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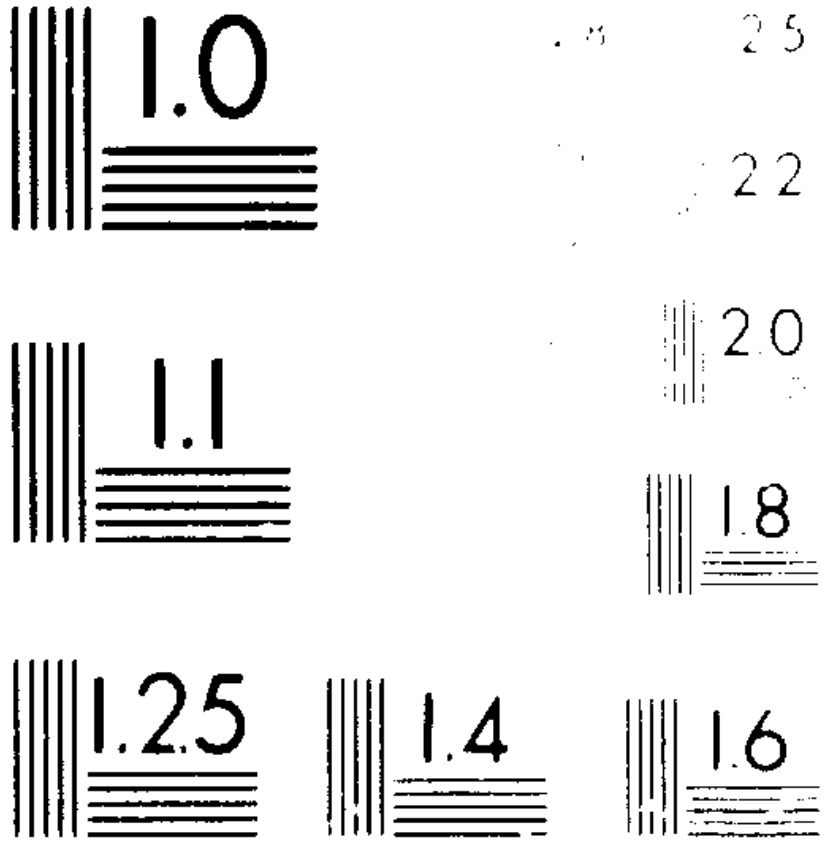
UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna International Centre, P.O. Box 300, 1400 Vienna, Austria
Tel: (+43-1) 26026-0 · www.unido.org · unido@unido.org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# ASSISTANCE TO THE DEVELOPMENT OF SMALL INDUSTRY IN INDONESIA

## ( PROYECT DP/INS/78/078 )

DEPARTEMEN PERINDUSTRIAN

DIREKTORAT JENDERAL INDUSTRI KECIL

PROJECT INS/78/078

Indonesia

# Terminal Report of UNIDO Packaging Consultant

by

GUY CHEVALLIER
(UNIDO Packaging Expert)

This Report has been
cleared by UNIDO

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# 1. SUMMARY

This report concerns the 3 months mission of the Consultant in Packaging on Project DP/INS/78/078. The objective of the mission was to examine the situation of packaging in the small scale industries and make recommendations in relation with the government program for their development and promotion.

- In terms of packaging it is necessary tomake a distinction between :
  - The very small industry (90% of the 1.4 million entrepreneurs) which sells its products locally, and is using packaging to the scale of operation and needs.
  - The growing and more active entrepreneurs; to secure their development they have to improve their packaging practices.
- Eventhough all appropriate packaging is available in the country, small scale entrepreneurs are having great difficulty in solving their packaging problems - cost and size of minimum order for manufacturing and printing is the major problem. Most packaging manufactures are operating or a scale which does not correspond to the packaging need of the small scale industry. Simple packaging equipment are very difficult to find.
- This situation creates great opportunities for developing a small scale packaging industry which will be able to operate and deal successfully with the appropriate quantities needed, or produce simple packaging equipment with adequate performances and at a cost which the small scale entrepreneurs can afford.

- The establishment of a National Packaging Institute is essential to assist the small scale industry in solving their packaging problems. The Institute should coordinate research on improving the uses of locally available materials.

- The training of personnel in basic packaging technics is also strongly recommended. Attached to the Kanwil District or Regional offices, they will be the link between the small scale entrepreneurs, the packaging Institute and other research institution competent in solving complex packaging problems.

- Appropriate packaging will help reduce and prevent waste. From that aspect only, it will play a major role in increasing the contribution of the small scale industry in the industrial development of Indonesia.

## II. C O N T E N T

## III. PROGRAM OF THE MISSION

### A. Job description DP/INS/78/078/11.54/313.L

Purpose of Project : To assist the Government in the planning and implementation of various programmes for the development of Small Industry, the establishment of Mini Industrial Estate and the formulation of policies and incentives for the promotion of Small Scale Industries.

D u t i e s : Under the Supervision of the Team Leader, the Consultant will be specifically expected to :

a. Review the packaging practices followed in the small sector in the country.

b. Suggest innovations in the traditional practices.

c. Recommend the utilisation of locally available materials for packaging.

d. Identify the necessary industrial support for the production of packaging materials.

### B. Selection of products

Considering the great variety of activities of the small scale industries it was agreed at the request of DJIK (Directorate General for Small Scale Industries) to focus the study on the food industry and the following products :

- Emping : a chip made from crushed soya beans
- Krupuk : a different type of chip sold either cooked or not cooked
- Tempe : a soya bean cake, still fermenting, sold to be fried
- Kecap : a soy based sauce
- Sambel : a hot spicy paste
- Dodol, and Jenang : dried spiced meat
- Mie : noodles
- Trasi : a shrimp based paste for cooking
- Gula kelapa : coconut sugar
- Geplak : coconut based confectionary
- Tahu : soy cakes
- Minuman : soft drink
- Jamu : medicinal herbs and paste.

All products are basic food products widely available in Indonesia. Some varieties are specific of a region and not always available outside the area of production.

## C. Visits and contacts

It was agreed that the programme of work would include :

- Visits of factories manufacturing the products,
- Visits of traditional markets and supermarkets,
- Contacts with trading agents,
- Visits of packaging manufacturers,
- Contacts with government departments and institutions involved in research concerning the processing, packaging and promotion of the products,
- Contacts with professional organisations.

