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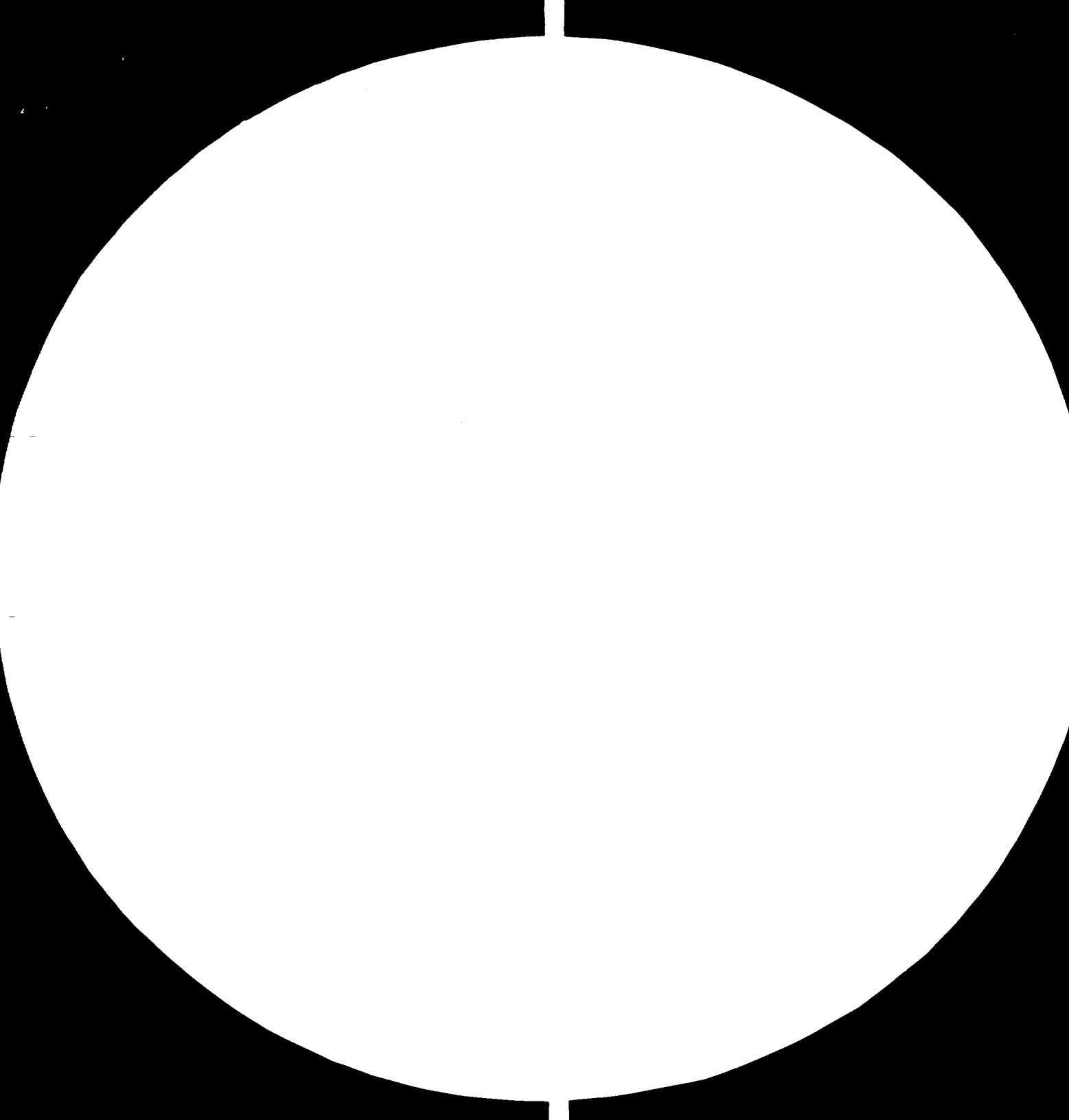
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UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANISATION

REPORT FOR THE GOVERNMENT OF
EGYPT

(R) PLASTICS DEVELOPMENT CENTRE.

PROGRESS REPORT No. 3 MAY 1980

BY

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Expert of the United Nations Industrial Development Organisation acting as the Executing Agency for the United Nations Development Programme.

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

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7. Abbreviations
 - PDC - Plastics Development Centre
 - GOFI - General Organization for Industry
 - TRM - Tripartite Review Mission
 - DG - Director General of PDC
 - ICRD - International Centre for Rural Development
 - VRD - Vegetable Research Department
 - LDC - Land Drainage Centre
 - LDPE - Low Density Polyethylene
 - CTA - Chief Technical Adviser
 - PAC - Purchase and Contracts Section
 - PVC - Polyvinylchloride

1. Summary

Visits have been undertaken to various agricultural institutions and the development of the use of plastics in agriculture assessed. Offers of co-operation with the PDC to assist in these development programmes have been made. The report highlights the need to form an Egyptian Plastics in Agriculture Committee to act as suitable platform to assist co-ordination of work in this field which is currently absent.

An amended and updated list of project activities has been prepared. This assumes an actual building completion date of January 1981. A work plan has been prepared and presented as a bar-chart, together with a list of accompanying notes. All three items are attached as Annex B with a selected circulation.

The training programme is now based solely on study tours. International consultants have been re-scheduled to meet the revised activities. Equipment quotations have been finalized. Government inputs have also been detailed.

A technology development plan, in outline, for plastics in agriculture has been attached as Annex A.

Three recommendations have been made, and a number of necessary actions to keep the project moving forward are indicated.

2. Recommendations

The following three recommendations and project actions are respectfully submitted to Government for their consideration and implementation:

It is recommended that:

1. A full time project manager be appointed to the project for at least one year starting in January 1981. A review should be undertaken in September of 1981 to determine if the project can revert to operation with a part-time Chief Technical Adviser as currently practiced in 1980.
2. In order to provide a common platform to bring together the various and diverse parties with a common interest in the use of plastics in agricultural applications an Egyptian Plastics in Agriculture Committee should be formed. GOFI should urgently take such administrative actions as may be necessary to legally establish such a Committee with the organizational responsibilities placed on the PDC. This Committee will act as a co-ordinating and promotional body.
3. The Work Plan for the PDC, together with the Notes, and the revised and up-dated activities list be submitted to the Board of the PDC for approval. After approval these documents should then be officially attached to the Project Document as an Annex.

In addition to these recommendations a number of project actions have been indicated in the margins against the appropriate text. The planned forward movement of the project depends on these actions being executed within the time span indicated.

