OCCASION

This publication has been made available to the public on the occasion of the 50th anniversary of the United Nations Industrial Development Organisation.

DISCLAIMER

FAIR USE POLICY

CONTACT

Please contact publications@unido.org for further information concerning UNIDO publications.

For more information about UNIDO, please visit us at www.unido.org

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org

03569

Restricted

Date: 15 October 1975

Iran.

Feasibility Study on Packaging.

IRAN

IS/IRA/74/067/11-01/07

Terminal report prepared for the

Government of the Empire of IRAN

by

Dr. Klaus Luxenhofer

expert of the United Nations Industrial Development Organization

acting as Executing Agency for the

United Nations Development Programme

This report has not been cleared with the United Nations Development organization which does not therefore necessarily share the views presented.

3740

TABLE OF CONTENTS

1. Summary

The quick industrial development of IRAN could not be followed from some parts of the industry like fruit and vegetable production, packaging, transport, cold storage, food processing and so on. Therefore one of the reasons to set up ISIRI (Institute of Standard and Industrial Research of IRAN) has been to hasten and to coordinate this development by creating standards.

ISIRI deals with the whole industry and therefore is best qualified to take care about the development of such an intermediate descipline like packaging. Beside this ISIRI has through its huge paper and packaging centre with is just now under erection the ideal presupposition to do applied research to help the small scale packing industries in solving their problems. In these efforts ISIRI has fully supported by the Government, especially the Ministry of Agriculture and the Ministry of Industry and Mines.

No further hesitation therfore should be put up with this project but these steps should be done in the following temporal order

- intensive training of ISIRI-staff abroad in packaging (fellowships) to prepare counterparts
- short term assistance in the field of fruit and vegetables (fresh & dried) packing , in standardization of packaging material, in measures and gauging in laboratory equipment and packaging economies
- long term assistance starting half a year before finishing the buildings. (project manager and assistant)

These recommendations overdraw the fixed budget of this V-years plan ending 1966/67 and must be looked at as a proposal for the follow up of assistance necessary for the next 5 years.

2. Introduction

After discussing the job description (DS/IRA/74/067/11-01/07) with the counterparts at ISIRI, Karaj the following items has been changed according to my letter dated 11 Sept. 1975 to Mr. R. Booth, Resident Representative.

- There exists no interest in establishing a pilot packaging enterprise
- ISIRI is interested in:
  a) a market survey about the packaging industry in IRAN
  b) over all analysis of the most important products (in 50 various products) products) in view of
     - packaging
     - shipment
  c) recommendations and critics of the planned packaging centre in Karaj

It is evident, that within 6 weeks a the rough survey of almost 50 products has not been possible . According to this fact, more sight has kept on the general problems of the main packing industries than to single commodities. Nevertheless single products which are just harvested like apples, grapes, tea or dates were carefully investigated. During my travelling to the packing stations I was permanently accompanied by Dipl. Eng. Soufjou from ISIRI, Karaj.

ISIRI has been consulted by Prof. Ingve Degel, Swedish Packaging Research Institute about the new packaging centre. Due to this fact and the settled planning I could give only marginal notes.

In general I went to emphasize, that in a country like IRAN, were statistics are hardly accessible and therefore a lot of primary investigation is neccessary a survey of such an extent needs about 3 month investigation. This means that all dates and parts of my judgement rest on a very small basis. This should always be recognized during studying this report.

A further hindrance in collecting dates from the private industry was the letter of recommendation from ISIRI. By reason of the status of ISIRI as a controller of quality there was only a very low interest from the side of industry to give exact figures. Therefore I think that some more public relation by ISIRI in the field of food processing and packaging should be no harm.

3. Analysis of the present situation

During this survey about 30 companies have been visited and another 20 experts and official and governmental departments have been interviewed [1]

3.1. Packaging industry in IRAN

Appendix 2 shows the import figures of the official iranian statistics of those materials which are also used for the production of packages. Exact figures have not been available because there exist neither special items for single types of packages nor dates about the interior production in IRAN.

Appendix 3 gives a list of the most important packaging firms in IRAN arranged after their production programme.

3.1.1. Paper, Cardboard, Corrugated box industry

Much more than in Europe is the dominating packaging material Kraftpaper (sacks), cardboard (folding boxes) and corrugated board for transport boxes. The basis material (Kraftliner) is mainly imported from Scandinavia, USA and Canada because of the lack of coniferous fibres in IRAN. In the near future with the help of Canadian and British companies there come to exist a certain percentage of domestic production (for ex: Chuka, Caspian Sea). Despite of these efforts and a high percentage of recycled paper this market will continue to be an import market.

The visited companies are well outfitted for the requirements of the packaging market in IRAN, striking is the fact that a wide range of quality of the material is converted to boxes because of the lack of a proper quality control for boxes. There exist a necessity to develop a standard for folding boxes and cases made out of corrugated board which attach to a box of a certain size and a certain maximum packing weight (Kg) a material with exact defined and testable properties. Such a standard could help the quality control of both the producer and the consumer, it would be a basis for insurance of transport and an instrument for the government to control the profit rate.

---

1) Appendix 1: Itinerary

Paper bags used for example in Supermarkets are common for packing of fruit and vegetables but PE-bags are coming to compete with the paper bags very hardly because of the lower price. Shopper bags are almost unknown today.

Heavy duty bags valve-sacks used for example for shipment of fertilizer or cement are mainly produced in three companies.

3.1.2 Plastic packaging industry

The plastic packaging industry in IRAN is relatively new and there exist maybe 5 major companies and a lot of small conve tors so that today a total amount of 40-50 plastic packaging producer probably exist. According to the plans of the government there exist no doubt that in the near future, plastic packaging will gain much more importance as it has today. For the moment there exist only a 20,000 MTA production of PVC which is mainly used not for production of packaging.

The IRAN-JAPAN Company a 50:50 joint venture between NIOC and a consortium of Japanese companies is building a complex at Bandar Shahpur and the following materials are scheduled to come on-stream during 1978.

Polypropylene (PP)	50,000	MTA
ld-PE (Polyethylene)	100,000	MTA
ld-PE	60,000	MTA
Vinyl Chloride Monomere	150,000	MTA
Styrene Monomere	93,000	MTA

Another project by NIOC calls for the production of 100,000 MTA Caprolactam, for the manufacturing of Polyamide-6. 70,000 MTA DMT, raw material for polyesterfibre and films are expected to come on-stream in 1978 in Abadan . Besides this plants under construction there exists some more plans in the field of plastics, which shows the importance for the future development also in plastic packaging. But there exist no plans that the government is at the moment willing to enter directly in the plastic convertion business like it has done in the field of bleached paper. (Fars Paper industries).

3.1.2.1 Flexible packaging

Materials used for flexible packaging today are Cellophane, ld-PE, hd-PE, PVC, PVDC, PA-PE in form of wrapping, bags and to a very small amount also as vacuum packing for meat, sausages, pistachioes and raisins. The major consumer of cellophane print the imported films at their own printing machines. Most of the bags and films are imported (Appendix 2) and there is not always the right understanding about the necessity of the various types of plastic materials. According to the planned production of PP there exists in the near future the necessity of an internal production of OPP-film to substitute the expensive imported cellophane. Shrinkwrapping is almost unknown besides of plastisized PVC shrinkwrapping for portioned meat, vegetables and fruit. With the inevitable changing of transport system toward pallets and big containers in IRAN in the future the shrinkwrapping with PE will gain more and more importance. PE-film and bags are extruded in IRAN. Heavy duty valve bags are not produced today but imported or there are only flat sacks in use.

3.1.2.2. Rigid plastic container

There exist perhaps 5-8 companies (Plascokar is the most important) who has the machinery for production of plastic containers. The main packaging are bottles, jerry cans, buckets and crates up till 70 ltr content mostly made out of PE. A production of foamed polystyrene crates for transport of fruit and vegetable don't exist today despite the possibilities to do this.

The machinery is mostly 10 years old and there exists an urgent need to exchange.

Big consumers of plastic containers like Taliderv or Varda blow their own container.

3.1.2.3 Semi-rigid plastic container

Containers, who are thermoformed directly during the filling process are not very common. Materials like PVC and PS is used for diary products (yoghurt) and for sweeties. Due to the growing of

supermarkets and the working of married women in the next 5 years an increase of these packaging can be expected at least in the cities.

3.1.3 Glass packaging industry

Besides 3 major companies producing containers there exist a lot of small companies. The quality of the glass bottles is very bad. The bottles are very heavy due to the inability to produce an even thickness of the glass. As far as investigated there exist a plan to build a new modern glass factory for prod uction of bottles (Saint Gobain). The habit that almost each brewery use their own shape of bottles is a hindrance for a high quality production of bottles. The Department of Small Scale Industries wants to help also the small glass works but in my opinion due to the high costs of investment and the need of a highly automatized production sooner or later these small companies shall be wiped out of the market.

The complaints of the users of glass bottles like Pepsi Cola, Coca Cola, Canada Dry about the poor quality of the containers means that it would be helpful for the industry to be advised in modern production techniques and quality control.

Wide necked glass containers (jars, etc.) has not been examinated but shop checks showed that modern caps (twist off) are used for products like jam and honey.

3.1.4 Can industry

There exist one major company (container Corp. of IRAN) which has a modern production line and some licences from C.C.C., USA, Modern "easy open" ring pull caps are imported from West Germany and France.

The tin can industry is of a main importance for the packing of conserved goods and today about 100,000 MTA are used for production of cans.

Special problems don't exist.

The future growth in the tin can market depends on the development of processed fruit and vegetable as well as from the production of the new Chemical industry in IRAN.

Big consumers of tin plate packages produce their own cans (vegetable oil, machine oil) or crown corks (beverage).

3.1.5 Aluminum packaging industry

As far as known Al-cans are not used in this country. There exist production of Al-tubes. Also Tolidaru is just planning a most modern plant for production of tubes for shampoo, etc. Aluminum foil for flexible packaging is only converted by IRAN Roll Co. but there exist in IRAN no possibility to laminate aluminum with PE for sealing. That means that all Al-laminates used for sealed packaging must be imported.

3.1.6 Wooden packaging industry

In the area of the Caspian sea there exist about 2,5 Mio ha wood, but not all of this area can be exploited. There exist today two big sawing mills one in Azalern and the other in Nacka 70% of the exploited wood is beech, other wood use are carpius, maple, elm and poplar, 150,000 m^3 trees are cut a year in Azalern. All the forests are owned and exploited by governmental companies.

Only a small amount (25%) of sawn timber are prepared for the use of packaging like chests for caviar or sticks for strengthening of crates and pressboard tea boxes. Most of the wooden crates used for packing of fruits and vegetables are handmade by small local carpenters. Poplar wood is mostly used.

The single planks are not even and relative thick because of the use of nails instead of cramps which afford a much less thickness.

A wooden packaging industry does not exist in IRAN.

The use of plywood for packaging is also unknown in IRAN. The existing 5 factories in the country produce plywood only for the furniture industry. A certain amount of noble plywood is exported to Europe and only small boxes for cigars or cigarillos are produced.

3.1.7. General remarks about the packaging industry in IRAN

The machinery equipment of most of the visited packaging companies is in many cases better than the quality of the produced packaging. This however don't mean that the packaging industry is not in a position to produce better packages (exception the glass container industry) but it means really that the users of packages don't want to spend much money in packaging. Further favours the lack of standards of packaging materials the producer of packages with a lower quality.

The fact that almost the total packaging industry of IRAN is located in and around Teheran is very disadvantageous because it hampers the packaging development throughout the country in various manners:

- The transport cost of packaging especially of containers in coming to be more and more expensive.
- The regulation to stop the growth of the city of Teheran include a stop of investment in a circle of 100 km around Teheran. This stop of investment means for the packaging industry that they get no permission to buy new machinery. Despite the fact that modern machinery for packaging means rather less than more employees the government don't allow new investment for the established packaging companies therefore exist no inducement to start with a new production far outside from Teheran because this would mean a second building a second management, and new specialist for the machinery which are almost indiscoverable in IRAN.

There exist a need for packaging companies at least in the region of Isfahan, Shiraz and Tabriz.

As told before, because of the requirement of high quality packages for big companies and a much less standard of packages for the small industry the packaging industry in IRAN is at variance which of both needs should be fulfilled. The one needs very costy, high speed machinery indusive license costs and low costs of personnel and distribution. The second requires more manpower and a big selling staff and more demiautomatical machinery equipment easy to shift.

During besitting some major consumer of high specialized packages started to produce their own packages. But the problem is that only a high speed production guarantees an acceptable price of the single packaging and so these companies start to be packaging companies too. This development exist also in European countries and is dangerous because the type of produced packages are best fitted for the competing companies, which of cource reject buying.

3.2 Packing industry in IRAN (point 1 of the job description)

With the help of several shopchecks and during my visiting of various types of industries (s.a. itinerary) I could gather some experience about the way of packaging in IRAN. Ofcourse this short survey cannot claim to be complete but in any case it gives a rough idea quite enough to give some recommendation about UNIDO's further assistance to Iran's new packaging centre. The main difficulty has been that there are no exact statistical figures available about the interior production of the various commodities. Such overall figures which has been available during this investigation are shown in Appendix 4.x)

To get an impression how important the central province round about Tehran is, shows the figure of 67% of the total industrial turnover in IRAN. The city of Tehran has more than 4 Million inhabitants, IRAN has a total population of 33 Mio. The main centres are the regions of Tehran, Tabris, Mashad, Isfahan, Shiraz, Abadan.

In the following chapters is given a summary about the packaging situation in the various field of industrial and rural products.

After discussing the problem of packaging in IRAN with ISIRI, a list of the most important products was given to me and is shown below. For the moment regarding to the tasks of ISIRI only food stuffs are of interest. Official statistical figures has been available only for export and import. The figures about the total interior production of single products can not be given despite a lot of attempts in the various ministries and statistical centres. If at all available, only a toilsome survey at the main centres of production like Ghazvin, Fars, Gilan could deliver more accurate figures. I am also not in a position to judge the exactness of these figures. Just now has been finished a new rural census but dates are not summed up and not available before at least half a year.

---

x) The year 1972/73 means in farsi the year 1352.

Products	Annual production in 72		Annual import in 74/75		Annual export in 74/75	
	in 1000 t's	in Mio Fls	in t's	in Mio Fls	in t's	in Mio Fls
Grapes	616		1828	65	2145	23
Plums dried			1,2	0,1	1,8	0,09
" fresh			-	-	14	0,1
unshelled almonds	31		-	-	668	61
Beans &peas fresh	44		-	-	155	1,5
Onion & garlic	139		3.995	12	20306	106
Pistachioes	36		-	-	10104	1344
Cummin seed			-	-	5886	415
Apples	90		24.900	875	719	6
Pears			26	1,7	28	2,8
Apricots & Peaches, dried			-	-	7.334	340
Pepper, black			843	78	0,2	0,02
Raisins			17	0,3	39145	1906
Cabbage						
Wheat (+ rye)	4398		1433903	20986	59	0,8
Tomatoes	126		-	-	6650	33,4
Shelled almonds	-		-	-	1827	355
Beans, shelled			96	28	155	2,2
Shelled walnuts	18		70	11	157	28,6

Products	Annual production 1972		Annual import in 74/75		Anhual export in 74/75	
	in 1000 t's	in Mio Riels	in t's	in Mio Riels	in t's	in Mio Riels
Split peas			-	-	5	0.1
Shelled peas	65		59	4.5	29	0.7
Peaches & apricot fresh			-	-	998	14
Barley	1227		178483	2223	-	-
Dates fresh	210		-	-	32.641	584
dried			-	-	12	0.05
Biscuits			1052	147	1529	122
Macroni & spaghetti			0.9	0.2	128	4.5
Pomegranates	132		3589	82	1117	9.36
Figs, dried			482	32	97	2.9
Sunflower seed	39		0.5	0.01	24	0.4
Hazel nuts			-	-	37	3.1
Walnut			-	-	18	1.0
Shelled pista pistachioes			1082	114	371	60.6
Vodka (spirits)			-	-	2.7	0.2
Liquorice roots			92	0.8	16456	166
Vegetable shortening 1)	198		648	20.8	9885	234
Tea	46					
Other cereals 2)	38					
" Fruits 3)	43					

1) garlic, carrots, cauliflower, spinac eng peanut, celery, Parsley etc.
2) rye, rice etc
3) pears, peaches, quinces etc.