## IV. CONCLUSIONS AND RECOMMENDATION

Eventhough every aspect of the mission objectives and program were covered, the investigation was limited in the number of factories visited. It is therefore difficult to appreciate whether those selected for visits were representative of a general situation for a given product. Except for several cases which were throughly analysed, conclusions and recommendation are based on what was found to be similar in the small scale food industry regardless of the product manufactured.

### A. CONCLUSIONS

1. Concerning the packaging practices in the small scale industry.
   It is necessary to distinguish between :

   a. The very small factories (90% of the 1.4 million entrepreneurs). Selling their product locally on a day to day basis and operating on a cash basis, they can only used whatever standard packaging is available. For these entrepreneurs others factors of development have to be dealt with before they will have to face packaging problems.

   b. The growing and more active entrepreneurs. (10%)
   As their production increases and exceeds the demand of the local markets, they are facing distribution problems and have to improve their packaging practices. The difficulty they meet come from :

   - Packaging being approached as an isolated operation, rather than a part of manufacturing and marketing.
   - Lack of information available on packaging technics, material characteristics, leading to the improper uses of packaging.

- The very imited added-value of product does not allow for the necessary increase of packaging cost.
- In many cases, product will have to be modified to meet the requirements of appropriate packaging.

2. Concerning the packaging industry.

All appropriate packaging is available in the country. However, concentrated within the large industrial area, most manufacturers of packaging are operating on a scale which is inappropriate for the limited needs of the small scale factories. Packaging is therefore only available through agents or converters not competent to provide technical assistance in the use of proper material and equipment. Whenever improvement is needed, the small scale factories are, therefore, having great difficulties in solving their packaging problems.

3. Concerning the role of packaging in the development of the small scale industries.

A high percentage of the production is or will be wasted due to improper packaging. From that aspect only packaging will play a major role in increasing the contribution of the small scale industry to the general industrial development of the country.

## B. RECOMMENDATIONS

In addition to recommendations made during factory visits on specific packaging problems (See : pages 19 to 25) the following recommendations deal with the interrelation of packaging with other aspects of the development of the small scale industry.

1. Development of cooperative Packaging facilities

Since the scale of operation of most entrepreneurs (conclusion 1 - a) is too small to accomodate packaging improvements it is quite feasible to consider the development of packaging facilities on a cooperative basis.

- either manufacturers will bring their goods to be packed;
- eventually small mobile packaging units will come to the factory. This means that goods can be stored unpackaged without deteriorating.

It may be difficult for some food products but quite feasible for nonperishable goods.
Such cooperative facilities would be quite appropriate in the packaging for retail of tempe, kripik, krupuk, emping, requiring the same type of packaging. Manufacturers will have to standardised their production particularly in term of shapes and sizes, and packaging will not be personalised.

The type of equipment required depends on the product to be packed, the volume of production, size of the retail packaging.

NB Aside from making appropriate packaging available to this very small scale business, the cooperative system will also be a good way to improve quality of products, production methods and enforce elementary hygienic rules for food processing. Strict control will have to be imposed in order to guarantee the quality of the cooperative production, which should be widely advertised and promoted using modern marketing technics. It would be quite appropriate to develop a logo for all commodities are produced by the cooperative syatem, also when enough commodities are produced, to develop a direct distribution system similar to the franchising system.

2. Assistance to the small scale entrepreneurs in dealing with their packaging problem

Most small scale entrepreneurs are unable to solve their

packaging problems alone. They need advice. To increase the competence of the personnel of DJIK (Directorate general for Small Scale Industry) the Kanwil offices, or the specialized institute, the Department should include a long range training programme in basic packaging technics in its programme of assistance to the development of the small scale industry. Competence is needed at all levels but mostly at the field level (Kanwil offices) where direct contact can be established with the small scale industries, and on the spot analysis can be made.
The type of advice needed are :

- packaging material to be used
- shape, size and technical characteristics of above.
- name and address of nearest material suppliers
- machine and equipment needed; nearest suppliers
- organisation of packaging facilities
- legal requirements for graphic design

Properly trained personnel (see annex 1) would be competent in solving basic packaging problems, and the Kanwil office of each province would be in a position to offer direct consultancy services to small scale entrepreneurs. Whenever confronted by complex packaging problems they would refer to proper research institute, operating at a higher level of competence.

Such a training program could be organised within the Institute of Technology Bandung, which could easily create a Packaging Department.

See Annex I.

3. The development of a small scale packaging industry

3.1. Since the small scale industries can not be expected to meet the requirement of the large packaging manufacturers, it is necessary to help in the development of a packaging industry operating on the same small scale. This industry will consist essentially of converters able to produce locally small quantities of standard or personalised packaging, from raw material or semi finished product (carboard, corrugated board, complex plastic film etc.)

3.2. Such an industry can operate within the financial scope of small scale industry (Rp 70.000.000. maximum investment in equipment). However such activity is not labour intensive and it might be difficult to meet the requirement regarding the maximum investment per employee (Rp 700.000)

3.3. Organised and operating with the advice and technical assistance of raw material manufacturers as independent or affiliated company this industry would be a good outlet for manufacturers of packaging machines produced in the country. Also considering that there is 1.4 million of small scale enterprises, if only 5% will need to use some in house packaging facilities the manufacturing of 70.000 simple packing machines of different kinds represents a very significant activity in mechanical engineering. It is therefore strongly recommended that appropriate action be taken by the Department of Industry to include the development of a small scale packaging Industry in REPELITA IV.
(See page ...36.....to ....39....).

4. Manufacturing packaging with locally available material

This is a totally unexplored field with definite possibilities, particularly with the use of bamboo. Basket weavers have been traditional suppliers of shipping packaging; the activity is dying out not because lack of raw material or weavers but because packaging shapes, size, are no longer adapted to needs and weavers are enable to create new designs. If given proper guidance they could largely contribute to the manufacturing of proper packaging particularly if some other materials are introduceed to produce suitable items. (See detailed recommendation page 40, NB).
However it was not clear where such research could be carried out; the most suitable would be an institution dealing with bamboo.

