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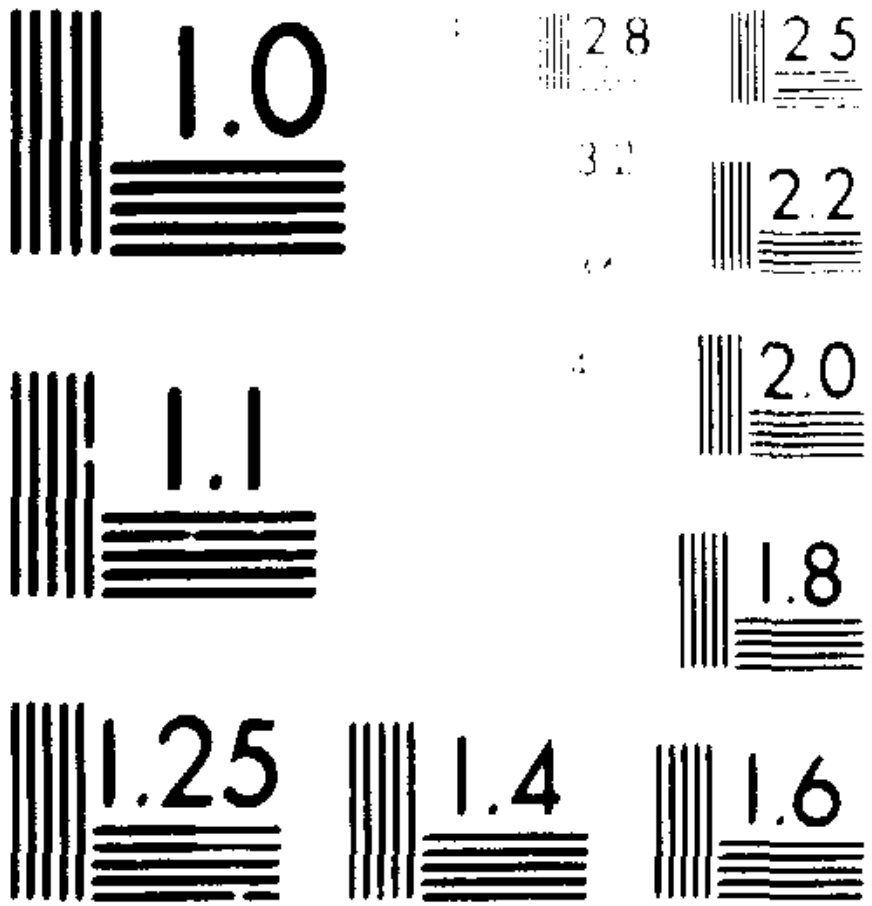
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DP/ID/SER.B/343
1 June 1982
English

Jamaica.

ESTABLISHMENT OF A PACKAGING RESEARCH, TESTING, DEVELOPMENT AND INFORMATION DEPARTMENT AT JAMAICA BUREAU OF STANDARDS, KINGSTON

DP/JAM/77/008

JAMAICA

Terminal report *

Prepared for the Government of Jamaica
by the United Nations Industrial Development Organization,
executing agency for the United Nations Development Programme

Based on the work of John Salisbury, project manager

United Nations Industrial Development Organization
Vienna

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ABSTRACT

The Establishment of a Research, Testing, Development and Information Department at the Jamaican Bureau of Standards. March 1979 to April 1981.

This terminal report describes a two year project to establish a packaging centre in Jamaica.

There are sections describing:

a. The type and cost of equipment purchased with the 150, 000 U.S.$ allocation.

b. How five graduates were trained on fellowship at Michigan State University, U.S.A., Rochester College, U.S.A. and Walford College, U.K.

c. The eight consultancies covering Paper and Board, Glass, Metal Containers, Techno-Economic studies, Dangerous Goods, Laboratory Procedures, Plastic Containers, Flexible Packaging, Transport Testing, Fruit and Vegetables Packaging.

The principle function of the new laboratory will be to provide a competent testing service to industry. This will enable the

collection of data about the physical and chemical properties of the materials and containers at present use in Jamaica. At the same time the information system would be developed. The combination of these two activities will build up the means and experience to give direct help to industry in structural design of packages and in trouble shooting. It is recommended that the local staff be given additional support in this latter activity in the form of a follow up project scheduled to begin in 1982. The Jamaica Bureau have requested that this proposed project to consolidate the Packaging Centre be combined with the establishment of a Plastic Centre.

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INTRODUCTION

The Government of Jamaica became concerned about two aspects of packaging technology that featured in their development plans. The first was the very high proportion of packaging material and containers being imported into the country and the second was to up grade the packaging associated with exports.

It was agreed that a centre for packaging technology would be established at the Jamaican Bureau of Standards as part of the UNDP programme of assistance and that the project be implemented by UNIDO.

The project document was drawn up and the project commenced in March 1979. The project was completed in April 1981. The document figure for the UNDP contribution was 381, 233. This was increased by 50, 000 U. S. $ in 1980 for additional equipment purchases. The total UNDP contribution was 431, 233 U. S. $.

The objective of the project was to establish the packaging laboratory (or Packaging Centre as it later become known). This entailed locating and modifying suitable premises, selecting, purchasing and installing appropriate test equipment and training local staff by fellowship courses abroad and providing help from consultants working in Jamaica. It is generally agreed that these objectives were attained.

ACKNOWLEDGMENT

It has often been said that the key to a successful project is the counterpart and the experience gained on this project supports that view utterly and completely. The counterpart chosen, Mrs. Margurite Domville, had spent ten years with the Standards Bureau, building up the Metallurgical Section after qualifying with first class honours in Chemistry and Applied Chemistry. She applied herself tirelessly to the 1001 tasks necessary when converting two dwelling houses into the excellent laboratories they are now. Under normal conditions this is exacting work yet this had to be one under the very abnormal conditions that prevailed in Jamaica prior to the 1979 elections when shortages and unrest made even the simplest construction job difficult to bring to fruition. In addition to this she was being inundated with masses of information concerning the wide variety of specialities that go to make up packaging as a subject in its own right. If this project be rated successful, then a lot of the credit must go to her because she was determined from the outset that it was going to be a success, and applied all her abundant energy and ability to making it so. There has been an excellent spirit of co-operation throughout the entire project, the vital ingredient that can so often be elusive in this kind of work. However, such keeness cannot be sustained for two years unless it is cradled in the right atmosphere and this was created by the administrative efforts of the Director, Dr. A. Henry, the Deputy Director with special responsibility for the project, Dr. Thomas, and the Departmental Head, Mr. Ken Garfield.

I. RECOMMENDATIONS

1. Testing Service to Industry

Becoming fully familiar with the equipment installed and confident in its use. Test methods must be produced for all the techniques being used. Each new method should be discussed with the appropriate part of local industry and accepted formally by them before it is considered established.

A massive drive is needed to apply the above testing techniques to as many of the materials and containers in use in Jamaica as possible to establish "normal" values for all the important properties. Helping industry without this knowledge is very difficult, sometimes impossible.

At least two years hard work is necessary if a significant impact is to be made but the two activities outlined above are the ones most vital to the Centre's success.

Joint exercises in quality measurement testing and raw material assessment should be entered into with industry as part of this basic data collection activity.

2. Equipment Complexity

The Centre is equipped with up to date and relatively spohisticated test equipment. However, many of the tests can be carried out sufficiently well to meet industry's present needs on quite simple test equipment. An important part of the Centre's activities should be to construct such equipment and become thoroughly adept in their use and applications (e.g. seal strength, stiffness, rub resistance, leak detection). It is the introduction of such simple test equipment into industrial practice that raises the level of quality measurement activities and the producers knowledge and interest in the performance of the product.

3. Utilisation of Test Results

When the staff are thoroughly conversant with the standard testing techniques, the results from such tests can be applied to helping resolve packaging problems in industry. The laboratory's special function is to provide accurate data against which ideas and theories as to the causes of problems being experienced in industry can be judged. Because packaging problems are so intimately interwoven with industrial activities it is difficult for a laboratory based person to tackle trouble shooting operations alone. Such activities need to always be a joint exercise with industrial personnel who will better understand the practices in the factory or packaging house. Special attention would be focussed on the converter i.e. the companies who make the packaging. When you help a user you affect only one pack or product, help a converter and eventually he could apply improvement to twenty or more of his customers. This is why there has been so much emphasis on materials testing throughout the project.

4. Education

Presentation of courses, roundtable discussions, seminars etc. will play a vital role in the development of the Centre's activities and in persuading and helping industry to upgrade its technological level. Special emphasis must be placed on this aspect.

5. Special Study Subjects

The information available on the following topics needs to be assimilated thoroughly and its relevance to Jamaica clearly thought out.

Lead and tin content of canned products.
The optimum future pack for milk.
The relationship between laboratory test results and field performance for fruit and vegetable packs (joint exercise with JNEC).

The role of unitisation in fruit and vegetable exportation.

The use of particle boards, and bagasse boards, in constructing crates and boxes.

The relationship between paper properties and label machine performance.

Shrink wrapping in retail and export distribution.

The sterilizable pouch and other possible substitutes for the can. Special emphasis to be placed on known successful applications in other countries, not development potential.

The methods for laminating aluminium foil and plastic films.

6. Consultant Recommendations

The reports prepared by the visiting consultants are with the Centre and Bureau management. Each contains recommendations relevant to that specialised subject. These recommendations need to be examined periodically to examine their relevance to Jamaica's needs and the feasibility of implementing them at a given time.

7. Reporting

If industry are to use the Centre's facilities fully, speed in reporting back is essential. Formal, written, reporting is necessary but it is often too slow in an industrial environment. The Centre must develop the habit of reporting back verbally, either by telephone or informal 'get together' as soon as sufficient test data has been gathered. It is to be understood by all concerned that such interchange between technical staff has no formal standing as is the case with the properly prepared and vetted report that follows later.

Personnel from industry should be encouraged to be present during testing, should they desire it, especially when storage samples are being periodically evaluated. Subsequent action on their part is much likely if they participate in the investigation and the Centre staff can broaden their knowledge of industrial practices at the same time.

8. Structural and Graphic Design

It is recommended that the Centre focusses on scientific investigation and assists in structural design only. If The Centre yields to pressures to become involved in graphic design and the visual aspects of packaging, they will do it badly and so damage their effectiveness in strictly technical activities. Graphic design is better left to specialised designers or 'in house' design sections.

9. Range of Activities

The above remarks apply to almost any additional activity that may be considered for the Centre. To make acceptable progress in the activities already embarked upon will take an immense of work and thought by the existing, trained, staff. Adding to the range of activities will merely dilute their efforts and reduce the depth of penetration into the established technical fields.

10. Fruit and Vegetable Exports

Close co-operation should be built up with JNEC and JETCO staff in the speciality of transit package testing. The results from the Centre's transit laboratory tests will only have real meaning when they are related to pack performance under actual transit and storage conditions and the people dealing with exports are in the best position to make these observations. This is especially true in fruit and vegetable packaging in which field JNEC and JETCO have several experienced consultants.

11. Quality Measurement

It is strongly recommended that the Centre (and the Bureau of Standards) change the name 'Quality Control' to 'Quality Measurement". This sounds a trivial suggestion but a lot of the opposition experienced when trying to upgrade quality stems from the idea that this new activity somehow 'controls' the quality of the product. The production personnel from machine operator to production manager do not appear to be involved. This is a wrong attitude that caused endless problems in industrialised societies. The quality is being measured so that all those involved in making the product can produce consistantly at an agreed quality level.

12. New Project

Because the newly trained staff lack the industrial experience needed to effectively operate in educational activities, trouble shooting and in applying the laboratory results to real life situations, it is strongly recommended that they are given further support in the form of a consolidation project. The Bureau of Standards have prepared a project proposal describing their needs, and this request is at present being considered by the Jamaican Government and UNDP.

13. Video Training Films

An important facet of any agreed consolidation project should be a special study of the use of video methods for training/staff, personnel from industry and possibly personnel from other Caribbean countries, in the use and interpretation of laboratory test equipment.