3.2.1 Fresh fruit and vegetables

The main packaging for fruit and vegetables are mostly expendable banana-box[es] which are used again and again. Besides the hygienical point of view the strength of the material is not thought for reuse and gives therefore not enough protection against impacts of transport and storing. The other common packaging is a very simple wooden crate nailed together by the farmers themselves or local carpenters. A high percentage of the fruits are in a very bad condition due to this rough handling. Another high rate is of so poor a quality that the fruits are not worth packing. Most of the transport boxes are so that the products are squeezed.

Starting from the requirements of the super market sales system there starts also a prepacking (or over-packing) of fruit and vegetable. Normally are card board folding trays used with cellophane or plasticised PVC shrink wrapping but the units are too big and not carefully packed or/and roughly handled during transport so that the quality of the packed fruits and vegetables (grapes, peaches, apples, pears, apricots, beans, eggplants, peprices etc) is very bad and the sale goes on slowly which again causes a fast rottening of the product in the hermetical closed atmosphere of the packaging. Discussions with a lot of farmers and packaging experts inside the country showed very clearly that the farmers are not willing to buy a new, good but expensive wooden case or a corrugated box. It seems necessary that in the future there must happen something to prevent the country from spending money for products which can be produced inside, but cannot stored long enough. One thing is, that the quality of the fruit (and vegetables) must be improved. Second is, that there must be increased the capacity of cold storage, and third the quality of the packages must be improved. Some effort has been made for export packaging but there exist scarcely the possibility to export outside the season fresh fruits and vegetables

To give an idea about the possibilities of cold storage of

fruit and vegetable, the following table is shown:-

Product	Storing temperature	Possible storing time
apples	0-3	3-5 month
oranges	3-7	2-4 month
apricots	0	2-3 month
pears	0	2-3 month
peaches	0	2-4 month
plums	0	6-8 weeks
grapes	0	2-6 month
walnuts	0	10-20 month
hazelnuts	0	1-2 years
unshelled almonds	0	6-8 month
tomatoes	2-8	2-4 weeks
Onions	0	6 month
green beans and peas	4	4 weeks
cucumber	1	5 weeks
potatoes	4	6-8 month
celery	1	3 month
spinage	0	6 weeks

3.2.2 Dried fruits

Both the season for raisins and dates packing has not yet started, so there was only the possibility of looking at the packing machinery. The total production of dates in IRAN is constantly 300.000 t/a from 22 Mio date trees. Only 10% of this production is of such a quality that it can be exported. Main export area is Khorramsher and Shiraz. In Khorramsher a very dry sort of date is produced (SIEAR) and in Shiraz a much better quality (cap cup and yellow Jahani) but not so resistant against storage. In Khorramsher are produced more than 200.000 t and in Shiraz 70-80,000 t/a. Dates are holy trees and therefore usually it is impossible to cut them if they are too old. The date trees in Khorramsher are relative old, the Shiraz date trees young so that the future lies in Shiraz also because of the oil industry in Khorramsher. JSIRI-Shiraz together with the date farmers is working hard to solve the packaging problems of the soft dates.

One main problem with all dried fruits is the short time of packing which needs a lot of personnel and modern machinery which only can be used for that short time. There exist a need to get the packing personnel trained in modern, hygienicel packing methods and conserving methods. Furthermore the world market in the future prefers dates without stones. There exists only in California suitable machinery to do this but this machinery cannot be bought. If there exists a possibility to get help in constructioning such a machinery, this would be very helpful too.

The packing of raisins in cellophane bags don't bring about special difficulties. But it should be tried in the future to sell more and more raisins in this portioned way, which is a marketing question. The quality of dried apricots is much too bad for an attempt of export. From the hygienicel point of view there also should be tried to prepack this dried fruits for the internal market.

3.2.3 Packing of nuts (walnut, almond, pistachio, hazelnut)

If one asks about the export possibilities, one should be clear

about the fact that IRAN is a very big self consumer of these nuts. These nuts, mostly unshelled (not pistachios) are sold on the streets. In this habit wont anything happen if not hygienics force a prepacking. For export usually bulk transport or cellophane bag packing is in use. The more expensive pistachioes for export are packed in tin cans and just now starts also a vacumm packing in PA/PE film which is quite easier and cheaper.

For export promotion I would like to propose an "pistachio action" in Europe especially in West Germany to make the people familiar with that products. The type of labelling and the packaging design must be much better adapted to the precious content.

3.2.4 Packing of tea

The tea produced in the Lahijan area is somewhat strength in taste and usually is blended with foreign tea. For this purpose all the tea after sorting and drying is brought to Tehran for blending. After that the consumer packing in folding boxes and cellophane wrapping happens. The dried tea (3-5% H_2O-content) is brought, in 40 Kg nailed press carton boxes with wooden sticks for strengthening, to Tehran. This expensive packages (140 Rials) can be reused twice or three times, but the retransport is expensive, so for this transport heavy corrugated folding boxes can be recommended which are collapsible after emptying.

3.2.5 Packing of fish and caviar

During visiting the North fishery Comp. in Bandar-Pahlavi, we were not allowed to have a look at the packaging of fish (fresh and frozen) but could only see the packages of caviar. The 2-Kg Caviar can consists really of two open cans which are put in together and tightened by a gum cuff. This packaging is very funny and don't agree with the precious content. Especially for transport packing a very heavy hard wood box must be used to protect the caviar from squeezing.

As far as the shop checks showed exist no portion packing of fish today in IRAN. Trouts for example are packed on ice and sent in big iron container to the supermarkets. The iranian people are yet not very accustomed to eat fish throughout the year.

3.2.6 Diary products

There exist 3 diary plants in Tehran and one in Tebriz, Shiraz, Mashad, Isfahan, Resht, Sari, Chermanshar, Reaniye and Abedan. Eight of them are private, others belong to the government.

For milk packing is usedthe Tetra pack and Tetra brick system as well as the Pure pak system and returneble glass bottles. The packing of yogurt start just in polystyrene cups but only in form of fruit mixtures. Iranian people are used to eat much bigger quantities so that on ½-1 ltr cup of PVC should be the better packaging as the nowadays used PE-bags.

The packing of cheese is unimportant because of the very low consume. Only the ordinary white cheese is packed in 10 ltr rectangular tins or in supermarkets in waxed paper or cellophane. For packing of butter Al-foil/Paper laminates are used.

3.2.7. Packing of meat and processed meat.

In IRAN there exist 5 companies who produce sausages. The two biggest companies are in Tehran and only they use flexible laminates for vacuum formed packaging. Those packed sausages are mainly distributed to supermarket. The production is still unimportant related to European countries, but an annual increase of 15-20% can be expected for the next years.

Today about 20 t/day of cutted meat is packed in Tehran, for packing are very expensive PVDC-bags used, but the Cryovac packing stations are not used correct. Also the hygienical standard is not the best.

Due to the fact that Iranian people want to eat meat from fresh slaughtered cows or sheep the future development in prepacked meat probably is not very fast. For packing of portioned meat in supermarkets are cardboard trays used with plasticized PVC shrink wrapping, while ISIRI is wondering if PVC with plasticizes can be allowed or not. The packing of cuts is more a shelter from dust and therefore can be used also cheap PE-bags. A maturing pouch for meat cuts is completely unknown. It is expected that the per capita consumption of beef and veal will rise from 3 Kg to 4 Kg and of mutton, goat and lamb from 16 to 22 Kg within the next 10 years.

3.2.8. Packing of poultry

Fresh and only cooled poultry is packed in PE-bags. This packaging is unsuited for a more days storage. Outside from Tehran are the major poultry producers. The total production of poultry was 1974/75 about 112.000 t, not enough for the domestic consumption. For the next ten years a rise of the per capita consumption from 2 Kg to 3.7 Kg is expected. The market of frozen poultry packed in shrink-bags will therefore also grow very fast in the near future.

3.3 Shipment of packed goods in IRAN

Estimately more then 90% of all products are transported by trucks. There exist practically not shipment on pallets. With exception to this some factories use for their internal transports mostly wooden pallets and beverage companies like Coca Cola use also pallets for external transport but also them pallets never leave the lorries. Especially astonishing is the fact that also products (fertilizes, cement) which are filled in heavy duty sacks are not palletized but loaded on heavy trucks with strapping against movement. Due to the fact that no fork lift trucks are available at the most reloading points there can not be expected some change towards palletized shipment in the near future. This is regretable because the great hazards of transport in IRAN today could be easily reduced by using palletized shipment.

The rough handling during transport is one of the main reason of products damage. A reduction of transport hazards would make it possible to lower the stability of the packaging material and with it the cost of the packages. "Rough handling" means:

- reckless loading and deloading
- uncorrect sturing due to over-filled or half-empty boxes, unstable boxes, and crates, inequality of sizes.
- heavy impacts during truck transport on the roads.

Especially striking and shocking is the rough handling of the imported kraft paper reels in the harbour of Khoramshar which means a high loss of money and precious raw material. There should be taken care to call to account the responsible persons.

Internal shipment with bulk, silo or big container is also mostly unknown. At the moment exists no department which deals with the future development in transport systems like pallet or overseas-container.

To prevent high and neccessary cost for the future it would be very important to study the transport systems in IRAN very carefully and to elaborate proposals for the government and the industry. Especially with regard to packaging development and future consulting in packaging a thoroughsurvey of the transport system is recommended.

3.4 Cold-storage system in IRAN

There exist two types of cold-storage-houses in IRAN

a) governmental stores

b) private stores

a) governmental cold-storage

deals mainly (70%) with meat (imported mostly) but vacancies are free to private industries for renting.

The total capacity of storage is about 60.000t, without the fishery cold store houses with another 45.000t which are only used for fish and similar products.

b) private cold-storage

with a capacity of 140-150.000t are mainly used for fruits and vegetables. This type of cold-storage can be distinguished in

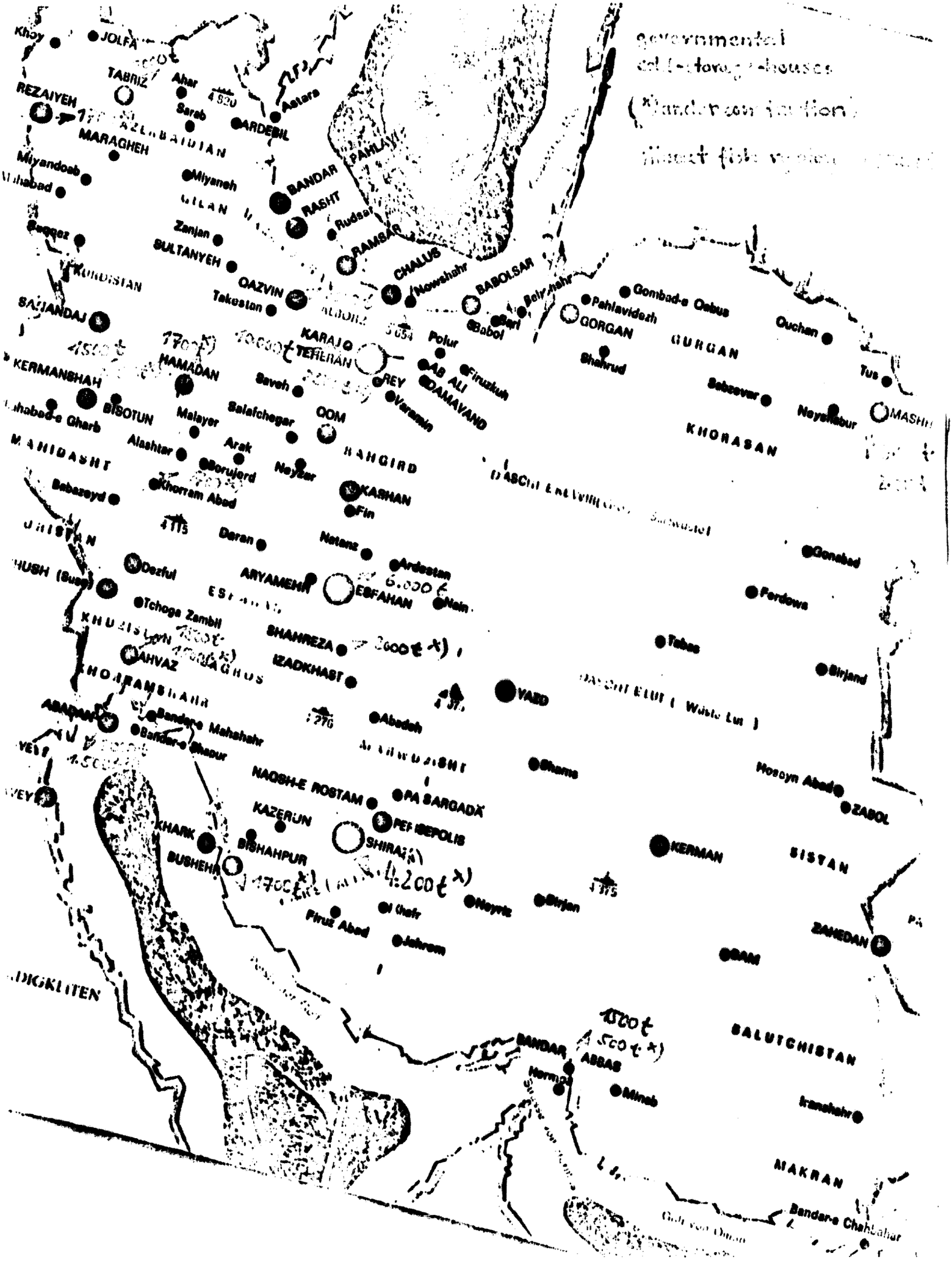
bb) commercial cold storage-houses which produce nothing and are working only on a rent basis, and

bbb) producing cold storage-houses, which must produce at least 50% food commodities of their own to be accepted by the government in that form.

The last one (bbb) is rather new and holds only 5% of the capacity of the private cold storage houses. But it is the exclaimed policy of the government to change commercial into producing cold storage, furthermore only producing cold storage house receive permission for extension or new building. There exist today no cooperative cold storage houses.