NB. During a visit made at the Fine Arts Department of the Institute of Technology Bandung, the possibility of studying such problems, as design assignment for students, was discussed and received very favourably. The Institute would also be a very appropriate place to organise a more general workshop on the use of locally available material for packaging. Such workshop have already been done on other subjects in collaboration with experts specially invited for the occasion. A two weeks workshop held in 1981 on bamboo furniture design was particularly successfull. If UNIDO or UNDP would make funds available to deal with this matter ITB would certainly be able to make the best of it. (See Annex I)

5. Creation of a Packaging Institute

The need of this institute is so evident and has already been mentioned so often that it is hardly necessary to make the recommendation. Its creation would certainly be extremely valuable to the small scale industries in solving their packaging problems.

Consultancy services, collecting and making available up to date information, organising seminar are the priorities in activities of the Institute.

## V. PACKAGING PRACTICES

### A. Three typical Case-Studies

During the visit several identical situations were witnessed. The following cases are analysed to show the interelation of packaging with other aspects of business development. They are examples of situations where a manufacturing process or a product has to be modified to either :

- increase production
- reduce manufacturing costs
- improve quality
- meet packaging requirements.

These packaging requirements being generated by the distribution of the product on a wider scale itself imposed by the increased production.

#### 1. The Production of Salt (Semarang factory)

Eventhough this is not a small scale factory, its operation depends on a great number of family dwellings established in the city suburbs and producing the salt. The rough salt is taken to the factory to be, cleaned, processed into blocks, packed and sold to the trade.
Traditionally, salt is sold in solid blocks 6 x 6 x 4,5 cm, the reason for this was not very clear; it can be assumed that due to uncontroled moisture content volume was considered a more accurate measure than weight. The blocks are packed by hand into opaque polyethylene plastic bags (2 colours printing) closed by staples, containing 12 or 14 blocks. It then forms

a block 54 x 12 x 12 cm, stored on the floor in large stacks, up to 2 meters high. The delivery to dealers is done by trucks; the packages are loaded by hand directly on the truck platform without any protection. The packaging system is totally inappropriate. During all the handling up to storage, many bags are cracked, torn, slit-open eventhough some sorting is made at the loading stage, many bags leave the factory in damaged condition. The amount of additional damage occuring during transportation was not given, as the factory is not responsible for delivery. The selling price (Rp. 60,-/kg) is based on an average loss per shipment, accepted as normal.

Recommendation

This is a typical situation where a traditional product presentation is incompatible with a technically and financially appropriate packaging solution. For the blocks, a much more sensible solution would be to generalise a packaging the factory is using only an special order. The salt is packed loose in sealed retail unit plastic bags (200 gr) themselves assembled into shipping units (large polyethylene plastic bags).

- cost of block making operation,
- maintenance of block making machines,
- value of damage plastic bags and their replacement,
- value of packing and repacking of the damaged bags,
- value of lost product and of its replacements.

The filling of the retail unit should be done mechanically for better accuracy and performance, the hand-labour available being used in other duties within the factory. As production would certainly increase and saving could be achieved the salt, a product of first necessity, would be made available at a lower piece. If more appropriate, savings and hand labour made available by the changes, could be used in upgrading the product or on developing some new refined products.

2. The Manufacturing of Coconut Sugar (near Semarang)

It is a cottage activity. The "Juice" is collected into bamboo containers attached to the trees after the "flower" has been cut. Full containers are taken down every day and replaced. The liquid collected is cooked (4 hours) in a deep pan containing up to 10 litres (2 trees collection) to give approximately 2 kg of sugar. When hardening it is quickly scooped into molds, to make solid blocks of unequal sizes and shapes sold at Rp 450,- per kg. The packaging of the sugar blocks into printed plastic bags (with or without a hard paper as stiffener) folded and stapled, if adequate for delivery to the nearby market, is in appropriate for distribution to far away wholesaler. (same problem as salt) A suitable packaging (a carboard box for 1 Kg and a skrink wrapping of 30 Kg loads maximum) would be far too expensive and complex to be adopted at the cottage level. It would also required manufacturing more regular sugar blocks.

This is a typical situation where a finished product has to be modified in order to be packed at an acceptable cost, to face the distribution problem.

Recommendation

Considering the figures given during the visit the village production would be :

- number of trees : 4.000
- number of peoples involved : 300
- average daily collection per tree : 4 to 5 litres
- average sugar equivalent per tree : 1 Kg
- total production of sugar : 4.000 Kg
- average value of sugar : Rp.500,-
- total gross income : Rp.2.000.000,-
- average gross income per person : Rp.7.000,-

NB.

These figures are certainly optimistic; also the cost of manufacturing was not given, not was it very clear whether

The production was constant throughout the year.

The volume of production is significant enough to study another production system for a very basic traditional product. The processing of the "Juice" being done by a cooperative factory rather than by individuals in their cottage. With more adequate processing equipment, the quality of the product, the cost of manufacturing, the amount of sugar produced ( a significant percentage is lost in the moulding operation) would increase. Packaging facilities would also be part of the collective system, and assuming the product is economically sound the improvement and the scale of operation of the factory (4tons a day if the figures are accurate) would certainly offer new market opportunities. With a conveniently located factory the change would not upset the living pattern of the village. In the actual set up, it is hardly conceivable that the making of coconut sugar can remain a profitable activity as a cottage industry.

3. The Lestari Factory (Jakarta)

This is one of the largest small scale manufacturers of snack food, chips and crackers in Jakarta. The factory has enjoyed a steady growth since it was established 10 years ago. It employs 90 to 100 people and its products are well received by the trade.

Two types of packaging are used for chips and crackers :

- a returnable containers holding an average of 150 crackers, sold to the trade @ Rp.3500,- (± 1500 for the container if not returned or damaged by the retailers). This containers is used in local market for bulk sales.
- retail unit polyprophylene bags (10 microns) in several sizes. Some product are vacuum packed, others just sealed in the bag (over the flame of a kerosene lamp). The bags are transparent without printing, a printed label bearing the name "Lestari" and the factory registration number is

put inside the bag. As the chips are still quite oily, the label is put inside another plastic bag to avoid oil stains.

NB.: The vacuum packing is used to lock the very brittle chips in the bag. It is also said to increase the shelf life of the content.

Some contacts have been made for export but the Management is reluctant to follow-up until the following problems have been solved.