II. OBJECTIVES AND LOGIC OF THE PROJECT

A. Objectives

The objectives stated in the project document (page 3) were as follows:

"To establish a Packaging Research, Testing, Development and Information Department of the Jamaican Bureau of Standards and ensure its operation so as to meet domestic and export requirements."

B. Long Range Objectives

1. To guide and assist the packaging industry by establishing standards for materials and manufacturing methods of packaging.
2. To substantiate the quality control by using adequate material and applying proper techniques for packaging.
3. To ensure the goods get to the consumer sound and intact in adequate packaging.
4. To increase the competive superiority and promote marketability of domestic products in the international market by helping preserve the quality and enabling the shipment of them to distant places in adequate packaging.
5. To formulate a long-range programme of packaging development, based on the assessment of local quantitative and qualitative demands for packaging materials and machines as well as foreign market requirements.
6. To co-ordinate the implementation of the programme with the ministries and other responsible organizations.
7. To advise the Government on steps necessary to improve the packaging industry as well as on the licensing, customs, taxation and pricing policies with regard to the investments, imports and local production and supply of packaging media.
8. To compile and analyse statistical data related to the packaging industry.
9. To carry out techno-economic studies on selected subjects concerned with the new investments and application of the Packaging systems.
10. To institute promotional activities in the field of packaging, for example:
    - seminars, congressos and other forms of exchange of information and transfer of knowledge:
    - periodic exhibitions and contests for the best package of the year.
11. To represent packaging interests of Jamaica abroad and develop co-operation with packaging institutions in other countries and with the international packaging organizations.

C. Logic

The thinking behind the creation of this Packaging Centre is embodied in the "justification" section of the project document (page 4 of Project document). Subsequent events have shown this to be soundly based in that:

1. The packaging industry in Jamaica does need to become more technologically aware and the aquision of such technology and attendent equipment would be hard to justify for individual companies at the present time. There is a need for centralised laboratory to provide a testing service and to train personnel from industry in packaging technology.

2. The move from pure standardisation to "technical assistance to industry" has been welcomed. Future success will be judged against performance, however, and if industry does not have tangible evidence that the Centre can reduce their problems, co-operation will dry up.

3. The country is gearing itself to develop non traditional exports, especially those with good "value added" context. Such products have a vital packaging component that cannot be ignored.

4. The rules and regulations concerning packaging in industralised countries have grown more numerous and more complex as predicted and if Jamaica is to export a knowledge of how to meet these requirements is essential. The problem over lead and tin content of canned goods is an example of an immensley serious situation that needs a technical answer.

5. Too much of the packaging in use is imported and lack of knowledge and test facilities did mean Jamaican buyers were in the suppliers hands.

III. ACTIVITIES CARRIED OUT AND OUTPUTS PRODUCED

The key activity was to acquire suitable premises. Two bungalows were purchased, extensively modified and commissioned as excellent laboratory and office accommodation.

The numbered subsections below refer to the appropriate activity number in the project document.

1. Preparation of Work Plan

Three were prepared	First	on 28th March	1979
	Second	on 13th December	1979
	Third	on 15th July	1980

2. Identification of areas requiring improvement of packaging standards and stablishment of priorities

The main area for the new laboratory was to prepare its standard methods. Lists of those prepared are given in Annex 8.

Through the contacts with industry and the Packaging Committee a picture of Jamaica's priorities was built up. These include:

(a) Cans. Standardisation of paint cans, toxicity problems, import substitution, quality of seams.

(b) Fruit and vegetables packaging. Testing and standardisation of containers.

(c) Recycling waste packaging materials.

(d) Liquid Packaging in cans, cartons, glass, composites and plastics.

(e) Plastic films, laminate specifications. Local manufacture.

(f) Pharmaceutical Packaging.

(g) The use of aluminium in packaging.

3. Studies on methods of testing retail packages

This activity was given an excellent start by the visit in February/March 1980 of the specialist in laboratory test procedures. The local staff member has been well trained.

However, the climatically controlled storage cabinets which are vital to this function are installed but not yet fully commissioned. There are problems with one component being unsuitable for the local electricity supply (suppliers error) and the purchase of chemicals for humidity control. These should be resolved soon.

List of retail pack test methods given in Annex 8.

Industry is being helped with pack selection.

4. Project Manager

Appointed March 12, 1979 to April 12, 1981.

5. Training of Counterpart staff on the job.

This was perhaps the strongest point, of the whole project. The activities of the laboratory were grouped under four headings. Transit Packaging, Retail Packaging Testing, Materials Testing and Techno-economic Studies. Each section had a local graduate specialising in that subject and each became the counterpart to the appropriate consultant.

It was also desirable that each graduate had a knowledge of all the laboratory activities and three or four times per week each consultant gave a 1½ hour talk to all staff summarising the subject matter discussed with his direct counterpart. These sessions were also attended whenever possible by the head of the laboratory and the project manager, and by other Bureau personnel. As a technique for ensuring maximum benefit from each consultancy visit this was very successful.

Effective training was given during discussions about the work carried out for industry and about such procedures as test planning and recording, test method preparation, equipment commissioning, trouble shooting in industry and the application to this of the test equipmnet. These discussion ween the local staff and the consultants must be regarded as the most ef form of technology transfer. What needs special attention in futu projects is how to train the local staff to a reasonable level in the basics, before the arrival of the consultant, so that they can place the emphasis onto applications as soon as possible. This problem is discussed at length under findings.

6. Selection, procurement, delivery, installation and setting up of the testing equipment.

35mm slides of most of the equipment types required for this kind of work were brought to the project and used as a basis for discussion with the counterpart as to what equipment should be ordered.

The original budget figure of US$100,000 was allocated, equipment requisioned and orders to this value placed by UNIDO very promptly.

It became apparent that the targets outlined in the project document could not be achieved (the equipment listed for consideration in that document had a value in excess of US$250,000). A request for an additional US$50,000 was granted by UNDP and the Jamaican Government Planning Agency and further orders placed.

All the major items of equipment are in place with the exception of the laboratory air conditioning. The exact position for each piece is given in annex 3 which gives the cost, date of requision, date of UNIDO purchase order and the date the equipment was delivered to the project. Such a result could not have been achieved without a great deal of effort by the UNIDO Purchasing and Contracts staff and the project manager and his counterpart would be to express their great appreciation for this back up.

7. Initiation of the first Standards Preparation Work

The emphasis has been on standard methods, and reasonable progress has been made.

The industrial situation in terms of raw material and container supply has been chaotic during the life of the project due to extreme shortages and foreign exchange problems. Any effort to introduce standards would have been ineffective. It will be a concern from now on, little was done in this field of activity that has made any impact on industry.

8. Studies on the methods of testing packaging materials and elaborating their technical specification

Good progress has been made and the materials testing equipment has been used in helping to solve industrial problems. Test methods are described in Annex 8.

The job of writing technical specifications for packaging materials calls for a lot of experience and thorough knowledge of what constitutes normal values (and spread of results) for the important physical and chemical properties. Collecting such background data has begun and the results are being compiled but it will be several years before this work is satisfactorily completed. However, helping industry with how to specify their needs in broad terms is under way. It should be stressed that any attempt to draw up tight technical specifications before a thorough knowledge of the subject has been acquired will cause more harm than good in that costs will rise faster than benefits.

9. Training of counterpart staff abroad

All five of the counterpart staff received training abroad. Training for two Bureau staff (chemical analysis and metallurgy) is programmed.

	Subject	Staff member	Location	Date	Period
(a)	Organisation and Management	Mrs. M. Domville (Counterpart to Project Manager)	Michigan State University USA.	June/July 1979	1½mm
(b)	Materials Testing	Miss Pat Douce	Watford College of Technology UK.	Sept/Oct/Nov/ Dec. 1979	3mm
(c)	Techno-economic Studies	Miss Yvonne Allen	Mexico & Belgium	Oct/Nov/Dec.1980	3mm
(d)	Transit Testing	Mr. E. Williams	Rochester College of Technology USA.	Dec/Jan/Feb. 1980/81.	3mm
e)	Retail Pack	Miss I. Bennett	Michigan State University USA.	Jan/Feb/March 1981	3mm

	Subject	Staff member	Location	Date	Period
(f).	Chemical Analysis.	Mr. G. Rose	Pira U.K.	Scheduled June July 1981	3/4 mm
(g)	Metallurgy	Miss L. Whyte	British Steel Laboratories UK	Programmed 1981.	1½mm
(h)	Study tour	Dr. A. Henry Mr. K. Garfield Mrs. M. Domville	U.K. and Portugal	Cancelled due to lack of funds.	
					15.3/4

Outputs had to be geared to costs which meant a considerable reduction in fellowship man months.

10. Consultants

The original plan to use four consultants for six months each was changed to ten for 2/3 months each.

Eight consultants completed their mission within the project period. The remaining two have been recruited and are due in April and JUly 1981.

Completed

Number	Subject	Name	Dates	Period
11-01	Project Manager	J. Salisbury	March 1979 to April '81	24mm
11-02	Metal Containers	E. Meyer	Nov/Dec. 1980	2mm
11-03	Drums, Sacks, IBC. Dangerous Goods.	C. Swinbank	April/May 1980	2mm
11-04	Laboratory Procedures	G.D. Sykes	Feb/March 1980	2mm
11-05	Paper and Board	F. Paine	June/July 1980	1½mm
11-06	Transit Packaging	E. Schmidt	Aug/Sept/Oct.1980	3mm
11-07	Plastic Films and Laminates	H. Wolfrum	May/June 1980	2mm
11-09	Rigid Plastics	I. Turtle	October 1980	1mm
11-13	Techno-economic	A. Jones	June/July/Aug.1980	3mm

Scheduled

Number	Subject	Name	Dates	Period
11-08	Glass Containers	A. Sharma	April/May 1981	2mm
11-11	Fruit and Vegetables	A. Kramer	April/July 1981	2mm

Cancelled at request of UNIDO due to fund shortage

11-10	Aluminium Containers	-	-	-
11-12	Rules and Regulations	-	-	-

Each consultant finished his report before leaving the project with the exception of H. Wolfrum. UNIDO have issued those for Swinbank, Turtle, Jones, Pane, Schmidt and the remainder are expected soon.

Other outputs included copy notes in many cases for counterpart use and each delivered a round table type seminar for industry.

11. Studies in methods of testing transport packages and elaborating their technical specifications

All the equipment is installed and working. Major modifications to the building, special foundation work needed in most cases and a long delay in supplying electrical power meant that this aspect fell behind schedule in terms of applying the equipment to current problems. This is unfortunate because with the need to expand and improve exports this is a key activity.

However, all is now ready and the local staff member well trained and confident he can tackle the job.

IV. ACHIEVEMENT OF IMMEDIATE OBJECTIVES

The project document (page 3) gives the immediate objectives as follows:

"To establish a Packaging Research, Testing, Development and Information Department of the Jamaican Bureau of Standards and ensure its operation so as to meet the domestic and export requirements".

This objective can be said to have been satisfactorily met for the following reasons:

1. A laboratory exists that is based in two buildings bought and modified extensively to fit their new function.

2. The laboratory fittings, benches, office furniture are of good standard and suitable for the purpose. The two buildings have been completely rewired, and an adequate power supply laid on.

   All major pieces of equipment (with the exception of the air conditioning units) have been purchased and sited.

   The laboratory is very well equipped, full details of the equipment procurement are given in annex 8.

   Testing of export packaging is especially well catered for.

3. The full complement of local counterpart staff envisaged in the Project Document have been recruited and all five graduate staff have received fellowship training abroad in addition to extensive "on the job" training by the consultants.

4. The latest work plan called for ten consultants in various specialities. Eight have completed their work on the project for the allotted time. Two are expected after the project terminates (details are given in the activities section).

5. Some sixteen lectures or courses have been given for local industry. The techniques of teaching packaging technology have been successfully transferred stressing the importance of visual aids. The Centre is well equiped with the camera, projector, slide copying device, etc., necessary to build up interesting courses in packaging technology and has a good collection of ready prepared courses too.

