound, only.

34. Nevertheless, with the prevailing world market prices for cashew, processing of cashew through mechanical methods appears to be profitable; particularly in Mozambique, where processors get their raw materials at two-thirds of the price paid by Indian processors (although in Tanzania there is no special scheme to help local processors, who pay for their raw materials only about 12 percent 2/ less than the Indian processors). The European trade is not sure that, for the time being, investment in mechanical equipment in Tanzania would prove to be profitable; on the other hand, and other things being equal, investment in a factory in Mozambique is expected to be written off within 6 years.

35. In terms of profitability, Indian processors have a substantial advantage over their African counterparts and it is obvious that for the time being India must continue to rely on traditional methods. Nevertheless, even if mechanical processing in East Africa appears to be less profitable than hand processing in India, it is here to stay and to expand further. First, because it is the deliberate policy of the African authorities to expand mechanical processing as quickly as possible to the whole crop in their respective countries and, secondly, because mechanical methods will, no doubt, be further perfected, through new technical improvements. It might even happen that after some time (say about 5 to 10 years or more) mechanical processing could become cheaper than hand processing; at this stage, India would eventually have to shift to mechanical processing. But for the time being, such a move would be extremely premature and unnecessarily costly.

1/ Fully automatic.

2/ i.e., the cost of the freight from East Africa to Cochin of raws.

VI. WORLD MARKET FOR CASHEW

36. Consumption 1/ of cashew rose rapidly from 16,000 tons in 1946 to 74,000 tons in 1969 2/. Nevertheless, consumption by Western countries, i.e. excluding the USSR and the German Democratic Republic (GDR), increased from 16,000 tons in 1946 to only 35,000 in 1958 and 47,000 in 1969. The main consuming country is the USA, whose consumption increased from 13,000 tons in 1946 to 37,000 tons in 1969. However, after having quickly increased between 1946 and 1954, consumption remained stagnant from 1954 onwards at about 30,000 tons a year up to 1966. During the last three years, consumption increased again: average consumption between 1967 to 1969 and 1963 to 1966 increased by 23 percent in terms of volume. On the other hand, UK's consumption remained relatively even during the last 20 years. Increases in consumption took place, especially during the 60's, in Australia, Canada and The Netherlands. Other EEC countries show no clear consumption trend and are still very small per capita consumers. 3/

37. However, the most spectacular increase in consumption materialized in the USSR: from 5,000 tons in 1962 to 14,000 in 1966 and 26,000 in 1969. The GDR is the world's largest importer per capita. These two countries may re-export a small part of their imports to COMECON countries but we found absolutely no evidence of re-exports to Western countries.

38. Price development of cashew has been favorable as shown in the table below:

Prices of Cashew Kernels 4/

(shilling per cwt., C.& F., U.K.)

1956	January	380	1964	January	405
	July	375		July	515
1957	January	410	1965	January	445
	July	384		July	490
1958	January	350	1966	January	465
	July	384		July	550
1959	January	325	1967	January	456
	July	370		July	495
1960	January	392	1968	January	605 (505)
	July	420		July	640 (544)

1/ Apparent consumption, i.e. equal to imports in developed countries.

2/ See Table I in Annex.

3/ See Table III in Annex

4/ Source: Gill and Duffus. Prices mentioned apply to "Count 450", but prices of other categories of kernels have followed a similar, if less marked trend. Figures in brackets are adjusted to take into account the £ devaluation of 1967.

Prices of Cashew Kernels 4/

(continued) (shilling per cwt., C. & F., U.K.)

1961	January	395	1969	January	630 (536)
	July	395		July	600 (510)
1962	January	330	1970	January	665 (565)
	July	355			
1963	January	320			
	July	335			

39. Prior to 1962, prices of cashew remained more or less stagnant; since then, prices of "Count 450" increased by about 60 percent, while prices of all kinds of grades of cashew increased by more than 40 percent: not many tropical commodities can claim such a distinction. Obviously, this means that, at present, supply of cashew lies behind demand.