- The crackers and chips are very brittle, their shapes is uneven and they require a large volume for packing.
- The shelf life is not guaranteed over two months if vacuum packed.
- The product is still quite oily at the packing stage.

The manager has already approached DJIK for assistance in the development of the business, as well as advice for better packaging.

Recommendation

- Request from the appropriate food processing laboratories of tests to determine the exact shelf life of the product under normal and vacuum packed conditions.
- If less than a year, request recommendation for correct preservative to be used to obtain this target.
- Find means to improve the shape, regularity & smoothness of chips and crackers to facilitate packing operation.

Regarding packaging the research will depend on whether or not the products have to be vacuum packed to reach proper shelf life.

1). If vacuum pack is required :

   a. For domestic market : eliminate label and use two colour printed O.P.P. (Oriented polyprophylene) bags in appropriate sizes.

b. For export : use thiner plain plastic bag and place into 4 colour printed carboard box wrapped in OPP Ship in one or two standardised size corrugated cartons.

NB.: Study various types of arrangement of products in relation with box sizes value of retail package.

2). If vacuum pack is not required, there will be a great number of possibilities the more suitable would be :

For crackers : Use a thermo-formed plastic container to stack an appropriate number of crackers to 2,3 or 4 stacks to be either wrapped automatically with OPP.film, or other flexible material or if preferable for export place into 4 colour printing card board box (stacking operation to be done by hand).

For all other products: contact importers of appropriate filing machines using flexible packaging material (OPP) and request feasibility study and quotation for equipment and flexible material.

N.B.: The Management should be aware of the complexity of exporting food stuff to some countries where Food & Drug Regulation are very strict. Proper inquiries to NAFED or commercial Attache of Indonesian Embassy abroad should be made before taking decision enter this highly competitive market. As these packaging improvements will probably increase the manufacturing cost, the management should consider improving the organisation of the factory to reduce production cost. For instance, a built in stove system with the appropriate number of burners would certainly reduce the amount of fuel used in the cooking by individual stoves.

Regarding the graphic design of transparent plastic bags it is always better to print the back of the bag in order to give a colour background for the product.

## B. Visits of small scale food factories

### 1. Guideline for factory visits

1.1. Product manufactured :
Date of Visits :
Name & address of factory :
Name of position of person interviewed :

1.2. Monthly/yearly production : - volume
- Rp

1.3. Number of people employed : - total
- packaging
- bulk
- shipping
- retail

Material
Manufacturers/agent :
Volume bought/year/months :
Total cost of packaging and packaging operations
% against manufacturing cost
Equipment and amount invested

1.4. Distribution of product
Made of payment

1.5. Product health registration No.
Control

1.6. Major Packaging problem witnessed
origin of problem
Solution available/possibilities of improvement, recommendation

1.7. Need for advice in packaging

## 2. V I S I T S

2.1. Product : KECAP Brand Name: "KORMA"
N a m e : Husen Ibrahim
Location : Jakarta Selatan

Small factory, employing 8 people and producing 600 bottles a day, representing a turnover of 450.000 Rp. per day. The cost of packaging (bottles, label, cap) is 16% of the price of the finished product. The bottle is standard beer bottle, (used bottles bought from street collectors). the cap is also standard. The label is of an original design. Some export to Saudi Arabia in 12 bottles cartons with special design of carton and label (15.000 bottles a year)

Possibility of Improvement:

The bottle is unnecessarily heavy since designed for beer. Since used bottles are cheap (100 Rp/bottles) and the packaging is still will accepted there is no real need for improvement for the domestic market.

For export the situation is different.

- weight of empty glass bottle : 600 gr.
- total weight of empty glass per shipment/year : 9.000 gr.

Since the product does not require to be packed into such a strong bottle, it would be logical to look for a lighter bottle. A plastic container would weight less the 100 gr reducing the weight of shipment by 7,500 kg - Eventhough the plastic bottle would be more expensive, considerable saving would be made in shipping cost. The difficulty consist in finding a manufacturer which can produce or sales 15.000 bottles a year.
The most common minimum order is 1 million bottles representing 7 years supply, an investment totally out proportion for the scale of the business.

2.3. Product : TEMPE Brand Name : "NONE"

N a m e : Kilang Tempe

Location : Jakarta Selatan

Very small operation producing 175 kg/day. Tempe is packed in perforated plastic bag (to allow fermentation) hand sealed over a flame; delivered to near market in basket on a bicycle.

Possibility of Improvement None in the actual size and type of operation

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2.4. Product : T A H U Brand Name : "NONE"

N a me : Kilang Tahu "Tegal Pasang"

Location : Jakarta Selatan

Small factory employing two shifts of 9 people, producing an average of 600 Kg of Tahu per day (90 tahu cakes/Kg), processing is done by hand.
The Tahu cakes being formed in a cloth and a wooden mold.

Possibility of Improvement. None in the actual scale of operation, which can not be improved within the production set up.

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2.5. Product : T A H U Brand Name : Tahu Sumedang

N a m e : S.M.D. Tahu Factory

Location : Jakarta Pusat

This factory employs 25 people and produces an average of 1000 Kg of Tahu per day. It is sold by an "Armada" of 370 small cooking units wandering through the street; capacity could be increased, but the manager is not interested in developing its activities to include selling to markets.

2.6. Product : GEPLAK — Brand Name :

N a m e : Bantul tahun 1921 — Mbok Pawirodinomo

Location : Yogyakarta

This small family business employs 5 people and produces 100 Kg of geplak per day in various flavours. It is sold directly from the factory at an average of 1.200 Rp/ Kg. It is a high quality and expensive product. In order to keep its taste unspoiled, the product has to "breathe", it is packed in a small woven bamboo basket, with a cover tied by a plastic string holding a printed label.

The factory could produce more but is faced with a problem of counterfeit; apparently competitorsare copying the label to sale lower quality geplak.
Until this problem is solved, the product will be sold only at the factory.
The packaging is quite adequate for this type of operation.

Possible Improvement : Several suggestions were made to solve the counterfeiting problem particularly a product with an original and personalised shape difficult to imitate. A more standardised shape would help in solving the packaging problem requiring a more rigid packaging. The bamboo basket being quite appropriate and manufactured locally, it is just a mater of improving the existing, as seen for similar products in the market.