6 Testing and trouble shooting work has been carried out

7. An information system is in place and functioning . A search for information on a specific topic can be made.

V. UTILIZATION OF PROJECT RESULTS

A. CO-OPERATING COMPANIES

The projects function was to "establish" the packaging laboratory, to create the means by which the technology level of the packaging industry could be raised. Towards the end of the project the process of utilizing the results of the project was well under way. A list of the companies and organisations who are co-operating with the packaging laboratory in one way or another is given

B. Testing Service

The industry is often called upon to meet certain requirements in the properties of its products but lacks the equipment and know how. For example a Jamaican company offering soap wrappers in Trinidad had to assure the customer that the printed wrap was detergent proof; a straight forward test for the laboratory to do. A local ink company seeking to upgrade its product regularly submits samples for tests on abrasion resistance. A company offering a new design of corrugated box for fruit exports needs information to show that this new box is substantially stronger than those already in use. This testing role will be of immense importance in the future when more and more companies begin to introduce quality measurement techniques.

Accurate testing of physical and chemical properties of materials and containers is the whole basis to settling quality disputes between suppliers and user companies. Since most of the packaging supplies are imported at the present time it is very important that incoming goods have been well specified and are checked against those specifications. Only in this way can Jamaica buyers protect themselves against being sent inferior and faulty products, something which many feel happens frequently at the present time. Companies seeking partial or total protection against imported goods on the grounds that they can be supplied locally are being asked by the Ministry to have the quality of their products checked by the Bureau's packaging laboratory. It is interesting that one of the most important of these concerned plastic containers was made by a first class local company . This underlines the need for the laboratory to strengthen its plastics technology as described in the new project now under consideration by the Jamaican Government, UNDP and UNIDO. It also illustrates an activity that can be utilised on a Caribbean scale since this particular problem has to be faced by all the countries of the region.

This applies equally to any testing carried out against a clear specification, it could be an important function for the Caribbean as well as Jamaica but it will take some years before the laboratory's are accepted as being as reliable and accurate as those carried out in supplier countries.

It is frequent and wide spread testing that builds up the knowledge upon which advice concerning pack selection is based. New products are not numerous, but the consideration of an alternative packaging material or container for an existing product is often done.

C. Education

The skills acquired by the laboratory have already been utilized in this activity

Each time someone from industry comes for advice on a packaging problem, the laboratory is carrying out an "educational" function.

Certain courses have been given in a form that can be repeated periodically, for example those on export packaging and flexible packaging technology.

The Jamaica National Export Corporation runs courses periodically on export techniques. One session is devoted to packaging and at their request this is given by the Packaging Centre. The first four sessions were given by the project manager, the most recent was delivered only and confidently by the local counterpart, Mrs. Domville, setting the pattern for the future.

The Jamaican Manufacturers' Association (JMA) requested the course on flexible packaging technology and have been sufficiently pleased with the result to ask for a periodic repeat, plus the same approach to be applied to other subjects, in particular food packaging, packaging for export and the technology of paper and board containers. The laboratory is particularly well equipped in these areas and demonstrating the application of this equipment to the problems being experienced in Jamaican industry utilises this facility in an important way.

The techno economic section has a really tough job in being accepted by industry. It has no equipment to utilize, only ideas, certain techniques and effort.. These "tools" have been applied to a number of problems as indicated in the list of reports issued in Annex 6.

In a country where it is generally agreed that a lot of changes are necessary it is also clear that these changes must be based on good reasons - the product of a techno-economic survey on a given proposal. This new laboratory cannot carry out such work in isolation, only as an integral part of a movement in industry that is seriously interested in making the proposed changes. The reason for this is that for a study to be of value it must be based on real data (costs, production figures, anticipated market values (etc) and such data is jealously guarded by industry (or alternatively everyone is "too busy" to extract it). It is only when industry itself wishes to move, and wants to be sure that the movement is in the right direction, that this particular skill will be fully utilized. In the meantime the graduate involved must continue to acquire those skills and techniques referred to so as to gradually convince the senior managers of industry and Government that the section can provide a competent and neutral focal point for all the interested bodies to concentrate the whole picture for collation and preliminary analysis.

D. Standardisation

The standards most important to the newly formed laboratory are the standard test methods needed to utilize the array of equipment now available. These are well under way as shown by the list given in Annex 8. The importance of these standard methods is that they will be freely available to Jamaican (and Caribbean) industry thus reducing the problems of supplier and user working with different equipment and techniques.

There are a number of vital issues that will shortly need intensive standardisation work concerned with containers and materials, for example the very severe problem of lead content in canned food that could seriously affect the plans to increase exports in this area.

E. Trouble Shooting

Helping industry solve its problems is a vital role for the new laboratory and it is well set to do this. A perfect example concerns locally made polythene tubing that would not work on the sugar packaging machines, causing the continued importation of large quantities of a U.K. product. There were many theories as to why the local material would not work, the laboratory was able to check out each possibility, establish the most likely causes and recommend a course of action that those involved believe will make local manufacture possible. This sets a pattern of procedure that will be utilized in examining other, similar, situations.

VI. FINDINGS

A. Consultants

A1. Total man months

The project document suggested 24 m/m divided into 4 periods of 6 m/m each. In discussion with the Project backstopping officer, Mr. J. Belo, in Vienna during briefing, it was agreed that the project would be better served by more consultants for shorter periods.

At a later date consultancy costs had risen so much that UNIDO requested a reduction in the m/m to ensure compliance with the budgeted figure and the total m/m was cut to 21, divided up as follows:

Name	Laboratory	Period
G.B. Sykes	Laboratory Procedures	Feb/March 1980 - 2 months
C. Swinbank	Drums, IBC's	April/May 1980 - 2 months
H. Wolfrum	Flexible Packaging	June/July 1980 - 2 months
F. Paine	Paper and Board	June/July 1980 - 2 months
A. Jones	Techno Economic	June/July/Aug.1980 - 3 months
E. Schmidt	Transit Packaging	August/Sept/Oct.1980- 3 months
I. Turtle	Rigid Plastic	October 1980 - 1 month
E. Meyer	Metal Containers	Nov/Dec. 1980 - 2 months
A. Kramer	Fruit & Vegetable scheduled	June/July 1981 - 2 months
K.D. Sharmer	Glass Containers scheduled	April 1981 - 2 months

A2. Consultancy length

The one month consultancy was rather too short but two months worked out very well indeed and can be recommended. The techno economic work was difficult to implement and would probably be better done as a split mission next time to give the counterpart time to gather information.

A3. Work Programmes

In every case, a detailed work programme was agreed in the first week by the consultant, the project manager and his counterpart. Obviously spaces were left to cope with the unexpected but at least 2/3 of the time available was programmed from the beginning. A typical work programme is attached as Annex 2. ... Note the separation of counterpart subject matter from other activities such as visits, talks, conferences etc. Each consultant report included his work programme as a compliment to his terms of reference.

A4. Location

In all cases except one, the consultant had one staff member designated as his counterpart and, with his agreement, they were accomodated together, sometimes at two desks in the laboratory, sometimes at two desks in an adjacent office. This sounds a trivial point but it is considered to have been very helpful in creating the strong feeling of goodwill that grew up between the consultant and his counterpart in almost every case. At no time could the counterpart feel neglected and the consultant could not help but feel integrated from the first day. On one occasion a consultant had two counterparts and itwas felt that this was a mistake.

A5. Counterpart Arrangement - Talks

It became immediately apparent that all the graduate staff wished to learn something from each consultant and would not be happy with a 1 to 1 relationship throughout. In addition the project would not get full benefit from the consultants visit if all his "message" passed only to one person. This was solved by each consultant being asked to give a series of one hour talks utilizing the first hour of the day whenever possible three times per week.

Titles and timing for each talks were agreed when the programme was arranged in the first week. This was undoubtably a major success. The local staff are specialising in transit, retail packaging, materials testing or techno economic work. These talks enabled them to relate their speciality to the others and they help to lay a firm foundation for the time when speciality changes became necessary. It also helped everyone to feel a part of the whole project. On occasions other members of the Bureau were invited to sit in when the subject overlapped into their field, e.g. canning regulations.

A6. Round table Seminars

All eight consultants gave a one day round table type seminar. This ensured that the industry felt that they had had maximum opportunity to discuss their problems with him. The afternoon was given over entirely to private discussion in case any problems were considered to be of a confidential nature. In general these were well attended but we noticed that the participants were principally those with whom contact had been made during the consultants visits. The point to be noted is that the time of the seminar should be fixed right at the beginning and a letter summarising the details left with each company visited. It is vital that an early announcement is made about the seminar and a followup letter (or better a phone call) made to the companies a few days before. If the letter of invitation can be made to an

individual in a senior post in the company so much the better, if not the letter should go to the Factory Manager. The presentation by the consultant should be as brief as possible and maximum effort put into stimulating discussions. This can best be done by the consultant briefly outlining what his conclusions and recommendations will be in his report thus giving final chance for re-examination.

A7. Overlap Problems

One or two consultants on a small project does not create any special problems. Three is already too much and four at the same time, as we thought we might have for one brief period, would be very inefficient indeed. The problem is largely the difficulty of telephone communication and counterpart availability. Making a series of visits can take many hours of hassle with the telephone system in most developing countries and Jamaica is certainly no exception. In addition to this, the more important companies are often interested in almost all of the consultants on the project but there is a limit as to how many visits can be absorbed in a given time. Two consultants should be the maximum at any one time, a conclusion which has implications on the project length discussed later. Considerable care must be taken to avoid having two consultants for the one counterpart.

A8. Consultancy Sequencing

This fortunately does not cause too much difficulty in packaging because the specialities are so different. In general though the Laboratory Procedures (or retail pack testing)person should come first and the fruit and vegetable man (or similar specialist) last. The Drums, Sacks and IBC consultant would be better described as a consultant in Dangerous Goods because this speciality is very necessary and it covers the containers mentioned very well. This should be near the end of the project because it is a good summarising subject, calling on knowledge from many of the other specialised subjects.

B. Fellowships

B1. Local Staff Member

Local Staff Member	Subject	Location	Period
M. Domville	Many subjects	Michegan State University, U.S.A.	June/July 1979 - 1½ m/m
P. Douce	Materials Testing	Watford College U.K.	Sept/Oct/Nove/Dec 1979 - 3 m/m
Y. Allen	Techno economic studies	Mexico & Belgium	Oct/Nov/Dec 1980 - 3 m/m
E. Williams	Transit Pack Testing	Rochester Institute USA	Dec 1980-Feb 1981 - 3 months
I. Bennett	Retail Pack Testing	Michegan State University, USA.	Jan/Feb/March 1981 - 3 months
D. Rose	Chemistry	PIRA, UK.	May/June/July 1981 ~~3/4~~ month
M. O"Connor	Metallurgy	British Steel or Tin Research Council, UK	Programmed 1981 - 1½ months
			16 3/4 months

B2. Fellowship Costing

The figure of US$1300 used for budgeting purposes does not cover the high costs of fellowships in todays inflated world, especially if the decision is taken to spread the available man months of training over as many people as possible. If only 3 or 4 people travel the cost of airfares is obviously a smaller proportion of the total cost than when 7 are involved as in our case. Additional funds were requested but it was not possible to grant more, the man months had to be cut quite drastically from 24 mm to 16 3/4 mm to ensure compliance with the budget. It was decided to cut out the study tour that was scheduled for 3 senior members of the Standards Bureau when it was found that the likely cost would exceed US$10,000.

The important point is, however, is that all 5 graduate staff were given excellent training abroad in their various specialities and it is still hoped to send two Bureau staff members on specialised training in packaging technology as related to Metallurgy and Chemical analysis so that they are better able to serve the needs of the Packaging Centre. The Chemisal Analysis fellowship has been confirmed.