Cold storage usually have there own pallets for storing and the delivered packed products must be reloaded twice before and after cold storing.
The future plans for the next 10 years assigns an extension till 450.000t's capacity of cold storage houses. (1t ≙ 4 m^3).
This is not very much considering the fact that five times the capacity of Kasvins' cold storage house are required by the farmers for apples only.
Most of the commercial stores are rented to banana companies. A general estimation of the necessary capacity for fresh fruit and vegetables can not be given because of the lack of dates of annual production tonnage. One interesting figure shows that an annual export of 720 t apples stands opposite an import of 25.000t during the year 1974/75

The wooden cases used nowadays for the high cold storage are even if


governmental
collectors
(*)under construction
Khoy
JOLFA
TABRIZ
Ahar
Astara
REZAIYEH
Sarab
ARDEBIL
AZERBAIDJAN
MARAGHEH
Miyandoab
Miyaneh
BANDAR
RASHT
Rudsar
GILAN
PAHLAVI
Zanjan
RAMSAR
SULTANYEH
CHALUS
Nowshahr
BABOLSAR
Beyr Anhar
Gonbad-e Qabus
Pahlavidezh
GORGAN
GURGAN
Ouchan
Tus
Sabzevar
Neyshabur
MASHH
KHORASAN
KURDISTAN
OAZVIN
Takestan
SANDJANDAJ
KARAJ
TEHERAN
REY
Varamin
Polur
Babol
Sari
Firuzkuh
AB ALI
DAMAVAND
Shahrud
KERMANSHAH
HAMADAN
Saveh
Malayer
Salafchegar
QOM
BISOTUN
Alashtar
Arak
Boroujerd
Nayzar
KASHAN
RAHGIRD
MAHIDASHT
Khorram Abad
Fin
Natanz
Ardestan
Dezful
ARYAMEHR
ESFAHAN
Nain
Gonabad
Ferdows
Tchoga Zambil
SHAHREZA
IZADKHAST
AHVAZ
KHUZISTAN
Tabas
Birjand
YAZD
Abadeh
Bandar-e Mahshahr
Bandar-e Bushir
NAQSH-E ROSTAM
PA SARGADA
PERSEPOLIS
KAZERUN
SHIRAZ
KHARK
BUSHEHR
BISHAHPUR
Shams
Hoseyn Abad
ZABOL
KERMAN
SISTAN
Neyriz
Sirjan
El Ghafr
Firuz Abad
Jahrom
ZAHEDAN
SAM
BAHREGAN
BANDAR ABBAS
Minab
SALUTCHISTAN
Iranshahr
MAKRAN
Bandar-e Chahbahar


MAKU
Khoy
JOLFA
TABRIZ
Ahar
REZAIYEH
Sarab
ARDEBIL
Astara
AZERBAIDJAN
MARAGHEH
Miyandoab
Miyaneh
BANDAR
RASHT
Rudsar
GILAN
Zanjan
RAMSAR
SULTANYEH
CHALUS
Nowshahr
BABOLSAR
QAZVIN
Takestan
ALBURZ
SANANDAJ
KARAJ
TEHERAN
REY
Varamin
Pahlavidezh
GORGAN
GURGAN
Gombad-e Qabus
Ouchan
Tus
MASHH
Sabzevar
Neyshabur
KHORASAN
KERMANSHAH
BISOTUN
HAMADAN
Malayer
Saveh
Arak
QOM
RAHGIRD
KASHAN
Alashtar
Borujerd
Noyzer
Khorram Abad
Dezful
Natanz
Ardestan
ARYAMEHR
ESFAHAN
Tchoga Zambil
SHAHREZA
IZADKHAST
AHVAZ
ZAGROS
ABADAN
Bandar-e Mahshahr
Bandar-e Shapur
MAHDASHT
NAQSH-E ROSTAM
PASARGADA
PERSEPOLIS
KAZERUN
KHARK
BUSHEHR
SHAHPUR
SHIRAZ
YAZD
Abarkuh
Shams
Rabor
Birjand
Neeyn Abad
ZABOL
KERMAN
SISYAN
Nayriz
Sirjan
Firuz Abad
Jahrom
ZAHEDAN
BAM
BALUCHISTAN
BANDAR ABBAS
Minab
Iranshahr
MAKRAN
Bandar-e

new, not suited for storage because of differences in size and construction caused by the amateur construction of the farmers. The lack in capacity of cold storage houses could be used for forcing the farmer to use better wooden crates acceptable for palletized storing.

Corrugated boxes are not suitable because there exists only one cold store house with racks.

Refrigerator transport

The railway organization owns 40 waggons suitable for cooling but they are not in use. Most of the frozen products like meat, fish or poultry as well as the merely cooled products like bananas are shipped by trucks outfitted with refrigerators.

4. General Recommendations

The explosion of economics in IRAN in the last ten years brought about fast changing in shipment and packaging which is still going on so that for the future there is a need for assistance in packaging to secure the home products from damage, promote the export of import nt products, and to introduce new packaging materials in accordance with the local conditions in IRAN.

The quick development in this country combined with the complexity of this matter requires a fundamental solution of the basic problems concerned in packaging as there are:

a) development of testing and quality control methods

b) development of a programme to create a packaging industry based on the special problems and requirements of IRAN.

c) development of packaging research

Further there should be taken care that the needs of the users and the possibilities of the producers of packaging are coordinated in the right way. ISIRI a governmental body could be a suitable institution to do this.

To get shure that the total complex is handled in the right way it is necessary that all these matters are concentrated at on place - the new packaging centre of ISIRI (IRANIAN Packaging Centre - I.P.C.). After setting up in some years this Centre should be a body, independant as far as possible, but fully responsible to ISIRI and the main tasks should be:

a) standardization and quality control of packaging material

b) marketing in packaging, to solve home trade problems and promote packaging for export

c) information workshops especial for small scale users and producers of packaging

d) training of the management of local users in the modern application of packaging materials

e) packaging economics, make surveys of the most suitable packaging systems which could be applicable to the local conditions

f) basic research and testing

The best way to avoid false developments in packaging is the creation of a national packaging committee. In this council there should be represented

- user and producer of packaging
- domestic trade associations
- international trade associations
- transport associations (truck, railway)

- ministry of health
- ministry of cooperatives
- ministry of commerce
- ministry of agriculture

} Governmental Officials

and the chairman to be appointed by the government should be the director of ISIRI. The persons nominated for this council should be not the same persons as in ISIRI's existing council but persons who deals practically with packaging and transports. For further assistance in the field of packaging the help of UNIDO is inevitable. The "input of UNIDO" can be

- experts
- followships and
- management training of ISIRI staff abroad

and the input of ISIRI can be

- buildings and testing rooms
- testing equipment for laboratories
- equipment for pilot packaging machinery for testing and research
- local staff

Before one start to study the below given detailed recommendation one should consider the following:

a) As Mr. Sabersheikh, responsible director in ISIRI, pointed out comes the money for this new packaging centre from a special department[x] (ISIRI belongs to the Ministry of Industry and Mines). The emphasisinthe future activities of this packaging centre lies therefore in the field of rural products, i.e. the improvement of agricultural products and the packaging.

b) According to the fact, that project No. DP/IRA/74/050/A/01/37 elaborated from Mr. Biritz has been approved from the government and with this the budget is fixed until the end of the fifth 5-years plan in 1977, this presented survey, the conclusions and the recommendations for further UNIDO - assistence must be looked at as a supplement of Mr. Biritz proposal beyond the year 1977.

c) Vagueness about the further financial means being available from both sides UNIDO as well as the IRANIAN government allows only a proposal for further assistance which seems necessary without considering the monetary possibilities and timing.

---

x) Plan Organization for the Purpose of Improvement of the Quality of Iranian Agricultural Products

4.1 Recommendation of UNIDO inputs (job description point 3)

4.1.1 Assignment of international staff

After the necessary training of the counterparts in UNIDO the following experts can be proposed: before

a) long term assistance (start 1 year/establishing of the institute)

	Location	Duration
1 allround expert in packaging officiating as a manager of the whole project with the main tasks - built up the packaging centre - train the counterparts on the job - train users of packaging theoretical and in the field - interest the Iranian packaging industry and the main consumer of packaging (packing industry) in the activities of this institute on a management level.	Karaj	3-5 years
1 expert in standardization of all kind of packeging with broad experience in solving packaging problems to support the managing packaging expert above.	Karaj	2-3 years

b) short term assistance (begin immediately)

2 experts in packaging (packing material and machinery) for dried fruits like dates, figs, raisins	Karaj	2x4 months +travelling
1 expert in packing of fresh fruit and vegetables with wide experience in the various packaging media and capability of teaching the farmers and local packers	Karaj	6 months
1 expert in standardization of quality of corrugated and cardboard boxes	Karaj	6 weeks
1 expert in measures and groping of size and volume of various types of container and their filling volume to setup standards	Karaj	3 months
1 expert for equipment of laboratories and testing machinery to consist the project manager and to train the counterparts	Karaj	6 months
1 expert for packaging economics especially for packaging systems to train the management of the packaging centre about the economical influences for the national economics and to help small packing industries and farmers in their decision of the packaging materials	Karaj	4 months

4.1.2 Training provisions

During the time necessary to erect the packaging centre in 1976/77 and before long term foreign experts should start their activities there is an urgent need to preparing the counterparts for their future tasks.

	Location	Duration
3-5 persons should be sent abroad to get trained in solving packaging problems. The following training schedule is proposed:	European Country or USA	(3-5)x6 months

-3 month training in various packing in industries, to learn how to solve packing problems and to get equaintent with the problems of standardizations

-1.5 month in conclomer te packaging industries to get an impression of competing packaging materials and to study production and quality control of packages

-1.5 month training in a packaging research centre to learn testing methods and research work both by tests and analytical

Apart from this general training in packaging which only can give some allround education, special training should be given by further fellowships in the following fields to the same persons:

- 6 months in flexible packaging production
- 3 months in shrink film production and application
- 6 months research and testing in one of the European packaging centres named below.
- 6 months training in standardization of various packaging materials
- 12 months education in training experience
- 3 months information and documentation.

To prevent ISIRI to loose this well trained persons to the domestic packaging industry a 5 years contract should bind them.

The proper acunational background of packaging engineers should be the study of chemical engineering or physical chemistry to understand best food chemism, food processing, packaging physics and the problems of packaning machinery.

The department of packaging should have beside an allround education of the engineers the following priorities:

- division of transport and shock testing
- division of food and vegetable packaging
- division of testing and quality control of packaging material
- division of packing equipment and machinery

The chiefs of the departments should be sent on a study tour to research centres as T.N.O., PIRA, AFP, Service central d' emballage, Swedish packaging research centr , Polish packaging centre, Tekno engineering Italy for 6 weeks.

4.2 Additional recommendations for the planned packaging centre

(job description point 3)

Due to the fact that ISIRI has consulted Prof. Y.Dagel, Swedish Packaging Research Institute x) and thereafter planned the building as well as the laboratories and its equipment there remain only a few point worth discussing after studying the plans and the equipment.

- Because of the high impacts during drop testing and here from resulting difficulties with electronical measuring I went to propose a swinging foundation. Depending on the size of most of peckages a size of ca $1m^3$ is enough and also frequency of 1Hz
- The height of 6m for the main testing hall shall bring about a lot of difficulties with climatizing and because of the problems we already had in the Munich Institute. I dont believe that is possible at all. 4 till 4.5m height is enough, because a 6m storege of packaging materials bring about handling problems.
- The glass window should be specially coated to protect a heating up of the interior of the testing rooms.
- A proper insulation as well of the roof as of the pillars can prevent a stream of condensate water during winter time.
- A industry vacuum cleaner is absolute necessery.
- Buying the testing equipment, especially the electronic, there must be carefully looked that they harmonize.

4.3 Recommendation for the packaging pilot plant

(job description point 4)

Included in the building area of 6200 m^2 for the peckaging and paper centre is a hall sized 10x20 m x9m higher for pilot plants. There

x) Appendix 5

exist plans for installing a pilot paper machine, but financing is quite unclear today. For the moment there exist no possibilities and also few interest in establishing a pilot plant for packaging.

Despite that fact I want to propose at least a shrink wrapping gun or channel and a small thermoforming machine of films with the possibility of sealing, vacuum packing as well as inert gas filling because in the near future this type of packaging will be introduced in IRAN and there exist no knowledge in the packaging industry about this matter.

4.4 Recommendation to the existing packaging industry (point 1 of job descr

- There exists a need to give the domestic glass container producer advice for a more precise and thinner moulding of glass bottles. Further there should be elaborated together with ISIRI and the bottling industries quality standards on the proper tolerances of the thickness, the volume and the width of the neck.

- The producer of crates for transport of bottles should be helped to design also returnable hd-PE crates for transport of fruits and vegetables. A special look has to be thrown that no unsuitable strengthening ripe can damage the sensitive products.

- Corrugated boxes are highly advantageous also in the future for packing of fruit and vegetable as well as for transport packaging, but today not very much suitable constructions are used in IRAN despite the necessity to protect the fruit and vegetables.

To avoid failures in the future there must be elaborated packaging standards which deal with the size (or volume) and the quality of the packaging material in relation to the gross weight of the package. To prevent misunderstanding a standardization of the shape, design and printing of the packaging is not desireble because it would block the future development in packaging.

Modul standards according to the future requirements of IRAN as palletizing, truck and big container shipment should be elaborated.

4.5. Recommendation for the developing packaging industry
(point 1 of job description)

- Despite the poorness of IRAN in wood, there exists no doubt that also in the future a certain amount of cheap wood (poplar etc.) will be available for packaging and should be used. The production of peeled (3mm) instead of sawn boards(> 5mm) is possible with the available machinery but the use of cramps and iron wires to construct a wooden crate is unknown. The use of nails instead of cramping afford twice the thickness of the boards but are not necessary for the strength of the package. The best experts in this field are people from Italy:

  - To substitute the import of expensive cellophane a national or private production of oriented polypropylene (OPP)-film is recommended.

  - The growing production of fertilizer and other basic chemicals allow for the near future a domestic production of PE-Valve-Sacks. The use of flat heavy duty sacks wont fit the requirements of proper storing because of their pillow shape.

  - The production of woovon PP-or PE-sacks should be supplemented by "net like" sacks for those products which need a much better air conditioning.

  - A big market can be expected for shrink wrapping PE-film despite the nowadays lack in shrink channels and suitable transport systems like pallets.

  - For the next 3-5 years a domestic production of laminated plastic films (PA/PE) for portion packing of dried fruits, nub, cutted meat, sausages etc could be worth discussing.

According to the national effort to built up a domestic plastic industry ISIRI should have a close eye to the development of the plastic packaging industry. For the application of this new materials produces in IRAN pilot plants (experimental lines) are required to make the basic research to convert packaging media into packages (Point 2 of job description).

4.6. Recommendations for the packing industry

Despite the fact that some of the visited companies use ancient packing methods, which should be changed, the real problems are the insufficient packing customs for fruit and vegetable.

To improve packaging the following steps are proposed:-

- Force of cooperatives to receive bigger packing plant units and a easier quality control of the products packed.
- Force the farmer to use better packages for better product. This cannot be attained only by showing the proper packaging but must be forced any way. This can be done in various manners and this is a highly political problem:
  - (a) ban on the reuse of packages by the health organization substantiated by hygienical reasons or the much lower stability.
  - (b) Only standardized crates are allowed for cold storage.
  - (c) the government gives financial help during introduction of new packages.
- An intensive training and teaching programme by a movable packaging demonstration vehicle especially in winter and spring time should be established with the help of the domestic or foreign packaging industry together with ISIRI. Such an institution is suited to reveal the difficulties and problems of the packing farmers. To give the necessary emphasis the participation to this courses should be obligatory for the responsible staff in the packing houses. A special department in the packaging centre of ISIRI (workshop) which can be recruited out of the permanent staff according to the special packaging problems being discussed.

4.7. Further recommendations beyond the job description

During my stay in IRAN I got only a slight impression about this Country yet it might be allowed to give some further recommendations dealing not immediately with my job.

The packaging centres in Europe has made very good experiences with the following constitution. Both the packaging industry as well as the big users of packaging (packing industry) are paying members of the institute. I can recommend this constitution also to the new packaging centre of ISIRI because it guarantees a neutral position and team work in solving future packaging problems. Furthermore will it help ISIRI to be understand in their standardisation works. The annual subscription should be acceptable to be not a hindrance for a membership.