3. Introduction

This one month mission was a further mission to supervise the implementation of project EGY/77/004, Plastics Development Centre. The expert undertook two days briefing and debriefing in UNIDO Vienna, arriving in Egypt on 9 May 1980 and departing on 1 June 1980. The CTA was informed during briefing that as Mr. A. Chavez of UNDP, New York, would be in Egypt at this period when a further (2nd) Tripartite Review Mission (TRM) for the project would be undertaken on 11 May 1980. This would be an opportune time to review the outstanding actions which had been detailed during the first TRM.

A continuation of the TRM was held on Wednesday 29 May. The expert was requested to return for the last part of this year's split mission activities in November 1980.

4. Findings

Following the meeting of the TRM on 11 May the majority of time was spent on data collection in order to revise and re-date the list of project activities prior to establishing the work plan.

A set of explanatory notes was prepared to accompany the work plan which is presented as a bar-chart. These notes, the revised activities list and the work plan are attached as Annex B to this report, and are of selected circulation. Appropriate copies of this Annex have already been, or will be circulated separately to concerned personnel at UNDP, GOFI and also the PDC. The concluding meeting of the TRM was held on 29 May and the minutes are being prepared by UNDP office.

1. Plastics in Agriculture

Visits were made to the Land Drainage Research Centre - Ministry of Irrigation, to the Vegetable Research Department of the Department of Agriculture, to the International Research Centre for Rural Development (IRCRD) of the Ministry of Land Reclamation, and also to the Agricultural University. (Note: during this mission the Egyptian Constitution was amended leading to changes in some Ministry titles, etc.).

a) Land Drainage Centre (LDC)

The Water Research Centre of the Ministry of Irrigation has some 10 research institutes. One of these is the Land Drainage Centre, started in 1977 with Dr. Hassan Amer as its Director. The Ministry has started its own production facilities for plastics drainage pipe with three factories in Upper Egypt using World Bank loan and US Aid. Two other factories are being constructed with West German financing and a sixth with Dutch bilateral funds.

All factories produce corrugated PVC drainage pipe. Last year production of 8 cm PVC pipe was started as a replacement for cement pipes based as drainage collectors.

There have been technical and production problems. The development of the LDC was outlined by the Director, who indicated that he would welcome the assistance and co-operation of the PDC.

It is known from an earlier visit made to the Cairo University Engineering Department that they have been consulted in relation to some of these problems which have been examined with assistance from MIT in USA.

There is a massive drainage scheme in hand involving some 5.5 million acres of ground. 2 million acres have already been completed. Some 0.35 million acres per year are currently scheduled by draining all of which involve corrugated rigid PVC drainage tube (the word 'tube' in this sense is used since the pipe is sufficiently flexible to be coiled).

8 cm extruded smooth bore PVC rigid pipe is already being used as a drainage collector. This utilises some 100 metres of pipe per feddar (approx. one acre) and it was disclosed that the requirement will call for 100,000 km of such pipes. Therefore any improvement in formulation cost or process efficiency would have a significant cost saving.

A reference to a paper in September issue of *Plastics Age* entitled "Optimization of plastics in drainage", would appear to be worthwhile obtaining by the DG.

Action

b) Vegetable Research Department (VRD) at Dokke, Cairo

Dr. Sayd Hassan Nassar is Head of the department, but the interview took place with Dr. Arafa Arafa, a research officer.

The VRD are just starting a large-scale 5 year development project on plastics greenhouse cropping involving a World Bank loan of 12 million US dollars. The project was developed by and also being directed by the Vegetable Crop Research Institute in Eire (Southern Ireland) and their consultants, ULG Consultants Ltd.

The project is located at Kaha, some 26 km from Cairo. It is proposed to progressively erect some 5 acres of plastics greenhouses of which the first one acre has already been erected. These are imported Filclair plastics houses (French design). The project calls for half the houses to be made of local materials and construction. The objective is to determine the optimum cropping techniques and crop pattern for growing in plastics greenhouses having in mind the export market for the produce.

In September/October they propose to plant tomatoes, cucumbers, melons (Cantelope, Ogden and Charantee varieties) french beans, etc. which should be ready for harvesting during mid December to March period.

Experiment provision has been made for supplementary heating but it is believed now that this is not required.

They would welcome the co-operation of the PDC in their programme and agreed that we could evaluate imported plastics film in side by side experiments with locally produced material, which has now recently become available in wide widths. An international plasticulturist will be requested by the PDC to assist with these trials, as well as with the use of perforated film as flut tunnels for potatoe crop advancement which was also discussed. The DG will arrange to follow up this visit and then arrange with local producers for the supply of suitable material to be included in these controlled trials.

Action

The pilot sizes for crops will be 5 x 7 m and all experiments are performed with 4 replications. Discussion also took place on trickle irrigation potential, but it would appear too early for its introduction at VRD for trials at this stage. However, note should be made that it would require 500 m of pipe and 1500 emitters per system for an evaluation.

Information was also given that small plastics tunnels were examined by FAO assistance in 1965-70 for winter crops. It was found that with LDPE film there was a heat loss (right radiation loss) but were satisfactory for seedbags. With current technology this problem can be resolved by selection of more appropriate plastics films and represents an area for future development for the PDC's programme.

Action

The VRD are also currently engaged in a project with the University of California for tomatoes growth under tunnels using plastics film of 200 micron thickness. This is a project which the developing countries can pursue for additional details.

Action

Finally, it was noted that Department of Agriculture (previously the Ministry of Agriculture) has an Agriculture Research Centre and its work is distributed within 11 research institutes covering a wide range of specialized activities such as, Fruit and Vegetables, Horticulture etc. It would be worth following up this information by personal visits to obtain further information of the use of plastics.

Action

C. International Centre for Rural Development (ICRD) at Amyer

Discussions were undertaken with Mr. Mohamed Abd El Haleim, irrigation designer, and with Mr. Mohamed El Gitany, Head of the Soil and Water Department.

It was reported that some black LDPE pipes, of local manufacture had shown physical failure after about one year of use. A second problem was non-uniformity of pipe diameters as well as ovality which resulted in fittings leaking, or could not be fitted because of over-size. In addition, black LDPE film also cracked after two years use. The problems occur despite the fact that the pipes are ordered to pipe specifications which are laid down. It would appear that no pipe is marked with a standard quality designation, and there are no guarantees sought in the tenders. From these comments it is clear that such processors in the plastics industry could benefit from technical assistance and trouble shooting activities, both of which are potential areas for PDC activity.

It was agreed that it would help the PDC if future failures of plastics could be removed from the field and the samples duly marked with a short history of the product, its performance time, manufacture, and nature

of failure. The PDC could then assist the ICRD by a detailed examination of the sample, and build up a bank of data of such items so that appropriate action could be taken with the manufacturer to assist in production improvement and such other work as may be necessary.