B3. Fellowship period

It is generally agreed that 3 months studying a specialised subject is a reasonable period. Obviously the ideal can be said to be attendance at one of the 3 to 4 year courses now being offered at a number of places but this is hardly a realistic possibility when one considers the chances of eventually loosing trained staff. Three months also fitted the academic term, therefore, in most cases represented a minimum possible too.

B4. Academic v Practical Training

There is a continuing discussion about the relative merits of practical versus academic type training. In this project we decided on academic training in normal institutions, relying on the consultants to provide the practical and applications training and this has been regarded as highly successful. The advantage of joining in an appropriate course in a university or college is that the fellow gets exactly what he he went to get. When a training is attached to a working establishment he may receive regular and very helpful attention but there is a high risk that illness, holidays, a sudden increase in work may mean that with the best will in the world the trainer may just not have the time to spare that was expected. Many institutions who used to train people from abroad free, or for very low charges, are now becoming very cost concious and costs in the order of US$9,000 for a three month training programme have been asked in recent times. The fees in academic institutions are much less than this and will not rise as rapidly in the future either. However, there is no disputing the value of experience in a working laboratory in an industrialised country and if possible this should be arranged as part of any follow up project. In which case the basis for the arrangement would be that we will be asking that our well trained graduate be permitted to work under normal conditions in the host laboratory, contributing to the daily tasks not needing the constant attention of senior tutors. In this way it should be possible to negotiate a reasonable cost figure, one that can be met from the budget allowance. It will be up to the trainee to gain what he or she can from the experience by observation and careful questioning, combined with the work actually undertaken.

The three academic establishments mentioned gave excellent value for money, therefore on future occasions it will be a matter of matching the needs of the trainee to the subject matter of the courses available. In each case the fellows felt that they had been given rather better than average treatment at the establishments which was very pleasant to hear.

B5. Fellowship timing in relation to Consultants visit - The Potential of Video Film Training

Another point of discussion is, should training be done before the arrival of the consultant or after. Up to the present project the writer was of the opinion that prior fellowship training helped the local staff member to get more out of the visit by the consultant, but what happened on this project has led to the conclusion that this might not be the best approach after all.

In the first work plan all the fellowships were scheduled for the period before the arrival of the respective consultant, however, the time needed to locate suitable premises and recruit suitable staff was such that those plans had to be abandoned and all the fellowship training moved to the end of the project (it could not be done in the middle period because of the need to match up with course availability. The results were most interesting. The three graduates involved found that they had a good start on the course material, they were star pupils rather than struggling behind others who had the opportunity to learn more because of the environment from which they came. This did a great deal for their morale and there can be no doubt that in the frame of mind that such confidence produces they benefitted to a much greater extent from the course, especially the practical exercises and the visits. The fourth fellow was trained before the consultant arrived but was actually in a similar position to the others because she had several years experience in the Bureau's Non -Metallic Laboratory and so was reasonably familar with the course material. When one takes into account the effects of cultural shock, jet lag and the horrible effects that winter in the United States or the U.K. can have on someone from a hot country the fellow needs to be in the best possible condition of preparedness if he or she is to get maximum benefit from the very expensive training being offered, especially as this is so often of an intensive nature and the amount of ground covered takes the strength and ability of the participants to the limit.

If fellowship training is left to the later stages of the project, the project manager and his counterpart can be more certain that they are sending the right person, able to benefit and likely to stay.

The relationship between the consultant and his counterpart is likely to be better if the latter has not yet had training abroad, a common cause of friction is described under 3g where the point is made that newly trained staff are likely to be dazzled by being exposed to the very latest techniques too soon and see only the advantages without the problems of using them in an environment that may have a long time to go before it can adapt to such methods. Consultants tend to concentrate on tried and tested techniques and equipment that they have been familar with for years and this is probably a good place for anybody to start.

It is of immense importance that the local staff are feeling at most confident when the project terminates and it could be that this is best achieved by leaving the fellowship training abroad to the end of the project period. If one accepts that there are very real advantages for fellowship training to follow the consultants stay in the country then the problem that immediately comes to mind is how can the newly recruited staff member be trained to a standard that will ensure that he or she is able to work with the consultant from the beginning on the more advanced aspects of the work together with an immediate start on the problems that are troubling local industry. Consideration of this aspect brings one to the conclusion that initial, basic training of local staff to enable them to work confidently with the test equipment as it comes on stream must be made possible somehow in all the specialities of paper, board, plastics, flexible packaging, glass and metal containers, retail pack and transit pack testing. This could be achieved at reasonable expense if the project manager has a wide experience and is backed by a first class system of training aids of undisputed authority related directly to the equipment being received and installed. In this way we can hope to achieve the desirable goal that the consultant has the right equipment ready for his attention and a counterpart who has had time to absorb the basics, and the terminology, and so comprehend fully what the consultant tells him as they plunge straightinto applying the technology to be transferred to the countries real problems.

Obviously the system described above will take an immense amount of work to bring about but the only methods that appears to be adequate is one of first class video training films if we are to learn from studying the inadequacies of the present methods and face up to escalating costs involved in transferring technology to developing countries.

B6. Loss of Trained Staff

Nothing is more certain than the fact that most of the staff being trained will eventually leave; the only point at issue is when. One hopes that it is at least several years after the project terminates. It has to be accepted that this loss is a normal fact of life for an organisation like the Bureau of Standards and that it is an important method by which the technology being absorbed by the Packaging Centre will pass into the local industry. One of our consultants, Mr. Frank Paine, has just retired from his post as director of one of Europe's best packaging laboratories, PIRA, UK. He makes the claim that most of the key personnel in the UK packaging industry spent some time working at PIRA. This is something of an exaggeration but there is a lot of truth in the statement. The Bureau has already played a similar role in other fields and packaging will not be different. The pressing problem then is how can new staff be trained quickly and in a way that they can be useful members of the team almost from the first day. A possible solution is to use video training films made specifically to introduce people to the test equipment they will be using as part of the Centre's service to industry. Trouble shooting and design skills should follow naturally, if slowly, after a thorough knowledge of the properties of materials and containers combined with guidance from the more seasoned staff members.

C. Equipment

C1. Selection and Purchasing

The Project Manager had the good fortune to visit many packaging laboratories throughout the world before arriving on the project. It was not difficult, therefore, to guide the Bureau as to the equipment required , obtain the necessary data and requisition it. The fact that only one major piece of equipment is outstanding at project termination pays tribute to the speed and efficiency with which the Purchase Orders were placed by the UNIDO Purchasing and Contracts Division in Vienna. The air conditioning for the testing laboratory has yet to be delivered but all building preparations are complete and a local firm of engineers are waiting to put in the components when they arrive. Installation should proceed without problems after project termination.

C2. Equipment Budget

In the project document the pieces of equipment suggested as possibilities had an approximate value of US$250,000. The allowance in the first budget had been agreed at US$100,000. Requisitions for the US$100,000, some were placed and then an application made for an additional US$50,000 to cover the purchase of additional items that were considered essential to the success of the project. Happily this was granted by the Jamaican Government and UNDP and the additional equipment purchased. The laboratory can be said to be very well equipped indeed and all the visiting consultants expressed their general satisfaction with the type and quality selected. Glass container test equipment proved to be a problem, however, since the balance of funds available, US$8,000, was not enough to buy the pieces one would normally expect to find in a laboratory such as this, and up to project termination we had not had the benefit of a glass consultant to guide us. Simple, measuring equipment will be ordered and this may well prove adequate for the needs of the foreseable future.

C3. Equipment Installation

There is quite a lot involved in installing the equipment, especially that for transit pack testing. In some cases walls had to be modified and the foundations for the inclined plane, drop tester and the vibration table are particularly elaborate. What helped greatly was the assistance of a very capable mason/joiner whom the Bureau employed when required. He was quick and worked to a high standard.

Laboratories in other countries have had problems finding accommodation for the 5m diameter wheel that used to be a standard piece of equipment in packaging laboratories. This equipment is not now recommended, therefore, we did not have the problems associated with housing it. Annex 8 shows the plan of the main laboratory and adjacent offices. The conventional side benches must be well supplied with electrical outlets as they carry almost all of the material testing equipment. The large centre bench has no outlets for services of any kind since it is very important to keep this area free so that the large sheets of paper and board used for printing and the samples necessary when a large storage trial is being prepared can be spread out on it.

C4. Electricity Supply

One serious hold up was in the supply of electricity to the transit laboratory. The two bungalows that were modified to house the packaging centre had the usual light domestic supply The re-wiring of the two building was completed in reasonable time but the time needed to lay on cables and meters to bring the additional power required from the public supply was much greater than expected. This is something that must be arranged as quickly as possible in similar projects in the future. Power was finally provided in February 1981.

C5. Record Keeping

Each month the equipment position was recorded in a return sent to the UNDP office in Kingston. The date requisitioned, the late ordered by UNIDO and the date received by project were tabulated in the manner shown in the last record produced for the month of March 1981 attached as annex 3.

C6. Accuracy Significance

A danger to be avoided is to measure to accuracy that have no significant meaning in an industrial environment. Packaging materials (especially paper) vary considerably along and across the web with the ambient conditions. Constant vigilance is necessary if results are to be realistic when applied to a whole delivery or batch and not just to the small sample being examined. The equipment will measure to a high degree of accuracy but the figures must be meaningful in practice.

C7. Project Length

It is very important to have equipment working before the arrival of the consultant if at all possible. Installation problems and operating problems should ideally all have been overcome and draft test methods and operating instructions prepared so that the consultant has tools with which he can work, demonstrating their use, interpretation and applications. Sadly this was not possible in many cases on this project, partly because of the natural time lapse in equipment selection, requisition, ordering arrival, installation and commissioning; partly because staff has to be recruited and trained and partly because we had no power until February 1981. It does take time to achieve these things, and this draws attention to project length. The period up to the arrival of the first consultant should be at least 12 (twelve) months if a whole packaging centre is to be created. The project manager and his counterpart will need all of that apparently long period to deal with premises, local staff recruitment, equipment and to prepare in detail for the consultants and fellowships to follow. If 8 to 10 consultants are visiting the project,(and more than 2 at any one time is to be avoided)than 12 months is the minimum period in which this can be carried out. If 5 or 6 graduates are to be trained abroad on say 3 months fellowships than a 12 months period is again required especially as opportunities for training in academic establishments can only be taken during their time and not ours.However, fellowship training can overlap the period during which the consultants are present, as long as the appropriate counterpart is not away, of course, as can easily happen without careful planning.Adding this up one comes to the conclusion that to ensure maximum benefit from a project like this the minium period is 2 ½ years.

D. Information System

Obtaining information on packaging topics when operating in a developing country is a major headache. A start has been made with the system installed and now something can be done. Information on those topics most relevant to Jamaica, e.g. fruit and vegetable shipment, packaging processed foods, metal can improvement and possible substitution, applications for tropical waste e.g. baggage, should be here on the island. When information is needed it is usually needed quickly and a months time lag can often be unacceptable.

E. Communication

Fast communication with industry is obviously a vital ingredient in the operation of a centre like this one. Yet there was no telephone link for more than six months of the final years operation.

F. Educational activities

gone satisfactorily, but there is no doubt that there must be many more. The courses are the most effective way of promoting the message that industry must become more technically minded and more proficient at handling its packaging problems. The greatest need has proved to be for good visual aids to enable local staff to take over the task of presenting talks and seminars in an interesting way. There cannot be too many of these aids but their creation requires considerable experience, lecturing skill and opportunities that are not available in the early stages. Good visual aids will carry a lecture and give the fledgling lecturer growing confidence. A reasonable number has been left with the project but this aspect has proved to be so vital that all new projects should make it a special point

Visual aids were used freely on the flexible packaging course which is a quite complicated subject. As can be seen from the analysis of the questionnaire filled in by most of the 34 participants given in Annex 5. they helped considerably in transferring the technical information. Providing detailed course notes was also appreciated highly but this is not always possible.

G. Special considerations - Possible Caribbean Role for the Packaging Centre.T.C.D.C.

The Special Considerations section of the project document (page 3) states the following:-

> "The establishment of the Packaging Research, Testing, Development and Information Department at the Jamaican Bureau of Standards could promote technical co-operation among the CARICOM countries by being the nucleus for a Regional Packaging Institute."