ISIRI should also start to be an active member of the international packaging organization as exists: European Packaging Organization

World Packaging Organization.

ISIRI should do some more public relation work in the field of packaging to be accepted as an important and usable institution and not considered like a "police organization". This could easily be done by edition of a packaging journal mayby 6 times a year.

The future development of packaging in IRAN depends in a high grade on the future development of the transport systems (pallets, bulk etc.) the cold storage capacity and cooled transport possibilities, and the supermarket system. To give the coming experts a better understanding what is going on in these fields in IRAN, I want to propose the surveys. For this task the following foreign experts would be necessary:

		Location	Duration
1	expert in transport systems	Karaj	3 months

	Location	Duration
1 expert in cold storage to study transports and storage development for - fresh and frozen meat - fresh and frozen fish - poultry - fresh fruit and vegetable	Koraj	3 months
1 expert (economist) to study the future development of super-markets in the retail system.		2 months

APPENDIX 1

Appendix 1

20 September 1975

ITINERARY

3-9-75 Arrival in Tehran. Meeting with Mr. Maconick, UNDP. Discussion of food packaging with Mr. Hood, FAO.

4-9-75 RAFT, Mr. Zarrabi. Discussion about plastic packaging in IRAN

6-9-75 ISIRI, Karaj, meeting with Mr. Ghalesi, Mr. Holte Discussing the new packaging centre

7-9-75 ISIRI, Karaj, meeting with Mr. Sabersheikh Discussion of the overall programme of the mission

Consulting of ISIRI people in packaging standards of fruit and vegetables

8-9-75 ISIRI, Karaj - visitation of the site of the new building and the advance in erection
- Preparation of the planned visits
- Import and Export statistics

9-9-75 ISIRI, Karaj - assignment of Mr. Souljouse, as permenent assistent at ISIRI; discussion on plastic packaging with Mr. Gasparian

Visiting IRAN Roll Company, Mining Div. ESHDO (Al-foil and converted paper products for packaging)

Meeting with Mr. Laming and discussion of the project.

10-9-75 Visit to a governmental meat packing house in Tehran (Safer Depot)

Discussion of feasible packaging for meat in IRAN

- Shop checks on packaging in IRAN Super

11-9-75 Visit of IRAN Carton Company, Tehran and discussion about cardboard and corrugated board packaging in IRAN

13-9-75 Discussion of meat packaging in IRAN with Dr. Ulumi

- Visit of the biggest dairy plant (Pasteurize Tehran) and discussion of packaging with Mgr. Riahe.

- Ministry of Food and Agriculture (livestock statistics)

- Small-scale industry in packaging; discussion of project IRA/73/009 with Mr. Marshall and Mr. Hakim

- Iran Centre of Statistics - Dr. Westzmann

14-9-75 Visiting MINOO (largest biscuits and candy producer) and discussion of needs in packaging medium (Mr. Dastegheib)

- N.P.C.: evaluation of future development in production of plastic raw materials in IRAN (Mr. Sharoch Shai)

- Mikailian processed meat and sausages. Discussion with Mr. Mikailian about trends in feasible packaging.

.../...

15-9-75 Cold storage office (Dept. of Ministry of Agriculture) Discussion of the future trends in cold storage in IRAN with Dug. Tamizker.

- IRAN Centre of Statistics, Mr. Fehi, Statistics of Food Production

- Arzuman Company, processed meat and c[illegible], Mr. Uradiession

16-9-75 Pepsi Cola, Managing Director I. Sabet, discussion of glass bottle production and transport systems in IRAN.

- Unolit, Managing Director Jus Hariri, discussion on technical packaging, cushioning materials and foamed polystyrene packages in IRAN

- Visit of Int. Exhibition. Discussion with several packaging companies about the standard in packaging in IRAN

- Plasco Kar, Technical Division, Petrossion. Visit of the biggest plastic packaging producer in IRAN.

17-9-75 - Chamber of Commerce, Tehran

- Ministry of Commerce

- Ministry of Finance

- Bank Markazi
Statistics in trade and industry.

Two visits to Int. Exhibition

18-9-75 Preparing for departure to Ghazvin, Bandar Pahlavi, etc.

20-9-75 Travelling to Azalem by car

21-9-75 -Wood & Paper Ind. visit of the sawing mill in Azalem, Mr. Kerimi
-Northen fishery Co. (Gilat) Pandur - Pahlavi, Mr. Shamsizade
-Teapacking house in Lahijan
-ISIRI Pandar - Pahlavi

22-9-75 -Plywood factory (Iranian Wood & Paper Ind.) in Rasht
-Sausage factory of Gilan, Rasht, Mr. F. Fakri
-Ramkuh Choubi, I[illegible]N, biggest plywood factory of I[illegible]N, Mr. A. Taab Poov
Ghazvin

23-9-75 -ISIRI Ghazvin, Mr. Ing. Azis Hakimzadeh
-Visit of Rod Khan raisin production and grape plantation
-Targol Co., Coldstorage house Mr. Lohmani
-Raisin packing house (production of tomato pulp)

24-9-75 -West German embassy Mr. Seidel ass. Attache commercial discussion of assistance in the field of food and standard's
-Container corp. of I[illegible], Karaj Mr. Melikian
Biggest packaging Company in IRAN, production of
Corrugated board and boxes and tin cans
-Raisin packing house, Teheran

27-9-75 -Flight to Isfahan
-ISIRI Isfahan
-Gum tragacanth packing house
-Cold storage house ("10.000 t")

28-9-75 Holiday - Flight to Shiraz

29-9-75 -ISIRI Shiraz, Mg. Melyhan
discussion of the new date processing plants
-Visit of the cement factory in Shiraz
-Fruit packing house, Shiraz

30-9-75 -Visit of IRAN Fayla, corrugated box produce in Shiraz
-Flight to Teheran

1r-10-75 Flight to Abadan
-Visit of ISIRI, Khormshar discussion of date production
-Visit of Kimia date packing house
-Visit of padeco, Mr. Jouzafi, date packing and export
-Flight to Teheran

8-10-75 Preparing of the report

2-10-75 " " " "

4-10-75 First discussion of the results with Mr. Sabasheikh, ISIRI and Mr. Zaczkiewicz, UNIDO.

5-10-75 Preparing of the report

6-10-75 Final discussion with ISIRI and Mr. Zaczkiewicz of Luxenhofer's conclusions

7-10-75 Holiday - end of Ramazan

8-10-75	Discussion of the results with UNDP officer Mr. Khan Shah. Discussion about the future programme and the monetary situation. 7 - week's prolongation for Mr. Luxenhofer accepted by Mr. Zaczkiewicz and R. Booth, UNDP.	
9-10-75	Visit of CCJ, Mr. Fercim, visit of Tetra Pak, Mr. St. Runnstrom	
11-10-75	Technical preparation of the report Visit of Reyovac (Batteries), Mngn. Dir. Bond, Mr. Sturm, technical Dir. Visit of Pfizer (Pharma), Mngn. Dir. Dr. McKinnel	
12-10-75	-North Gilat' Fishery Companies -South Gilat	Dr. Bachaii Mr. Aref Pour Mr. Nadarf
	-Novzour Co. (Kleenex) -IRAN BAGEL (Cartonprinting) -Pass electric -Pass toshiba	Dr. Shahmirian Mr. Shafii Mr. Ashrafjahani Mr. Dehghan
13-10-75	-Parsa pak (Carton) -Zang Co. (Foldingboxes) -Colgate Paluwhor -Golestan	Mr. Etemad Mr. Seco Mr. Horen Mr. Gorgi
14-10-75	-Vitana (Biscuits) -Bella (Shoe) -Apadana (Foldingboxes)	Mr. Tschronchi Mr. Amidi
15-10-75	-Preparing of the report and departure	

APPENDIX B

Appendix 2

20 September 1975

Import Statistics on plastic-materials: 1974/75

PA	288 t	24,3	Million Riels
PU	2,685 t	222,7	"
	7,900 t	666,9	"
PVC-powder	3,053 t	207,7	"
PVC-granule	736 t	68,8	"
PVC-liquid	2,815 t	188,3	"
PE-granule	16.381 t	1.163,4	"
PP-granule	6.518 t	450,5	"
PS-granule	6.089 t	552,6	"
PE-film, sheets	165 t	34,6	"
Cellophane	2.819 t	370,2	"

Import of Sawn Wood and Wooden Packaging 1974/75

Lengthwise sawn wood 5 mm	86. 112 t	2.211 Million Riels
Complete wooden packing cases	431 t	2,0 "
Wooden casks, vats, barrels	67 t	12,3 "

Import of pulp, paper (packaging) 1974/75

Sulphate wood pulp	3.254 t	155,9 Million Riels
Kraftpaper and kraft liner (sheets, rolls)	106.710 t	3.793,9 "
Composite paper and paper board	21.697 t	850,9 -"
Corrugated paper and board	1.108 t	72,9 -"
Parchment or greaseproof paper	1.283 t	85,6 -"
Impregnated paper and paper board	4.653 t	308,3 -"
Sacks	11.454 t	578,3 -"
Container of paper and paper board	1.725 t	130,5 -"

unconfectioned paper

Import of packaging glass 1974/75

3.058 t 188,1 Million Rials

Import of tin plate and - packaging 1974/75

tin plate	331.102 t (100.000 £)	2.116,9 Million Rials	
tin plate packages	1.569 t	114,5	-"-
container (aerosols)	3.759 t	346,8	-"-

Import of aluminium foil and - packaging 1974/75

aluminium foil	<0,2 mm	1.124 t	189,5 Million Rials
aluminium foil/paper	<0,2 mm	2.669 t	433,0 -"-
(aluminium plates	>0,2 mm	2.174 t	305,6 -"-)
collapsible tubes		21 t	3,6 -"-
container (aerosols)		13 t	4,1 -"-

APPENDIX B

Appendix 3

LISTING OF PACKAGING FIRMS (by type of product)

bags and film

Park Plastic,	Tabriz	Mgr Dir: K. Kaleghichi	(pe-film, of-bags)
Austir Co,	Teheran	Mgr Dir: Red Nia	
Foozhanco Co,	Mashhad	R. Reissian	(sheets, PA-bags)
Khoozestan Packing Industries Co,	Teheran	H. Ghafoori	(PA-bags, PE)
JR SACO	Teheran	M. Berghradit	(paper sacks)
Jahan Industrial Co.	Teheran	M. Fateli	(PE-bags)
Kiseeh IRAN Co, Ltd	Teheran	Gh. H. Mottehari	(")
Varzidekar Industrial Co	Teheran	M. Khorasaani	(")
Khosravi Kordestan, Nasser	Teheran		(PP-PE bags)
IRANIA	Tabriz		(PP-film)
Braz	Ghom	Lh. Ghamshah	(PP-film)
Tolidi Teheran Ghan Co	Teheran		

Bottles, cup (narrow and wide necked)

IRAN glass Mfg. Co.	Teheran	Mgr Dir.	Nikpour
Mina glass Co.	Teheran	Mgr Dir.	Neyestani
Parch glass Mfg Co.	Teheran		M. Abdi
Eagle Industrial Co. Ltd.	Teheran		T. Fahimi (flasks)
Shishe Va Gas Co.	Teheran		L. Sahakian

Boxes

Diaco Co. Ltd. Tehera	Teheran	Mgr Dir.	Noghreh (Cardboard)
Tape-safe cardboard Mfg. Co.	Teheran		S. M. Dalili (")
Gutenberg Printing Co. Inc.	Teheran		M. Bahrami (")
Container Corp. of IRAN Co.	Teheran		G. Melikian (corrugated board)
Chemico Co. Ltd.	Teheran		M. M. Dersuner (aluminium)
Golshid Mfg. of Industrial Co. Ltd.	Teheran		Saiki Faina (metal boxes)
Havva Canned Products,	Teheran		Mojaddad Shah Rooz (tins)
Khabaraa canning Co. Ltd			
Nasseli, Mansoor, Te	Teheran		Sh. Ghaiqavand (tins)

Cans

Behshar Industrial Group	Teheran	A. Lajvardi	(tins corrugated boxes)
Container Corp. of IRAN Co.		G.K. Melikian	(tins
Prime Mfg Corp.		Gh. Gheinavand	(boxes, barrels

Cans, Cups, Plastic bottles

Shakoufar Mfg. Co.	Teheran	A. Gabbay
Irapack	Ghazvin	
Plasko Kar	Teheran	M. Eighanian

Capsules

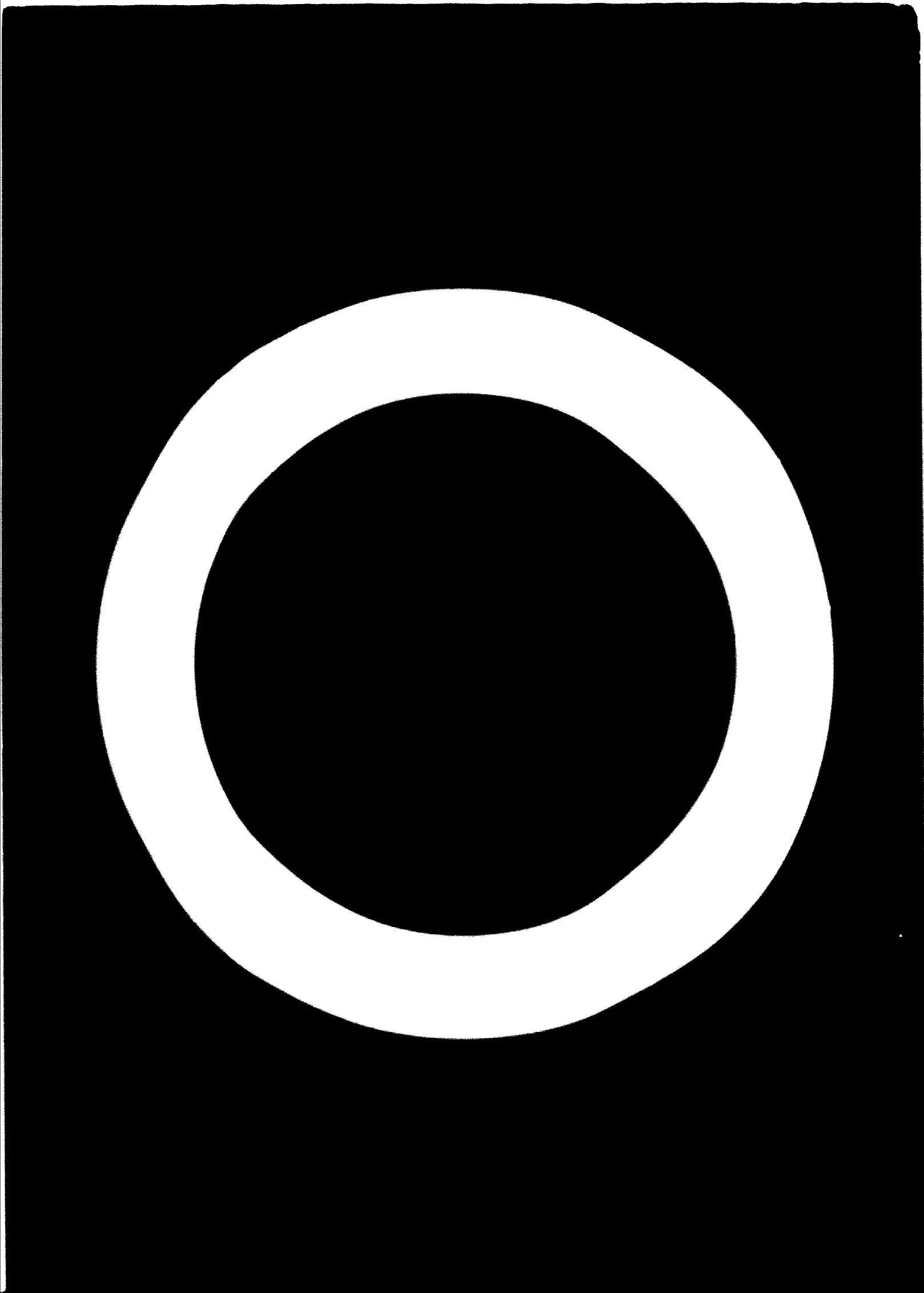
Parncik Productive Co. Ltd,	Teheran	I. Kohan Shahet (Al)