40. But the cashew economy cannot be isolated from the economy of other nuts, like almonds, walnuts and hazelnuts 1/. Prices of all these nuts follow about the same trend 2/, but their price level reflects, however, their relative scarcity. Table V in the Annex shows the comparative increase in prices and production for principal edible nuts: for about an equivalent increase in production, prices of almonds and walnuts increased, respectively, by 23 percent and 41 percent during the period 1966/69 compared to the period 1961/65. This price increase differential can be explained mostly by the fact that consumption of walnuts, especially on special occasions, like Christmas, has grown quicker than consumption of other nuts, without encountering important competition from other nuts. 3/

41. On the other hand, the price development of hazelnuts and cashews was quite consistent with those of almonds. Production of hazelnuts increased by 20 percent while prices increased by only 15 percent during the 1966/69 period over the 1961/65 period; available cashew nut production (i.e. total exports minus exports to U.S.S.R. and East Germany) did not increase in the Western markets, and therefore prices increased by 41 percent. The convergent trend of prices, consistent with the relative supply and demand situation of almonds, hazelnuts and cashew nuts, reflects the fact that these three nuts are substitutable in their end-uses.

1/ The peanut is also a popular nut, but its main utilization is for oil and therefore its price is determined by factors different from those affecting cashews, almonds, etc.

2/ See Table IV in Annex.

3/ Despite the fact that no behavioral study has ever been made on this subject, it is probable that demand for unshelled walnuts is deeply rooted in old aged tradition, chiefly in Europe. Furthermore, production of walnuts increased by only 1.3 percent between 1946 and 1969.

42. In the U.S. market, almonds are used for confectionery and baking and as solid (for cocktail) nuts, while cashew nuts are, for the time being, consumed only as cocktail nuts. When the price differential between almonds and cashew nuts changes, composition of nut-mix is adjusted accordingly 1/; there is little demand for hazelnuts (or filberts) in the U.S. In Europe, consumption of cashew, chiefly as solid nuts, is limited and the European market consumes mostly hazelnuts, and to a lesser extent almonds for confectionery and baking purposes and also as solid nut. So far no market study has been made to try to explain this low per capita consumption of cashew in Continental Europe. Probably the product, which has never benefited from promotion campaigns, is little known and its high price limits its consumption to high income groups. It is therefore possible that with income increase and some promotional efforts, demand for cashew would increase in Europe. There is no evidence however to help us to formulate a guess regarding the magnitude of this increase. Would European - and Japanese - per capita demand equal the present U.S. per capita consumption when per capita income in Europe reaches the present U.S. income? Or would this demand be different because the market would develop a different taste towards cashew? However, we think that consumption of cashew, as solid nut, is probably bound to increase in the European market.

43. Nothing much is known about the future consumption in the U.S.S.R. and the G.D.R. No doubt past imports have created a relative scarcity in the Western market and this explains the sharp upward trend in prices of cashew for the past six years. It would probably be unrealistic to expect future demand to grow at a rate comparable with the one recorded in the recent past; on the other hand, it is unlikely that the U.S.S.R. would suddenly cut its imports of cashew. There is a genuine demand in this market and our assumption is that the U.S.S.R. would at least keep its imports at the present level, but more likely increase them.

44. In the Western market, cashew is exclusively consumed as solid nut and is not used in confectionery and baking probably due to its high price. But were the price differential between cashew and hazelnuts or almonds to change, there is every reason to believe that the confectionery industry would partly shift to cashew 2/.

45. For the past 25 years production of edible nuts, excluding peanuts, increased by 3.2 percent 3/ a year and price development shows that apparently supply lay behind demand. Growth of walnut production is expected to remain slow and prices are likely to increase further. Increase in output of almonds will probably be similar to the one recorded during the 60s (about 1.5 percent a year) 4/. Increase in the output of hazelnuts is expected to be of

1/ About 70 percent of cashew nuts in the U.S. are consumed in nut-mix (for cocktail purposes).