Action

They have some trickle irrigation systems in use on new land using Cyprus manufactured materials. This involves 20 mm diameter LDP black pipe with emitters of the 'press-stud' type. They have grown tomatoes, peas, water melon and artichokes with this system and appear so far to have no problems. Other crops are irrigated by portable plastics spray irrigation of Greek manufacture. Here they have had failure of the metal springs, in the quick-fit clamps.

They take two crops per year. Planting winter October/November and planting February/March for summer.

They would be willing to co-operate in a small trial with mulch for a ground-nut (peanuts) crop to be planted October this year. Suitable quality materials will be imported and an expert in plasticulture will be organized by the PDC project for this purpose. By this reasons co-operation will be seen to be active, and will provide suitable samples both before and after use to obtain data on change in properties. The possibilities and constraints of using such mulch film for more than one crop will also be examined.

Action

d) Agriculture University of Alexandria

Two visits were made. At the first visit Prof. Ali El Ladoub outlined his scheme for snail control in relation to control of 'river blindness'. What appears to be required is a plastic film in which a specific riverside weed can be wrapped and then immersed in water to permit the slow-release of the active chemical in the plant which will kill the snails. The possible use of finely perforated LDPE film could be a starting point for a trial.

The discussion then ranged to desert plantations and the use of plastics for water conservation, hydroponies etc. There were a large number of ideas proposed and a great enthusiasm for plastics.

It was agreed that the Professor would develop a project on paper which could then be submitted for financing to various bodies since the areas of interest were so wide that a major project development could be easily envisaged.

At the second visit discussions were undertaken with the Dean, Professor Khalid El Shazley, and other members of his staff. Prof. Fatih Amer referred to a recent paper "Uniform irrigation with a low-head bubbler system" by Stephens L. Rawlins of the US Salinity Laboratory, Agricultural Research Services, USDA. This had the advantage of overcoming 'clogging' which is a main problem in trickle(also called drip) systems. However it required a relatively flat soil profile. He is also looking for other low cost irrigation systems, which may or may not involve plastics. He would welcome the co-operation of the PDC with his problems.

The Dean expressed an interest in silage storage, a system that is new in Egypt and has a large potential. This will involve further discussions to work out detailed programmes. It was explained that the University has an experimental trials plot for carrying out various experiments. They are now just starting an demonstration farm where the new techniques established from the trials can be put into practical use. This will greatly assist the extension operation of transfer of technology to the farmers.

It was also disclosed during the discussions that since the small farmers show great resistance to change, it is the Minister's opinion that new agricultural technology should be first directed to developing desert areas and new reclaimed land where the technical trained personnel are available. This will ensure an easier transfer and utilization of technology to the benefit of the food programme of the country.

The Dean, therefore, offered the fullest possible co-operation of the University in the development of the use of plastics in agriculture, and it is now left to work out specific details. This can be done when the international plasticulturist is in Egypt with the DG.

Action

e) Egyptian Plastics in Agriculture Committee

From these discussions it became quite clear that there are a number of trials being undertaken in Egypt, using skilled and competent agriculturalists to develop raw technologies which involve the use of plastics, and such trials are being undertaken in a number of different locations within the country. Enquiries also revealed that no official mechanism exists to co-ordinate such activities, the information, difficulties etc., encountered by each group of researchers is not generally available outside their own unit.

If speed of implementing applications to the general benefit of the country is to be achieved, and also to avoid the possibility of duplication of effort, then there is an urgent requirement to provide a mechanism of co-ordination. This problem is not new, it also recurred in Europe during the early period 1952-62 when plastics were being developed for use in agriculture. A suitable solution is to provide a common platform where all the various and diverse parties with an interest in this specialized area of application can get together and interchange their views and information. This can be achieved by the formation of an Egyptian Plastics in Agriculture Committee and its membership would be drawn from agricultural (irrigation etc.) research workers, the appropriate Ministries, the Plastics industry (raw material suppliers, processors, fabricators) universities, development banks, representatives of farmers and growers (public and private sectors) etc. The PDC can form the focal point and act as the organizer for such a Committee which would operate in both a co-ordinating and promotional role. It would be open to the Committee to join the International Committee for Plastics in Agriculture (CIPA) and thus open up access to international workers in this specialized field as well as receiving copies of 'Plasticulture' a quarterly journal published by CIPA.

It is therefore recommended that GOPI take urgent administrative action to legalize the formation of an Egyptian Plastics in Agriculture Committee with the organizing function made responsible to the PDC.

A development programme outline, for plastics in agriculture applied research work to be undertaken by the PDC has been prepared and included as Annex A for general information.

2. Work Plan

(The Work Plan is attached as Annex B with selected circulation)

a) Data collection - plastics industry

The 1973 Egyptian plastics industry survey undertaken by UNIDO experts indicated that there were 130 processing companies and forecast a 1980 consumption of 105,000 tons. It also indicated that there were nine public sector companies. Three of these were primarily plastics processor while the remaining six can be regarded as peripheral in so far that the plastics which they utilized were a component part of a product which itself was their main line of business. For example, electrical cables, shoes, coated paper etc, although a peripheral activity they consume reasonable quantities of plastics raw material and should be included in any future survey.

The 1979 plastics survey undertaken by the Egyptian Petrochemicals Co., was in Arabic. Its activities were restricted to information concerning polymer usage by type and by volume. A realistic figure of 191,000 tons of polymer consumption for 1980 is almost double the figure predicted in the 1973 UNIDO report and would suggest there has been a significant leap forward in the past few years.

This most probably relates to the freer foreign exchange availability since the majority of the polymer is all imported. In addition as indicated in the section "Plastics in Agriculture" there are now three new public sector factories consuming PVC for land drainage pipe. In addition it is known that the military have at least two factories processing plastics for their own use but no details are available.

Information from the appropriate Chamber of Trade indicates that there are only about 65 plastics companies now registered, which is approximately half the number of 1973. The 1973 report stresses that many of the private sector companies were very small. Additional information obtained from discussions indicated that, indeed, many were one extruder in a living room or a small injection machine in a garage. The reduction in numbers is, therefore, to be expected and taken together with the volume of raw materials consumed indicates a much stronger industry is emerging.

On this information it would appear that the number of public sector companies now represents about 20 per cent of the total companies in the business. From other discussions it is believed that there are only three or four private sector companies who are comparable with the size of the public sector companies, and the remainder are small scale.