Periodically thought has been given to this idea.

One activity that has clearly emerged as highly feasible is training. Courses have been prepared and presented to Jamaican industry that are equally relevant to the needs of the other countries in CARICOM. Periodic presentation of these courses for CARICOM countries is a straight forward matter. Those concerning standardisation of laboratory test techniques and export packaging will have a real unifying effect and help to promote technical co-operation.

In the consolidation project proposal being considered at present the development of video training films, is stressed, especially in laboratory test techniques. Their application to training personnel from CARICOM is an exciting possibility because it can be carried out at any time without significant disruption of the normal work of the Packaging Centre. Training time and subject selection to fit the specific needs of the trainee becomes possible. If sufficient demand exists, the training films can be taken periodically to centres within CARICOM for training of local personnel in their own country. Sponsorship from aid organisations or existing CARICOM project e.g. ITC, RCA/10/55 would probably be forthcoming for such a clear cut activity.

Another role one can well envisage being realistically applied is a consultative role. A representative from any of the other countries could be encouraged to bring his problem to the Jamaican Centre for examination and discussions so that he or she may return to the struggle with useful guidelines as to possible solutions.

When the test facilities are fully operational, and the staff expert in their use, there seems little doubt that other countries will submit the materials and containers for test that are at present being sent to U.K. and U.S.A. It is a matter of faith, reputation and service that will take years to build up but it can be done. A major benefit from this activity in terms of integration will be the standardisation of test equipment and test techniques throughout CARICOM that is bound to result. There is very little application of this kind of technology to packaging problems but gradually the institutions and major manufacturers throughout the region will be introducing it into every day procedures. It is natural that they will adopt the equipment and techniques already in use and such standardisation will do much to harmonise the inevitable growth of raw material assessment, quality control and trouble shooting activities in the packaging field.

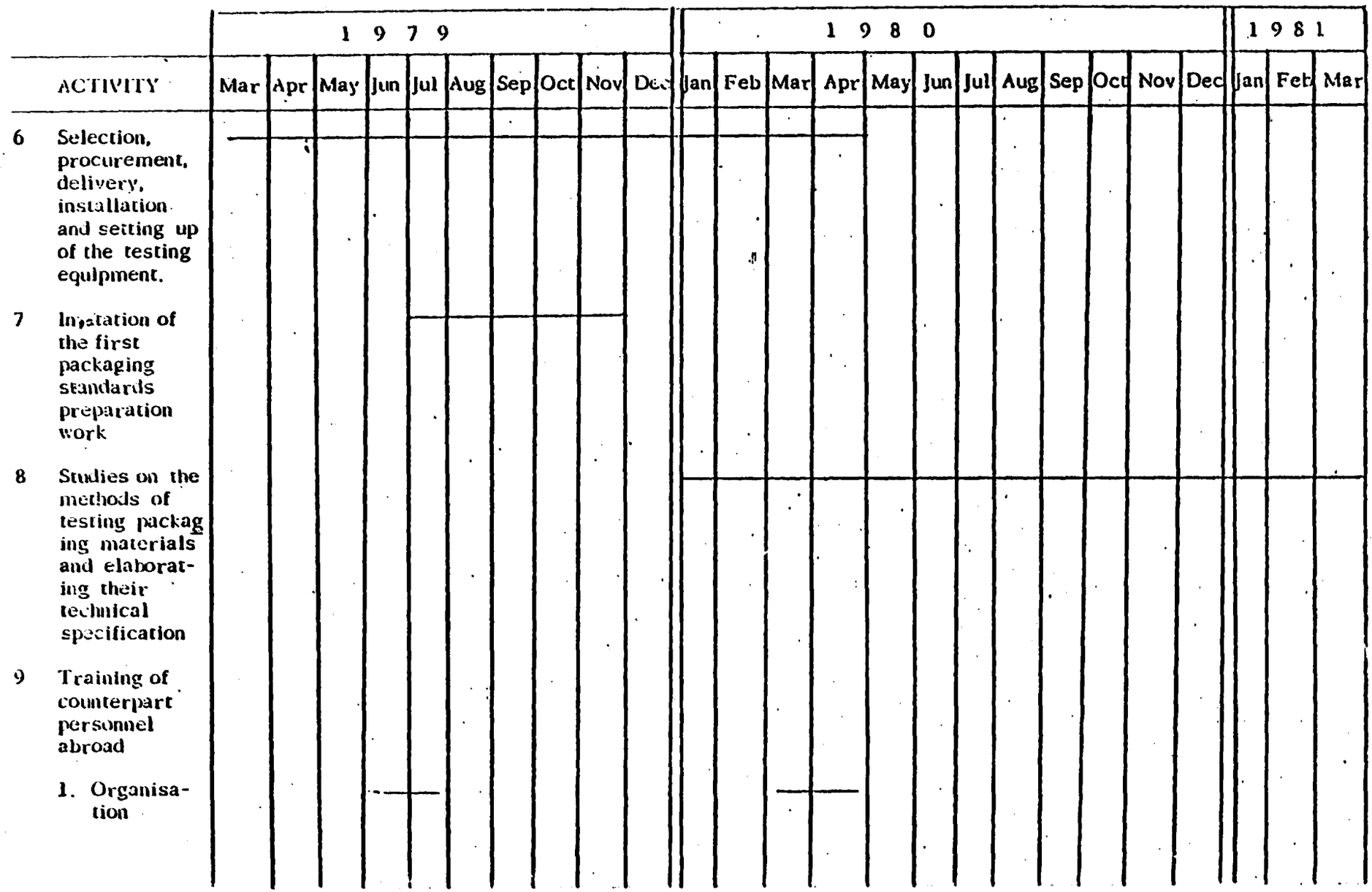
The activity as described appears to fit closely into the aims of Technical Co-operation between Developing Countries (TCDC) , and Barbados, Guyana, Grenada and Santa Domingo have expressed their interest to the Director, Dr. A. Henry.

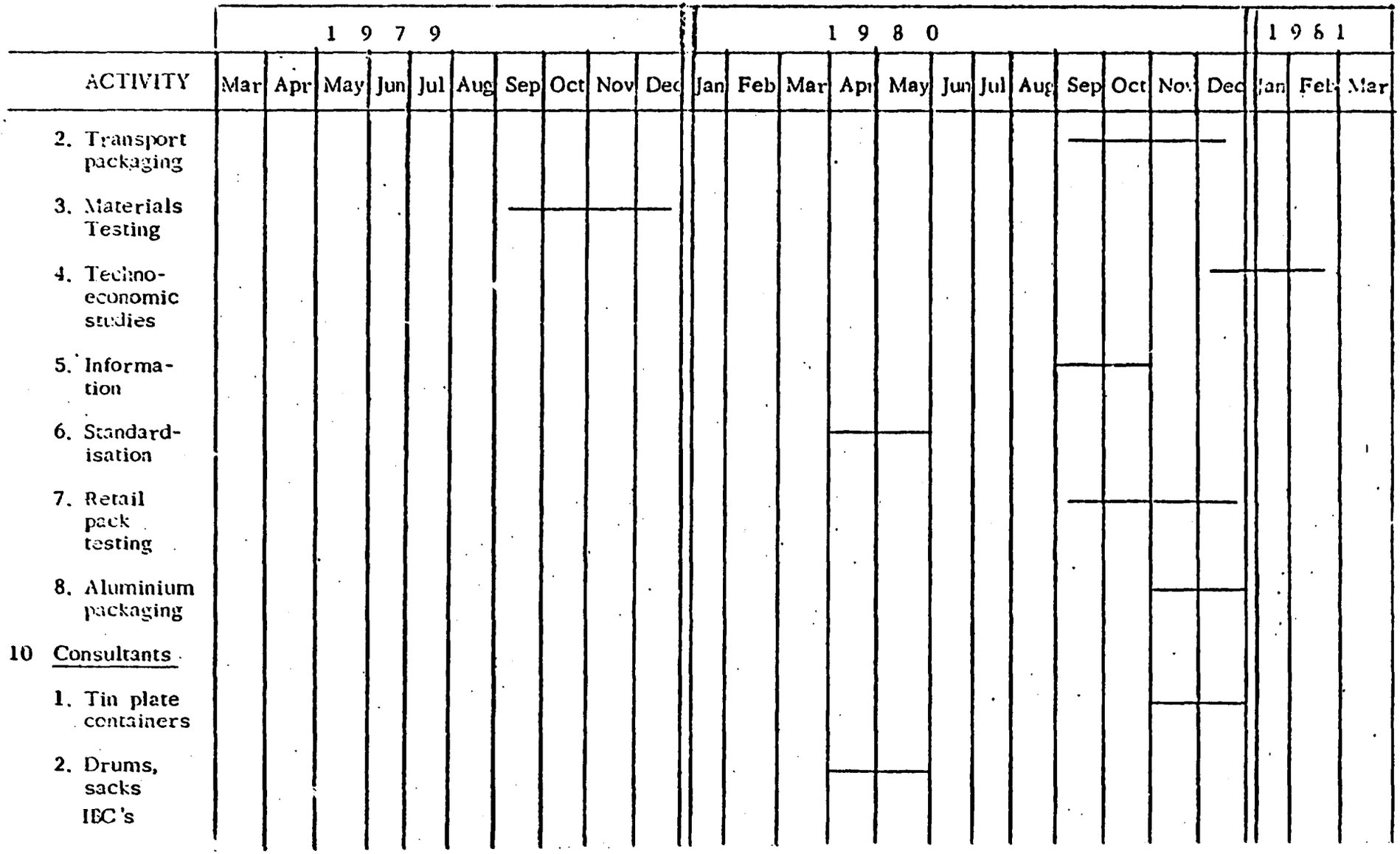
ANNEX 1
2ND Work Plan - Project JAM/77/008