Cardboard - Manufacturers

IRAN Moghawa Mfg. Co.	Teheran	I. Moghrazian
Kahrizak, Paper Mfg. Co.	Teheran	L. Gemayel
Kemack Co. Ltd	Teheran	N.T. Nakou
Mihan Carton Co.	Teheran	H. Baradaran Kosrowshahi
Moghawa Sazi Iran Co.	Teheran	H. Megrizan
Moghavasazi Sharg Ind. Co.	Teheran	G. André (egg trays)

Carton - Manufacturers

Alborz Carton Co.	Teheran	J. Ganji
Carton Kar Co.	Teheran	E. Karvar
Cellophane Printing Co.	Teheran	A.E. Jam
IRAN Carton Inc.	Teheran	E. Farin Rad
IRAN Film Mfg. & Industrial Co. Ltd	Shiraz	A. Dashti
Pakvar Co. Ltd	Teheran	S.A. Moahmmad Rafatti
Santehandi Carton	Teheran	
Parsapadi Co.	Ghazvin	



Plastic foam

Fars Plast Mfg. Co.	Teheran	Sh. Mahboubian
Irano-Garb	Teheran	A. Afshar Nejad
Anolit Co.	Teheran	Ing. Heriri

Foils (Al)

IRAN Roll Co. Ltd,	Teheran	F. Eshoo

Paper (packaging)

IRAN Wood & Paper Industries	Teheran	A. Karbaschian
Kalni Zak Paper Mfg. Co.	Teheran	L. Gameyel
Pars Paper Co.	Teheran	R. Malekzadeh

Plastic packaging (miscellaneous, containers etc.)

Benouj Plastic Mfg. Co. Ltd	Teheran	M. Benouj
Borouz Mfg. Cectories	Teheran	Borouz
IRAN Fila Mfg. and Industrial co. Ltd	Shiraz	A. Dashti
IRAN Maka Trading & Mfg. Co. Ltd	Teheran	Babaeff
IRAPEK Co.	Teheran	4 Chit Bazian
Keyan Co. Trading Co.	Teheran n	A. Alavi
Kushid Co. Ltd	Teheran	K. Ganj Bakhsh
Parnek Productive Co. Ltd	Teheran	I. Kohan Chohet
Pars Gram Mfg. Co.	Teheran	Sh. Farzan
Pars Plastic Co.	Teheran	A. Alavi
Plasco Kar Corp.	Teheran	H. Elghanian
Plastiran Mfg. Co.	Teheran	R. Hakim Zadeh

Faroe Co. Ltd	Teheran	H. Gabrellian
Plate Co.	Teheran	M. Farah Nik
Teheran Plastic Mfg. Co. (Tolidi Teheran Plastic)		H. Rooshan
Toliplast Mfg. and Industrial Co.	Teheran	A. Yassini
Towlid Plastic Co. Ltd	Teheran	Ali Nik Pour (PVC)
IRANO-Carb Mfg. Co.	Teheran	A. Aphar Nejadit
K.B.C. Co. (Tolidideru)	Teheran	J. Koshrow Shahi (41 tubes)
IRAPACK Co.	Teheran	
IRANDAR Co. Ltd	Teheran	R. Tertitianas
Kerman Plastic Co.	Kerman	

Plywood

Behterin Factories S.A.	Khoramshar	A.A. Hakim Zadeh
Selle Fibre Co.	Teheran	R. Noor Afshan
Rakhshe Fibre Co. Ltd	Teheran	MIR. Sahab

Tapes, Adhesives

Bendix IRAN	Teheran	A.S. Eshhaiani
Cellosaf Co. Ltd	Teheran	H. M. Nazarbekian
Iran Ver Co. Ltd	Teheran	M.T. Morid
Mendafar Co. Ltd	Teheran	

Timber , Sawn

IRAN Wood and Paper Industries	Teheran	Dr. M. Shams
Takhtah Gorgan Co.	Teheran	M. Salchin
Behterin Factories S.A.	Khoramshar	A.A. Haim Zadeh

APPENDIX A

ton did increase over the previous year, but their growth ranged between 2.5 percent (cotton) and 11.2 percent (rice).

The production of meat and poultry increased by 2.9 percent and 15.5 percent, rising to 455 thousand and 82 thousand tons respectively. The production of eggs and milk registered, respectively, growth rates of 8.2 percent and 7.5 percent.

During 1352 the Government increased the purchase prices of cereals considerably in order to protect producers and encourage higher production. According to this decision which is to be implemented in 1353, the Government will purchase wheat at Rls. 10,000 a ton and barley and corn at Rls. 7,500 and Rls. 9,500 per ton from the producers. Following the same policy, the Government also raised the purchasing prices of sugar beet, meat (lamb and goat) and milk by 22 percent, 3.4 percent and 7.4 percent respectively. However, the official sales prices of the said products were kept constant in order to protect the consumer and prevent a rise in consumer prices. Consequently, government subsidy of agricultural products drew heavily on the budget during the year under review, costing the Government approximately Rls. 14 billion, which was much greater than that for 1351.

TABLE 48

MAJOR FARMING PRODUCTS

(Thousand tons)

	1351 ^	1352 □	Growth rate 1352 (percent)
Wheat	4,546	4,600	1.2
Barley	1,009	923	—8.5
Rice paddy	1,200	1,334	11.2
Cotton (raw)	600	615	2.5
Sugar beet	3,918	4,240	8.2
Oil seeds	54	57	5.6
Tea (green)	88	93	5.7

Source: Ministry of Agriculture and Natural Resources

TABLE 49

MAJOR LIVESTOCK AND POULTRY PRODUCTS

(Thousand tons)

	1351 ^	1352 □	Growth rate 1352 (percent)
Red meat	442	455	2.9
Poultry	71	82	15.5
Eggs	73	79	8.2
Milk	2,000	2,150	7.5

Source: Ministry of Agriculture and Natural Resources

INVESTMENT

During 1352, capital formation in the agricultural sector amounted to Rls. 38.6 billion, its share in the gross domestic fixed capital formation increasing from 8.7 percent in 1351 to 9.2 percent in the reported year. Of the total capital formation in agriculture, about 46 percent (Rls. 17.7 billion) went to investment in agricultural machinery, which surpassed the 1351 figure by 38 percent.

In the year under review, a total of Rls. 13.7 billion of the credits of the Fifth Development Plan was paid out for agricultural investments. The share of the said amount in total development payments for economic activities was close to 15 percent and stood in importance next after industries, transportation and communication. Of total development payments for agriculture, 28 percent was earmarked for increases in the capitals of major credit-granting institutions such as the Agricultural Cooperative Bank, Agricultural Development Bank of Iran and the Pasture Development Fund and helped to expand the scope of their activities. Payments relating to agribusiness units and large agricultural projects took up 18 percent of total payments for agriculture. These payments mainly went towards the creation of production complexes, and the agricultural and livestock development projects of Sefid-Rud, Dashte-Moghan and Gha-

increases in vehicles, electrical and non-electrical household appliances, textiles, glass and radio, television and telephone sets, contributed 60 percent to the rise of the index (See table 61).

TABLE 61

PRODUCTION INDEX OF THE SELECTED INDUSTRIES

(1348 = 100)

Items	1351	1352	Growth rate 1352 (percent)
General index	152.2	179.3	17.8
Dairy products	142.7	180.3	26.3
Vegetable shortening	125.2	129.0	3.0
Sugar	108.5	112.9	4.1
Alcoholic beverages	162.3	207.1	27.6
Non-alcoholic beverages	172.5	242.0	40.3
Tobacco products	123.2	129.2	4.9
Textiles and yarns	133.2	149.8	12.5
Leather products	119.2	130.5	9.5
Shoes (machine-made)	201.5	225.8	12.1
Petrochemicals	467.7	539.0	15.2
Paints	130.6	129.7	—0.7
Pharmaceuticals	189.4	256.8	35.6
Cosmetics and soap	149.6	161.9	8.2
Automobile tyre	151.9	205.8	35.5
Sheet glass	253.2	417.2	64.8
Cement	142.4	153.7	7.9
Basic metals	185.3	203.4	9.8
Electrical and non-electrical household appliances	146.6	192.6	31.4
Radio, television and telephone sets	218.3	290.9	33.3
Electrical tools	176.6	194.9	10.4
Motor vehicles	153.2	195.0	27.3

The employment index of the selected industries rose by 8 percent. This increase was mainly due to a rise in the number of employees in the textile, vehicles, electrical and

TABLE 62

MAJOR MANUFACTURED GOODS

	1351	1352
Lump and granulated sugar (thousand tons)	669	697
Vegetable shortening (thousand tons)	183	188
Cigarettes (billions)	12.9	13.4
Non-alcoholic beverages (million bottles)	447	603
Paints (thousand tons)	21	25
Cement (thousand tons)	3,372	3,489
Refrigerators (thousand sets)	196	257
Radios (thousand sets)	222	261
Television sets (thousand)	185	242
Automobiles	50,528	50,577
Buses	1,237	1,666
Trucks	3,442	5,854
Vans	12,035	17,372

non-electrical household appliances and tobacco industries; the index of wages in the selected industries also rose by 27 percent over 1351.

INVESTMENT

The gross domestic fixed capital formation in this sector amounted to Rls. 55 billion at current prices (Rls. 50 billion at 1351 prices) showing a rise of 12 percent over the previous year's figure in real terms. The share of manufacturing and mining sectors (excluding oil) in total gross domestic fixed capital formation decreased from 15.8 percent (at current prices) in 1351 to 14.2 percent in 1352. Investment in industrial and mining machinery amounted to Rls. 43 billion, at current prices in 1352, which was 24 percent higher than the respective figure for the previous year.

Government disbursements for the expansion of the manufacturing and mining

TABLE 22

VALUE OF EXPORTS (1)

(Million Rials)

	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1. Traditional and agricultural goods	213.7	226.8	272.9	337.2	529.0	83.3	56.9
Carpets	59.3	53.9	75.5	90.6	108.0	20.4	19.2
Cotton	49.5	56.6	67.4	78.9	150.1	28.4	90.2
Fresh and dried fruits	30.0	34.6	35.5	57.4	94.6	17.9	64.8
Skin and leather	16.9	14.5	17.2	28.2	28.8	5.4	2.1
Mineral and metal ores	11.9	19.7	16.5	19.2	23.9	4.5	24.5
Caviar	5.8	5.1	5.4	8.3	8.0	1.5	—3.6
Casings	3.1	4.2	5.6	6.2	8.9	1.7	43.5
Gum tragacanth	4.8	3.8	4.7	5.3	9.0	1.7	69.8
Cumin seed	2.7	3.0	2.6	4.0	4.1	0.8	2.5
Others	29.7	31.4	42.5	39.1	93.6	17.7	139.4
2. New industrial products	31.0	45.8	61.7	102.6	105.7	16.7	3.0
Detergents and soap	5.1	8.3	7.9	15.6	5.8	5.5	—62.8
Glycerine and chemicals	3.4	5.2	4.1	14.8	16.0	15.1	8.1
Shoes	3.7	6.7	8.4	13.0	11.0	10.4	—15.4
Ghee and shortening	4.0	2.6	5.9	6.6	6.6	6.2	0
Ready - made clothes, knitwear and textiles	7.5	14.3	23.6	36.0	28.5	27.0	—20.8
Cement, building stones and mosaic	2.3	2.9	2.4	5.5	7.6	7.2	38.2
Road motor vehicles	1.8	1.8	4.5	2.0	11.7	11.1	485.0
Others	3.2	4.0	4.9	9.1	18.5	17.5	103.3
Total (1+2)	244.7	272.6	334.6	439.8	634.7	100.0	44.3

Source: Foreign Trade Statistics of Iran

(1) Excludes exports of oil and gas.

TABLE 20

VALUE OF IMPORTS ACCORDING TO THE INTERNATIONAL CLASSIFICATION OF GOODS

(Million baht)

	1349	1350	1351	1352	Growth rate 1352 (percent)
Foods and live animals	68	171	206	327	58.7
Dairy products and eggs	(10)	(15)	(21)	(32)	52.4
Pulses and their products	(6)	(104)	(94)	(113)	20.2
Sugar its derivatives and honey	(7)	(11)	(26)	(76)	192.3
Tea, coffee, chocolate, spices and other similar products	(13)	(15)	(18)	(19)	5.6
Fruits and vegetables	(3)	(3)	(12)	(21)	75.0
Other	(29)	(23)	(35)	(66)	88.6
Beverages and tobacco	1	3	4	5	25.0
Raw non-food materials excluding fuel products	75	85	120	189	57.5
Raw caoutchouc	(11)	(13)	(14)	(24)	71.4
Textile goods not mentioned above	(41)	(44)	(76)	(96)	26.3
Various raw fertilizers and minerals	(10)	(19)	(16)	(30)	87.5
Other	(13)	(9)	(14)	(39)	178.6
Minerals, oil products and related products	13	15	25	14	—44.0
Vegetable and animal oils	42	45	59	61	3.4
Vegetable oils	(37)	(40)	(52)	(51)	—1.9
Other	(5)	(5)	(7)	(10)	42.9
Chemical products	155	154	222	356	60.4
Chemicals and their compounds	(20)	(24)	(39)	(62)	59.0
Materials used in dyes and tanning	(22)	(26)	(34)	(44)	29.4
Pharmaceuticals and medical products	(48)	(50)	(67)	(97)	44.8
Plastics, celluluse, artificial gums not mentioned above	(16)	(18)	(30)	(79)	163.3
Chemical materials and products not mentioned above	(39)	(40)	(43)	(60)	39.5
Other	(10)	(6)	(9)	(14)	55.6
Goods which are classified according to their primary materials	588	648	758	1,252	65.2
Paper, cardboard and related products	(48)	(46)	(60)	(87)	45.0
Various textile yarns and related products	(81)	(84)	(133)	(225)	69.2
Goods made of non-metal mineral materials	(35)	(29)	(34)	(103)	202.9
Iron and steel	(253)	(300)	(321)	(583)	81.6
Others	(171)	(189)	(210)	(254)	21.0
Transportation vehicles, machinery and tools	679	866	1,100	1,403	27.5

TABLE 46

VALUE ADDED IN AGRICULTURAL PRODUCTS

(Billion riels)

	1348	1349	1350	1351	1352	Growth rate 1352 (percent)
At current prices						
Farming	100.6	113.7	120.9	135.6	150.4	10.9
Livestock breeding	44.7	44.3	49.1	62.1	77.1	24.2
Forestry	1.6	1.6	1.6	3.1	5.9	90.3
Fishing	0.9	1.0	1.1	1.0	1.6	60.0
Total	147.8	160.6	172.7	201.8	235.0	16.5
At constant prices						
Farming	129.3	136.8	123.0	135.6	142.3	4.9
Livestock breeding	57.3	58.3	59.9	62.1	65.9	6.1
Forestry	1.9	1.7	1.7	3.1	4.1	32.3
Fishing	0.9	1.0	1.2	1.0	1.3	30.0
Total	189.4	197.8	185.8	201.8	213.6	5.8