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2.7. Product : EMPING
Name : Not given
Location : Small village near Yogyakarta

Emping are manufatured in a large number of house around the village. One house is gathering the production of its neighbours which is shipped or picked up bulk by wholesalers and sold from bulk, or prepacked.

Possible Improvement. None in the actual set up, the waste which does not exceed 1,5% is difficult to reduce due to the condition of handling.

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Recommendation : The manufacturer should deal with a finished product shipped pre-packed in retail unit (small PVC vacuum formed trays). This can be done on a cooperative system to be set up with Kanwil assistance.
A slight increase of cost might be expected for a better packaging.

Apparently wholesalers justify their high profit by the finishing operation and are reluctant to buy a finished product at a higher price. It will take a strong cooperative to change the situation and get a better share of the wholesalers price.

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2.8. Product : A B O N (dried spice meet)
N a m e : KOPTI (cooperative)
Location : Near Yogyakarta

Actually made only to order an a small scale basis. A factory is expected to start operation in 1984. The proposed packaging appears to be adequate.

Possible Improvement . On the graphics for better product identification; better sealing required.

2.9. Product : PRECOOKED FISH
N a m e : Bandeng PRESTO
Location : Semarang

Small shop processing 100 Kg of seafish (approximately 400 fishes) a day. Displayed unpacked an a piece of cardboard the fish is put into a plastic bag (4 colour printing), then in a take-away cardboard box if the purchase is more than 2 fishes. Vacuum packing has been unsuccessfully tried. Sold at 4.000 Rp/Kg.

Recommendation. Try vacuum packaging with a foil laminated cardboard to hold the fish. This should extend the shelf life to 3 weeks or more, opening up the market range and volume of sales actually limited because very short shelf life. The cardboard box does not seem necessary and should be replaced by a stronger box (corrugated) for delivery to retail shops. (to hold 20 to 30 fishes)

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2.10. Product : YOGHURT Brand Name : COLOMBIA
N a m e : Colombia Milk
Location : Bandung

This factory producing Yoghurt,ice cream and milk flavored drinks, has solved its packaging problem adequately. It is facing a market development problem : as the products are not of first necessity they are not readily accepted - the factory could triple its production if the market would accept it.
The possible improvements in the packaging would bear little consequence in solving the marketing problem.

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2.11. Product : D O D O L Brand Name : PICNIC
N a m e : Herlinah
Location : Garut

Herlinah is very good example of a home industry activity developed into a medium size industry which has well integrated all its manufacturing and packaging needs, for a nation wide distribution. The latest packaging created uses very up to date packaging material.
Some improvement and saving are possible in the manufacturing of the shipping crates, but the major problem is the extension of the product shelf life. Apparently

packaging can do little to solve the problem which will be solved by a bio-chemical study of the origin of the product degradation.

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2.12. Product : D O D O L Brand Name : "SARINAH"

N a m e : Dodol Garut "Sarinah"

Location : Garut

The factory, smaller than "Herlinah" and employing 62 persons, is facing same distribution problem. The product is sold mostly at festive season, and since the shelf life is estimated at 2 months, the factory has a very uneven activity.
The packaging is quite adequate.

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2.13. Product : POTATO CHIPS Brand Name :

N a m e : PT. KMELLO

Location : Bandung

The factory is facing some serious difficulties for several reasons, including some packaging problem.

Recommendation :

The management should study the possibility of investing into a filling machine capable of packaging the chips as soon as dried, and look for another manufacturer of plastic bags (OPP preferably). It is essential to eliminate the storage of unpacked chips.

## C. Visits of Medium and Large Scale Factories

These visits were made through invitation by the factory management met during the 10th Asean Packaging Congress, Indo-Pack 83 Exhibition and/or other occasions.

### SARIMI INSTANT NOODLES FACTORY JAKARTA

1.000 employees.

The processing of the noodles is totally mechanised, including the packaging into sealed 4 colour printed plastic film wrapping. The rest of the packing operation in corrugated carton (20 packs per carton), closed with paper tape, is done by hand 3 cartons are strappled together then stacked.

The strapping is done so as to facilitate handling done by hand (storage, delivery) ; pallets are not used as no forks lift is available or vice versa.

Problems occure after the strapping operation :

- Irregular tension of strap.

  too loose : The 3 cartons are not properly lined up.
  too tight : The cartons are torn at the edges
  origin of problem : The gloved hands of the operator sometime caught by the strap.

- Very high (3 to 4 meters) and irregular stacking of boxes.

Otherwise a very well organised production of a well packaged product; some possible improvement in graphics design and printing of film.

### MUSTIKA RATU

This medium sized company manufacturers cosmectics, and process

herbs to manufacture traditional medicinal products (JAMU). It employs 200 people mostly involved in the packaging of the products (75 cosmetic products, 75 medicinal products).

The major problems faced in the packaging come from :

- Poor packaging manufacturing mostly due to the quality of the raw materials (card board).

- Unskilled labour and poor working conditions. (Light, work bench, tools etc.)

Thus the packaging does not meet the requirements of the international market, nor can the presentation of the products complete locally with that of imported products. Improvements of packaging would certainly upgrade the products which seem also to require other technical improvements such as homogeneity, smoothness, finer grinding, etc. Great need for better graphics.

## D. Visit of traditional markets

Three markets were visited in Jakarta :

- Pasar Senen Market
- Jati Negara Market
- Blok M Market

They were selected as representative of the most common means of distribution of the small scale food industries production. These very crowded markets are made of small booths or shops averaging 3 to 5 square meters loaded with precariously stacked goods. In some cases the goods bought in bulk are packed on the spot in retail packaging.

Chips (Emping, Krupuk, Keripik)

- Mostly presented in transparent non - printed plastic bags, sometime with a paper label inside.
- The plastic bags are either sealed, stapled or tied with a string.
- Most of the time there is no product/manufacturer identification.
- The shelf- life seldom exceeds a few days, which corresponds to the limited storage space in the booths.

Dodol

- A traditional confectionary also called Jenang, Found in a great variety of size and shpaes, mostly packed in cellophane or plastic film tied with strings or rubber band.

- Two large factories (Herlinahs & Sarinah) pack their products in cardboard boxes and cellophane wrapping quite attractively and sold at almost the same price/ Kg. as the can attractive packaging.