2/ In the G.D.R. cashew is mostly consumed in the confectionery and baking industry.

3/ See Table VI in Annex.

4/ According to available investment statistics, output of almonds is expected to increase by 10,000 tons every 5 years. It must also be pointed out that fluctuations of almond crops are wide because of early blooming of the tree (February/March).

the same magnitude as in the past, i.e. 3 to 4 percent a year, but cashew production is likely to increase sharply, by about 10 percent a year. By and large, world production of principal edible nuts could increase by 6 percent a year during the first half of the 70s, against 3 percent during the second half of the 60s.

46. This increase in supply could stop or decelerate general price increases of nuts, and particularly so in the case of cashew but, on the other hand, prices of almonds and walnuts might continue to increase because of their likely relative scarcity. However, it must be noted that this divergent trend in price development of almonds and cashew would be stopped when prices of cashew would be at a level where this nut could compete with almonds in the confectionery and baking industries. In other words, it is quite possible that the relative prices of almonds and cashew might develop unfavorably for cashew for some time. It is, however, impossible for cashew prices to behave in the long run differently from the prices of other nuts. After an adjustment period, the price of cashew would move along with prices of other nuts and there is very little likelihood that prices of nuts would fall from their present level given the reservoir of unfulfilled demand, especially in the European market, where total per capita consumption of all kinds of nuts is about half the present consumption in the U.S. Japan might also become an important market and the centrally planned markets might also continue to grow. The U.S. market should also continue to expand slowly following demographic growth and a slight increase in per capita consumption. 1/

47. By and large, it is unlikely that an oversupply situation, which could depress prices to an unprofitable level, would emerge following increased production of cashew in Africa and in India, in case Indian investment programs for this crop materialize during the Fourth Plan period. One has every reason to believe that new investments to promote cashew crops in India would prove economical. India would thus be able to maximize her foreign exchange earnings to generate more income and to create more job opportunities without either depressing the world market for cashew or the world market for other edible nuts

VII. FUTURE INDIAN EXPORTS

48. It is in the obvious interest of India that she takes immediate steps to increase her production of raw cashew; and if India is successful in her attempt, it would not create a situation of overproduction for the commodity as a whole, as the world demand will probably be in a position to absorb the additional supply for both East Africa and India, even if prices could possibly come down from their present exceptionally high level. Some price declines will not necessarily jeopardize the profitability of the cashew industry, but will at the same time probably boost demand in consuming countries, especially among low income groups and in the confectionery and baking industry.

1/ See Table IX in Annex.

49. The Fourth Plan strategy regarding the development of local production by putting emphasis on plantations is probably right, as the previous approach consisting of encouraging small growers has more or less failed, as mentioned earlier. There is also no reason why private capital should not be encouraged to invest in this cashew program, even if it comes from a Larger or Large Industrial House, as these investments would be mostly export-oriented. However, to translate into concrete results the proposed strategy, the present institutional set-up would better be drastically changed.

50. For the time being, at least five all-India agencies are looking after the cashew nut industry and they do not work in close collaboration; what would probably be needed is one agency with large statutory powers which, within the frame of an integrated approach, can look after the different problems of the cashew industry: production, finance, processing, imports and exports. Nevertheless, as things stand at present, it would appear rather difficult to completely do away with the existing set-up, as administrative organizations tend generally to perpetuate themselves. However, as the main priority in India is to increase the local production of cashew nuts, it would seem advisable that in each cashew growing State, a public sector Corporation be created independently from the Ministry of Agriculture, so as to allow such Corporation to be able to rely on public financing Institutions resources.

51. If there is a real will at the Government level and if the administrative set-up is reorganized, it is possible to increase the local production of cashew nuts, as cashew trees, which are cultivated on poor soils in wastelands and in forests, will not compete with existing crops. Finance will not necessarily be an insurmountable problem as long as the political and administrative will is there. However, for the time being, not much is known about the magnitude of the needed investments.