Faced with this background it was evident that it was opportune to undertake a further plastics processing industry survey to obtain more specific information regarding the current status and constraints within the industry. The DG reversed his earlier decision and agreed to utilize the services of an international consultant, Mr. J. Whitney for one man/month. UNIDO were able to advise his availability for the 9 June 1980 so that the survey could be completed before Ramadan. GOFI were advised by the DG to make the request for this expert but by 29 May no request had been received by UNDP office. This matter is being followed up by the DG. Action

b) Institutional Management and Administration

As indicated in the Work Plan 'notes' in Annex B, the PDC has decided to adopt the Public Service sector regulation for personnel, the finance regulations prepared by the Ministry of Finance, the regulations of Tenders and Purchases and auction for selling dated 1979 and the law on unified accounting. Appropriate documents, in Arabic, have been purchased and available in the PDC office.

There are still, however, some further administrative documents to be prepared, as indicated in the activities list. This includes the preparation of a technical manual to support the development of a document detailing output profiles for a five year period. Also the preparation of a manual explaining the approach to be used in developing the PDC programme for applied research, programme modifications, review machinery, and which users should be consulted and by what means in relation to programme content and modification. Following these the various programmes will require to be detailed.

After discussion it was agreed that a consultant in institutional management and administration for one man/month could be of specific value in assisting in the preparation of such manuals. In addition, with the right person a great deal could be learned on the administration organization. It was therefore agreed that the DG would take appropriate steps to request such an expert. He will be required in the November/December period of 1980. Action

c) Contract work - income generation

The Egyptian Standards Organization have had discussions with the DG. They have indicated they wish to use the PDC as an official test house for plastics and are prepared to pay for such service. Obviously this can only be entertained when adequate testing experience has been developed, but is indicative of future source of funding.

Similarly, the Chairmen of the three public sector processing companies have indicated that they are prepared to pay for development work to be undertaken specifically for their own requirements. They are all currently making a financial contribution to salaries of key personnel and have thus financially expressed their commitment to the PDC. Urgency has been expressed.

Additionally, as indicated earlier in the report, the Ministry of Irrigation requires technology assistance for which a fee can be charged.

Thus at this early stage of development there is positive evidence of a commitment from the industry to utilize the services of the PDC.

It is suggested that during 1981 when skills are being learnt that any development work undertaken should be on an in-house cost basis and free to the client, except for such raw material charges as may be necessary. This will enable the PDC to develop a confidence with the client and in 1982 consideration should be given to the scale of charges that should be made.

Other potential clients have already been indicated in DG's report to the TRM.

d) Inputs - general

Following TRM discussions the activities list was modified to stagger both the institutional building process as well as the equipment installation and new date-lines established. Training fellowships were all converted to study tours following advice from UNIDO. The equipment quotations were finalized and the CTA will prepare the appropriate justifications for PAC, UNIDO. The remaining items of equipment Action in the project physically takes shape as additional funding will be required to off-set the inflation increases. Consultant requirements were fully discussed and detailed for 1980 and 1981 with indications of requirements in 1982. These will require to be confirmed and up-dated during 1981. The CTA will prepare the necessary job descriptions or up-date existing drafts to meet the specific requirements. Action

On the Government side the contractor to undertake the building conversion has been selected and it is expected that the contract will be signed on 1 June, and a start made on the building by 10 June 1980. GOFI will have a full time officer located at Alexandria solely to Action supervise this conversion contract. Key points in the conversion timetable are being established by GOFI so that completion date can Action be carefully monitored. Positions of laboratory furniture are to be Action finalized by the DG.

Catalogues are to be obtained of various equipment items that Action are to be supplied. The CFA will then advise on suitable specifications to assist the tendering operation. The need of a photocopier Action is currently urgent. This machine must be considered as part of a Action total system since it is intended later to attach a collating machine as the project develops. Additionally, in view of the nature of the information services to be supplied by the PDC, it will be necessary to have a photocopier which has adequate facilities to undertake copy size-reduction. Much will depend on the type of machines available in Egypt, and particularly the speed of service that can be offered in Alexandria. In fact any contract for a photocopier must be effectively linked to a servicing commitment by the supplier or leasing agent. The PDC services to industry are time-sensitive and photocopies represent a part of that service.

The DG has already reported to the TRM that recruitment of key personnel is well in hand. However a full-time driver is outstanding. However, a new approach on effecting an adequate salary is in hand and interviews are already planned. Acquisition of personnel is Action therefore satisfactory. Recruitment of further technologists and assistant technologists, and other professional staff who will be required when the building is completed has been discussed. The DG has expressed the view that there will be no real problems in recruiting suitable personnel. However, at this stage, it is not possible to predict the number who will speak English sufficiently fluently to obtain the British Council English Language Certificate upon their appointment, nor how much local training will be required for this purpose. This is one of two reasons why technology training cannot yet be detailed for 1981. The second reason is the failure of UNIDO Training Section to provide the requested information on courses available and

their content as well as place availability. Information on mould setting courses was requested in October 1979 and on other courses in February 1980. The second progress report gave full details of UK institutions who normally run plastics technology courses. Yet despite the provision of such information Training Section have been unable to write to the institutions to request copies of the appropriate prospectus. Urgent action is now required from Training Section to Action provide the information requested and to assist in preparation of study tours as detailed in the next section.

e) UNIDO/UNDP inputs - specific

Appropriate action required by UNIDO Training Section: Action

			<u>Action</u>
i) <u>Training - Study Tours</u> (note man/months are approximate and will depend on final arrangements)			
1980	a) Plastics in agriculture Congress - Lisbon; and plastics technology centres in Europe	Oct./Nov.	1.375 m/m 1 fellowship for DG
	b) Plastics in agriculture Congress - Lisbon; and instrument training in selected organizations in Europe.	Oct./Nov.	1.375 m/m 1 fellowship
	c) Technical information centres	Oct./Nov.	1.5 m/m 1 fellowship
	d) LKT/UNIDO training programme	Oct./Nov.	1 person nominated to UNIDO invitation (2.25 m/m not charged to project)
1981	a) Equipment maintenance	Feb./Mar. (depends on manufacturers' timetables)	3.0 m/m 2 fellowships
	b) Sister institutional training	Oct./Nov.	1.0 m/m 1 fellowship
	c) Plastics in agriculture experimental stations and farms - Europe	Mar./Apr.	2.25 m/m 2 fellowships
	d) LKT/UNIDO training programme	Oct./Dec.	2.25 m/m 1 fellowship at project cost
	e) Technology	dates to be determined	6.0 m/m number of fellowships to be determined.