Noodles and Macaronis

- A mixture of presentations in plastic bags. Some printed but mostly without indication of content or manufacturer.

- Some instant noodles very adequately packed (See visit of Sarimi factory).

Tahu

No packaging. The product is bought from factories and displayed in old 10 litres tin cans plastic buckets.

Abon and Dendeng

- Dried spiced meat presented in large flat piece (dendeng) or somewhat grounded (abon).

. Packed in sealed or stapled plastic bags either printed or plain with a label inside with very limited information on product and manufacturers.

Kecap

. A soy sauce presented in 350 cl beer bottle with a colour printed label.

. Limited information on ingredients and manufaturer.

Sambel

. A red pepper based sauce, presented in 25 cl glass jar; poor plastic closure, sealed with paper label, around the cap.

. No product identification.

Tempe

. Cracked soya beans inbedded into a fermenting paste

. No Packaging.

Gula Kelapa

. Coconut sugar presented in cylindrical cakes averaging 100 gr, packed for shipping in wooden crates lined with plastic film.
Sold unwrapped, and packed in plastic bag or newspaper by vendor, after purchase.

Minuman

. Drinks of various kind presented in transparent plain plastic bags tied with rubber land.
No product/manufacturer identification.

Jamu

. Herbs and medicinal product presented either in plastic bags (closed by staples) paper bags (closed with glue) or card board boxes wrapped in cellophane.

. These traditional products are very attractively arranged in the transparent plastic bags, but the closure by the staples is inappropriate. This presentation appears to be done in the retail shop.

Terasi A shrimp or fish paste. Presented as cakes of various sizes and weight (up to 125 gr), most of the time packed with : cellophane wrapping, banana leaves, rubber band and printed paper sleeve.
Limited product/manufacturer identification.

## E. Visit of Supermarket

Eventhough they represent a small percentage of sales is food products (estimated at 8 to 10 %), the visits were made to compare packaging and display of food products with that of traditional markets. Both are definitely of a higher quality, mainly due to a greater competition with imported products, or products made in Indonesia under licenses or with technical assistance of foreign companies (SARIMI Instant Noodles).

Yet many locally produced item packed for export market are found in these Supermarkets. They lack impact and quality (poorly sealed plastic film, stained labels on bottles, stapled cardboard boxes etc.). Product and manufacturer identification is incomplete and not in accordance with domestic or international legislation. Some basic food products are not found in Supermarket (tahu, tempe, gula kelapa) either because of lack of proper packaging for shelf display or because of too short shelf live. Eventhough some of the prices of the selected products are almost identical to that in traditional markets, Supermarket are considered as displaying better quality products, due to the presence of imported items. Access to Supermarket is of little significance to the small scale food factories visited, which would rather remain within the distribution system of traditional market.

## F. Other Products

Products : CERAMICS
Name of factory : Kasongan Ceramic Center
Location : Kasongan Village (near Yogyakarta)

The Kasongan Ceramic Centre is composed of 216 craftsmen doing a specific type of ceramic figures quite popular - Each item is shipped to wholesalers who redistribute to retailer which display the items unpacked - some sales are directly done at the factory. In both cases, the items is packed after purchase to be carried by customer.

The shipping package combines a rough wooden frame in which an used corrugated carton is fitted top and bottom unfolded rice straw is used as filler depending on the care given to packing and handling the breakage % varies from 0 % to 25 % but most of the time remaining at an average of 5 %.

Possible improvement. Several suggestion were made, including returnable knock down containers with possible partition. As the goods are sold C.I.F. it was estimated that the cost of transport of empty crates back to the factory would exceed the value of breakage and therefore would increase the price; the suggestion was rejected without further analysis.

Recommendations : Improve the existing packaging by :

- requesting a better build frame (stronger pieces of wood, vertical members to be put outside the frame, double cross-bracing, using staples rather than nails)
- wrap the more vulnerable piece with long stretch of twisted straw, eventually wrapped in old newspaper.
- study the possible replacing of the rice straw by wood straw.

The single unit retail packaging. During the visit the question of replacing the traditional bamboo basket and rice straw, used to carry item purchased at the factory was brought up.

Technically speaking, the most suitable solution would be corrugated boxes of various sizes; the cost will certainly be a draw back. The proposed filler (made from waste of rubber soles) would be appropriate if pieces are made much thinner.
Wood straw would be a better solution, if available at reasonable cost.

N.B.: This is in fact a typical case of the need of improvement of packaging made from locally available materials. Feasible solution can certainly be found, but the lack of structure to develop prototypes to be proposed to local manufacturers, makes the research extremely difficult to carry. In these traditional home activities considerable inertia is to be overcome.

## G. Visits to various organisation & Institution

N A F E D (Jakarta)

Meeting with : Mr. Malcom Benjamin, ITC
Senior Advisor on Export Management
Mr. M.A. Patty
Counterpart.

Operates within the Department of Trade Cooperatives and responsible, with ITC assistance, for the Integrated Export Development Project. Within this project very serious packaging problems to export products manufactured by Small Scale Industries.
ITC is scheduled to provide assistance in this matter.

PPMB. Quality Control Laboratory (Jakarta)

Meeting with : Mr. Herve Vialle, Engineer
Representative of CERLAB, Paris.

Mr. James H. Broadbent, Engineer
Tropical Products Institute
Representative of Overseas Developement
Administration, London.

The existing laboratory operating under the supervision of Mr. Broadbent is being extended to include facilities for quality control of :

- Plywood
- Lubricants
- Textiles
- Electrical Appliances
- Packaging (limited to 250 letres and 400 Kg)

It is scheduled to be completed and operating by mid 1984.
Mr. Vialle is coordinating this extension.

The packaging testing and quality control unit unfortunately is not yet scheduled to include a team of advisors and designers to implement improvements. At the request of PPMB, the French Government has sent an expert to study the packaging of fruits and vegetables : the report of his mission will soon be available.