52. Barring that, exports would at best stagnate during the next four to five years and are bound to decline rapidly afterwards and many of the 100,000 workers employed by the cashew industry would face unemployment. The present juncture is favorable for the cashew industry: earning some \$75 million of gross foreign exchange, the industry is for the time being in a position to attract the Government's interest and help. But, if nothing very substantial materializes in the coming years, exports will come down to a level where the industry might be considered as a "dying" one; having lost its momentum and part of its trained manpower, the industry would have lost its bargaining power to attract sufficient attention from the planners. Action has to be taken now, on an urgent basis: if not, India will have missed an opportunity to increase her exports and to create more jobs.

VIII. EXPORTS OF CASHEW NUT SHELL LIQUID (CNSL)

53. An important by-product of cashew nut processing, the CNSL (cashew nut shell liquid), is an oil having many uses in the paint, chemical, plastic and allied industry. The CNSL's polymerising properties make it useful in these industries, and as a friction modifier it is important in the production of brake linings. There are said to be more than 400 patents based on CNSL.

54. In India, the production of CNSL is low compared with the quantity of shell processed, because many processors use the shell for roasting without extracting the liquid. The outflow of CNSL during the roasting is around 5-7 percent of liquid. If the shell is not used as fuel for the hot-bath process (in the mechanized plants in Tanzania, the oil bath is heated using fuel oil burners) and this same shell is further treated for extraction of its CNSL content, a total recovery of CNSL, equal to 20 percent of the raw nut weight, is practical.

55. The U.S. is the major market for CNSL, buying and consuming some 50-55 percent of world supplies in recent years. In 1963, some 24 percent of world market went to the U.K. and in 1965 shipments to that country were estimated at 38 percent. There is, however, some re-export from the U.K. of treated CNSL to Western European countries. Exports of CNSL to Japan from producing countries account for some 10-15 percent of world total. Markets where consumption of CNSL can be expected to increase are Western Europe and Australia. Eastern Europe is another prospective market where there are no direct shipments of CNSL from producing countries at present.

56. In 1964, CNSL prices reached a peak of more than U.S.\$400 C&F, New York, but late in 1967 they started falling below \$200. Average unit value f.o.b. of Indian export 1/, of CNSL has been as follows:

	<u>U.S. Dollar Per Metric Ton</u>
1962	200
1963	260
1964	308
1965	328
1966	267
1967	206
1968	165
1969	153

57. A future price level of between \$150 and \$180 is not an unrealistic assumption even with the present sharp increase in production. It should be noted, however, that as a result of oversupply, prices could well fall

1/ Source: "Cashew Marketing" and Cashew E.P.C.

temporarily below even this level.

58. India accounts now for about 55-60 percent of total CNSL world supply. Exports of CNSL from India 1/ have been the following:

Q = Quantity in Metric Tons
V = Value in Rs (000)

	1967		1968		1969	
	<u>Q</u>	<u>V</u>	<u>Q</u>	<u>V</u>	<u>Q</u>	<u>V</u>
Japan	2,198	38.95	3,065	43.68	2,000	28.84
U.K.	4,453	65.27	5,020	63.09	3,540	41.74
U.S.A.	<u>3,156</u>	<u>47.82</u>	<u>1,778</u>	<u>14.97</u>	<u>2,326</u>	<u>17.95</u>
Total (incl.others)	10,102	156.56	10,266	127.58	8,440	97.44

1/ Source: D.G.C.I. and S., Calcutta.