TABLE 47

PRODUCTION OF MAJOR AGRICULTURAL PRODUCTS

(Thousand tons)

	1348	1349	1350	1351	1352	Growth rate 1352 (percent)
Wheat	4,100	4,260	3,700	4,546	4,600	1.2
Barley	1,140	1,083	900	1,009	923	—8.5
Rice (paddy)	1,020	1,060	1,050	1,200	1,334	11.2
Cotton (raw)	517	503	444	600	615	2.5
Sugar beet	3,484	3,862	3,980	3,918	4,240	8.2
Oil seeds	32	58	46	54	57	5.6
Tea (green)	76	78	64	88	93	5.7

Source: Ministry of Agriculture and Natural Resources

TABLE 48

PRODUCTION OF MAJOR LIVESTOCK PRODUCTS

(Thousand tons)

	1348	1349	1350	1351	1352	Growth rate 1352 (percent)
Red meat	325	335	380	442	455	2.9
Poultry	45	50	60	71	82	15.5
Eggs	60	66	67	73	79	8.2
Milk	1,900	2,000	1,900	2,000	2,150	7.5

Source: Ministry of Agriculture and Natural Resources

TABLE 49

DEVELOPMENT DISBURSEMENTS ON AGRICULTURE

(Million rials)

	1352	Share (percent)
Conservation and exploitation of natural resources	1,448	10.6
Agri-business and large agricultural units	2,437	17.8
Improvement and increasing of farm products	920	6.7
Improvement and increasing of livestock products	177	1.3
Agriculture and livestock services	1,251	9.2
Management of the agricultural market	976	7.1
Agriculture and livestock breeding credits	3,863	28.2
Expansion of cooperative and joint-stock companies	2,048	15.0
Research	563	4.1
Total	13,683	100.0

Source: Ministry of Economic Affairs and Finance

TABLE 59

PRODUCTION INDEX OF [illegible] SELECTED INDUSTRIES

	Unit	1848	1849	1850	1851	1852	Growth rate 1970 (percent)
Milk (pasteurized)	Million liters	41.3	52.0	59.5	69.3	76.9	11.0
Pasteurized buttermilk and yoghurt	" "	12.8	12.6	12.6	10.8	8.7	—19.7
Pasteurized butter	Tons	2,839	3,150	3,529	4,022	5,514	37.1
Pasteurized ice-cream	"	2,475	3,099	3,684	3,418	4,264	24.8
Vegetable ghee	Thousand tons	146	146	164	183	188	2.7
Lump sugar	" "	134	159	157	160	169	5.6
Granulated sugar	" "	485	499	509	509	528	3.7
Non-alcoholic beverages:	Million large bottles	190.8	230.3	256.4	306.8	486.1	58.4
	Million small bottles	63.9	72.3	78.2	140.2	121.9	—13.1
Cigars and cigarettes	Millions	11,386	11,251	13,452	12,923	13,449	4.1
Tobacco	Tons	4,793	5,436	5,384	6,154	6,117	—0.6
Paints	Thousand tons	13·7	15.6	18.8	21.2	24.6	15.8
Cement	" "	2,343	2,638	2,832	3,372	3,489	3.5
Refrigerators	Thousand sets	174	160	171	196	257	31.1
Water heaters	" "	47	42	60	73	87	19.2
Heaters	" "	136	100	139	159	216	35.8
Gas stoves	" "	209	197	228	319	313	—1.9
Coolers	" "	66	67	94	143	134	—6.3
Radios	" "	136	154	159	222	281	26.6
Televisions	" "	73	134	158	185	242	30.8
Automobiles and jeeps	" "	28.8	31.8	39.9	90.5	90.6	0.1
Mini bus, station wagon and ambulances	Sets	1,803	3,277	1,981	2,652	1,551	—41.5
Buses	Sets	1,303	1,360	1,284	1,237	1,666	34.7
Trucks	"	2,926	2,970	2,549	3,442	5,854	70.1
Vans	"	1,381	7,386	8,297	12,085	17,372	43.7

TABLE 95

COMPANIES REGISTERED IN LARGE CITIES OF IRAN(1)

(Million rials)

	1348		1349		1350		1351		1352		Change rate 1352 (percent)	
	Number	Capital	Number	Capital	Number	Capital	Number	Capital	Number	Capital	Number	Capital
Tehran	774	6,979	734	6,500	902	5,932	1,256	12,219	1,789	48,771	42.4	299.1
Other large cities (2)	177	1,683	210	1,101	136	883	261	1,955	419	4,030	60.5	106.1
Total	951	8,662	944	7,601	1,038	6,815	1,517	14,174	2,208	52,802(3)	45.5	272.5

Source: The Office of Companies Registration and Industrial Property

(1) Excludes foreign companies, rural cooperative societies and agricultural joint-stock companies.

(2) Includes Abadan, Ahwaz, Isfahan, Tabriz, Rasht, Rezaieh, Shiraz, Qom, Kerman, Kermanshah, Mashad and Hamadan.

(3) Totals may not add up due to rounding.

TABLE 96

COMPANIES DISSOLVED IN LARGE CITIES OF IRAN (1)

(Million rials)

	1348		1349		1350		1351		1352		Change rate 1352 (percent)	
	Number	Capital	Number	Capital	Number	Capital	Number	Capital	Number	Capital	Number	Capital
Tehran	290	943	221	1,183	220	1,176	202	942	183	1,677	-9.4	78.0
Othe large cities (2)	30	162	34	120	39	199	41	101	36	210	-12.2	101.9
Total	320	1,105	255	1,303	259	1,375	243	1,046	219	1,887	-9.9	80.4

Source: The Office of Companies Registration and Industrial Property

(1) Excludes foreign companies, rural cooperative societies and agricultural joint-stock companies.

(2) Includes Abadan, Ahwaz, Isfahan, Tabriz, Rasht, Rezaieh, Shiraz, Qom, Kerman, Kermanshah, Mashad and Hamadan.

APPENDIX 5

[illegible]: MONTHLY EXPENDITURES ON FOOD AND NON-FOOD ITEMS CONSUMED BY RURAL AND URBAN HOUSEHOLDS, BY MAIN ITEMS

(In riels)

Items	1965 Urban	1965 Rural	1966 Urban	1966 Rural	1967 Urban	1967 Rural	1968 Urban	1968 Rural	1969 Urban	1969 Rural	1970 Urban	1970 Rural	1971 Urban	1971 Rural
No. of households surveyed	1,192	1,885	1,284	2,382	1,616	11,569	3,719	8,306	4,301	4,708	6,648	3.772	14.344	14,766
Total Expenditure	8,256.2	3,767.5	8,401.6	3,978.2	8,275.8	4,386.7	8,305.5	4,055.4	7,570.4	3 957.5	9,654.4	4,179.2	9,261.8	4 985.2
Expenditure on food and tobacco	4,200.2	2.587.9	3,998.7	2,381.6	3.978.6	2,784.3	4,142.7	2 580.6	3 899.0	2,631.1	4 905.3	2,791.1	4 945.3	3,192.3
Expenditure on non-food items	4,196.1	1,898.6	4,442.9	1,995.6	4,295.2	1.682.4	4,262.8	1,464.8	3,677.4	1,326.4	5,151.1	1,388.1	4.986.5	1,792.9
Housing	985.3	377.8	1,092.9	481.7	1,072.8	492.3	1,321.8	418.5	1,302.0	176.4	1,882.2	240.9	1.990.7	213.9
Household operation	988.4	68.0	895.0	71.3	998.3	69.2	967.3	65.0	871.3	382.6	654.5	895.6	662.6	849.9
Household effects	396.3	159.0	369.9	162.0	361.2	202.9	399.6	149.5	253.0	111.6	351.4	128.6	443.0	195.3
Clothing	796.6	387.1	880.9	495.4	780.3	494.1	842.2	392.5	987.2	328.5	842.2	396.5	821.0	445.6
Personal care and health	496.4	154.4	582.4	176.5	595.0	199.1	692.2	214.7	489.7	212.9	961.7	227.5	.606.5	250.9
Transportation	397.5	96.3	354.5	161.8	421.0	85.7	395.2	91.8	380.4	75.1	353.2	101.7	306.7	116.1
Education	389.2	18.0	748.2	11.4	193.2	12.3	114.9	11.7	198.3	18.9	368.9	12.8	254.4	26.4
Recreation	186.4	9.8	184.0	9.5	198.5	11.9	65.9	11.6	184.8	19.5	260.5	14.8	262.4	96.0
Gifts and donations	248.8	48.8	375.9	44.7	286.7	84.5	86.0	92.0	86.9	94.8	178.3	94.1	141.5	117.0
Others	183.2	.4	165.2	1.3	196.2	10.4	97.7	17.5	23.8	17.9	19.2	17.8	45.4	1

1/ [illegible] Karakni Iran data.

Source: Statistical Center of Iran

Table 5.2 : DISTRIBUTION OF EXPENDITURES ON FOOD AND NON-FOOD ITEMS CONSUMED BY URBAN AND RURAL HOUSEHOLDS IN A MONTH, BY MAIN ITEMS FOR SELECTED YEARS

(In percent)

Item	1965 Urban	1965 Rural	1966 Urban	1966 Rural	1967 Urban	1967 Rural	1968 Urban	1968 Rural	1969 Urban	1969 Rural	1970 Urban	1970 Rural	1971 Urban	1971 Rural
No. of households surveyed	1,182	1,015	1,284	2,182	1,688	11,569	3,710	8,386	4,381	7,468	6,648	3,778	15,186	14,344
Total expenditure	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Expenditure on food and tobacco	49.6	65.8	47.1	69.0	48.1	61.1	49.4	64.4	51.4	66.5	46.6	66.8	46.9	64.0
Expenditure on non-food items	50.4	35.2	52.9	40.0	51.9	38.9	50.6	35.6	48.6	33.5	53.4	33.2	53.1	36.0
Housing	22.7	10.0	23.0	12.1	23.0	11.2	25.8	10.5	27.2	4.4	28.5	5.8	25.0	4.3
Household operation	6.2	1.8	5.7	1.8	6.0	1.6	6.8	1.6	6.2	8.1	6.8	7.0	7.2	7.0
Household effects	4.3	3.9	4.2	4.1	4.4	4.6	4.8	3.7	3.1	2.8	3.6	3.1	4.8	3.9
Clothing	9.3	9.7	9.5	11.9	9.4	12.2	7.6	8.8	6.7	8.0	6.6	7.1	8.9	8.9
Personal care and health	6.0	4.1	6.0	4.4	6.1	4.6	7.5	5.4	6.5	5.4	5.8	5.4	6.5	5.3
Transportation	4.2	2.0	4.2	4.1	5.1	2.0	4.2	2.3	4.1	1.9	3.5	2.4	3.3	2.3
Education	1.9	0.5	1.8	0.3	1.9	0.3	1.4	0.3	2.1	0.5	3.8	0.3	2.5	0.6
Recreation	2.0	0.3	2.0	0.2	1.8	0.3	0.8	0.3	1.4	0.5	1.7	0.4	2.8	1.1
Gifts and donations	3.0	1.3	4.5	1.1	2.6	1.9	1.0	2.3	1.1	1.4	1.9	1.3	1.5	2.3
Other	2.2	0	2.0	0	1.6	0.2	0.7	0.4	0.2	0.5	0.2	0.4	0.5	0.3

Source: Statistical Center of Iran

1/ Bank Markazi Iran Data

[illegible] (+000 tons)

Growth in Volume of Livestock Production (%)

	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	Third Plan (1963-67) A	Third Plan (1963-67) B	Fourth Plan (1968-72) A	Fourth Plan (1968-72) B	1959 - 1972 A	1959 - 1972 B
Beef meat	315	330	335	343	340	347	353	351	355	371	378	376	390	389	1.8	2.1	3.7	2.6	2.7	2.5
White meat	26	27	27	24	21	23	25	26	28	31	35	32	35	41	3.1	5.9	16.3	14.9	10.8	11.5
Milk	1,562	1,607	1,773	1,699	1,692	1,800	1,800	1,803	1,732	1,816	1,816	1,800	1,900	1,950	0.1	0.0	2.1	1.9	1.8	1.1
Wool	34	35	37	35	32	31	34	37	33	33	34	34	35		-1.7	0.0	1.5	- 0.6 /1	0.3	- 0.3 /1
Eggs	39	40	42	44	45	47	49	51	52	60	62	72	80	87	3.4	4.2	10.8	8.2	6.4	6.5

A: Average annual growth between end years.
B: Average annual growth between 3-yr. averages.

/1 1972 data not available, so growth rates refer to period ending 1971 (A) or 1969 (B).

Source: Bank National Iran.

Table 10.6: ACTUAL AND PROJECTED DEMAND FOR SELECTED AGRICULTURAL COMMODITIES 1/

('000 tons)

	1972			1977 2/			1982					
							Low 3/			High 4/		
	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban	Total
Wheat	2,935	1,665	4,600	3,158	2,211	5,369	3,319	2,737	6,056	3,341	2,896	6,237
Meat - red	190	270	460	197	446	643	235	594	829	262	750	1,012
- white	22	46	68	35	92	127	46	147	193	57	191	248
Rice	597	223	820	841	351	1,192	1,043	499	1,542	1,497	761	2,258
Sugar	413	297	710	527	402	929	614	503	1,117	676	538	1,214
Vegetable oil	64	116	180	80	168	248	92	220	312	100	243	343
Dairy Products												
Fresh milk	90.9	67.9	158.8	124.0	113.9	237.9						
Cream	1.5	1.0	2.5	2.2	2.1	4.3						
Yogurt	317.6	138.1	455.7	370.0	191.8	561.8						
Butter	10.2	11.0	21.2	13.6	22.7	36.3						
Cheese	31.5	45.3	76.8	44.2	66.0	110.2						
Ghee	16.6	13.9	30.5	20.8	19.3	40.1						
Powdered milk	0.05	0.6	0.65	0.06	0.9	0.96						
Total (raw milk)	n.a.	n.a.		n.a.	n.a.	2,800						
Eggs	28	40	68	33	65	98	37	91	128	39	107	146
Pulses	120	120	240	160	170	330	192	219	411	215	240	455
Feedgrains 5/	n.a.	n.a.	1,100	n.a.	n.a.	1,980	n.a.	n.a.	2,950	n.a.	n.a.	3,270

1/ Assuming constant prices
2/ Assuming 8.3% annual growth in per caput expenditure, 1.2% annual growth in rural population, 5.1% annual growth in urban population
3/ Assuming 5.1% annual growth in per caput expenditure, 0.8% annual growth in rural population, 4.6% annual growth in urban population
4/ Assuming 9.5% annual growth in per caput expenditure, 0.8% annual growth in rural population, 3.9% annual growth in urban population
5/ Calculated on the assumption that incremental demand for white meat has a 1.8:1 grain input, eggs 2.5:1, milk 0.2:1, and red meat 8:1 (deadweight) for the incremental production expected from fattening operations (50,000 tons by 1977, 75,000 tons by 1982).