PPMB. FOOD PROCESSING LABORATORY (Jakarta)

Meeting with Dr. Indah Darmawan

The needs for food packaging improvements were discussed from a hygienic and health point of view - for most of the products on the list, properly sealed packaging would improved shelf life, particularly emping and krupuk which lose their crispness rapidly ( 2-3 days). Tahu is not packed has a shelf life of 2-3 days; it could be 10 days or more if sealed and kept in cold storage. With more appropriate plastic films the shelf life of Abon and Dendeng could also be improved. (Use of OPP for instance)

NB.:

Concerning the shelf-life of food products it must be stated that its increase will upset the traditional market distribution system, which is now well balanced - the little amount of shelf space available allows for only a few days stock, which correspond to the average sale volume. Eventhough the factory has to distribute its daily output through a great number of shops (which is costly and time consuming) it allows for dealing on a cash basis. Unless shops specilise in one type of products larger shelf life will be necessary only to meet nation wide distribution or export.

FOOD TECHNOLOGY DEVELOPMENT CENTRE (Bogor)

Meeting with : Prof. Dr. F.G. Winarno and staff.
The visit of the laboratory indicates that there is all the equipment and staff to make necessary test on existing food products. However the fact that only 50% of the activity of

the laboratory is on request of private food industry indicate that connections with this sector has to be developed. No work done on packaging and its connection with shelf life. Very interesting development of small scale food processing equipments.

AGRICULTURAL PRODUCT PROCESSING PILOT PLANT (Bogor)

Meeting with : Dr. Ir. M. Aman Wirakarta Kusumah.

Some very significant experimenting in small and medium scale equipment for food processing. Due to lack of expertise little integration of packaging problems in the research done. Great awarness about the interaction of food packaging and processing which must be dealt together.

INSTITUTE FOR R & D OF AGRO BASED INDUSTRY (Bogor)

Meeting with : A. Basrah Enie
Atih S. Herman

Some concerne about the role of packaging in upgrading the quality of food product. Some study in connection with the processing of gula kelapa (coconut sugar), at a very preliminary stage due to lack of expertise and information on packaging technics.

CHEMICAL INDUSTRY R & D INSTITUTE

Meeting with : Drs. D. Karyadi Joyoatmojo

Mr. K. Joyoatmojo has been asked to establish a packaging research department within the Institute. A request for UNIDO assistance has been made. The role and capacity of this institute to handle packaging problem should be carefully analysed together with other government projects before scuh assistance is granted.

## VI. THE PRODUCTION OF PACKAGING

From figures given by the Department of Industry or collected from others sources it has been possible to establish the following production for each material.

| Material | Number of factory | Total capacity |
|---|---|---|
| - Corrugated Board | 35 | 240.000 T |
| - Flat Board | 10 | 60.000 T |
| - Large paper bags | (unknown) | 200 M Units (50 kg bags) |
| - Rigid Plastic containers | 40 | (unknown) |
| - Glass | 6 | 150 M Bottles |
| - Metal can/drums | 14 | 170.000 Tons |
| - Woven plastic bags (50 kg) | 12 | 132 M bags |
| - Just bags | 7 | 15 M bags |
| - Flexible plastic packaging | 18 | 30 M m2 |

It is however difficult to get a clear picture of the distribution of this capacity of production among manufacturers (large, medium and small scale). However through various contacts it is possible to assess than the packaging in Indonesia is mostly produced by large factories (corrugated board for instance) operating only at 50 % sometime 30 % of their capacity. Equipped to deal with large orders these factories are out of reach for the small scale manufacturers.

A. Operating at a small scale

The problem is how to find way to help the small scale industry in getting the packagings it needs, that is to say in the appropriate quantities.

1st Possibility - a) Develop more standard packaging particularly for food industry.

- flexible packaging
- rigid plastic containers
- glass containers (bottles and jars)
- corrugated cartons adapted to the above.

b) Increase the availability of this standard packaging, as well as material to be transformed into finished products through agents or small converters.

c) Organised manufacturing to deal with several orders together (for example printing of bags of different size and decor on the same roll).

a) will of course require the cooperation of the manufacturers and take sometime but is quite possible if based on international standards.

b) would enable small scale industry to have access locally to the standard material at a much lower price and agent could deal with printing problems.

c) would also reduce cost considerally.

2nd Possibility b and c would in fact lead to the development of a small scale packaging industry which appears to be badly needed. Able to deal locally with small orders, either independently or as subsidiary company affiliated to the large manufacturers, and operating under their technical guidance, they would :

- facilitate the contacts with the small scale entrepreneurs
- operate not as agent but as manufacturers converters, or finishers, with real competence
- keep close contact with the users.

B. Manufacturing the equipment

If such an activity is slow in developing it seems to be because appropriate equipment is difficult to find. The developed country offer mostly sophisticated equipment fully automatic, requiring raw material or semi finished product of a quality which is not yet really available. The most suitable equipment is being manufactured by other developing country (Taiwan for instance) but has not yet gained the reputation it deserves.

There is no reason for Indonesia to import simple and basic equipment which can be manufactured locally

The department of industry should therefore :

1. Clarify through appropriate statistical studies, the exact situation of the packaging industry.

2. Investigate the possibility of developing the local manufacturing of the following equipment :

- filing machine,
- wrapping machine,
- die-cutting machine (up to 1 m2)
- silk-screening of flat and circular surfaces,
- shrinkage tunnel and blowers,
- one cavity extrusion - blowing machine
- roto-flexo printing machine,
- hot stamping.

Considering that the required equipment will have to be robust, easy to maintain and be operated mostly mually.

3. Facilitate the establishment of joint venture with appropriate partner.

4. Request that appropriate training in this manufacturing discipline be made available (ITB).

C. The use of locally available material

Aside from one visit to a bamboo weaver, in connection with the manufacturing of packaging for Geplak in Yogyakarta, and discussion an the packaging of ceramics this aspect of the mission was not really investigated. From previous mission in South East Asia it was known to the expert that, eventhough very challenging and probably rich in possibilities, this vast field of investigation is not being attended to because :

- lack of structure for research
- difficulty to innovate and to overcome inertia in traditional way of making things
- This field of research draws little interest and does not stimulate researchers.
- the complexity of the task, and the possible outcome have so far discouraged those involved in this research where no significant results have emerged.

The following is taken from the talk of Johan Selin, Senior Advisers, Expert Packaging. ITC/Geneva at the 10th Asean Packaging Congress held in Jakarta during the mission.

