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IRAQ

Technical report: Study of the status of industrial printing in Iraq*

Prepared for the Government of Iraq
by the United Nations Industrial Development Organization,
acting as executing agency for the United Nations Development Programme

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1. INTRODUCTION

The Government of the Republic of Iraq accords a certain priority to the development of the Iraqi industry ,and particularly to its food and agro-industries , and to the expansion of their domestic and export markets.

These sectors are strongly interlinked with the printing and packaging industries. Industrial printing is an integral part of the highly diversified packaging manufacturing industry. High quality printing and packaging contributes significantly to the successful marketing of products especially when directed to target export markets.

The Government wants to take action to combat related problems and assist the prints manufacturing enterprises in all the socialist , the mixed and the private sectors.

Short Term Objectives of the Mission

To identify the specific handicaps which are hampering the quality of industrial printing and to advice on appropriate action .

Long Term Objectives of the Mission

To Contribute to the development of an efficient cost effective and modern printing industry which would enhance and expand the marketability of industrial and agroindustrial products of the national, regional and international levels, by improving the quality and output and reducing losses.

2. CONDUCT OF THE MISSION

2.1 The industry in general is growing ; the packaging industry is expected to grow at a faster rate in the near future (Peace time) .

Many printers who are now doing only commercial printing , however , they already acquire necessary equipment and facilities to enable them to do package printing , and they may do so in future , so it was decided to take them into consideration in the programme of visits and the on the spot advice.

The following factors were also taken into consideration

2.2 In number the private sector printing establishments are many more than other sectors, although much smaller in size . The leadership in technology is acquired by the socialist and mixed sector backed by the government.

In view of new government directives to strengthen the private sector , it was decided to consider with equal attention all the three sectors socialist , mixed and private.

3. In order to comprehend the evaluation , both print producers and print users were taken into consideration in planning the programme .Producers and users of major packaging materials were interviewed : Paper , Board , Corrugated board,Cellophane, Polypropylene,Polyethylene Al Foil , Glass .. etc.

4. To further comprehend the evaluation , interviews were also held with government officials in the ministry of industry , Officials of the chambers of Commerce and Industry Federation and the Baghdad Chamber of Commerce and Industry.

5. Printing staff qualification was considered an integral part of this study , so relevent education and training institutions were included and have been assisted.

6. The consultant lays special importance to training counterparts during UN missions.Counter parts belonging to the ministry of industry, the Cigarettes and Tobacco Co., to the Chambers of Commerce and Industry Federation and to the Baghdad chamber of Commerce and Industry accompanied the consultant in almost all the visits and interviews . It was largely due to their efforts that so many contacts were made . Contacts and company visits are listed in the appendices to this report.

FINDINGS

3 - FINDINGS

3- 1. GENERAL

Two basic facts must here be recorded; namely:

- 1.1 That the situation as seen can not be classified as conventional , it is rather unusual . The shadow of the war lasted for 8 years and seized only few months ago can not be overlooked . Its fingerprints can be read in almost all the industry. Printing and packaging are no exceptions. One can imagine the impact of such a state of affairs on industry elements such as raw materials and personnel, hence on quality and demand.

In the writer's opinion any activity in Iraq , in the time being, if assessed or evaluated must be looked at within the context or framework of this unusual and temporary situation in order that judgement can be right and expectations can be sound.

- 1.2 Current Government policy is towards releasing its handgrip on many factories of non strategic nature, selling them to the private and mixed sectors. Encouragement of the private sector is expected to lead to a fast growth in number of new companies working in package making and in food industries.

3-2 PRINTING INDUSTRY FEATURES

2-1 General

The printing industry is a service industry , rarely with products of its own, competing to manufacture products for others and hence being subject to the fluctuating fortunes of their customers and their industries .

The printing industry worldwide is operating within an increasingly sophisticated information world with the convergence of microelectronics , telecommunications , satellites and computers.

In Iraq, many of the plants visited were non-operating or at best operating well below capacity . The principal problem is shortage of raw materials and hard currency to buy it . This problem is likely to continue fo sometime . Lucky ones who have raw material left overs are very selective in the jobs they undertake, being the ones which can afford extraordinarily high prices.

However , and in the middle of the process of injecting life and health in the Veins of the industry , it is admirable to observe the awareness and appreciation of the government of important issues like productivity and

utmost utilisation of production capacities, importance of quality, Development, Export promotion , Waste minimising ...etc.

The printing industry is classified into socialist (public), mixed and private sectors.

Nationally , in 1984 , the socialist industrial sector produced approx 70% in the food industry , 66% in the beverage industry , 100 % in the tobacco industry .

The higher technology , more sophisticated printing equipment , the larger number and better qualified personnel exist in the socialist sector. Major printers/converters are situated in Baghdad .

In-plant printing facilities

The major socialist sector package printing facilities exist in three in-plant operations belonging to three industrial manufacturing companies : The Vegetable oil Co. (offset and Gravure for detergent boxes , and tinfoil coating for Oil Cans ..) , the Cigarette and Tobacco Co. (Gravure for Cigarette boxes but not in a working condition), the Al-Nasria Aluminium Co.(Gravure and lamination of Al/Paper).

The argument for In-Plant printing would be the saving in costs of the printing bill , besides other things like producing whenever required , controlling priorities, and guaranteeing continuity ...etc. However

Iraqi manufacturers who hold in-plant facilities are stating that the operation is uneconomic .

This must be because of lack of experience , low plant utilisation , in addition to probably high waste (handling operational, damaged finished products, waste of ink , films , and plates ...etc) , high overheads (masked unemployment), absence of competition , cost of immobilised capital in stocks ...etc. The socialist sector companies also do not sell packaging of their production in the open market . In one case (The Cigarette Co.) the Bobst line has never been operative for that few weeks , approx 7 years ago .