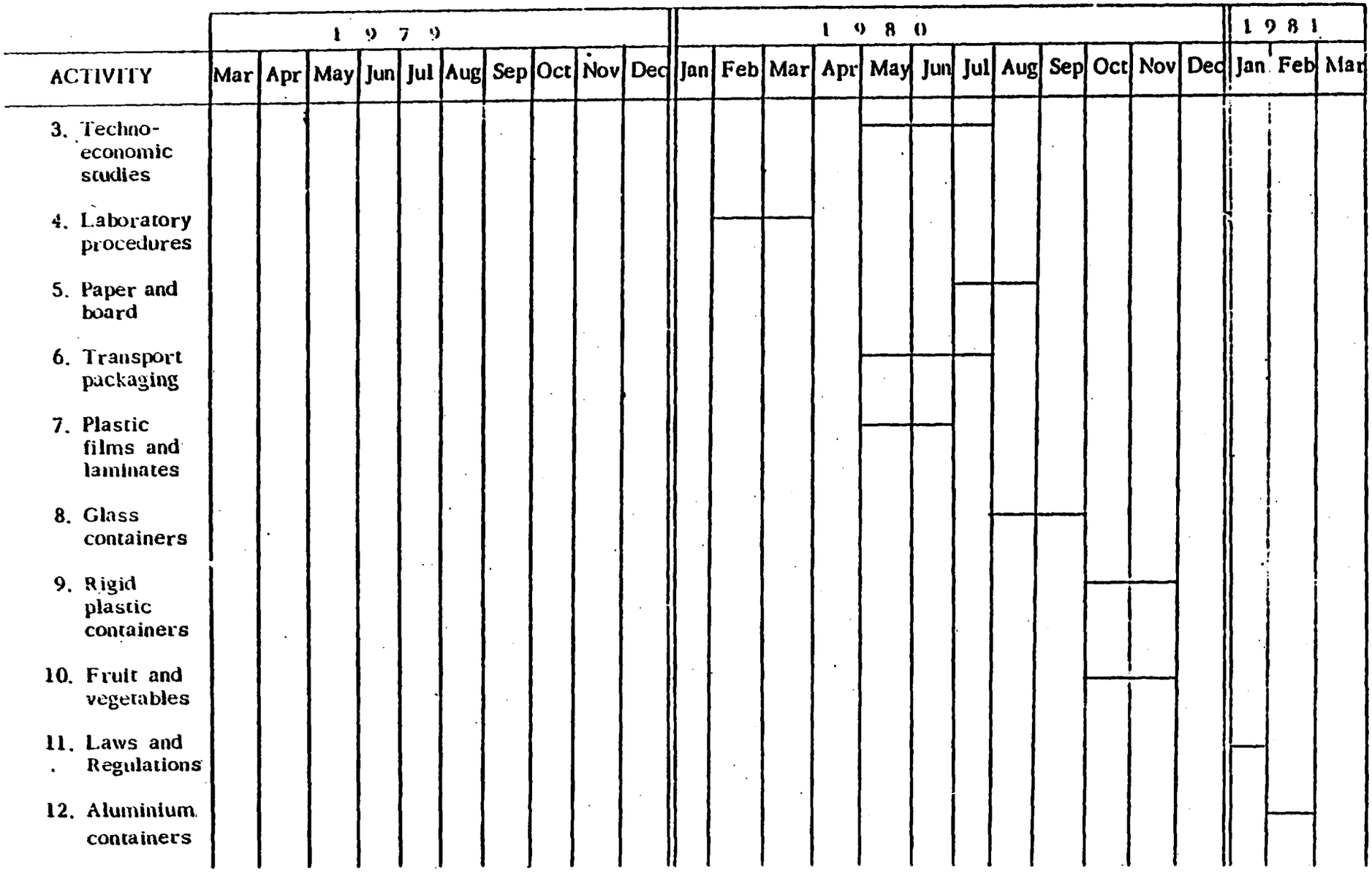
13 December 1979

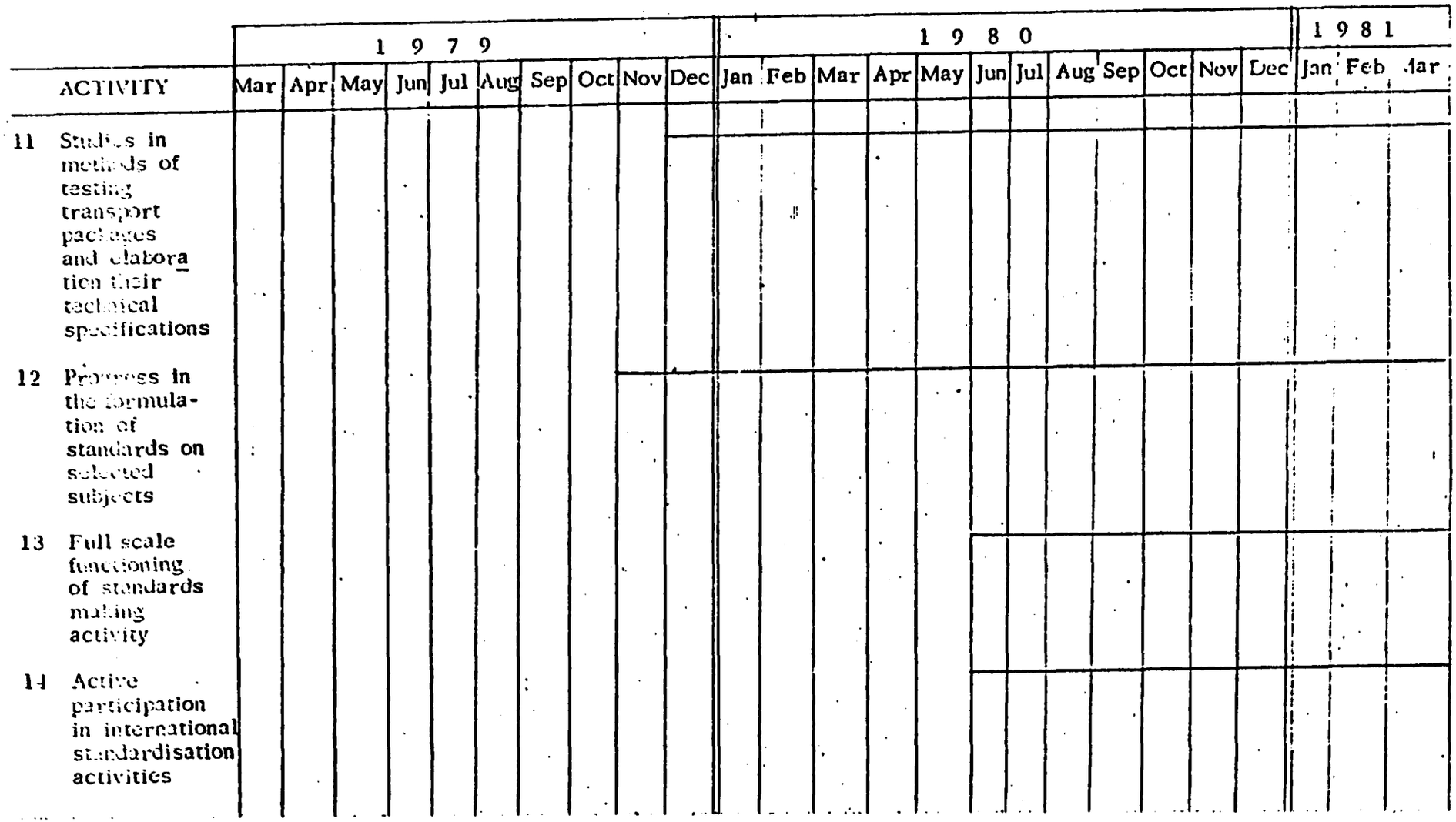
ESTABLISHMENT OF A PACKAGING RESEARCH, TESTING, DEVELOPMENT AND INFORMATION DEPARTMENT AT THE JAMAICAN BUREAU OF STANDARDS.

	1979										1980												1981		
ACTIVITY	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1 Preparation of Work Plan.																									
2 Identification of areas requiring improvement of packaging standards and establishment of priorities.																									
3 Studies on methods of testing retail packages.																									
4 Project Manager																									
5 Training of counterpart staff on the job.																									


1979
1980
1981
ACTIVITY
Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Jan Feb Mar
6 Selection, procurement, delivery, installation and setting up of the testing equipment.
7 Implementation of the first packaging standards preparation work
8 Studies on the methods of testing packaging materials and elaborating their technical specification
9 Training of counterpart personnel abroad
1. Organisation


1979
1980
1981
ACTIVITY
Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
2. Transport packaging
3. Materials Testing
4. Techno-economic studies
5. Information
6. Standardisation
7. Retail pack testing
8. Aluminium packaging
10 Consultants
1. Tin plate containers
2. Drums, sacks IBC's


1979
1980
1981
ACTIVITY
Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
3. Techno-economic studies
4. Laboratory procedures
5. Paper and board
6. Transport packaging
7. Plastic films and laminates
8. Glass containers
9. Rigid plastic containers
10. Fruit and vegetables
11. Laws and Regulations
12. Aluminium containers


1979
1980
1981
Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
ACTIVITY
11 Studies in methods of testing transport packages and elaboration their technical specifications
12 Progress in the formulation of standards on selected subjects
13 Full scale functioning of standards making activity
14 Active participation in international standardisation activities

ACTIVITY	1979										1980												1981		
	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
15 Testing services to the industry																									
16 Techno-economic studies on selected subjects																									

ANNEX 2

TRAINING PROGRAMME - TRANSPORT PACK TESTING

ERNST SCHMIDT - 31 JULY TO 31 OCTOBER, 1980

MONDAY, AUGUST 4	TUESDAY, AUGUST 5	WEDNESDAY, AUGUST 6	THURSDAY, AUGUST 7	FRIDAY, AUGUST 8
Independence Day.				
	Introduction terminology	Counterpart: Journey hazards, stacking tests, compression		

MONDAY, AUGUST 11	TUESDAY, AUGUST 12	WEDNESDAY, AUGUST 13	THURSDAY, AUGUST 14	FRIDAY, AUGUST 15
Counterpart: Journey hazards, compression testing				

MONDAY, AUGUST 18	TUESDAY, AUGUST 19	WEDNESDAY, AUGUST 20	THURSDAY, AUGUST 21	FRIDAY, AUGUST 22
	9.0 am Seprod visit		9.0 am J.P.I. visit	
← Counterpart: Long term compression testing. Influence of box design parameters →				
MONDAY, AUGUST 25	TUESDAY, AUGUST 26	WEDNESDAY, AUGUST 27	THURSDAY, AUGUST 28	FRIDAY, AUGUST 29
	9.0 am J.P.I. visit	9.0 - 10.30 Talk - Transit, handling, storage.	Participation in round table 2.30 - 4.0 pm WPPI	9.0 - 10.30 Talk - handling processes
← Counterpart: Impact testing. Drop and inclined plane. Edge, corner and face impacts →				

MONDAY, SEPT. 1	TUESDAY, SEPT. 2	WEDNESDAY, SEPT. 3	THURSDAY, SEPT. 4	FRIDAY, SEPT. 5
9.0 - 10.30 am Talk - Transport processes and hazards	9.0 - 11.00 am Grace Kennedy visit 2.30 pm Visit to port facilities	9.0 - 10.30 am. Talk - Storage processes	9.30 am Visit to local wood substitute manufacturers	9.00 - 10.30 am Talk - Transit pack testing, general rules.
← Counterpart: Testing, theory and practice →				
MONDAY, SEPT. 8	TUESDAY, SEPT. 9	WEDNESDAY, SEPT.10	THURSDAY, SEPT.11	FRIDAY, SEPT.12
9.0 - 10.30 am Talk - Transit pack testing, general rules	Visit to two freight forwarding companies	9.0 - 10.30 am Talk - Laboratory simulation of transport and storage condition; compression	Q.A. meeting - 10.00 a.m.	9.0 - 10.30 am Talk - Dynamic compression in transit
← Counterpart: Climatic tests. High humidity, corrosion, rain, sunlight, heat →				

MONDAY, SEPT.15	TUESDAY, SEPT.16	WEDNESDAY, SEPT.17	THURSDAY, SEPT.18	FRIDAY, SEPT.19
9.0 - 10.30 am Talk. Dynamic compression in transit (drop test, inclined plane).	9.0 - 11.0 am JNEC lecture Packaging for Shipment	9.0 - 10.30 am Talk - Laboratory simulation of other transit hazards	9.0 - 11.0 am Visit to Ministry Agriculture, Inspectorate	9.0 - 10.30 Talk - Laboratory simulation of climatic hazards
← Counterpart: Journey simulation. Design of test programmes →				
MONDAY, SEPT.22	TUESDAY, SEPT.23	WEDNESDAY, SEPT.24	THURSDAY, SEPT.25	FRIDAY, SEPT.25
9.0 - 10.30 am Talk - The design of transit packaging, guidelines (1)	9.0 - 12.00 a.m. Visit to banana packaging station	9.0 - 10.30 The design of transit packaging, guidelines (2)		9.0 - 10.30 am The design of transit packaging, guidelines (3)
← Counterpart: Transit pack design with reference to compression, vibration, shock and climatic forces →				

MONDAY, SEPT.29	TUESDAY, SEPT.30	WEDNESDAY, OCT. 1	THURSDAY, OCT. 2	FRIDAY, OCT.3
9.00 - 10.30 Talk - The design of unit loads, guidelines	Visit Fruit and vegetable export packaging centre	9.00 - 10.30 am Talk: The design of pallets. Guidelines	Visit. Fruit and vegetable export packaging centre	9.0 - 10.30 am Talk: Marking for export. Product properties Packaging materials
← Counterpart: Unitisation, palletisation and other unit loads. Strapping freight containers →				
MONDAY, OCT. 6	TUESDAY. OCT. 7	WEDNESDAY, OCT. 8	THURSDAY, OCT. 9	FRIDAY, OCT.10
9.0 - 10.30 Transit test sequences (1)		9.0 - 10.30 Transit test sequences (2)		
← Counterpart: Cooperative week testing samples from JPI, WPPI, Grace etc in presence of their representatives using the test sequence devised for export journies to Caribbean, Europe and USA. →				