Table I

IMPORTS OF CASHEW KERNELS
(Long Tons)

	Australia	Belgium	Canada	France	Germany Federal Republic	Holland	New Zealand	Sweden	United Kingdom	United States	USSR	Germany Democratic Republic	Total
1946		--	1,130				---		1,809	13,347			16,286
1947		--	686				---		3,799	14,168			18,653
1948		11	822				---		3,186	15,496			19,515
1949		--	949				---		1,642	16,362			18,953
1950		12	695				103	25	2,856	21,645			25,336
1951		60	939				89	1	4,316	22,546			27,951
1952		11	1,019			37	49	19	7,575	18,814			27,524
1953		3	1,214			40	74	13	6,995	21,227			29,566
1954	256	16	1,027			131	74	74	3,396	25,246			30,220
1955	568	43	1,123			284	78	252	3,158	29,640			35,146
1956	456	127	1,172			406	119	335	3,462	25,125			31,202
1957	640	64	1,457			---	116	189	3,060	26,070			31,596
1958	674	111	1,483			---	132	219	2,674	29,807	4,800		39,900
1959	557	105	1,341			199	78	202	2,224	28,283	4,000		36,989
1960	1,086	86	1,519		346	225	149	155	2,485	28,623	5,400		40,074
1961	1,199	109	1,732		1,145	282	163	133	3,265	26,281	3,900		59,009
1962	1,394	158	1,545		1,391	412	183	215	2,511	28,786	5,000		41,595
1963	1,523	146	1,862		1,460	497	207	196	2,514	33,812	8,000		50,217
1964	1,898	117	1,760		1,305	568	204	199	3,413	31,031	10,900		51,395
1965	1,512	145	1,852		1,054	442	167	140	3,213	29,291	13,100	3,500	54,416
1966	1,529	236	1,416		869	565	120	125	2,440	30,267	13,400	2,900	53,867
1967	2,163	201	1,913	506	957	645	108	145	2,704	32,523	12,400	2,400	56,665
1968	1,992	193	2,236	181	1,155	765	207	173	3,100	41,567	17,200	2,500	71,269
1969	2,260	170	2,250	885	1,437	928	167	160	2,519	37,350	25,300	2,100	73,626

Source: Gill and Duffus: Edible Nuts Statistics, March 1970.

1. Import figures for Australia are not available before 1954.
2. Dutch Import figures before 1952 are not available.
3. Swedish Import figures before 1950 are not available.
4. Where a nil return is shown, indicated by a dash, imports, if any, are under half a ton.
5. Some annual totals are adjusted.

TABLE II
IMPORTS OF CASHW NUTS INTO THE USA
1956 - 1969

Quantity = in thousand pounds
Value = in million US dollars

	1956		1957		1958		1959		1960		1961		1962	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Brazil	387	0.02	Neg.	Neg.	Neg.	Neg.	149	0.05	1,218	0.38	711	0.23	808	0.21
India	52,780	22.71	55,141	22.96	62,854	24.07	60,331	23.53	59,084	25.98	53,682	23.62	59,559	23.61
Kenya	(378	(0.15	(271	(0.11	(403	(0.14	(393	(0.12	(380	(0.15	(588	(0.21	(259	(0.08
Tanzania	((((((((((((((
Mozambique	<u>1,490</u>	<u>0.67</u>	<u>2,587</u>	<u>1.08</u>	<u>1,846</u>	<u>0.69</u>	<u>1,939</u>	<u>0.10</u>	<u>2,128</u>	<u>0.88</u>	<u>1,638</u>	<u>0.69</u>	<u>3,428</u>	<u>1.14</u>
TOTAL (including others)	56,278	24.03	58,396	24.32	66,770	25.42	63,351	24.63	64,338	28.28	58,870	25.70	64,481	25.21
UNIT VALUE (1956=100)	100		86		94		91		103		103		92	
	1963		1964		1965		1966		1967		1968		1969	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Brazil	1,234	0.41	1,822	0.69	676	0.26	2,500	1.12	2,234	0.92	5,546	2.67	8,159	3.60
India	42,635	16.42	62,671	30.61	56,614	30.19	53,700	30.83	56,004	29.45	65,402	38.41	53,710	31.76
Kenya	(119	(0.04	212	0.09	342	0.14	109	0.04	318	0.11	324	0.15	177	0.09
Tanzania	(	(	--	--	--	--	359	0.20	1,305	0.59	894	0.47	1,499	0.89
Mozambique	<u>3,115</u>	<u>1.12</u>	<u>4,665</u>	<u>2.00</u>	<u>6,374</u>	<u>2.79</u>	<u>8,817</u>	<u>4.17</u>	<u>12,715</u>	<u>5.56</u>	<u>20,765</u>	<u>10.26</u>	<u>19,256</u>	<u>9.62</u>
TOTAL (including others)	47,141	18.02	69,614	33.50	65,611	34.13	67,797	34.47	73,022	36.85	93,428	52.27	83,663	46.41
UNIT VALUE (1956=100)	90		113		122		120		117		131		130	