Private Sector

The private sector establishments , although many in number , but the larger share of the printing business goes to the socialist printing and publishing establishments.

In Iraq there exist approx 214 private printing establishments, out of which 174 in Baghdad only , and 40 establishment distributed in 12 other governorates. Only twenty establishments are of capitals exceeding 100 thousand ID, Forty establishments between 30 - 100 thousand ID, and one hundred and six establishments of capitals less than 30 thousand ID.

The total investment in the private sector printing establishments are estimated as 7.2 million ID.(one ID. approx 3 U.S Dollars).

Since the relatively small size printers are of limited resources as to knowledge and development, the industry has been dependant on its suppliers for advances in technology.

In Iraq there is no printing ink plant . All inks are being imported, previously from Germany, now from Turkey and Tunis.

The machinery existing is imported from well known suppliers , the paper and board and ink used for printing is also imported ; Yet the quality of the finished prints is inferior , the production cost is high , there is no stability in the level of quality within the market , the ability to compete in foreign markets is nonexistent . The society is not market oriented, the market is not profit oriented.

There are however many reasons to the inferior print quality, main ones are :

- Not enough attention is given to the preprinting stages .
- Not enough quality control is made on each stage of the production chain and on each element of the printing process namely paper, ink and printing

surface. Besides, the standards and specifications are not comprehensive and non-existent in many cases not only for prints but also for inks, plates, cutting knives ...etc.

- Unmistaken lack of training and skills of machine operators , quality controlers and managers , in addition to the lack of understanding of the relationship between paper and ink and the behaviour of ink on paper surface in the nip area and after. Iraq may be obliged to use imported labor force but the method and producers in choosing them must be changed.

2.2. MAJOR COUSTRAINTS AND PROBLEMS

The major constraints and problems can be summarised as follows ; But many of the statements presented here may seem negative in nature. However each one of them, if correctly handled , Can be turned into a marketing opportunity rather than constraint . At the same time they do not overshadow bright spots and admirable experiences here and there in the socialist and the private sectors.

2.2.1 A CONTINUING TREND TO IMPORT READILY PRINTED PACKAGES

There is an uncontrolled general trend to import printed packaging. When enquired, package uses claim it is cheaper that way than local manufacturing .It was not possible to get access to their pricing methods , however , there seems no good reason why prints should be higher in price than imported ones as claimed. Because of this seemingly uncontrolled free importation from well established foreign suppliers, local young printers and package manufacturers are facing unfair competition . The industry can never develop and improve that way. It is recommended in this report not to encourage importation of printed formed packages except if for export or if cannot be made locally.

2.2.2 LACK OF FOREIGN CURRENCY LIMITING RAW MATERIALS AND SPARE PARTS PURCHASES

Mostly package manufacture is dependent on imported raw material , perhaps except glass. As previously indicated many plants were standstill because of raw material shortages , and these shortages were generally explained as due to lack of hard currency from Government sources (at the official rate) .

N.B. The Government permitted industrialists to find their own sources of finance for their purchases in foreign currency . Yet they are hesitant , feeling insecure to use such facility .

The printing and packaging industry also seriously need spare parts and some new machinery . Although in some plants some spare parts were cleverly manufactured locally keeping the machines running, but on the expense of other things and the machines definitely need more than that .

This situation makes it extremely difficult to plan investments in production facilities in a feasible way and at the right time.

The choice of supplying country is determined by who offers two year deffered payment conditions, which inclusively means dictating selling prices. The reasons are quiet understandable, but all add up to making the operation non-cost effective.

What complicates the matter is that like other developing countries not only in package producing establishments but also in package using companies, people import complete lines of certain systems of machinery + materials outletting certain types of packaged products. The flexibility to change to new

products or to use a new material or different specification material is very limited unless the transferred know how is efficiently absorbed .

Running speeds were below normal capabilities of the machines not only due to scarcity of raw materials but also due to insufficient training of personnel . The case is aggravated when using local raw materials.

2.2.3 LACK OF PRESS MANAGEMENT AND JOB PLANNING SKILLS

One of the major deficiencies is the low level of technical and managerial knowhow and experience .

The missing thing is the system . Even standard management systems of industrial projects for planning , follow up , financial systems , costing, maintenance , preventive maintenance scheduling ...etc.

The operators in large establishments seem to work to their own standards without supervision . Bad planning of jobs was obvious . For example jobs loaded on multicolour machines whereac it could have been just as well printed at lower cost on single colour presses. The working conditions very often were far from satisfactory . In more than one

plant management did not appreciate the need for quality in print execution and box making , explaining this by production being less in any case than the needs.

The cost, quality , and performance controls associated with the production division of printing establishments should be a preoccupation of the management as it contributes significantly to improved profits . Taking for example the control on machine utilisation which reflects machine downtime due to quality stops, material running problems , unsatisfactory , make readies .. etc. and the inability to then redeploy the crew elsewhere on productive work.

Taking quality and performance : on a regular basis quality checks of random production should be undertaken against proofs and standard work to ensure that unsuitable quality , as yet overlooked by operator and supervisor , is not allowed to carry on well into long run jobs before correction. Along with this performance controls of output by machine and operation should allow slow running or method difficulties to be detected in the early stages.

The horror of a printer's life is the hazard of processing a high value job through three quarters of its operations, over a few months period, and to loose the lot with spoilage during the last quarter of the operations, loosing the profit, materials and conversion as well, besides it has to be done again occupying equipment which should be on other work, not forgetting the dissatisfaction of the poor customer.

Average quality staff at all managerial levels can obtain surprising profit improvement by merely following the rules, reading dials and acting just that little earlier on correction.