1982 a)	Plastics in agriculture(USA/Mexico) experimental stations and farms	Feb.	1.0 m/m 2 fellowships
b)	Sister institutional training	Nov.	1.0 m/m 1 fellowship
c)	Liaison with UNIDO plastics centres	Dates to be arranged	2.0 m/m 3 fellowships
d)	LKT/UNIDO training programme	Oct./Dec.	2.25 m/m 1 fellowship at project cost
e)	Technology	Dates to be determined	6.0 m/m number of fellowships to be determined

Total cost estimated(at May 1980 prices)	159,013 US dollars
Present budget total training allocation	81,140 US dollars
Additional funding required	77,873 US dollars

Note:

1. Current funds allocated will cover all training requirements in 1980 and 1981 except 4.0 m/m technology
2. a) The DG has requested that A.D. Clarke as CTA accompanies him on the institutional study tour where negotiations regarding potential sister-institutions contracts will be undertaken. This part of the tour is estimated at 0.5 m/m.
b) The DG has requested that A.D. Clarke as the CTA, or as specialist consultant accompany the plastics in agriculture study tour (Europe) for the initial stages only. This is estimated at 0.5 m/m.

Government approval will be requested by the DG and Action will inform the CTA before 1 July 1980 of the decision. Later than this date the CTA will be otherwise committed for the October period.

ii) Chief Technical Adviser

The CTA has been requested to complete the split mission operation for 1980 by returning for four weeks in November, the actual dates to be finalized later. Action

In the interim he will finalize the job descriptions for consultants, prepare the details and arrangements for study tours, as well as Action advise on specifications for Government provided equipment justifications for unprovided equipment and other follow-up actions.

As discussed at the TRM the CTA recommends that a full-time project manager should be appointed for a one year period starting January 1981 to generally supervise the many activities that will be undertaken in this period, and to be on-the-spot if rescheduling of planned operations is required according to the needs at that time. A review should be undertaken in September 1981 to determine if the project is sufficiently progressed and stable to revert to operation of a part-time CTA in 1982.

The DG opposes this recommendation and his views have been clearly expressed to and recorded by the TRM.

This now requires a Government decision to be made and preferably not later than July 1980 if the process of recruitment, selection Action and appointment are to be completed to permit such a manager to be in Egypt at the beginning of January 1981.

If a full time manager is appointed, it will require an additional sum of 28,800 US dollars for a one year period. This could be accommodated by appropriate project revision within the current budget, but would require additional balancing fund inputs during 1982.

iii) Consultants

Appropriate action required by substantive section and personnel recruitment section.

				<u>Action</u>
<u>1980</u>	1.	Plasticulturist - intensive cultivation (Mr. H.R. Spice recommended)	Sept.	1 m/m split mission
			Oct.	0.5 m/m
	2.	Industry assessment (Mr. J. Whitney recommended)	June	1 m/m
	3.	Preparation list books, journals etc.	July	0.5 m/m home duty station
	4.	Institutional management (Mr. Balasunder recommended) retired, ex-Director-Central Institute of Plstics Engineering and Tools (CIPET)	Nov/Dec	1 m/m

<u>1981</u>	1. Plasticulturist-intensive cultivation (Mr.H.R. Sprice recommended)	Mar/Apr. 1 m/m Sept/Oct. 1.5 m/m	split mission
	2. Plastics technologist-physical testing	Jan. 1.5 m/m Sept. 1.5 m/m	split mission
	3. Plastics technologist-formulations and compounding	Jan. 1.5 m/m Sept. 1.5 m/m	split mission
	4. Plastics technologist-blown film extrusion (Mr.R.A. Gould-ex-ICI-recommended)	June 1.5 m/m	split mission (into 1982)
	5. Plastics technologist-injection moulding (Mr.J. Nightingale recommended)	Aug. 1.0 m/m	
	6. Plastics in agriculture experts for Presentation specific papers at Plastics in Agriculture Seminar(Alexandria) (Subjects to be selected later by organizing committee)	Autumn 2.0 m/m	(6 persons 10 days each)
<u>1982</u>	1. Plasticulturist-(Speciality to be specified later)	April 1.0 m/m Sept. 1.5 m/m	split mission
	2. Plastics technologist-building applications (Mr. Crowder recommended)	Feb. 1.5 m/m Oct. 1.5 m/m	
	3. Plastics technologist-blown film extrusion	Jan. 1.5 m/m	
	4. Other consultants not identified or quantified at this point to be detailed during 1981 - possibly 8 m/m		

iv) Equipment

The remaining budget for equipment now totals about 106,000 US dollars. It is not possible to purchase both an extrusion line and an injection moulding machine for this sum. As plastics film will be a large item in plastics in agriculture, in building applications and packaging it is preferable to acquire this item first to meet currently known development needs.

Therefore, it has been agreed by the DG that an extrusion line, a grinder and a film re-work pelletiser will be ordered for delivery

May 1981, installation June 1981. The total for these items, on January 1980 quotations, is just under 100,000 dollars.

Justification for certain equipment items will be prepared by the CTA and passed to PAC so that orders can be placed. Action

f) Government inputs - specific

i) Building Conversion

In hand, as earlier indicated, work plan has been drawn up on basis that building will be completed by early January 1981. If delayed longer than 4 weeks then rescheduling will be necessary. Arrangements have been included that one section of the building should be completed about six weeks before final completion of the building. This will permit key personnel to move in and be on-the-spot for final operations. Official building completion date in end November 1980.

ii) Office and laboratory furniture and fittings, office equipment

The DG will arrange for the appropriate tenders to be prepared and finalized so that orders can be placed for delivery in October 1980, which will be required if the November completion date is maintained. Action

The location of the sink units in the laboratories and in the formulation section are to be finalized by the DG. These have been generally discussed and outlined in September 1979.

iii) Technical equipment

As indicated earlier appropriate action has already been discussed. The DG will obtain the necessary catalogues and post to the CTA, who in turn will advise on specifications for tenders. Orders need to be placed so that delivery is not later than end November 1980.

iv) Training

English language improvement courses are currently being attended by one staff member. The DG will inform the CTA not later than 14 June the names of the staff who have passed the British Council English Language Certificate which is necessary to hold before any study tour is undertaken. Action

Arrangements are to be made for additional staff members to undertake such improvement courses and the DG will inform the CTA by 14 June the names of personnel and course dates. Action

It is hoped that attendance at a management course can be arranged to be started at the beginning of June. The DG will advise the CTA of appropriate details not later than 14 June. Action

Difficulties have been experienced in entering the British Council classed in English due to great demand. Entrance to the American classes in English is an acceptable alternative.

The DG will also arrange to find a suitable course in statistics and their application to optimizing the number of experiments Action and also application in quality control. There are some specific training requirements in this area which should be undertaken before the end of 1980.

g) Approval of Work Plan

It is recommended that the work plan together with the notes and list of activities be submitted to the Board of the PDC for approval. After approval these documents should then be officially attached to the project document as an Annex.

h) Development Programme

In order to present the PDC staff with something specific to use in determining the weekly/monthly work plan for themselves and their section members during 1980 and 1981, the CTA drew up an outline of technical work that will need to be undertaken to support the development of plastics applications in agriculture. This has been based on information gathered in various discussions undertaken during the past missions to Egypt.