SOURCES: 1956-1963 - United States Bureau of the Census. Report No. FT 110: United States Imports of Merchandise for Consumption, commodity by country of origin.

1964-1966 - FT 125: United States Imports of Merchandise for Consumption.

1967 - FT 246: United States Imports for Consumption and General Imports.

1968-1969 - FT 135: United States Imports, General and Consumption.

Table III

ESTIMATED CONSUMPTION OF CASHEWS

	<u>Average Consumption 1966/66 in Metric Tons</u>	<u>1962/66 average per head in grams</u>
German Democratic Republic	3,472	217
U.S.A.	31,139	162
Australia	1,629	147
Canada	1,714	89
U.K.	3,210	59
U.S.S.R.	10,532	46
Netherlands	512	42
Federal Republic of Germany	1,176	21
France	538	11
Japan	459	5
Italy	61	3
India	5,000	10
Brazil	<u>1,000</u>	<u>11</u>
TOTAL (incl.others)	63,700	-
	<u><u> </u></u>	<u><u> </u></u>

Source: "Cashew Marketing" (I.T.C.)

TABLE IV
EDIBLE NUT KERNEL PRICES

	Almonds (Italian Sweet Cleaned P.G.'s) (shillings per cwt C. and F. U.K.)	Walnuts (French extra halves) (shilling per 50 kgs. F.O.B.)	Hazelnuts (Turkish Kerassundes) Shillings per 50 kg. F.O.B. gross for net	Cashew (Count 450) Shillings per cwt C. and F. U.K.
1959	366	514	309	360
1960	377	776	340	413
1961	373	587	431	376
1962	519	680	478	332
1963	555	608	450	357
1964	550	785	362	474
1965	536	761	379	463
1966	527	994	413	547
1967	537	855	425	470
1968	635 (530)	1050 (892)	532 (452)	630 (535)
1969	792 (673)	960 (816)	571 (486)	603 (513)

Source: Computed from Edible Nuts Statistics - Gill and Duffus. These yearly average prices have been derived from 24 semi-monthly figures per calendar year.

Note: Figures in brackets are adjusted to take into account the L devaluation of 1967.

TABLE V
COMPARATIVE INCREASE IN PRICES AND PRODUCTION FOR PRINCIPAL EDIBLE NUTS

	Almonds	Walnuts	Hazelnuts	Cashew
Average Increase in Production $\frac{(1966/69)}{(1961/65)}$	+ 9%	8%	+20%	+21% (no increase if exports to USSR and East Germany are excluded) ^{1/}
Average Increase in Price ^{2/} $\frac{(1966/69)}{(1961/65)}$	+23%	+41%	+15%	+41%

Source: Computed from Tables IV and VI.

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- 1/ Estimates of cashew production have been based on export sales.
2/ No adjustment for the 1967 sterling devaluation has been made.