2.2.4 QUALITY CONTROL

The quality of print production was below standard, little planning and organisation, poor separations, bad assembly, colour variation during the printing run and out of register, the plates badly scratched and full of spots. Quality control is lacking. Bad printing down of the yellow and blue printing plates in the process department causing a defect on the finished job.

Standards and specifications are not comprehensive and do not exist in some cases . Too little attention is paid to the standards and specifications of inks , plates , cutting knives ... etc. It is important that all machine operators work to a standard system or checklist , so that all setting up operations are performed correctly. For example: Inspection of plates before mounting , care to inspect and approve first sheet for details, all four colour work should carry bar strips , the use of densitometers in the press room for quality control , watching through regular inspection for colour variations ... etc.

Quality control is of vital importance to printers. The standard testing methods for raw materials in the graphic art industry deal exclusively with paper and ink testing . Functional aspects of quality must be tested . Appearance factors such as : colour , gloss , Brightness and opacity . Chemical factors such as light resistance , chemical resistance . Physical properties such as strength factors (Burst , tear , fold , tensile strength) , smoothness , formation , weight , rub resistance. Technical aspects of image quality include :

appearance related properties such as ink tack, viscosity, fineness of grind, pigment concentration, water pickup, absorptivity and sensitivity. Chemical properties include : PH, relative humidity , drying time. Physical properties include : fluffing , surface strength , ink length.

2.2.5 HOUSE KEEPING

Most establishment were not sufficiently clean and they are untidy . These conditions do not help to uplift the morale of the workforce. It is the management responsibility to ensure that the plant under its command is kept clean and tidy at all times as well as not being a fire hazard . Cleanliness has some bearing on production and quality . Dust and dirt are the greatest enemies of good printing and must be eliminated if quality work is to be produced.

2.2.6 GRAPHIC DESIGN

Graphic design and quality of presentation of Iraqi packagings is still far from international standards. Although seemingly acceptable by the local market , many in the industry realises the inferiority of the designs and the need to improve them .

There is no properly qualified graphic designers employed even by the large establishment to do the design job . In the private sector , owners and sometimes their wives with no rules have a say in the design of the packages and labels they print.

Inadequate quality of paper and board contributed to the low quality execution . The quality of the original artwork material particularly the photographs is of low quality and not suitable for reproduction in print. Unbalanced features are common, unsuitable typography (type of letters) and inconsistency of the type of letters. In cases the illustration does not provide a true picture of the product , the legibility or readability is weak , and on many packages the text is not very informative . Another feature is that brand names and logotypes are not very distinctive . Quality of design can be improved by employing qualified graphic designers and training them . Training must include the role of market reports or market research or design briefs to supply the designer with basic market data.

The writer has modified the syllabus of the printing section in the Inst. of technology and the syllabus for a course on print design and package

design was included along with other modifications (see appendix). A seminar was also held in the Academy of Arts for the benefit of the postgraduate students working in the area of print design. It is extremely important that the printer should understand both the use and the necessity for design , and the designer's role . Graphic design is now a powerful force in today's world. Printing is a specialised business and so is design. The designer must understand the technical problems that he poses for the printer. Although not the subject of this report , but knowledge and experience of structural design is lacking.

2.2.7 LACK OF TRAINING AND TECHNICAL KNOWLEDGE

In many cases printers and printed package manufacturers appeared to lack information and knowledge of essential technical facts related to print production , particularly with respect to :

- a - Artwork preparation , colour separation , and clean operating conditions.
- b - Information about latest developments in printing and auxiliary machines due to less opportunities of travelling abroad of

Iraqis and hesitation of European salesmen to travel to Baghdad during war time.

c - there is also lack of awareness and information about printing and packaging specifications and requirements for export.

Few managers seemed to have knowledge of printing and packaging practices and customer needs with respect to size, constructions, performance, standards, labelling systems, and graphic design.

A situation which needs upgrading and to be changed with the growing interest of Iraq in exportation. Communications between the package users and the local manufacturers of packaging materials is extremely poor. Informations and assistance to users from local packaging material manufacturers is nonexistent. Local packaging materials industry should assume the consulting and advisory role of its counter parts in the industrialised world. The reason of this may be due to the basic lack of local competition (one Aluminium foil Co., one paper and board Co., one flexible printing Co.,..etc.). In many cases they themselves lack the knowhow to offer such assistance.

2.2.8 OTHER PROBLEMS

2.2.8 THE BARRIER BETWEEN THE PRIVATE AND THE SOCIALIST SECTORS

There definitely exists a psychological barrier between the two sectors as if they are serving two different countries , which wastes and minimises the benefit from national assets in the socialist sector.

2.2.9 THE PRESENT LABOUR SITUATION

Due to absence of Iraqi trained personnel being called for other national duties , Iraq has to rely on imported labor force . There is no recruitment system. Establishments employ unskilled personnel present in Baghdad area and whose turnover also is high. It is then understandable that plant owners hesitate to invest in training and education ..etc. Which is a vicious circle. A different system of recruiting for industry must be found.

2.2.10 TECHNICAL AND QUALITY DEFECTS

These will be the subject of the next section.

The major features , constraints and problems were above presented which give on overall understanding of the situation . However to complete the picture, the next sections go into the depth of the technical matters in further detail:of machinery, individual printing materials, and individual printing processes.

COMMENTS ON THE MACHINES SITUATION

MAJOR EQUIPMENT

The major machinery in use are 7-12 years old.

Lithography is the leading process in use for printing both publications and packagings. The use of letterpress is limited and decreasing. Many letterpress Heidelberg are converted to do creasing of board for boxes, then the folding glueing is done either by hand or on a folder gluer. Although flexo worldwide replaces letterpress and offset in various applications, besides its leading place as a flexible packaging printing method; surprisingly its use in Iraq is very limited and is almost confined to polyethylene bag printing.