MONDAY, OCT. 13	TUESDAY, OCT. 14	WEDNESDAY, OCT. 15	THURSDAY, OCT. 16	FRIDAY, OCT. 17
		9.30 - 12.00 noon Round table 2.30 - 4.30 pm Interviews		
MONDAY, OCT. 20	TUESDAY, OCT. 21	WEDNESDAY, OCT. 22	THURSDAY, OCT.23	FRIDAY, OCT. 24

← Counterpart: Report preparation, discussion and reproduction →

MONDAY, OCT. 27	TUESDAY, OCT. 28	WEDNESDAY, OCT. 28	THURSDAY, OCT. 29	FRIDAY, OCT. 30
		Consultant leaves for Vienna		
← Counterpart: Final discussion future plans →				

ANNEX 3

LEDGER EQUIPMENT

12 April 1981

Equipment type/Description	Value	Date Ordered		Date Expected	Date Delivered
		PM req.	AG.HQ		
1. Mullen Burst Tester Model C	2342	18 May 1979	3 August 1979	April 1980	March 1980
2. Mullen Burst, Model A.	2583	18 May 1979	3 August 1979	April 1980	March 1980
3. Tear Tester, Elmendorf	2475	18 May 1979	3 August 1979	April 1980	March 1980
4. Puncture Tester, Beach	3690	18 May 1979	3 August 1979	April 1980	March 1980
5. Stiffness Tester, Taber	2530	18 May 1979	27 June 1979	November 1979	November 1979
6. Flat and Ring Crush Tester	2679	18 May 1979	3 August 1979	April 1980	March 1980
7. Paper Smoothness Tester, Bendtsen	3075	18 May 1979	3 August 1979	April 1980	March 1980
8. Climatic Cabinet, PATRA type	6235	18 May 1979	27 June 1979	April 1980	July 1980
9. Climatic Chamber, Walk in type	18000	18 May 1979	November 1979	November 1980	November 1980
10. Cobb Test Equipment	249	18 May 1979	3 May 1979	November 1979	October 1979
11. Heat Sealer, Sentinel	4545	26 June 1979	15 July 1979	December 1979	January 1980
12. Hooks for Drop Tester	1471	26 June 1979	15 August 1979	August 1979	August 1979
13. Vibration Table	8700	26 June 1979	7 August 1979	July 1980	July 1980
14. Torque Tester, closures	398	26 June 1979	20 August 1979	December 1979	November 1979
15. Micrometer, dead weight	499	26 June 1979	3 August 1979	April 1980	March 1980
16. Inclined Plane Tester	7785	26 June 1979	30 July 1979	January 1980	December 1979
17. Climatic Cabinet, WVTR	1000	26 June 1979	3 August 1979	January 1980	November 1979
18. Rub Tester, Sutherland	1605	24 May 1979	3 August 1979	April 1980	March 1980
19. Incinerator, Paper	264	24 May 1979	27 June 1979	November 1979	October 1979
20. Micrometer, Hanr	62	24 May 1979	27 June 1979	November 1979	October 1979
21. Oil Resistance Measurement	461	24 May 1979	27 June 1979	December 1979	October 1979
22. Tachometer, portable	172	24 May 1979	27 June 1979	November 1979	October 1979
23. Stopwatch	25	24 May 1979	27 June 1979	November 1979	October 1979
	170,845				

Equipment type/Description	Value
24. Guillotine	116
25. Pick Test, Dennison Wax	138
26. Hygrothermograph	740
27. Hygrometer, non recording	101
28. Push Pull gauges	476
29. Micro wax, sealing	90
30. Drop test hooks	200
31. Sample cutter, tensile tester	971
32. Sample cutter, ring crush	971
33. Cutting knives, paper	6
34. Caliper gauge, dial	77
35. Compression Tester, boxes	9,000
36. Friction Tester	
37. Air conditioning units, laboratory	9,000
38. Drop Tester, electromagnetic	2,670
39. Patra dishes WVTR	108
40. Can testing instrument 79/4	2,000
41. Information (79/3)	268
42. Microfiche Reader	2,860
43. Compression Gauge, ring crush	332
44. Plyboard Attachment and cutter	625
45. Punched card retrieval equipment	1,500
46. Blades, space Elmendorf (3)	140
47. Diaphrams, spare, mullen burst 2002	90

12 April 1981

LEDGER EQUIPMENT

Date Ordered		Date Expected	Date Delivered
PM req.	AG.HQ.		
24 May 1979	18 July 1979	November 1979	October 1979
24 May 1979	27 June 1979	November 1979	October 1979
24 May 1979	27 June 1979	April 1980	March 1980
24 May 1979	27 June 1979	November 1979	October 1979
24 May 1979	27 June 1979	April 1980	March 1980
24 May 1979	27 June 1979	November 1979	October 1979
24 May 1979	June/July 1979	November 1979	August 1979
24 May 1979	18 July 1979	November 1979	October 1979
24 May 1979	18 July 1979	November 1979	October 1979
24 May 1979	7 June 1979	November 1979	October 1979
24 May 1979	7 June 1979	November 1979	October 1979
24 May 1979	September 1979	November 1980	November 1980
3 August 1979	December 1979	April 1980	March 1980
3 August 1979			
18 May 1979	June 1979	December 1979	December 1979
18 May 1979	June 1979	December 1979	October 1979
Sept. 1979	(27 March 1980 (December 1979	February 1981 November 1980	In part:Jan.1981
30 August 1979	December 1979	August 1980	August 1980
21 Dec. 1979	5 Nov. 1980	February 1981	January 1981
21 Dec. 1979	21 April 1979	December 1980	January 1981
21 Dec. 1979	21 April 1980	December 1980	January 1981
21 Dec. 1979	25 April 1980	Cancelled	Cancelled
21 Dec. 1979	21 April 1980	December 1980	January 1981
21 Dec. 1979	21 April 1980	December 1980	January 1981

Equipment type/Desoription		Value
48. Information	80/	500
49. Camera	80/2	350
5ø. Flash Unit	80/2	100
51. Soreen	80/2	50
52. Projector	80/2	566
53. Copying Device Slides	80/2	165
54. Flow Cups, Viscosity	80/2	250
55. Angle Drop Attachment	80/2	315
56. Laboratory Balance Top Pan	80/3	1,500
57. Analytical Balance	80/3	1,000
58. Push Pull Gauge Stand	80/3	1,275
59. PIRA Board Creaser	80/3	1,800
60. Strip Sample Cutter	80/3	70
61. pH meter	80/3	800
62. Instron Tensile Tester	80/4	27,095
63. Head Space Samples	80/5	290
64. Guillotine	80/5	928
65. Strip Paper Cutters	80/5	218
66. Micro Cassette and Play back equipment	80/5	733
67. Film and Development Accessories		250
68. Patra Dishes for WVTR		
69. Transformer (Chemistry Lab.)		
70. Accessories for Vib. Table		1,563
GRAND TOTAL		143,432

LEDGER EQUIPMENT

12 April 1981

Date Ordered		Date Expected	Date Delivered
PM req.	AG. HQ.		
24 June 1980		October/Dec. 1980	Partial Oct/Nov
21 June 1980	14 October 1980	February 1981	January 1981
21 June 1980	14 October 1980	February 1981	January 1981
21 June 1980	14 October 1980	February 1981	January 1981
21 June 1980	8 December 1980	February 1981	February 1981
21 June 1980	14 October 1980	February 1981	January 1981
21 June 1980	5 November 1980	February 1981	February 1981
21 June 1980	5 November 1980	November 1980	December 1980
1 July 1980	11 November 1980	March 1981	January 1981
1 July 1980	11 November 1980	March 1981	January 1981
1 July 1980	11 November 1980	February 1981	February 1981
1 July 1980	12 November 1980	March 1981	January 1981
1 July 1980		December 1980	December 1980
1 July 1980	11 November 1980	February 1981	January 1981
11 August 1980	17 November 1980	April 1981	March 1981
30 Sept. 1980	10 December 1980	April 1981	
30 Sept. 1980	24 February 1981	May 1981	
30 Sept. 1980	11 November 1980	April 1981	
30 Sept. 1980	19 January 1981	April 1981	March 1981
4 Feb. 1981	L.P.O.	April 1981	
4 Feb. 1981	Local P.O.	April 1981	
Jan. 1981	L.O.O.	January 1981	January 1981.
26 June 1979		January 1980	MACEX 1981

ANNEX 4

UNITED NATIONS DEVELOPMENT PROGRAMME - JAMAICA
MONTHLY REPORT ON PROJECT EXPENDITURE

Complete Project No. DP/JAM/77/008
Project Title: Establishment of a Testing, Development Research and Information Department of the Bureau of Standards.

Report for: March 1 to April 12, 1981 - Project Termination

		ESTIMATED MONTHLY EXPENDITURE I	CUMULATIVE EST. EXPENDITURE (year to date) II			PROTECTED YEARLY EXPENDITURE III		
			m/m	US$	% Approx. Budget	m/m	US$	% Approx. Budget
10.	PROJECT PERSONNEL							
11.	Exports							
11-01	Project Manager	8,700	3.5	20,300		3.5	20,300	
11-02	Cons. on Metal Containers							
11-03	Cons. on Drums and Sacks							
11-04	Cons. on Lab. Procedures							
11-05	Cons. on Paper and Board							
11-06	Cons. on Transport Testing							
11-07	Cons. on Plastics and Laminates							
11-08	Cons. on Glass Containers					2	11,600	
11-09	Cons. on (Rigid Plastic Containers)							
11-11	Cons. on Fruit and Vegetable					2	11,600	
11-13	Cons. on Techno-economic studies							
	TOTAL	8,700	3.5	20,300		7.5	43,500	

		ESTIMATED MONTHLY EXPENDITURE I	CUMULATIVE EST. EXPENDITURE (Year to date) II			PROJECTED YEARLY EXPENDITURE III		
			m/m	US$	% Approx. Budget	m/m	US$	% Approx. Budget
12.	OPAS EXPERTS							
12-01								
12-02								
12-99	Sub-total	8,700	3.5	20,300		7.5	43,500	
13.	Support Personnel						3,000	
14.	Volunteers						1,385	
15.	Travel							
16.	Other Costs							
19	COMPONENT TOTAL	8,700	3.5	20,300	43 *		47,885	100
29.	SUB-CONTRACTS							
30.	TRAINING							
31.	Fellowships	1,500	5	7,500			16,473	
32.	Group Training (Study Tours)							
33.	In Service Training							
39.	COMPONENT TOTAL	1,500	5	7,500	500 **		16,473	1,098
40.	EQUIPMENT							
41.	Expendable							
42.	Non-Expendable							
49	COMPONENT TOTAL	2,395		4,395	100		4,394	100
50.	MISCELLANEOUS							
51.	Operation/Maintenance/Equipment							
52.	Reports			1,687			1,687	
53.	Sundry	600		1,000			1,000	
59.	COMPONENT TOTAL	600		2,087	100		2,687	100
90.	SUB-TOTAL							
97.	Cost Sharing							
99.	GRAND TOTAL	13,195		34,282	66 ***		72,967	140

REMARKS: (Reasons for delays in implementation if any.)

* 1. Cons. in Glass 11-08 Arriving April 17, 1981
2. Cons. in Fruit and Vegetable 11-11 Arriving July 1981

** 3. Fellowship in Chemical Analysis Scheduled May 1981. - Problems in placement.
4. Fellowship in Metallurgy - Programmed June 1981 - Problems in placement.

ANNEX 5

LECTURE NOTES FROM THE JMA/JBS
FLEXIBLE PACKAGING TECHNOLOGY COURSE
FEBRUARY 18-27, 1981
PREPARED BY THE COURSE DIRECTOR
JOHN SALISBURY B.Sc. C. Chem. F. Inst. Pkg.

NAME OF PARTICIPANT .....

COMPANY .....