TABLE VI

WORLD PRODUCTION OF PRINCIPAL EDIBLE NUTS

(Long tons)

	Average 1946-1950 (1)	Average 1951-1955 (2)	Average 1956-1960 (3)	Average 1961-1965 (4)	Average 1966-1969 (5)	(5) as % of (1)	Yearly Increase in %
Almonds (Shelled basis)	84.200	63.400	92.200	117.800	128.000	152	+2.1
Hazel Nuts (Unshelled basis)	112.100	121.600	141.100	178.600	214.200	191	+3.3
Walnuts ^{1/} (Unshelled basis)	104.300	110.700	109.600	123.800	134.000	129	+1.3
Cashew ^{2/} (raw seeds apparent production)	<u>118.000</u>	<u>132.000</u>	<u>170.000</u>	<u>255.000</u>	<u>310.000</u>	<u>262</u>	<u>+4.9</u>
	418.600	428.600	512.900	675.200	786.200	187	+3.2

Source: Estimates derived from Gill and Duffus Statistics

1/ Selected countries: France, Italy, Turkey, U.S.A.

2/ These estimates are based on sales of kernels from India, East Africa and Brazil.

TABLE VII

TREE NUTS: COMMERCIAL PRODUCTION IN
SPECIFIED COUNTRIES,
AVERAGE 1960-64,
ANNUAL 1967 and 1968

(000 tons)

Commodity and Country	Average 1960-64	1967	1968
Almonds (shelled basis):			
Iran	6.6	6.0	7.0
Italy	35.1	43.0	50.0
Morocco	3.3	5.5	4.0
Portugal	3.4	6.0	5.0
Spain	<u>30.8</u>	<u>30.0</u>	<u>45.0</u>
Total	<u>79.2</u>	<u>90.5</u>	<u>111.0</u>
Brazilnuts (in the shell):			
Brazil	43.4	29.0	47.4
Filberts (in the shell):			
Italy	46.4	60.0	86.0
Spain	17.0	19.0	18.0
Turkey	<u>114.8</u>	<u>75.0</u>	<u>145.0</u>
Total	<u>178.2</u>	<u>154.0</u>	<u>249.0</u>
Walnuts (in the shell):			
France	28.6	27.0	24.0
Italy	24.9	25.0	17.0
Turkey	8.4	8.0	8.0
Yugoslavis	<u>3.7</u>	<u>3.0</u>	<u>2.5</u>
Total	<u>65.6</u>	<u>63.0</u>	<u>51.5</u>

Source: Agricultural Statistics 1969 (USDA).

Table VIII

WORLD ALMOND CROP - Shelled Basis
(Long Tons)

	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	1959/'58 Ten -Year Average	1969 Estimate
Italy	45,000	14,000	60,000	13,000	39,000	34,000	35,000	37,500	38,000	40,000	35,600	20,000
Spain	25,000	28,000	35,000	18,000	27,000	34,000	26,000	37,000	27,000	40,000	29,700	21,000
Portugal	4,000	3,000	5,000	3,000	2,000	3,000	4,000	1,000	6,000	4,500	3,600	2,000
Morocco	4,000	3,000	5,000	3,000	3,000	6,000	6,500	6,500	5,000	5,000	4,700	2,500
Iran	9,000	5,000	8,000	12,000	6,000	6,500	7,000	2,500	6,000	6,000	6,800	5,000
U.S.A.	37,500	24,000	32,000	23,500	30,000	37,000	35,500	42,500	36,500	36,000	33,500	60,000
Others	5,000	5,000	6,000	4,000	6,000	8,000	6,000	6,000	6,000	8,000	6,000	4,500
<u>Total</u>	<u>129,500</u>	<u>82,000</u>	<u>151,000</u>	<u>76,500</u>	<u>113,000</u>	<u>128,500</u>	<u>120,000</u>	<u>133,000</u>	<u>124,500</u>	<u>139,500</u>	<u>119,900</u>	<u>115,000</u>

Source: Edible Nut Statistics - Gill & Duffus, Ltd., London, England, March, 1970.