Sheet offset: One and two colour machines mainly Heidelberg. But Roland, Solna & Koenig and Bauer are also in use. Four and six colour machines exist only in two places (Dar Alhoreya and Aldar Alarabeya). In the socialist sector Polygraph machines are also in operation (Afak Arabeya and the ministry of education press).

Web Offset : Four colours mostly Koenig & Bauer. All nonheat set except in one establishment (Aldar Alarabeya) where there is a Koenig Bauer machine heatset 8 colours 4 units.

Rotogravure:- Bo'lst champlain in the socialist sector.

Flexo Fischer and krecke almost only in the chemical & plastic industries Co.

Letterpress Mostly Heidelbergs

Hot stamping In the chem. & plast . Ind. Co. for printing refrigerator & TV. parts

Radiation

Curing None were traced.

Ink jet : Recenly introduced, not yet in operation

(pharmaceutical Co. & Veg oil Co.)

The 174 private establishments in Baghdad have a 145 offset and a 224 letterpress machines . In all the private sector only 9 establishments have phototypesetting equipment. None of the socialist sector in-plant gravure operations has a cylinder etching facilities , all rely on importation. None of them has a scanner for colour seperation . All other socialist sector offset printers (e.g Dar Alhoreya , Afak Arabeya , ministry of eduction press) all have phototype setting equipment and some of them have scanners.

In a couple or so of the cases the machines were in a remarkable condition with good housekeeping , organised, clean shopfloor (e.g. Al-Rasafa press).

In many plants the working conditions were far from satisfactory ; bad lighting , dusty, and cramped , in addition to untidy machines. Almost in all establishments visited there is no fixed standadised instructions for cleaning machines

to be followed strictly, No lubrication standards and scheme for preventative maintenance which usually reduces emergency repairs as well as downtimes.

Many machines were in bad shape, surprisingly in some cases, how can they still produce acceptable quality.

In cases, the printing machines needed change of some parts: such as rollers , grippers , rubber blankets , ball bearings ... etc.) in other cases they needed overhauling .

All equipment : Cameras , plate making , printing machines , folders, flodergluers .. etc. are imported. Due to the special circumstances of Iraq being in War during the last 8 years, it has been difficult and still is either to obtain spare parts for existing machines or to acquire new machines. The other major observation related to machinery is the unavailability of skilled machine operators and maintenance staff. In the majority of printing firms the machines are manned by unqualified personnel whose experience may be to push buttons, with no understanding of how to get the best out of a machine and no understanding of ink transfer elements and their control.

COMMENTS ON MAJOR PRINTING MATERIALS

Packaging is an integral part of any product and in general it is the product and its ultimate destination which exerts the major influence on the pack material, its construction and performance . It is important to note that apart from some specialised pharmaceutical applications , food is probably the most demanding product with which the packaging industry has to contend.

The worldwide split of packaging materials with paper and board having the largest share , followed by plastics , metals, glass and lastly wood , almost holds valid in Iraq if not exactly in percentages but generally in the trend.

Examples of food produced locally and need printed packaging materials are: fresh fruits and vegs., meat, poultry, frozen foods , dried foods , concentrated foods , confectionary & Biscuits, milk, juices, mineral water, dairy products ..etc.

1.1. PAPER & BOARD

Only one company produces paper and board locally (paper industries Co.) will specifications however for from international.

The majority of the printing paper and boards are imported , traditionally from everywhere mostly scan-

dinavia and Austria . At present purchase with deferred payments limited the sources . Among current suppliers are Austria , Turkey and Tunis.

In a few printing establishments quite a number of paper rolls are damaged due to bad handling either at the port or on unloading in the plant using forks on forklift trucks instead of grabs which do not seem to be available at the coast. Bumping of reels is another cause of wastage of local paper damaging cores and affecting badly the tension , where the reels are already slack and cores are weak to start with.

The storage of paper in many establishments was inadequate being covered with dust and sand consequently finding its way in that condition to the machine room.

2.2 FOLDING CARTONS

The major users of folding cartons are the detergent plant (Veg. Oil Co.) who have their converting facilities , and the pharmaceutical Co. who import all their needs. The quality of folding cartons being produced seems to be generally acceptable for local markets, although it can be improved . Cutting and creasing of folding cartons was generally of acceptable quality . The fact that most stripping is performed by hand makes

the maintenance of die cutting edges especially important ,as tears otherwise occur during the stripping operations . Printers hesitate to use locally produced board as it causes a lot of fluff , powder & picking, with matt & rough surface when printed with uncontroled absorption.

The number of folder gluers is below needs. Many printers would take their printed diecut blanks to another place where it can be folded glued automatically. Most graphic designs of folding cartons rely on large solid areas, which visualates problems of ununiform ink film thickness and colour variations.

1.3 CORRUGATED BOARD PRINTING

Produced nationally in 3 companies (one socialist , one mixed, one private sector). The printing units were standstill in the two mixed & private companies visited . The first because lack of ink, the second because of lack of photopolymer plates. However the quality of previous printing runs leaves room to plenty of improvement , not only in artwork and plate prep ration but also in ink viscosity adjustment and cleanliness of the machine (dirty flexo rolls) . The board seamed squashed due to excessive pressure.

Only kiss pressure is required for printing corrugated board. In cases the 3 layers of corrugated board were made of fluting due to unavailability of kraft. The blame for the board quality can be put on worn corrugating rolls, and blunt cutting and creasing dies. Local fluting & liner is below standard, weak, with low tensile strength producing a lot of dust and fluff. Most of the corrugating box itself problems could be overcome and rectified may be at no extra cost, by training personnel on machine wear, cleanliness of machines and shopfloor, defined and observed quality standards and a programme of preventative maintenance.