JAMAICAN BUREAU OF STANDARDS

COURSE EVALUATION FORM

TITLE OF COURSE: Flexible Packaging Technology

DURATION OF COURSE: 10 days

FROM: February 18, 1981

TO: February 27, 1981

We would like to have your comments on the course you have just completed. Please respond to each of the following questions. Your evaluation and constructive suggestions will enable us to improve the training programme. You may sign your name if you so desire.

1 COURSE

(a) Were the course objectives

All achieved	☐	15
Partly achieved	☐	7
Completely off target Nil	☐	Nil

(b) Did you find the course content

Adequate and applicable	☐	18
Meaningful but not applicable	☐	2
Irrelevant	☐	Nil

(c) Which would you say was the most beneficial topic ?

Applications 12

Properties of Flexible Packaging Materials 10

(d) And the least beneficial topic ? Principle factory operation.

Please comment:

1. Very important, enlightening, informative
2. Starting time 8.30 a.m. good
3. Duration of course was too short

INTRODUCTION

These notes have been prepared so as to record some of the main points that will be discussed during the various parts of the course. The participant then has more time to think about the information.

A space has been left on the right hand side of each page for participants to make notes about other points that come up during lectures or in discussion.

The course is designed to cover the subject broadly. No doubt participants will wish to go more deeply into those parts that are of particular relevance to their needs. Participants are encouraged to contact the course director, John Salisbury or the Head of the Packaging Centre, Mrs. Marguerite Domville, about any point on which they would like further information.

PART I

SURVEY OF THE MOST IMPORTANT PROPERTIES OF FLEXIBLE PACKAGING MATERIALS

Including in each case:

1. A brief description of the property (IS:)
2. Some reasons why the property can be important to users and converters. (IMPORTANCE:)
3. Testing Techniques. A very brief outline of the principle method or methods for measuring the property (TESTING). In most cases a slide illustrating the actual equipment or principle will be shown.
4. Comments relevant to the feature (COMMENTS:).

PART II - PRINCIPAL FACTORY OPERATIONS

INCLUDING 1.

A brief resume of what is happening in the factory when such operations as lamination, extrusion, casting, blowing, waxing, heat sealing, printing etc. are being carried out.Slides will be used to illustrate the more important operations.

Special attention is paid to heat scaling methods as these cause the most trouble.

PART III

A SURVEY OF THE MOST IMPORTANT MATERIALS IN FLEXIBLE PACKAGING

INCLUDING

1. Those properties that the material has that are of particular interest and importance.
2. A comparison between the more important materials and polythene film. In what ways it is better or worse than this well known material.
3. How the properties of individual materials can be combined to provide a wide range of them in one laminate.
4. A table comparing the important properties to those of 25 (0.001", 0.25mm) L.D. polythene film.
5. Summary notes by I. Turtle giving useful data, especially on O_2 transmission rates for widely used laminates.
6. References for suggested further reading about flexible packaging.

2. TRAINING

(a) Did you find the level of instruction

Too basic	☐	Nil
Appropriate	☐	21
Too advanced	☐	Nil

(b) Will the information received on the course be

of great help to the present working condition	☐	8
of some help to the present working condition	☐	12
of no use to the present working condition	☐	Nil

(c) Were the Lecutres - (check two)

Easy to follow	☐	19
Difficult to follow	☐	Nil
Difficult to understand	☐	Nil
Easy to understand	☐	19

(d) Was the Methodology

Very good	☐	11
Good	☐	5
Reasonable	☐	2
Poor	☐	Nil

Please comment

Mr. Salisbury commended

Should have more time for Question and Answer.

Canteen Service was good.

Use of slide appreciated.

Hand-outs appreciated.

Visit appreciated. Personnel Co-operation

Period between course and visit too long.

3. PHYSICAL ENVIRONMENT

(a) Was the venue

ideal	5	☐	5
suitable	10	☐	10
reasonable	6	☐	6
poor		☐	Nil

(b) Was the immediate training environment conducive to learning ?

yes	☐	21
No	☐	

(c) Was the daily schedule

Too long	☐	Nil
Just right	☐	15
Too short	☐	

Please comment

Condusive to learning	(1)
Better seating needed	(9)
Should be offered to a greater sector	(2)

4. FUTURE PROGRAMMES

(a) Would you say that the benefits derived (if any) from attending this course were worth the time and effort

Definitely	☐	17
Partially	☐	4
Not at all	☐	Nil

(b) If you were given the opportunity to attend a similar course in future what area of packaging would you be interested in.

Food Packaging	☐	10	Export Packaging	☐	9
Tincans	☐	2	Other (please specify)		2
Glass Containers	☐		Detergent Packaging Corrugated and chip board		

(c) Should the course be repeated would you recommend it to other employees and/or companies.

Yes	☐
No	☐

(d) Would your overall assessment of the course be

Very Good	☐	9
Good	☐	11
Satisfactory	☐	1
Fair	☐	Nil
Poor	☐	Nil

Please comment

Should have future programmes.

The period should be longer

ANNEX 6

LIST OF REPORTS ISSUED BY THE PROJECT

Reports issued by Project DP/JAM/77/008

Title	Author	Date
Packaging Laboratory Test Procedures	G.D. Sykes	21 March 1980
Drums, Sacks Intermediate Bulk Containers and Package Requirements for Dangerous Goods.	C. Swinbank	30 May 1980
Packaging with Paper and Board Based Materials	F.A. Paine	6 August 1980
Techno-Ecnomic Studies	A. Jones	31 August 1980
Rigid Plastic Containers	B.I. Turtle	28 October 1980
Transport Packages Testing	E. Schmidt	29 October 1980
Tinplate Containers	E.F. Meyer	19 December 1980.

ANNEX 7

UTILISATION OF PROJECT RESULTS

ACTIVITIES WITH INDUSTRY

1.	Grace	- Labelling problems - Juice exports packaging - Soup exports packaging - Quench Aid export packaging - Crate for bottle collection - Case gluing - Carton and pouch identification - can lacquer identification
2.	SEPROD	- Case for detergents - Filling Machine problems. - Sacks
3.	J.P.I.	- Quality Control Test Methods - Paper sack material - Box compression testing.
4.	W.I.P.P.I.	- Quality Control system - Substitute board for beer boxes
5.	Packaging Committee	- Participancs - Technical advice - Bottles - Waste recovery
6.	Desnoes & Geddes	- Bottle recovery - Bottle standardization
7.	Community Economic	- Furniture - Glasses
8.	Consolidation Laboratories	- Labels rub - Export bottle breakage
9.	Ministry of Agriculture	- Sacks

10.	Reliable Packaging	- Paper sack materials - Paper board drums
11.	Coffee Industry	- Pawpaw and ginger packs
12.	Tapes, Adhesives and Glues	- Soap wrapper evaluation - Peanut chocolate wrap - Sugar bag - local material v imported - uses for metallised polyester film.
13.	Cement Company	- Paper sacks
14.	Jamaica Bags	- Paper sacks - Polypropylene sacks
15.	New Company	- Frozen Callaloo packaging
16.	UNDP Forestry Project	- Packaging of seedlings
17.	Nutrition Holdings	- Paper Sacks
18.	Casava Products	- Bammie packaging
19.	Hinton Est. Ltd.	- Export pack for linen
20.	N.P.A.	- Calcium carbonate pack
21.	Brazilian Embassy	- Packaging regulations
22.	New company	- Mayonaise packaging
23.	Thermoplastics	- Tableware Packaging - Container evaluation
24.	Metal Box Co.	- Can making techniques - Lead content of canned foods - Plastic Resin selection - Splitting cans.

25. Ministry of Industry and Commerce

26. Jamaica Industrial Development Corporation - Coconut pie filling

UTILISATION OF PROJECT RESULTS

EDUCATIONAL ACTIVITIES

1. Jamaica National Export Corporation - 4 Lectures on Export Packaging
2. Jamaica Society of Scientists & Technologists - Lecture
3. a. Television - 2 Interviews
   b. Radio - Interview
4. Caribbean Seminar - Fruit and Vegetables - lecture
5. Jamaica Manufacturer's Association - Talk
6. The Jamaican Bureau of Standards (JBS)
   (a) Round Table - Laboratory procedures
   (b) Round Table - Techno economic studies
   (c) Round Table - Films and laminates
   (d) Round Table - Dangerous goods
   (e) Round Table - Role of packaging laboratory
   (f) Round Table - Transit Packaging
   (g) Round Table - Rigid Plastic Containers
   (h) Printers Course - Testing Techniques for paper and board
   (i) Flexible Packaging Technology

ANNEX 8

LIST OF STANDARD TEST METHODS

MATERIALS

1. Water Absorption (Cobb) of paper and board.
2. Basis Weight (grammage) of paper and board.
3. Grain Direction of paper.
4. Thickness of a single sheet of paper or board.
5. Ash Content of paper or board.
6. Preparation of a mild stain.
7. Grain Direction of thick papers and thin boards.
8. Heat Sealability of Flexible Packaging Materials (Impulse Seal).
9. Heat Sealability of Flexible Packaging Materials (Bar Seal).
10. Standard Deviation.
11. Resistance of Prints and Printing Inks to Detergents.
12. Flat Crush Resistance of Corrugated Board.
13. Water Absorbency by Water Spot Method.
14. Resistance of Prints and Printing Inks to Soaps.
15. Standard Tests Performed on Corrugated Board and Case Blanks.
16. Surface Tension of Polythene Film (Union Carbide Test).
17. Ring Stiffness of Paper.
18. Dimension of Labels.
19. Basis Weight of Component Papers after separation of Corrugated Board.
20. Dry Rub Resistance of Ink Films.
21. Wet Rub Resistance of Ink Films.
22. Wet Bleed or Transfer of Ink Films.
23. Puncture Resistance of Board.
24. Standard Tests performed on Fluting Medium and Kraft Liner Sheets.

25. Standard tests performed on paper labels.

26. Bursting Strength of Paper and Board.

27. Sampling Terminology of Paper.

28. Static Co-efficient of Friction of Polythene Surface to Polythene Surface.

LIST OF STANDARD TEST METHODS

RETAIL

1. Permeability of water vapour of flexible sheet materials.
2. Permeability of water vapour of packages.
3. Determination of Equilibrium relative humidity and deterioration moisture content of a product.
4. Identification of film materials based on their physical properties.
5. Identification of films based on their chemical properties.
6. Method of test for the Assessment of Odour from Packaging materials.
7. Assessment of taint from packaging materials.
8. Separation of plies in a laminate.
9. Strip test.
10. Determination of Burst Strength of a Flexible Pouch.
11. Determination of Seal Strength and Inner Ply Bond Strength of flexible materials.
12. Determination of Initial Moisture Content of a product by oven drying.
13. Method for application and removal of closures to a specific torque.
14. Method for Screw Cap leakage testing.
15. Method of test for Environmental Stress Cracking Resistance.
16. Method for Density determination of High Density Polypropylene.

17. Method for determining the Compression Strength of Rigid Plastic Containers.

18. Method for the determination of viscosity of lacquers, paints, varnishes by the Ford Cup.

19. Method for the determination of Non-Volatile Content of Lacquers.

20. Method for the determination of the Curing Properties of Epoxy phenolic lacquers by Stroking Test.

21. Method for the determination of curing properties of epoxy-phenolic lacquers by the Brush Test.

TEST METHODS

TRANSIT LABORATORY

1) Stacking Test - complete, filled transport packages.
2) Stacking Test using Compression Tester - complete, filled transport packages.
3) Horizontal Impact Tests (Inclined Plane Test; Pendulum Test) - complete, filled transport package.
4) Vibration Test - complete, filled transport packages.
5) Compression Test - complete, filled transport packages..
6) Vertical Impact Test by dropping - complete, filled transport packages.
7) Identification of parts when testing - complete, filled transport packages.
8) Complete, filled transport packages - General rules for the compilation of performance test schedules - Part I and II.
9) Conditioning for testing - complete filled transport packages.
10) Drop Test of individual containers (Bruceton Staircase Method - lab method).
11) Water Spray Test - complete, filled transport test.