Source: IBRD Agricultural Task Force

Table 10.7: ACTUAL AND PROJECTED SUPPLY AND CONSUMPTION PATTERNS OF DAIRY PRODUCTS, 1972 AND 1977

Consumption Pattern	1972 Product ('000 tons)	1972 Fat Equivalent (tons)	1972 %	1977 Product ('000 tons)	1977 Fat Equivalent (tons)	1977 %
High value products:						
- fresh milk	158.8	3,970	4.6	237.9	5,948	4.9
- yogurt (urban) /1	138.1	3,729	4.3	191.8	5,179	4.2
- cream	2.5	1,250	1.5	4.3	2,150	1.8
- powdered milk /2	0.7	210	0.2	1.0	300	0.2
Sub-total		9,159	10.6		13,577	11.1
Low value products:						
- yogurt (rural) /1	317.6	9,528	11.1	370.0	11,100	9.1
- cheese	76.8	19,968	23.2	110.2	28,652	23.4
- butter	21.2	16,960	19.7	36.3	29,040	23.7
- butter-oil	30.5	30,461	35.4	40.1	40,100	32.7
Sub-total		76,917	89.4		108,892	88.9
TOTAL		86,076	100.0		122,469	100.0
Supply Pattern (Assuming self sufficiency)						
High cost milk						
- pure-bred cows	100.0	3,300	3.8	1,203.0	39,693	32.4
- cross-bred cows	96.0	3,456	4.0	96.0	3,456	2.8
Sub-total	196.0	6,756	7.8	1,299.0	43,149	35.2
Low cost milk						
- local cows	840.0	33,600	39.0	840.0	33,600	27.5
- goats	264.0	17,160	19.9	264.0	17,160	14.0
- sheep	384.0	24,960	29.0	384.0	24,960	20.4
- buffaloes	45.0	3,600	4.2	45.0	3,600	2.9
Sub-total	1,533.0	79,320	92.2	1,533.0	79,320	64.8
TOTAL	1,729.0	86,076	100.0	2,832	122,469	100.0

/1 Although the value of yogurt consumed in rural areas is comparable to that consumed in urban areas, it is largely produced locally in small quantities and cannot be readily replaced by output from centralised processing plants.

/2 It is assumed that the majority of this is consumed in the form of baby food, ice cream, or other high value products.

Source: IBRD Agricultural Task Force.

Table 10.8: USE OF CULTIVATED LAND, 1971

('000, %)

	Area			%		
	Irrigated	Dryland	Total	Irrigated	Dryland	Total
Grains:	2,232	4,657	6,889	62.5	89.6	78.5
Wheat	1,533	3,650	5,183	42.9	70.1	59.1
Barley	286	1,000	1,286	8.0	19.2	14.7
Rice	392	-	392	11.0	-	4.5
Others	21	7	28	0.6	0.1	0.3
Industrial Crops:	424	160	584	11.9	3.1	6.7
Cotton	231	69	300	6.5	1.3	3.4
Sugar beet	154	-	154	4.3	-	1.8
Sugar cane	5	-	5	0.1	-	-
Tea	-	30	30	-	0.6	0.3
Tobacco	8	7	15	0.2	0.1	0.2
Oilseeds	26	54	80	0.7	1.0	0.9
Fruits	373	61	434	10.4	1.2	4.9
Vegetables	172	66	238	4.8	1.3	2.7
Pulses	108	54	162	3.0	1.0	1.8
Forage Crops	233	130	363	6.5	2.5	4.1
Others	30	72	102	0.8	1.4	1.2
TOTAL △	3,573	5,200	8,773	100.0	100.0	100.0

△ Totals do not add because of rounding.

Source: Plan Organization.

Table 10.2: ESTIMATED LAND USE, 1971

(million ha., %)

	Area	%
Total Land Area	164.8	100.0
Arable Land	16.6	10.0
Under Cultivation	8.8	5.3
- irrigated	(3.6)	(2.2)
- dryland	(5.2)	(3.1)
Fallow	7.8	4.7
Forests	16.9	10.2
Scrubland	1.6	0.6
Permanent Pasture	10.0	6.1
Other Land	119.8	72.4
Cultivable	33.0	20.0
Non-Cultivable	86.8	52.4

Source: Ministry of Agriculture; Plan Organization.

Table 20.20 DISTRIBUTION OF CULTIVATED LAND AND MAJOR CROP CATEGORIES BY PROVINCE, 1971

Province	Percentage of National Total			Percentage of Land in Province		Percentage of Land in					
						Grains					
	Irrig. Land	Non Irrig. Land	Total Agri. Land	Irrig.	Non Irrig.	Irrig.	Rainfed	Industrial Crops	Forage Crops	Fruits & Vegs.	Others
Central Ostan	10.8	4.6	7.3	64.8	35.2	10.9	4.9	6.0	5.6	11.7	10.6
Gilan	5.9	2.0	3.8	69.5	30.5	9.2	0.6	5.5	3.0	3.8	3.4
Mazandaran	3.7	5.0	4.4	35.7	63.3	5.4	3.0	11.6	2.1	5.1	3.0
Gorgan	6.8	5.4	6.0	49.9	50.1	4.7	4.8	26.6	1.2	1.8	3.2
E. Azarbaijan	11.1	13.4	12.4	39.5	60.5	10.8	13.4	1.8	24.7	11.5	22.0
W. Azarbaijan	6.4	6.1	6.3	45.1	54.9	5.6	5.8	4.9	18.2	5.3	8.7
Kermanshah	2.7	7.1	5.2	23.1	76.9	3.2	7.7	2.7	3.2	0.7	3.4
Khuzestan	7.9	5.7	6.7	52.2	47.8	8.3	6.5	1.0	1.6	12.4	4.3
Fars	6.8	4.2	5.4	55.8	44.2	6.1	4.4	7.3	1.6	9.2	5.1
Kerman	4.1	0.5	2.1	86.6	13.4	2.6	(-)	4.5	2.7	10.0	2.1
Khorasan	13.7	7.6	10.3	58.4	41.6	14.4	7.5	18.8	5.1	8.4	10.8
Esfahan	3.8	2.5	3.1	54.3	45.7	3.2	2.8	2.6	5.4	3.8	3.5
Kordestan	1.0	5.4	3.5	12.5	87.4	1.0	5.9	0.8	2.7	0.7	1.5
Sistan & Baluchistan	3.6	(-)	1.6	99.2	0.8	4.2	(-)	(-)	0.8	4.5	1.0
Persian Gulf	1.5	0.6	1.0	67.9	32.1	0.7	0.6	0.3	0.1	5.4	0.5
Ilam	0.2	2.5	1.5	6.4	93.6	0.3	2.8	(-)	1.2	(-)	0.2
Hamedan	2.1	8.0	5.4	17.4	82.6	1.8	8.7	1.9	5.6	1.2	5.4
Lorestan	1.9	4.1	3.1	27.0	73.0	2.0	4.2	1.4	2.7	1.0	5.6
Boyr Ahmadi Kohkiyluyeh	1.4	4.6	3.2	19.1	80.9	2.0	5.1	1.6	0.7	0.1	1.6
Semnan	0.9	0.2	0.5	80.5	19.5	0.9	0.2	0.2	0.3	1.6	0.4
Yazd	0.3	(-)	0.1	100.0	(-)	0.3	(-)	(-)	0.4	0.7	0.2
Zanjan	1.6	4.4	3.1	27.9	72.1	1.5	4.8	0.3	6.2	0.9	0.8
Charmahal Bakhtiary	1.4	5.7	3.8	16.1	83.9	1.1	6.4	0.5	4.8	0.5	2.1
Total / Average	100.0	100.0	100.0	44.0	56.0	100.0	100.0	100.0	100.0	100.0	100.0
Area ('000 ha)	3,649	4,636	8,286	3,649	4,636	2,232.4	4,088.5	652.5	372.5	672.0	263.4

Source: Ministry of Agriculture

Table 10.13: Value of Caviar and Fish Caught by the North Fishery Company for Selected Years

(In 1,000 rials)

Year of Exploitation	Total Value	Index /1	Value of Caviar	Index /1	Value of Cartilaginous fish	Index /1	Value of scaly fish	Index /1
1960	254,796	230	206,558	344	28,887	268	19,351	48
1961	267,327	241	222,546	371	33,658	313	11,123	28
1962	311,876	282	236,816	394	56,728	527	18,332	46
1963	392,282	354	317,065	528	68,186	634	7,031	18
1964	335,138	303	273,048	455	54,351	505	7,739	19
1965	447,218	404	326,295	544	64,723	602	56,200	141
1966	473,799	426	373,553	622	73,932	686	26,314	66
1967	328,004	296	187,632	312	87,565	814	52,807	132
1968	441,925	399	162,464	271	75,835	705	203,626	510
1969	481,221	434	152,143	253	81,733	759	247,345	619
1970	504,740	455	209,297	348	94,796	880	200,647	502

/1 Base year: 1952.

Source: North Fishery Company.

Table 11.10: Petrochemical Products

(In thousands Tons)

	1968	1969	1970	1971.	1972/1
Chemical fertilizer	67.5	66.5	100.7	270.6	242.4
Do Decil Binzen	..	..	6.4	9.8	7.9
Poly-vinyl chloride	..	..	11.3	11.3	15.6
Urea	40.0	51.9	56.0	114.9	125.4
Sulphuric Acid	3.5	4.3	3.5	3.8	2.5

1/ Average of April to December, 1972.

Source: Trends of Business for Industrials (Ministry of Economy).

Table 12.1: GROSS VALUE ADDED IN MANUFACTURING IN CURRENT FACTOR COST/1

(In million Rials)

	1962	1963	1964	1965	1966	1967/2	1967	1968	1969	1970	1971	1972
Total Iran	36,400	42,390	48,660	56,464	65,578	75,689	79,520	90,210	104,333	117,527	138,101	163,704
Total - Urban Areas	34,087	39,850	45,289	52,027	58,578	68,489	69,789	75,868	87,329	98,787	113,395	133,355
Non-Durable Consumer Goods	23,208	27,741	31,126	35,369	38,272	43,016	43,016	46,561	51,236	54,328	59,609	64,147
Processed Food	7,465	7,847	10,504	8,434	12,615	14,183	14,183	15,258	17,193	18,420	20,787	21,197
Beverages	723	501	576	411	953	659	669	1,218	1,635	1,923	2,099	2,145
Tobacco Products	4,184	4,204	3,995	4,425	5,358	5,505	5,505	6,550	7,207	7,216	7,308	7,569
Textiles	8,379	9,179	7,776	13,721	9,928	13,343	13,343	13,193	13,309	13,983	15,642	17,090
Wearing Apparel	1,147	2,861	4,710	6,151	7,333	6,859	6,859	7,891	9,513	10,380	11,304	13,150
Wood Products & Furniture	797	2,279	3,079	1,704	1,767	2,175	2,175	2,008	1,883	1,890	1,914	2,156
Leather and Leather Products	513	870	486	523	268	282	282	443	496	516	525	540
Intermediate Goods	7,570	8,451	9,923	11,260	14,341	17,568	18,868	20,935	24,388	30,994	35,936	47,477
Paper and Paper Products	252	98	105	268	253	709	709	389	612	852	1,260	1,403
Printing and Publishing, etc.	196	340	699	486	398	787	787	1,139	1,679	1,765	1,912	2,115
Rubber and Rubber Products	286	348	1,013	474	1,190	1,539	1,539	1,816	2,234	2,395	2,569	2,809
Chemicals & Chemical Products	1,418	1,050	1,124	1,914	2,870	2,988	2,988	3,108	4,000	6,555	8,015	9,899
Oil and Coal Products	-	123	185	173	154	323	323	528	544	570	727	1,141
Basic Metals	308	282	326	240	350	1,355	1,355	1,528	1,703	3,120	3,874	8,628
Metal Products	2,496	3,173	3,009	2,957	3,361	3,931	4,431	4,422	4,990	5,916	6,895	7,990
Non-Metallic Mineral Products	2,614	3,037	3,502	4,718	5,765	5,936	6,736	7,705	8,626	9,801	11,604	13,501
Durable and Capital Goods	1,205	1,212	1,469	1,372	5,154	7,067	7,067	7,343	10,634	12,309	15,611	20,268
Machinery (non-electrical)	75	229	323	345	393	429	429	487	582	672	770	1,827
Electrical Equipment	239	382	245	1,305	1,238	2,646	2,646	2,482	3,506	4,064	5,475	6,150
Transport Equipment	2,711	2,601	2,901	2,722	3,523	3,992	3,992	4,374	6,546	7,573	9,366	12,311
Miscellaneous Industries	284	446	771	1,026	811	838	838	1,029	1,071	1,156	1,210	1,443
Total - Rural Areas	2,213	2,540	3,371	4,437	7,000	7,200	9,733	14,370	16,968	18,746	24,707	30,354
Non-Durable Consumer Goods							8,289	10,260	11,957	14,264	19,503	23,447
Intermediate Goods							711	2,153	3,506	2,027	2,165	3,701
Durable and Capital Goods							733	1,957	1,466	2,391	3,039	3,206
Miscellaneous Industries							-	-	29	64	-	-

/1 Total does not necessarily tally with data of value added by industrial origin (Table 3.1) presented in the national accounts data which are from Bank Markazi Iran.

/2 The 1967 data in 1962-67 series are not the same as the 1967 data in the 1967-72 series.

Source: Iran, Ministry of Economy, Bureau of Statistics, Iranian Industrial Statistics, 1972.

Table 10.4 : INDUSTRIAL PRODUCTION INDEX [1]

(1967 = 100)

Industry	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972 [2]
Total index of selected goods	60	65	69	76	87	100	114	127	143	170	191		
Food	72	71	74	73	80	100	107	116	128	131	142		
Beverages	82	91	102	88	90	100	161	179	144	153	192		
Textile	73	61	57	80	84	100	97	107	126	148	157		
Wearing apparel	36	73	81	84	90	100	114	114	117	132	155		
Wood & furniture	144	107	80	83	89	100	115	107	136	142	124		
Paper & cardboard	93	90	88	75	91	100	81	97	112	160	157		
Leather & hide	75	82	62	77	89	100	141	147	133	96	99		
Rubber	57	70	150	90	86	100	114	144	156	165	196		
Chemicals	72	88	88	89	89	100	159	188	243	403	497		
Construction & non-metallic minerals	90	92	81	75	81	100	122	134	139	157	186		
Basic metal	99	78	90	65	80	100	118	146	172	202	282		
Metal products	99	90	90	65	80	100	113	123	134	182	191		
Machinery (non-electrical)	74	77	79	84	94	100	99	112	113	126	194		
Machinery (electrical)	23	27	30	52	73	100	127	148	181	233	250		
Transport equipment	19	22	36	42	45	100	200	188	251	299	347		
Electricity	53	55	63	85	97	100	132	174	232	301	371		
Miscellaneous	29	34	53	62	91	100	116	99	121	233	208		

1/ The indexes have been prepared from shipment quantities of factories. Shipment quantities are taken as the quantities of production after adjustments for change in stocks. In the preparation of these indexes, average per day production in 1967 has been taken as 100.

2/ Data cover the first three quarters (April-December) of 1972.

Source : Bureau of Statistics, Ministry of Economy.