4. PLASTIC FILMS PRINTING

Printing on plastics suffer from the same defects arising from poor maintenance and dust contaminated printing operations. In addition lack of knowledge of the relationship between ink and the nonabsorbent plastic surface, and of surface treatments, suitability of the type of inks to suit various plastics, (mottle is common to most solid areas). Ink containers are left open during the run leading to significant variations in viscosity, contamination and fire hazard.

Very little flexible plastic film being printed locally. There are only one company (private sector, Al- Gilani) printing gravure, paper, cellophane, and polypropylene. The majority of these materials for biscuit and confectionary factories especially polypropylene is imported directly by the users . Flexo printing is limited at the moment to polyethylene bags. (Chem. & Plastic industries Co., use conventional rubber stereotypes; where they can obtain better results from photopolymer plates. Advice was given on this on the spot).

In the writer's view the use and consumption of plastic materials and plastic packagings will grow, partly as result of growth in total packaging, partly from the substitution of plastics for other traditional packaging materials and due to the local manufacture of some (polyethylene, PVC and polystyrene).

The traditional market for regenerated cellulose films; snacks, sweets, bread, cigarettes and tobacco will increasingly use alternative films or in some applications a laminate with regenerated cellulose film as one of the components.

The major complaints of thermoformed containers in the variable film thickness of the polystyrene rolls locally produced.

5. METAL PRINTING

This was investigated in only one company (Veg.Oil Co.) which seem also to be the only one in Iraq doing metal decorating.

A feature of the market is that most manufacturing operations have their own can making facility. The Veg oil Co. produces only for its own use. The rest of users (Paint companies as for example) import printed sheets and convert it in-plant. The quality is affected;(scratched) most likely due to rough handling conditions. Definitely a new investment in metal decorating plant to serve metal can users can be easily justified - However one must take into consideration possible use of new technologies of aseptically filled plastic pouches for example. In this report a feasibility study for such a project is recommended. Food cans are mostly labelled not printed, whereas almost all paint cans are printed . For export,and against competition,food canners may have to improve their can quality structurally and graphically and may have to have them printed.

In the can printing plant, house keeping was poor. There was a lack of appropriate equipment for testing tinsplate, lacquers ...etc, In addition to the lack of knowledge about tinsplate surface conditions and their

correlation with lacquering problems. Coaters like other machinery suffer from poor maintenance.

Printing in the Veg. oil Co. is made either directly on the tinfoil or over a transparent lacquer, excluding conventional opaque enamelling. The final result is not at all pleasant. For good looking result conventional enamelling with a white and overprint varnishing is necessary.

MAJOR TECHNICAL PRINTING DEFECTS AND PROBLEMS

The writer believes that the main printing problems encountered in the printing industry are not caused purely by poor materials, although no doubt they do to an extent, but the main areas, which were found far below standard were inherent in the production and quality of the products before printing, whether gravure, off set, letterpress or flexo.

The blame of these technical defects must rest on the shoulders of the top management. Senior management must take the trouble to inspect at regular intervals the production lines, asking questions, measuring quality, inspecting the cleanliness of the plant...etc ensuring that their middle management are performing their tasks efficiently.

ROTOGRAVURE WORK

Main defects included :

Ink mottle in solid areas detected both on cellophane and paper, possibly due to wrong practice of thinning or overthinning ink.

Bad cylinder preparation, bad correction, absence of quality control in this stage and lack of equipment for it (Gailani Co.).

Speckle (dot skipping), very obvious on carton printing for detergents. It seems that a lot of the

highlight areas are clogged (Veg. Oil Co.).

Incorrect job planning . Small jobs printed gravure whereas it can be as well printed flexo.

A lot to be done in the area of graphic design & choice of colours and type.

2 OFFSET WORK

Low quality colour separation is a very common feature in the whole country and in the whole printing (packaging and publication) industry . In the private sector it is done manually on a camera ,whereas in the socialist sector scanners are used.

- Matt bronzing, where it should be glossy (imported packages)
- Inconsistency all through a run .
- Lack of sharpness.
- Plates arriving to the machine room with scratches and spots.
- Variance in ink densities while printing , this can be due to either variation in ink feed, paper absorbency, water feed, in some cases, it was due to variations in blanket smoothness (worn blankets).
- Set off (Due to delayed drying).
- Picking (either due to weakness of paper surface or to high ink tack) specially when using local raw materials.

- Hickies

- Bad colour assembly , out of register.
- In finishing departments, the use of blunt blades used for trim work, bad stitching and above all bad handling of finished products coming out of the plant in soiled condition.

FLEXO

3-

-
- Mottle
 - Lack of sharpness
 - Bad printing plates (still using natural rubber, chem & plast. Co.)
 - Inferior graphic designs
 - lack of adhesion (either due to wrong type of ink or inefficient surface treatment)
 - Blocking (The whole reel clogg together on reeling, whether due to inefficient drying or due to bad selection of the resin in the ink,i.e bad solvent release.)

4- **PRINTING INK**

-
- wrong type of ink being bought , e.g heatset ink for non-heat set web offset presses.
 - Mal practice leaving ink containers open most of the time causing solvent evaporation, changing the liquid ink viscosity or allowing surface oxidation of paste inks with continual loss.)

- In other instances completely wrong type of ink was used e.g. offset ink was diluted and used for a gravure machine resulting in very bad doctor blade wiping, setoff, and clogging (blocking) a lot of the highlight cells.

- Blending colours takes place in the machine ink fountain making homogeneity very difficult . It would be much better to do the blending of small quantities on a slab (glass or porcelane)., whereas large quantities can be done using a mixer.