TABLE IX
Tree Nuts: Supply and Distribution,
United States, 1954-68

Crop year	In-the-shell basis										Shelled basis	
	United States production ¹	Imports ²	Beginning stocks	Total supply	Exports	Ending stocks	Civilian disappearance	Loss in shelling process	Net civilian disappearance			
	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	Total	Per capita		
1954.....	347,578	391,430	82,463	821,401	37,618	34,292	749,491	459,430	1,000 pounds	259,071	1.61	
1955.....	393,231	414,234	34,297	827,822	22,129	53,739	711,963	466,788	1,000 pounds	245,175	1.50	
1956.....	411,098	310,358	93,702	815,156	30,570	142,821	642,765	436,515	1,000 pounds	236,270	1.41	
1957.....	373,870	414,912	142,677	931,459	32,165	102,924	844,769	569,635	1,000 pounds	271,074	1.50	
1958.....	404,730	417,093	185,520	950,319	25,136	102,924	792,289	530,075	1,000 pounds	272,214	1.57	
1959.....	458,532	394,541	102,875	955,947	55,621	110,406	759,940	518,475	1,000 pounds	271,465	1.64	
1960.....	450,271	387,308	110,306	956,781	35,869	118,421	846,891	523,410	1,000 pounds	283,372	1.68	
1961.....	549,189	327,495	113,247	1,019,701	28,683	164,374	845,534	529,954	1,000 pounds	296,580	1.63	
1962.....	631,480	402,401	164,166	1,198,080	31,718	97,671	799,391	515,735	1,000 pounds	273,566	1.48	
1963.....	681,561	416,478	96,588	1,198,627	62,315	252,915	849,712	586,070	1,000 pounds	310,168	1.61	
1964.....	533,407	362,116	262,831	1,158,376	82,418	202,775	875,123	572,953	1,000 pounds	310,168	1.62	
1965.....	581,168	410,598	242,775	1,234,541	71,818	202,112	912,531	622,491	1,000 pounds	334,060	1.73	
1966.....	506,876	391,162	265,112	1,158,150	63,484	177,834	912,812	557,340	1,000 pounds	323,492	1.67	
1967.....	560,272	482,341	177,804	1,220,307	64,783	161,782	965,942	656,867	1,000 pounds	358,065	1.72	
1968 ³.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

¹ Includes almonds, filberts, pecans, walnuts, Brazil nuts, pignolias, pistachios, chestnuts, cashews, and miscellaneous tree nuts. Beginning 1960, includes macadamias.

² Almonds, filberts, walnuts, pecans, and macadamias; no reports on other nuts. Excludes quantities unharvested and culls not used or used for oil.

³ Foreign trade data on a fiscal-year basis, beginning July 1 of year indicated.

⁴ Preliminary.

Economic Research Service. Data for 1950-53 in *Agricultural Statistics, 1969*, table 377.

TABLE X
Exports of Cashew Kernels from India^{1/}

Q = Quantity in Metric Tons
V = Value in Rs. (000)

Countries	1965		1966		1967		1968		1969	
	Q	V	Q	V ^{2/}	Q	V	Q	V	Q	V
Australia	1,365	8,051	1,245	11,683	1,824	17,095	1,790	18,655	1,910	19,150
Canada	1,510	8,640	1,311	11,425	1,896	15,982	2,015	21,060	1,776	17,658
West Europe	5,072	24,854	4,199	29,528	4,918	37,651	4,791	41,261	4,605	38,684
of which U.K.	2,857	14,646	2,299	17,665	2,758	22,519	2,827	25,612	2,261	20,088
U.S.S.R.	13,315	73,536	13,554	106,565	12,601	101,515	17,460	167,245	25,712	238,359
East Germany	3,585	14,880	2,973	16,704	2,449	16,661	2,510	16,982	2,156	15,023
U.S.A.	27,048	147,416	23,346	183,000	26,419	224,723	29,359	283,516	23,323	225,269
Japan	535	2,773	416	3,343	423	3,693	421	4,144	479	8,721
Total incl. others	53,793	287,586	48,616	376,373	52,256	431,721	60,491	574,195	62,678	585,479

^{1/} Source: Indian Cashew Export Promotion Council.

^{2/} Devaluation of the rupee took place in June 1966.