The CTA has requested PAC, UNIDO, Vienna, to obtain quotations of appropriate materials for green house covering, flat tunnels and mulch so that these can be ordered and delivered before the arrival of the Action consultant in September 1980. Catalogues for trickle irrigation systems have also been requested. It is expected that the plasticulturist consultant will advise on such other items that are required to continue his operations.

Annex A

Development programme - outline

Plastics in agriculture

Field trials with selected imported materials with co-operation of VG Research Centre (Dept. of Agriculture)
International Centre for Rural Development (Ministry of Land Reclamation)
Agricultural University of Alexandria

covering following applications

long life film for green houses and tunnels;
perforated film for flat tunnels;
shading and sand-barriers;
mulching;
trickle irrigation;
silage;
canal and channel linings.

1. Establish base line data for product performance (physical properties) both imported and local plastics products;
2. Monitoring changes in properties with time of exposure to weather;
3. Using data obtained propose minimum values for product standardization and develop national standards with co-operation Egyptian National Standards Organization;
4. Develop improved formulations for local production;
5. Evaluate formulations for processing characteristics pilot plant equipment and modify formulation as may be necessary;
6. Establish test data on product produced on pilot plant;
7. Arrange field scale trials of pilot plant product (if possible);
8. Transfer information to interested processors, assist in initial plant runs;
9. Establish test data on production materials of new formulations;
10. Arrange field scale trials of local production and monitor change of properties with time;
11. Establish cost-performance data from field scale trials;
12. Develop more cost effective systems:
 - a) Effect of thinner film under Egyptian field conditions;
 - b) Mixed polymer films;

- c) For mulching - two colour films;
- d) Co-extrude films for improved mechanical handling;
- e) Low pressure pipe, smaller diameter and other methods of cost reduction per unit length (fillers, foam etc.);
- f) Co-extruded pipes for improved performance at lower system cost;
- g) Design of simpler pipe fittings and more cost effective performance;
- h) Develop and evaluate formulations and products based on varying quantities of know re-work (scrap) plastics;
- i) Investigate and examine local natural materials which might be usable as fillers in thermoplastics.

13. Discuss other known applications with local agricultural experts to determine if potential exists in Egypt. If positive, determine low application could be developed to fit local conditions, agricultural and cost effectiveness. Arrange appropriate development programme.

5. ACKNOWLEDGEMENTS

The CTA to express his sincere thanks to his counterparts Dr. O. ABU ZEID, Director General of the PDC and other staff members of the PDC for all the help and assistance given during the course of the mission.

Acknowledgements are made to the staff of UNDP office Cairo for all the help and assistance given during the course of this mission, which has greatly assisted the project moving forward.

Finally, many thanks are due to the various involved members of staff at UNIDO HQ, who have all provided valuable back up services and support operations , which have been very much appreciated.

WORK PLAN

EGYPTIAN PLASTICS DEVELOPMENT CENTRE

MAY 1980

PREPARED BY A.D. CLARKE , UNIDO CHIEF

TECHNICAL ADVISER

NOTES

1. The list of activities has been revised where necessary and updated. It is attached with the work-plan which is presented as a bar-chart .
2. The general picture is as follows:
Second half 1980 Planning and training
1981 Establishment of institutional and technical facilities, and training.
1982 Consolidation and training.
3. Training needs in 1981 and 1982 can not be fully detailed until the additional scheduled staff have been recruited (starting work when building is completed) and their training requirements assessed. Additionally, until UNIDO training section is able to supply details of course and place availability for 1981 for plastics technology courses, it is not possible to provide any timed plans.
4. National training in Egypt covers English language improvement, management courses and on the job training in local factories.
5. International training will be given only to holders of British Council English language certificates.
6. The work-plan covers the development of both the institutional infra-structure operations as well as permitting the development of plastics technology facilities.
It is planned to build up the PDC on a step by step approach. For this reason the order for the pilot plant processing equipment will be made in 1980 to allow delivery in June 1981 . In the meantime the testing equipment will be available for installation on completion of the building conversion (January 1980) Similarly for the service sections where the drawing office facilities will be started in the second half of 1980 with the market research and statistics / economic sections being started in early 1982.
7. In accordance with the Board. priorities provision has been made for the following:-
 - a) Start development work in September 1980 on plastics application in agriculture with co-operation of :
 - i- Ministry of Land Reclamation through the international centre for Rural Development (FAO project) at west Nubarya (near Alexandria)
 - ii- Department of Agriculture through the Vegetable Research Centre at the plastic cropping project at Kaha (near Cairo) (World Bank financed project).
 - iii- Agricultural University of Alexandria at its experimental farm.

An international consultant is scheduled to assist in these

- b) A seminar on plastics in agriculture is planned to be held in Alexandria in the Autumn of 1981 with international participants.
 - c) Co-ordination with other existing plastics activities in Egypt has been started and liason will be formalised on a continuing basis.
8. An industry survey is planned for June 1980 to provide additional and up-dated data concerning the status and constraints within the Egyptian plastics processing industry. On the basis of this survey and other available data appropriate technical programmes can then be detailed. An international consultant will assist in the organisation of this survey.
9. At the request of UNDP Cairo Office an out-line projection for an extension of the PDC project covering the five year planning period 1982-1986 has been made. This will involve UNDP inputs of between 1 to 1.5 million US Dollars, additional building to provide a further 1500 square metres space and about 28 additional staff. Government inputs were not quantified. At this stage of the PDC development it is too early to be more specific; however as more data becomes available it will be possible during 1981 to plan in more detail such a project extension.
10. A full time project manager to start January 1980 for at least one year's operation is recommended. During this period there are a large number of activities to be organised which are time related. If there are delays the work programme will need immediate up dating and revision. A review of the situation is advised in September 1981 to determine if the progress made is sufficiently advanced and stable to permit a return to operation of a part-time Chief technical adviser in 1982.
11. An international consultant is scheduled for 1980 to assist the Director-General in the preparation of manuals and other documents necessary for the development of management functions of the PDC. The PDC has agreed to adopt the regulations for public sector companies which covers personnel administration and finance for which appropriate documents have already been obtained.
12. A Board meeting is proposed to be called in June 1980 to approve and adopt this work-plan together with the attached list of activities.