- In many plants there is no way of following up ink viscosity during a long run, especially in case of liquid inks, where it should be monitored , using for example a Zahn cup.

CONCLUSIONS AND RECOMMENDATION

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CONCLUSIONS

In the consultant's view there are, in number, sufficient off-set printing machines available in Iraq to meet current needs. What is required there are improvements in production efficiency and product quality to which the assistance given during the mission and comments in this report will contribute. Further investment is however needed in gravure and flexo and particularly in converting machinery e.g. Folder gluers and dicutters. Also in new converting plants such as lamination, collapsible tubes ... etc. New capital, mostly limited, will need to be injected into a few private sector printing establishments if at all higher quality is to be attained.

Increased levels of education, of contacts with outside world, of dealing with imported packages of first class printing and designs, and of appreciation on the part of the consumers, in addition to intervention from the government in the distribution of food will all increase the level of demand for packaging materials and packages. As more processed foods and other consumer goods become available, the impact of packaging will be increasingly felt. The benefit of packaging of foods, less wastage through improved distribution and retail chains, can make

a substantial contribution to the national economy and to improving the standard of living of the population as a whole.

Developments in manufacturing industry will also cause an increased demand for packaging . There will be more goods available and therefore a greater need for packaging . The goods are becoming more sophisticated & therefore require greater protection during distribution and enhanced presentation at the point of sale.

One cannot miss the growing awareness of the importance of packaging in Iraq.

The printing industry being interrelated and closely associated with the packaging industry will have to play an important role.

The choice of industrial printing to be studied in this mission at this stage indicates an awareness of various facets of society economic developments and indicates correct national and Unido priorities.

There exists currently realisation of importance of export for future by the authorities. Further encouragement of exportation and further facilities for export oriented investments are needed. More awareness of the role of better quality packaging and more appealing prints and graphic designs is necessary to withstand competition.

The printing industry must gear itself to the changes that are to come in the economic front, and must spot the business opportunities that will come with industrialisation. It is the consultant's feeling that with gradual development of Iraqi consumer market, packaging must dominate activities in the coming years.

However a mission of such limited time is not at all enough, follow up activities are required to strengthen and consolidate and build up national capacities through a programme of technical assistance.

RECOMMENDATIONS

In the light of the findings explained by the consultant it is recommended that Iraqi authorities request assistance in this area from UN organizations. The following proposals are put forward for short term assistance to the Iraqi printing industry during the next 12 months January- Dec. 1989.

1. CONSULTANCY MISSIONS

1.1. On the establishment of a Printing - Packaging Institute or Center Now in association with the chambers of commerce and industry federation, later can be part of an export promotion center if founded. 2m/m

1.2 On packaging graphic design
Involving three consultants simultaneously, one product marketing .One graphic design (Artist) and one printing technology. 3m/m

1.3 On Education and Training
To be engaged in lecturing on printing technology to students in the institute of technology and the students and postgraduate students in the Academy of Art (printing design dept.). In addition lectures for engineers & chemists from the industry can be organised through the chambers of commerce and industry federation. The counter part can be the Technological institutes organisation, ministry of education.

1.4 A Pan gulf study on flexible packaging films e.g cellophane, polypropylene & laminates .. etc. To study the use of and facilities of printing of flexible packaging materials in Iraq & GCC countries. As most of Iraqi and gulf importation now comes from Jordan and Turkey both markets can be taken too into consideration. 2m/m

1.5 A pan Gulf study on tinsplate printing and forming (As above item). 2m/m

1.6 A Pan Gulf study on liquid cartons (Tetrapak type) (As above item) 2m/m

N.B. The above three studies emanates from the fact that almost all printed flexible materials, printed tinsplate and printed tetrapaks are imported.

2. FEASIBILITY STUDIES

To carry out the following feasibility studies :

2.1 Establishment of a printing ink plant to satisfy the Iraqi requirements and to bring some needed technical assistance in the field of printing, taking exportation into consideration. 1m/m

- 2.2. Production of polypropylene film as a substitute for cellophane with an option of having it printed and or metallised 1m/m
- 2.3. Production of and printing in line of collapsible tubes for pharmaceutical and other applications. 1m/m
- 2.4. A modern flexible packaging materials printing taking into consideration gravure and flexo, with extrusion lamination, and perhaps water based inks and above all exportation. 1m/m

3. SEMINARS

A national 3 day seminar on the role of printing and packaging for export promotion (of food products) , to be organised spring of 1989 in Baghdad. Speakers to be drawn from Unido and ITC experts. Local expenses to be born by counterpart " Chambers of commerce and industry federation " . Related topics would include : Printing technology, Graphic design , maintenance of printing machines, maintenance of pckaging machines, printing industry in Iraq, experiences from other Arab Contries. New developments in printing and packaging materials and machirery . (on this subject speakers from machine suppliers can be withdrawn.

4. Training Material

Preparation of the text and relevant visual aids (transparencies, Slides, maps, samples) of a proper printing and packaging training course composed of a set of lectures which can serve as a basic foundation for printing / packaging technicians and engineers. The slides and aids are to show experiences from other Arab Countries.

This is to be prepared by a consultant of an academic with industrial background and to be prepared in a country with a wide industrial base, Iraq, Dubai or Saudia Arabia. Dubai is choice No.1.

3m/m

5. The editing or composing of four books in Arabic language to serve as references in the Arabic library to students, researchers and industrialists, to back efforts to consolidate activities in education and training , not only in Iraq but also in all Arab Countries . The procedure suggested is similar to that in recommendation No.4, to contract with a University professor with printing and packaging background . The task can be fulfilled over 18 months or it can be phased.