"Possibilities may (.....) exist for the development/ adaptation of traditional packaging to the distribution requirement of developed industrialised countries, for instance by combining indigeneous raw materials with more modern packaging materials such as combination of wood and corrugated board, or of textile fibres and plastic film, etc.
Unfortunately very little development work is done to this end; the research is beyond the resources of the developing countries themselves and the subject itself is not of much interest to researchers in industrialised countries. Abandonment of such indigeneous packaging methode would (.....) have serious repercussion on the employment situation in rural areas.
It is essentially for this reason that a recommendation is made on this subject which does not seem to have, so far, received enough attention in Indonesia.

NB.: During the visit of the future PPMB quality control laboratory, the project manager mentioned a study made by an expert an the packaging of fruits and vegetables for domestic and export market. The most common packaging is a large bamboo basket, tronconic shape (for stacking when empty) and wide weaving. These baskets are always too full and hold as much as 50 to 80 kg of product.

The average % of waste is around 30%

1. Fruits and vegetables should not be packed in vertical shape but horizontal trays with strong structures for stacking.

2. Depending on the product the package should allow only 2 or 3 layers without protection (one only for very delicate fruits).

3. The size of the trays should be fixed so that it can be easily handle by one man, carrying one or several trays depending on the weight an appropriate size would probably be :

   60 cm x 15 cm. Trays size will have to be quite accurate for proper stacking.

ANNEXURE I

FURTHER UNIDO ASSISTANCE ON PACKAGING

1. Assistance in organising a Packaging Department within ITB (Institute of Technology Bandung)

Aside from occasional seminars and workshops, and a course in Packaging Design (given by ITB School of Fine Arts) training in Packaging discipline is not available in Indonesia. Considering that :

- advisers on basic packaging technics are needed
- various research institutes and government agencies could use more expertise in specialised packaging technics
- engineers are needed to design simple packaging machines and equipment
- the development of a Small Scale Packaging Industry will require technicians.

It is quite appropriate to consider the organising of a Packaging Department at ITB. The organisation of this department should be such that it could provide the training needed for :

- Basic Packaging Technics and Design
- Packaging Production & Maintenance (Technician)
- Packaging Engineering (Engineers)

This matter was discussed during a visit to ITB. The School Engineering considered the organisation of such a training quite possible. The School of Fine Arts answered quite possitively to organising seminars on specific packaging subjects (for example: the uses of plastics for better packaging and shelf life extension of processed food). Both schools however considered necessary for the faculty to acquire more expertise on the matters.

In connection with the recommendations 2 & 33, UNIDO (or UNDP) could provide ITB with :

- A Packaging Expert with experience in teaching to assist ITB in organising the department and the training of the faculty.

- Fellowships for the faculty to study abroad.

- Experts as guest lecturers for specialised workshops.

This may be done under an agreement that ITB would train every year selected DJIK personnel.

NB.: The French Government is involved in Technical Cooperation on several projects requiring expertise on packaging. During a meeting with the Counsellor for Scientific, Cultural Affairs and Technical Cooperation of the Embassy of France in Jakarta the above matters was discussed. The Counsellor was quite willing to examine the possibility of assistance to ITB in as much as the programme would be ofered to technicians of the projects the French Government is sponsoring.

As no such course exists in the neighbouring countries of South East Asia, this course could attract international participation if it concentrates on the problems of packaging in tropical countries. It would therefore be up to give this course at a level high enough to attract foreign students for both undergraduate and postgraduate work. As already mentioned (see page 11) ITB would be a very appropriate structure to do research on the use of locally available material - a problem common to all Sout East Asian Countries.

2. Packaging Institute

The UNIDO Project ID/DEV/PRO : "Assistance in developing a Packaging Development Centre", is still being discussed. Eventhough it has to be reviewed due to the recent evolution of the packaging industry (particularly number of experts and field of expertise), the structure of the project remains valid.

In discussing further this Project UNIDO should be aware of some recent initiatives and actions taken by some ministries (PPMB-Research and Technology), The Indonesia Packaging Federation, and the Chemical Research Institute. Pushing this project is a priority in regard to the development of the packaging industry; the following should be considered :

2.1. Whether the Packaging Institute should operate under the responsibility of the Department of Industry (to which the project has been presented) depends essentially on the mission to be assigned to the Institute.

2.2. In making the decision the following needs have to be taken into consideration :

a. The packaging industry has to be organised to better satisfy the packaging needs. (Development of a Small Scale Packaging Industry)

b. Quality standards have to be established and control facilities made available to manufacturers and users of packaging.
(included in PPMB Project).

c. Packaging testing facilities have also to be accessible to manufacturers and users (included in PPMB Project).

d. Advices on necessary improvements after testing will have to be provided.

d. Research on the use of locally available materials is urgently needed.

f. Up to date information on packaging technics, equipment, materials has to be centralised and distributed through library facilities, publications, lectures, seminar, training courses.

g. Consultancy services on packaging design and graphics to improve sales appeal for domestic and export market (including legislation) are also needed.

h. Curriculum for training and degrees in packaging disciplines have to be established.

2.3. Fulfilling all these needs, (except a) can be considered as the responsibility of a National Packaging Institute. It requires a complex organisation, considerable equipment, competent staff, and several years before efficient operation and results can be achieved.
Considering that urgent needs have to be satisfied it seems appropriate to develop and coordinate these activities with existing structures.

2.4. As several ministry are concerned the most appropriate solution would be as follows :

The Packaging Institute would be an independent professional organisation sponsored by all ministry concerned (Industry, Commerce, Research and Technology etc.), each financing the Institute operation. The Institute Management could propose a basic program of activities for one or two years with appropriate request for financing contributions. Project not included in the program (requested either from government

institutions or private enterprises) would be carried against additional budget or fees.

The management of the institute composed essentially of professional people would operate under the supervision of a board of Directors to include representative of the sponsors and the packaging industry.
To avoid delays in starting operation, the sponsors would make available or delegate the operation of their facilities until the Institute could house them or get its own when duplication would be more appropriate.

2.5. Packaging professionals should play a major role in this Institute. Considering that this was essential to the development of the Packaging Industry, the Indonesian Packaging Federation has taken the initiative of setting up a Packaging Institute as a private organisation, and is looking for funds to start effective operation. Considering the competence of the Indonesian Packaging Federation, UNIDO should make all necessary efforts toward the government recognition of this Packaging Institute as a very feasible counterpart and suggest that it should receive official government sponsorship for carrying the UNIDO Project.