<u>Description of project activities</u>	<u>Location</u>	<u>Starting date and duration</u>
1. Appointment of National Staff	Alexandria	Sept. 1979 onwards as required
2. Identification and development of necessary management functions, objectives and tasks which includes policy-making; administrative management (including resources management); financial management; programme management; evaluation and forward planning; co-ordination and relations with governing authorities, Government, other organizations and institutions, etc.	Alexandria	June 1980 14 months
3. Preparation of staff profile document in co-operating job objectives, task descriptions, qualifications and experience required and other elements of a profile of staff needed for operating the PDC at optimum level, and its implementation	Alexandria	Jan. 1980 12 months
4. Preparation of job descriptions for shortterm consultants required for the PDC development programmes implementation to be advised to UNIDO to enable recruitment procedures to be initiated.	Alexandria	Sept. 79 3 months and onwards as required
5. Local training courses to be attended: a. English language improvement b. Management	Alexandria	Sept. 79 onwards
6. Development of suitable organizational structure for PDC & modified as necessary from time to time	Alexandria	April 1980 6 months
7. Development of a policy statement for PDC to be approved by the Governing Board and implemented	Alexandria	Dec. 79 3 months
8. Consultant for selection of books and journals plastics technology library service		July 80, 0.5 m/m
9. Provision of short term international specialist consultants	Alexandria and travel within country	Sept. 1980 onwards as required
10. Preparation and implementation of a system of PDC staff induction and development	Alexandria	Sept. 1980 onwards
11. Establish stores, inventory and stock control records	Alexandria	June 1980 onwards as required

Description of project activities	Location	Starting date and duration.
12. Checking equipment on delivery, installation and testing of equipment; checking and listing spares.	Alexandria	Jan. 1980 as required
13. Collection and indexing of service manuals provided by machinery and equipment suppliers.	Alexandria	Jan. 1980 as required
14. Develop contacts with plastics raw material and machinery suppliers, with trade associations and appropriate Government organizations	as required	Jan. 1980 onwards
15. Investigate and identify areas of potential use of plastics in agriculture, and in building/construction applications.	Alexandria and travel within country	Jan. 1980 onwards
16. Provision of fellowships for overseas study tours:		
a) Participation in International Congress for plastics in agriculture.	Lisbon	0.75 m/m Oct. 1980
b) Consultations with plastic technology institutions to assist determining choice of institution for formal sister-institutional relationship for constant updating of technology Consultations and visits to selected equipment and processing factories accompanied by an appropriate consultant if required. One fellowship for the Director General of the PDC.	EUROP	1 m/m Oct./ Nov 80
c) Testing and quality control	Europ/USA	0.75 m/m Oct/Nov. 80
d) UNIDO/LKT plastics training course.	Europ	Oct. 80 UNIDO invitation Oct. 81 2.25m/m Oct. 82 2.25m/m Feb/ March 81 3.0 m/m
e) Equipment maintenance training at manufactures.	Europ	3.0 m/m
f) Technical information systems and resources.	Europ/USA	Oct./ Nov. 80 1.5 m/m
g) Training in plastics technology: formulation, compounding, recycling, fabrications product development and evaluation, materials science, mould setting etc. Participation in overseas conferences and exhibitions.	Europ/USA	12 m/m to be arranged
h) Plastics in agriculture: Consultations and visits to experimental stations, institutions and farms, accompanied by appropriate consultant if required. This tour is seasonal dependant.	Europ USA	March/April 80 2 m/m Feb 1982 1 m/m
i) Sister-institutional visits for consultations and technology interchange.	Europ	Oct/Nov 81 1m/m Nov 82 1m/m
j) Liason visits to other UNIDO supported plastics technology institutions, India Mexico, Upper Volta.		3.0 m/m dated to be arranged. (most likely in 1982)

Description of project activities	Location	Starting date and duration
17. Industry survey to determine up dated information and needs of the plastics processing industry.	Alexandria and Cairo .	June/July 80 2 months.
18. Preparation of a technical manual to support the development of a document detailing the outputs profiles of the PDC for a 5-year period of the project and explaining (a) the approach, methods and techniques as well as the information and data to be used in preparing the outputs forecast document; (b) how the approach, methods and techniques and what kinds of information and data should be used to modify the established profile of outputs; and (c) what kind of machinery should be established within the PDC to review, and modify as necessary, the outputs from time to time.	Alexandria	Octo. 1980 3 months
19. Preparation of an outputs profile, document, to be approved by the Governing Board and implemented, indicating the following: a. the different types, categories and levels of outputs (products or services) which the PDC will produce over a five year period; b. the quantitative and qualitative attributes of the outputs which will be produced; c. a time-phased schedule, where applicable, for the production of the different outputs; d. the justification for the production of the different outputs, i.e. justification of categories, quantities, qualitative attributes, and schedule.	Alexandria	Decem. 1980 onwards
20. Preparation of a manual explaining the approach (a) the techniques as well as the information and data to be used in developing the various elements which constitute the PDC programme for applied research; (a) how the approach, methods and techniques and what kinds of information and data should be used in modifying the established program.	Alexandria	Octo. 1980 3 months

Description of project activities	Location	Starting date and duration
(b) what kind of machinery should be established within the Centre to review, and modify as necessary, the programme, from time to time; and		
(c) which users or groups of users of the Centre's outputs or services should be consulted, and through what means, in regard to the contents of the programme.		
<p>21. Design and execute programmes for development of applications, particularly in:</p> <p>agriculture and building/construction applications and later in other industrial applications</p> <p>a. design and development of required products</p> <p>b. evaluation of existing and new products</p> <p>c. demonstrations of applications and training, installations and use</p>	Alexandria	Decem. 1980 onwards
<p>22. Initiation of discussion group meeting involving plastics technologists and counterparts from Agricultural Research institutes to interchange information, ideas and experience. To develop co-ordination and co-operation in work programmes for developing and extending the use of plastics in agriculture</p> <p>Organisation of Seminar in 1981</p>	Alexandria and travel within the country	May 1980 and twice yearly
		Seminar
		Provisional date: Nov. 1981
<p>23. Development of contacts with the Egyptian Committee for Plastics in Agriculture (when formed), which will act as an advisory body to the Institute</p>	Alexandria and other parts of the country	May 1980 onwards
<p>24. Preparation of the PDC's plastics technology programme setting out the purpose and scope of the applied research programme; the specific applied research activities or fields of applied research the methods and techniques to be used; the information data and related materials to be used; selection and scheduling of applied research activities or projects</p>	Alexandria	Octo. 1980 onwards
<p>These programmes will be expected to be designed to:</p>		
<p>a. increase productivity on indigenous equipment</p>		
<p>b. improve quality of products</p>		
<p>c. establish parameters for product performance</p>		
<p>d. initiate and draft quality standards</p>		
<p>e. evaluate raw materials, raw products, processes, equipment and applications</p>		
<p>25. Building and office conversion</p>	Alexandria - currently in hand	