Table 12.5: PRODUCTION OF VARIOUS MAJOR PRODUCTS OF SELECTED INDUSTRIES

Product	Unit	Production				
		1968	1969	1970	1971	1972
Automobiles and jeeps	Number	20,227	28,828	31,760	39,912	50,528
Mini-bus, station-wagon and ambulance	"	3,372	1,803	3,277	1,981	2,652
Buses	"	1,842	1,503	1,360	1,284	1,237
Trucks and vans	"	1,879	4,307	10,356	10,846	15,527
Refrigerators	Thousands	141	174	160	171	196
Cigarettes and cigars	Millions	11,621	11,386	11,251	13,458	12,923
Tobacco and pipe tobacco	Tons	5,080	4,793	5,436	5,384	6,154
Cement	Thousand tons	1,972	2,343	2,638	2,882	3,372
Beet and cane sugar	"	..	134	159	157	160
Refined sugar	"	..	485	499	509	509
Vegetable oil	"	158	146	146	164	183
Radio	Thousands	..	136	194	159	221
Television	"	..	73	134	158	185
Water heaters	"	37	47	42	60	77
Space heaters	"	103	136	100	139	159
Gas stoves	"	74	209	197	288	318
Coolers	"	96	66	67	94	143
Alcoholic beverages	Thousand bottles	38,343	46,072	60,556	67,733	76,372
Non-alcoholic beverages	"	216,429	254,788	302,654	334,602	447,050
Paints	Tons	11,639	13,652	15,633	18,847	21,218

Source: Bank Markazi Iran

Table 12.9: NET INVESTMENT IN MANUFACTURING SECTOR BY PRODUCT GROUPS. 1968 to 1972

(Current prices, million rials)

	1968	1969	1970	1971	1972 Δ	Fourth Plan Total	Fourth Plan % Share
Total	32,238	43,224	50,912	57,715	65,073	249,162	100.0
Non-Durable Consumer Goods	8,598	12,343	13,406	18,407	20,218	72,972	29.3
Processed Food	3,271	4,556	5,099	6,999	7,712	27,637	11.1
Beverages	541	805	843	1,157	1,269	4,615	1.9
Tobacco Products	350	520	544	749	821	2,984	1.2
Textiles	2,172	3,087	3,385	4,647	5,095	18,386	7.4
Wearing Apparel	845	1,259	1,319	1,814	1,986	7,223	2.9
Wood Products & Furniture	560	835	875	1,200	1,316	4,786	1.9
Leather & Leather Products	859	1,281	1,341	1,841	2,019	7,341	2.9
Intermediat Goods	19,558	24,448	30,629	31,952	36,668	143,255	57.5
Paper & Paper Products	821	1,222	1,283	1,758	1,930	7,014	2.8
Printing & Publishing, etc.	626	935	980	1,349	1,476	5,366	2.2
Rubber & Rubber Products	797	1,186	1,243	1,706	1,870	6,802	2.7
Chemicals & Chem. Products	6,391	7,256	7,398	6,329	6,735	34,109	13.7
Oil & Coal Products (excluding NIOC)	277	413	434	595	653	2,372	1.0
Basic Metals	7,893	8,642	14,255	13,240	16,450	59,880	24.0
Metal Products	1,651	2,459	2,578	3,539	3,881	14,108	5.7
Non-Metallic Minneral Products	1,702	2,335	2,458	3,436	3,673	13,604	5.4
Durable and Capital Goods	4,006	6,236	6,645	7,102	7,648	31,637	12.7
Machinery (Non-Electrical)	1,437	2,408	2,635	1,594	1,611	9,685	3.9
Electrical Equipment	629	937	981	1,349	1,478	5,374	2.2
Transport Equipment	1,940	2,981	3,029	4,159	4,559	16,578	6.6
Miscellaneous Industries	76	197	232	254	539	1,298	0.5

Δ Provisional.

Source: Iran, Ministry of Economy, Bureau of Statistics, Iranian Industrial Statistics, 1972.

4 EQUIPMENT

x 1 = Immediately 2 = In one year 3 = In 2 to 5 years 4 = In 5 to 10 years
xx Equipment joint with Paper Department
xxx Does not fullfill the specification completely
xxxx No more alternative manufacturer exists, who meet the specifications

Name of apparatus	Specifications	Manufacturers	Urgency x	Standard method
Compression Tester	Capacity: 5 000 kp Plate size: 150x150 cm Max distance between plates: 150 cm Electronic measuring	1. AB Lorentzen & Wettre 2. Testing Machines Inc xxxx	1	SIS 840213 PTH 19-72
Vibration Table	Load capacity: 400 kg Table size: 1 250 x 1 500 mm Adjustable for frequency (1-15 Hz) amplitude (0-12,5 mm) and direction of motion	1. AB Lorentzen & Wettre 2. Buchel-van der Korput 3. Testing Machines Inc xxx	1	ASTM D999-[illegible]
Table drop Tester	Load capacity: 30 kg Max drop height: 1 200 mm	1. L.A.B. Co 2. Testing Machines Inc xxxx	1	SIS 840213
Telfer, I	Load capacity: 100 kg Easy adjustable Momentary stop Standard equipment + quick release hook	1. Demag 2. Hvilan 3. Zacco	1	
Telfer, II	Load capacity: 1000 kg Easy adjustable Momentary stop Standard equipment + quick release hook	1. Demag 2. Hvilan 3. Zacco	1	
Table drop Tester (for sacks)	Load capacity: 100 kg Drop height: 5 m Size of table: 1 200 x 1 000 mm	1. Iggma xxxx	2	PTH 11-72
Sack filling machine	Possibility for filling value sacks of paper or plastics	1. According to drawing from Swedish Packaging Research Institute Local manufacturers	2	
Storage containers (for sacks)	3 separate steel containers with a capacity of 3 m³ each	Local manufacturer	2	

EQUIPMENT (continued)

Type of apparatus	Specifications	Manufacturers	Units	Standard
Pendulum Tester	Weight of pendulum: 30 kg Shape of pendulum: Cylindrical ballshaped with diameter 125 mm Impact energy: 6 000 kgcm	According to drawing from Swedish Packaging Research Institute Swedish or local manufacturers	1	
Inclined-plane-tester	Steel-mild Distance of rest 4 m Heavy foundation stop Motor driven	Local Manufacturers	1	SIS 9[illegible]
Desert climate chamber	Size: 3,8x3,4x2,5 m Temperature: 50 ± 1°C Humidity: 10 ± 2% RH	1. Carl Weiss 2. Svenska Fläktfabriken 3. Wärtsch	2	
Tropic climate chamber	Size: 3,8x3,4x2,5 m Humidity: 90±2 % RH Temperature: 40 ± 2°C	1. Carl Weiss 2. Svenska Fläktfabriken 3. Wärtsch	2	ASTM[illegible]
Variable climate chamber	Size: 3,8x3,4x2,6 m Humidity: 10-95-2% RH Temperature: -30+70±2°C Cycling possibilities	1. Carl Weiss 2. Svenska Fläktfabriken 3. Wärtsch	1	ASTM[illegible]
Immersing tank	Size: 1000x800x800 mm Possibilities to press down the package under water level with a force of 200 kp	Lokal manufacturers		
Cushioning drop hammer	Drop height: 200 cm Hammer size: 15x15 cm Max load: 30 kg Max acc: 5000 m/s² Electronic measuring device for acceleration velocity and compression	1. According to drawing from Swedish Packaging Research Institute Swedish or local manufacturers	4	FTN [illegible]
G-tester	Drop height: 1 500 mm Table size: 1000x1000 mm Free height for test object: 1 600 mm Max load: 120 kg Max acc: 1 200 m/s² Electronic measuring device for acceleration	1. According to drawing from Swedish Packaging Research Institute Swedish or local manufacturers	4	FTN [illegible]

EQUIPMENT (continued)

Name of apparatus	Specifications	Manufacturers	Urgency	Standard [illegible]
Shrink tunnel	Size: 1 900x2 200x 2 730 mm Filmthickness: 0,03–0,30 mm Capacity: 10-200 units/h	1. Mach[illegible]-Lindell AB S [illegible]gatan 25 Solna 2. [illegible], Göteborg 3. [illegible] Machinery, [illegible]	2	
Drop tester (small)	Guided rail with low friction and incline angle of 2° Drop height: 190 cm	1. [illegible] & [illegible] xxx	1	PTN 13-72
Tensile and compression-tester xx	Load range: 1 p-500 kp Speed range: 5-500 mm/min Stroke range: 0-200 mm Electrode [illegible]	1. Lorentzen & Wettre 2. Instron xxxx	1	SCAN P16:65
Vibration-table (small)	Frequency: 1,5-25 000 Hz Max acc: ≤ 2 g Dynamic load: 125 kg	1. Ling xxxx	3	
Pendulum tester	Energy range: 0-3 kgm	1. Büchel-van der Korput xxxx	3	
Water-vapour-permeability equipment	Pira-dishes Creasing equipment	1. Labora 2. van der Korput xxxx	1	SCAN P22:[illegible]
Gas permeability cells	For plastic films Range: 10^{-7}–10^{-11} $\frac{cm^3 (NTP)}{cm^2\ s\ cm\ Hg}$	1. Otto Brügger Feinmechanik Erzgiessereistrasse 8 München 2 xxxx	2	PTN 21-72
Gaschromatograph xx	Perkin Elmer 900 Recorder 165 equipped with molecular sieve nr 5 x	1. Perkin-Elmer Ltd Beaconsfield Buckinghamshire, England xxxx	3	PTN 17-72
Humidity cabinet	Size: 0,75 m^3 Temperature: 0- +100°C Humidity: 10-100% RH Accuracy: ±2°C, ±2% RH	1. Fisher Scientific Apparatus 2. Vötsch 3. Carl Weiss	1	SCAN P2[illegible] ASTM D[illegible]
Low temperature	Size: 0,75 m^3 Temperature: - 25°C Accuracy: ±3°C	1. AB Coldator 2. Vötsch 3. Carl Weiss	2	ASTM D[illegible]

LABORATORI (continued)

Name of apparatus	Specifications	Manufacturers	Urgency*	Standard
Cabinet, variable conditions	Size: 0,85x0,7x0,55 m Temperature: -70° - +90°C Humidity: 10-100% RH Accuracy: ±1°C, ±2% RH	1. Fentron 2. Carl Weiss 3. Vötsch	3	ASTM D975
Bursting tester**	See standard Automatic Range of bursting pressure 10-100 kp/cm²	1. Lorentzen & Wettre 2. MAE 3. Testing Machines Inc	1	SCAN P25:61
Puncture tester**	See standard	1. L'Homme & Argy 2. Testing Machines Inc 3. Büchel-van der Korput	1	SCAN P28:61
Cobb tester**	See standard	1. Lorentzen & Wettre 2. Büchel -van der Korput 3. Testing Machines Inc	1	SCAN P12:61
Bending stiffness**	See standard	1. Lorentzen & Wettre 2. L'Homme & Argy xxxx	1	SCAN P29:61
Strip cutter for corrugated board	See standard Pneumatic device	1. Lorentzen & Wettre xxxx	1	SCAN P33:71
Creasing tester**	Variable width and depth of crease	1. PIRA xxxx	2	
Glue bond tester**	PKL-type Fipago-recommendation	1. Ströbein (Swedish agency Wennberg App.) xxxx	2	FTN 1-70
Accelerometer-equipment Oscillograph and Polaroid camera	Accelerations: incl. 0,1-500 g Independent of mechanical vibrations less than 5 Hz Oscillograph and Polaroid camera	1. Brüel & Kjer, Copenhagen xxxx	3	
Humidity and temperature recorders**	Measuring range: 20-100 % RH and 0 - +40°C	1. Lambrecht (Swedish agency Rudolph Grave) xxxx	1	

[illegible]

[illegible]	[illegible]	Manufacturer	[illegible]	[illegible]
[illegible] xx	For analytical [illegible]	1. [illegible]werke, [illegible] 2. [illegible], Berlin		
[illegible] xx	[illegible], polarograph [illegible]			
[illegible] xx	[illegible]			
Thickness Tester	[illegible] mm	1. Lorentzen & Wettre 2. [illegible] 3. [illegible]	1	[illegible]
Friction Tester		1. Lorentzen & Wettre 2. [illegible] 3. [illegible]	1	[illegible]

[illegible] ASTM, American Society for Testing Materials

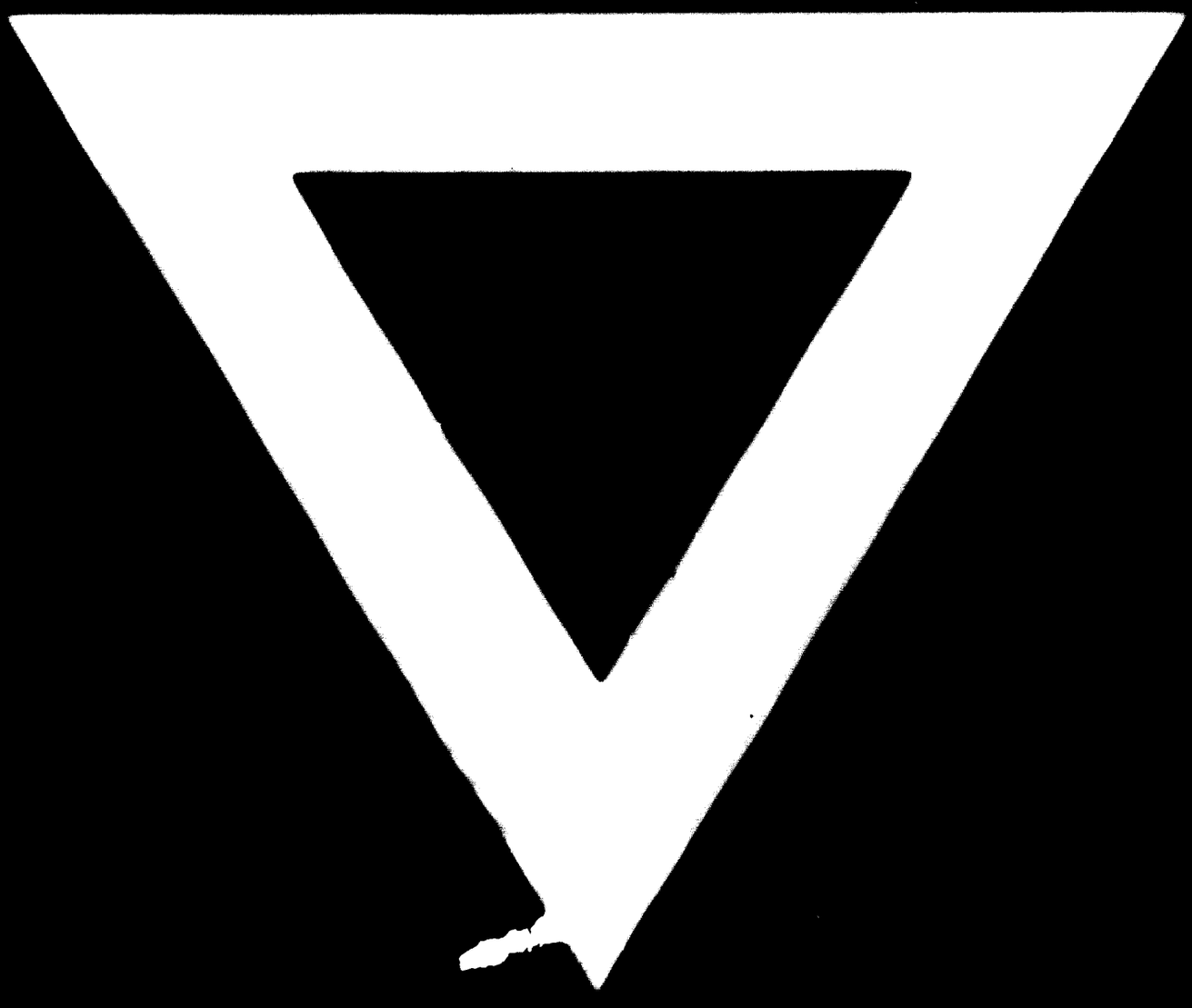
SCAN: Scandinavian Pulp, Paper and Board Testing Committee

SIS: Swedish Standardiseringskommission

[illegible]: Swedish [illegible] Test Norm

[illegible]

C-954



86.01.29
AD.87.04
ILL5.5+10