Proposed topics : Paper and printing technology , ink and printing technology, printable packaging materials, packaging technology.

18m/m

6. The compilation of an English/Arabic printing Glossary to help people in the field to understand catalogues and leaflets .. etc. especially as the English language in the country and the printing industry is weak. 2m/m

7. Urgent assistance with maintenance and spare parts is required through a maintenance company or a limited task force basically of three people, Engineer, mechanic and electrician, to examine/ maintain printing equipment and determine if spare parts are needed. It is suggested that international assistance funds could be very profitably directed towards the obtaining of critical first line spare parts. A limited aid outlay in this area could achieve disproportionately beneficial results in terms of Iraqi production efficiency. The exercise is useful not only in restoring the condition of the printing machines, but also in instructing personnel on maintenance and teaching them preventative maintenance.

8. Assistance in the procurement of some printing test equipment such as : IGT printability tester , grinding guages, reflection densitometer , transmission desitometer, viscosity meters. Zahn , laray or sheen or similar. Such equipment can be temporarily accomodated in a small lab.in Dar Alhoreya (state Co.) to serve all socialist, mixed and private sectors.

Dar Al Hurrya has the space and technicians ,Later they can be accomodated in the Iraqi printing and packaging institute or center when created. Approx \$ 150.000

9. Study tour to packex, England.

For five to 10 top management personel, guided by a Unido consultant to explain and introduce exhibited technologies, make analogy with existing situation in Iraq. The critical thing in this exercise is the choice of people. Recommended participants from Cigarette & Tobacco Co., Veg. Oil Co., pharmaceutical Co., Baghdad chamber of commerce and industry, Institute of technology (printing dept.) , and Paper industries Co., if requested, the consultant from his experience during this mission can help in the nominations. Duration is to be for 10 days so that educational visits can be done to PIRA, institute of packaging and some industrial printers.

10. Design Clinic

To evaluate , assess and criticise the graphic designs of say 20 packages of major items and propose modified designs . It is suggested that the exercise takes place in Vienna or Baghdad.

The team to include one product marketing consultant, one structural designer, one graphic designer and one

printing consultant who knows the printing industry in Iraq and its limitations. Two Iraqi Young designers may join the team for training. Duration one week.

Apart from above recommendations which form a short term technical assistance programme , there are other recommendations as follows :

11. To discourage importation of readily printed packages except in three cases :-
 - a. If required for re-export
 - b. If cannot be produced locally or
 - a. If the local capacity is not enough at a certain time.

12. To increase the intercooperation between the socialist and private sector and exchange of knowledge and expertise between them . The government needs to set the example on this, in order to boost the morale of the private sector. It is recommended that socialist & mixed companies be all members of the chambers of commerce & industry federation.

13. And the federation to be national rather than only for the private sector.

14. There must be a new procedure to recruit trained or semi-trained personnel to the industry . May be the

chambers of commerce and industry federation or the ministry of industry can form interviewing committees to travel to Egypt for example and select from there.

15. When foreign currency becomes available , attention must be paid not to rush into buying new machines similar to the old ones but to study carefully latest and different technologies doing the function wanted and to make use of less energy consumption , less packaging materials used, more universality and flexibility more suitability to the changing habits, all can serve exportation in a better way. Also investments should be directed towards lines and technologies which did not yet exist. As for example if investment in tins is considered, UV curing should be considered to save space, eliminate dryers and obtain better quality.
16. International assistance is strongly recommended to help in establishing an Iraqi export promotion center which encompasses a unit for printing and packaging emphasising graphic design and printing.
17. An Iraqi printing and packaging institute or center is needed to identify , promote and develop a functioning focal point at the national level aiming at upgrading the printing and packaging industries, by giving

technical advice, disseminating information, running education and training courses and seminars, publish a newsletter.. etc., and before all increase awareness. From past experience, the writer is opposed to regional or subregional institutes. National institutes are the solution. However , in some countries of high population, stronger industrial base, more qualified people like Iraq, Saudi Arabia , national institutes can not only serve well their countries but also can offer their services to other neighbouring countries, keeping at the same time their national identity. International aid to regional projects should be rather redirected to national ones. In the mean time if just an Iraqi printing and packaging committee is being revived and activated , it should encompass all the three sectors.

18. Related to the upgrading the capabilities of the institute of technology (Dept of printing):
 - a. It is necessary that the institute acquire basic press equipment for the applied teaching hours (phototypesetting , printing press, Camera .. etc.). This type of equipment already exist as extras in the ministry of education press.
 - b. The educational system as such (sandwich course) is not fruitful. As it is now , it wastes 50%

of the time . The recommendation is either to return to full year teaching system or to formulate a sort of official cooperation with printing establishments by which the half yearly training of the students becomes rather an employment.

c. In the present circumstances of Iraq, it might be useful to admit girls also in the department, whereas they are not allowed currently.

19. Further concern must be given to quality control in the printing industry both for raw materials and finished products.

Specific testing criteria has been mentioned somewhere else in this report.

20. To encourage improvement of printing and packaging price, quality , and performance, competitive pressures are required . The socialist sector must be allowed and encouraged to sell packages and to do services for other sectors in order to use its under-utilised capacities, or even, work 2 shifts.

21. From the industrialisation point of view there must be more concern for import substitution and progressive use of locally available materials. The failure of present local paper mill to provide

international standards quality paper and boards should not be allowed to discourage renewed interest and support from the government for paper making projects and government should provide support in this direction and to training people on paper and plastics making.