Description of project activities	Location	Starting date and duration
26. Install office equipment and supplies	Alexandria	Dece. 1980 as required
27. Install testing & process equipment and supplies	Alexandria	January 1981 progressively as required
28. Preparation of physical resources document setting out the following, and appropriate up-dating;	Alexandria	November 1980 onwards
<ul style="list-style-type: none"> a. an itemized list of buildings and other physical plant needed, with descriptions thereof in adequate detail, and with an indication of the parties responsible for carrying out repairs, etc., under contractual arrangements; b. an itemized list of machinery and equipment and related spares needed, with specifications in adequate detail; a list of sources of supply of the machinery and equipment and related spares; and information on servicing agreements entered into with the institution by suppliers or other organizations; c. an itemized list of expendable equipment and supplies, together with an indication of their purposes, sources of supply, optimum inventory levels, and storage and distribution arrangements; d. a description of any programme of maintenance established, its purposes, mode of execution, roles of different units of the institution in it, roles of any outside parties in it, etc.; and e. description of the organization and procedures implemented to plan, procure, control and manage the physical resources of the institution. 	Alexandria	November 1980 onwards
29. Preparation of a revenue sources document incorporating alternative and recommended proposals concerning sources of revenue and the arrangements for obtaining needed finances. This should include proposals, together with explanations of implications, on such matters as fees (e.g., for training, research and consultancy services), scholarships or fellowships, and official subventions.	Alexandria	October 1980 as required
30. Execution of development programmes	Alexandria	June 1981 onwards
31. Develop an evaluation, testing and technology support service for the industry	Alexandria	June 1981 onwards
32. Preparation of manual: routine preventive maintenance. Implementation with schedules and records.	Alexandria	Novemb. 1980 onwards

<u>Description of project activities</u>	<u>Location</u>	<u>Starting date and duration</u>
33. Initiation of discussion group meetings involving plastics technologists and counterparts from specific sectors of industry (as users of plastics products) to interchange information, ideas and experience. To develop coordination and co-operation in work programmes	Alexandria and travel within country	Jan. 1981 and at regular intervals
34. Development of sister institutional arrangements in plastics technology to ensure continuous interchange and updating of technical and technological information and services. Provision of specialised experts at short notice. Regular visits to sister institutions.	Alexandria and overseas	January 1981 onwards
35. Preparation of long-term and perspective financial plan for the PDC to be approved by the Governing Board and implemented	Alexandria	July 1981 one year
36. Preparation and implementation of a system of staff assessment	Alexandria	April 1981 onwards
37. Preparation and implementation of a comprehensive plan approved by the Governing Board for the phased development of the PDC as a whole, specifying to what extent and how each of the specific aspects are to be further developed following the termination of the UNDP assisted project.	Alexandria	Octo. 1981 onwards
38. Promote and assist introduction of quality control at plastic processors	Alexandria and travel within country	Septem. 1981 onwards
39. Commence technical information publications for the plastics processors with particular reference to small scale and potential entrepreneurs	Alexandria	July 1981 onwards
40. Develop or improve plastics products for specific agricultural applications at optimal cost / performance ratio. Current products monitoring to establish data.	Alexandria	September 1980 onwards
41. Transfer the technology of improved processing, products, or applications to processors and users through demonstrations and training, lectures, seminars, workshops, industrial clinics and literature as appropriate.	Alexandria and travel within country	August 1982 onwards

<u>Description of project activities</u>	<u>Location</u>	<u>Starting date and duration.</u>
42. Government provided furniture and fittings for installation into building . Priority offices to be furnished and operational six weeks before official completion total building.	Alexandria	December 1980 January 1981
43. Government provided equipment: installation completed.	Alexandria	January 1981
44. UNDP equipment: testing equipment installation.	Alexandria	January 1981
Pilot plant equipment installation.	Alexandria	June/July 81
45. Government provided supplies:	Alexandria	
a) Books and journals		Oct.80 onwards
b) Raw materials and semi finished goods		Jan.80 onwards
c) Items for comparative trials		Aug.80 onwards
d) Micellaneous items for agricultural trials		Aug.80 onwards
e) Office supplies		Nov.80 onwards
f) Technical information acquisition		Nov.80 onwards
46. Sister-institutional contact operational		Nov. 1980
47. UNDP provided supplies: delivery		
a) Materials for application trials	Alexandria	Aug. 1980
b) Raw materials for processing technology development	Alexandria	Dec. 1980
48. Project mid-term review		
49. Annual reports		
50. Final report.		

PROJECT MANAGEMENT PLAN
 WORK PLAN

1. Appointment of National Staff:

- Director (1)
- Technologists (3) - Section Leader
- Secretary General (1)
- Finance/Admin. officer (1)
- Engineer- Mechanical (1)
- Electrical (1)
- Technical information officer (1)
- Driver (1)
- Security Guards (4)

- Secretary General (1)
- Technologists (5)
- Assistant Technologists (8)
- Technicians (7)
- External liason & training officer (1)
- Marketing officer (1)
- Administration officers (4)
- Maintenance personnel
- Other servicing personnel

2. Identification and development of management functions

3. Preparation of Staff profiles

4. Preparation of Job description of consultants.

5. Training in Egypt
 English language improvement
 management

6. Develop PDC structural
 Organisation

7. Policy statement -effective-

8. International Staff (consultants)

- Chief Technical advisor (CTA)
- Plastics in agriculture
- Plastics in building
- Industry assessment
- Plastics testing : Physical
- : Formulations/compounds
- Blown film extrusion
- Books and Journals list preparation
- Injection moulding
- Plastics in agriculture experts for Seminar (6)
- Institutional management

9. Preparation/implementation staff development

10. Establish inventory/stock control
 System and records & implement

11. Equipment checking and testing

12. Indexing servicing manuals

13. Development of contacts external organi-
 sation and institutes and industry

14. Investigate potential applications
 agriculture
 building

Activity	Start	End	Resources	Notes
1. Appointment of National Staff:				
2. Identification and development of management functions				
3. Preparation of Staff profiles				
4. Preparation of Job description of consultants.				
5. Training in Egypt English language improvement management				
6. Develop PDC structural Organisation				
7. Policy statement -effective-				
8. International Staff (consultants)				
Chief Technical advisor (CTA)				
Plastics in agriculture				
Plastics in building				
Industry assessment				
Plastics testing : Physical				
: Formulations/compounds				
Blown film extrusion				
Books and Journals list preparation				
Injection moulding				
Plastics in agriculture experts for Seminar (6)				
Institutional management				
9. Preparation/implementation staff development				
10. Establish inventory/stock control System and records & implement				
11. Equipment checking and testing				
12. Indexing servicing manuals				
13. Development of contacts external organi- sation and institutes and industry				
14. Investigate potential applications agriculture building				