22. The practice whereby product manufacturers produce their own packaging (bottles , jars, cartons, cans..) should be discouraged.
23. The system of placing large orders for delivery at intervals should be encouraged between user and print suppliers, for better planning and raw material ordering.
24. There is a need for a national campaign to clean and tidy up the printing establishments. This will surely improve productivity and quality.
25. Building on Iraqi successful experiences in military industrialisation the ministry of industry can encourage local private or public sector manufacturing of simple equipment for the printing industry (e.g. stapling machines, knives, rollers, and small presses, montage tables ...etc.). Reverse engineering can be helpful in this regard.

26. There is an urgent need for the present management in the socialist printing sector to be educated in printing and press planning and management.

Training of the middle and top management should have top priority . Press management in particular is one topic needing attention. Management skills needing upgrading.

27. There are cases where technicians working in the socialist sector for one shift start another shift with a private sector printing establishment. This practice should stop, as both places are being negatively affected , it is also likely to cause accidents.

28. Exchanging experiences with developing countries and particularly Arab countries need to be encouraged. Again UN cooperation through Pan Arab seminars or round table discussions can prove beneficial. The important thing is to make sure of the level of attendants, to be decision making personnel (top management). Pan Arab Seminars for technicians and Engineers are not recommended.

APPENDICES

OTHER TASKS THE CONSULTANT
PERFORMED DURING THE MISSION

1. A lecture held in the ministry of industry for public and private sectors in the printing and packaging fields, on "Basics of printing Technology, paper & ink".
2. A lecture held in Dar Alhorreys printing & publishing Co. for both the socialist and mixed print producers, on "the role of each of the printing elements with emphasis on offset printing".
3. A Discussion Seminar in the Academy of fine arts on postgraduate work related to printing and design , The writer discussed and analysed 10 subjects of postgraduate work, and amended on the spot their programmes of reseach.
4. A lecture held in the Institute of technology for the students and teachers of the depts of printing and design, on "Introduction to packaging , Basics of printing technology , graphic design role in marketing ..etc".
5. A round table discussion in the ministry of military industrialisation on package printing problems and prospects and new technologies as related to pharmaceutical, dairy, food industries and Cigarettes products.

6. Study group meeting for evaluation of market research done by Baghdad chamber of commerce; and guidelines on sectorial market studies preparation and evaluation was presented.
7. Preparation of a programme for a 2 day seminar on "development of printing and packaging for export promotion "; for the Iraqi chambers of commerce and industry federation.
8. Holding a one day seminar in the Baghdad chamber of commerce and industry on two subjects:
 - a. Evaluation and the consultant's view on printing and packaging in Iraq.
 - b. Other experiences on export promotion and export constraints with emphasis on the Egyptian experience on exportation of fresh fruits and vegetables.
9. Printing Education

On request from the technological education organisation, the consultant studied the syllabi currently used in the Inst. of technology , printing Dept. Modifications were proposed and syllabi for new five courses were prepared and discussed (printing & packaging materials, design for printing , printing technology, Applied chemistry , applied physics.).

LIST OF COMPANIES AND ORGANISATIONS INTERVIEWED

SOCIALIST SECTOR

1. Cigarette and Tobacco Co.
2. Vegetable oil Co.
3. Dar AlHoreya printing & publishing Co.
4. Paper Industries Co. (Lecture book plant).
5. Dar Afak ArAbeyya for printing
6. Dairy Products Co.
7. Glass manufacturing Co.
8. Medicine & Pharmaceuticals Co.
9. Ministry of Industry (Various Dpts.)
10. Baghdad chamber of commerce and industry
11. Iraqi chambers of commerce and industry federation
12. Academy of fine arts (Graphics dept.)
13. Ministry of Higher Education press
14. Ministry of Education Press
15. Technological Institutes Organisation
16. Institute of Tecnology (printing Dept)
17. Arab Industrial development organisation
18. Arab Food industries federation
19. Arab paper industries federation
20. Standardisation and quality control organization

MIXED SECTOR

1. Modern paints Co.
2. Iraqi corrugated board Co.
3. National chemical and plastics industries Co.

PRIVATE SECTOR

1. Iraqi Co. for technical printing
2. National corrugated bord Co.
3. Iraq Co. for printing wrapping materials (Al Kailani)
4. Dalia Pastry and Confectionary co.
5. Middle east printing Co.
6. Al Rassafa press
7. Kanaan press
8. Al Faraj meat precessing co.
9. Al Nabil food packaging co.
10. Albunnia food precessing co.
11. United paints co.
12. Semiramis press.
13. Al Salam plastics co.
14. AL Rawi press
15. Soham foodstuffs co.
16. Adhesive tape co.
17. Ashpilia press
18. Aldar Al Arabeyya printing co.
19. Al Adeeb press.

RECOMMENDATION FOR THE MODIFICATIONS OF THE SYLLABI
OF THE INSTITUTE OF TECHNOLOGY (PRINTING DEPT.)

GENERAL COMMENTS

1. The following basic science courses must be included :
Applied chemistry 1H+1H weekly, first and second year
Applied physics 1H+1H weekly , first and second year
Electricity & electronics 1H+1H weekly , first and second years.
2. The following specialised courses must be included :
Printing and packaging materials
3H+2H weekly, first & second Year
Design for production
3H+2H weekly, second Year
Printing tecnology
3H+3H weekly, first & second Year
3. Number of hours allocated for Engineering drawing , computer , maintenance , quality control are a bit excessive and can be reduced , for the benefit of new courses proposed.
4. In the quality control course of the prevailing syllabus, the following measurements need to be added:
Ink dispresion
Paper weight (grammage)
Paper smoothness
Examination of paper under the microscope.

A DETAILED COMPREHENSIVE SYLLABUS FOR FIVE COUR AS
PER ITEM 1&2 ABOVE WERE DELIVERED TO THE DEPARTMENT
UPON THEIR REQUEST (13PAGES).