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ENGLISH

EXPERT ASSISTANCE FOR THE ESTABLISHMENT OF A PESTICIDE  
PILOT PLANT UNDER A SOFT LOAN ADVANCE FROM THE ITALIAN GOVERNMENT

SI/URT/86/875

UNITED REPUBLIC OF TANZANIA

Technical report :  
Engineering, Construction and Commissioning of Chemical Plants\*

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

Based on the work of K. Szabo  
expert in engineering, construction and commissioning of chemical plants

Backstopping officer: B. Sugavanam, Chemical Industries Branch

United Nations Industrial Development Organization  
Vienna

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(i)

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## CONCLUSIONS AND RECOMMENDATIONS

1. The Scope of the mission had to be substantially amended in view of the delay in project implementation, which was mainly due to problems arising from currency rate changes and associated financing considerations by the signatories of the contract and the respective Governments. Future short term UNIDO assistance (SIS) will have to be adjusted to this change in the schedule of implementation.
2. Communication both within Government Agencies and with the UN system has not been very effective (e.g. an official request of 20 October 1986 on changing the terms of reference of this mission did not reach UNIDO in two months time) as a result amendments in the scope and duration of the mission had to be worked out after the arrival of the consultant. Closer and more frequent direct contacts with UNDP could offer a remedy.
3. The relation between NCI and TECNIMONT seems to be very good, however, it is felt that this should not exclude a strict insistence on exercising proper control (e.g. know-how and reference units) and demanding full cooperation from TCM in areas of responsibilities, not defined clearly enough by the contract or other agreements (e.g. development of formulations based on local carriers and securing import raw materials for plant start-up and commissioning):
4. Inspection and assessment of TCM's process know-how and reference plants as to their suitability to be transferred to Tanzania, as well as the development of pesticide formulations based on local inert ingredients should be assigned highest priority as belated changes and corrective efforts and measures are expensive and not acceptable.
5. It has been rather disappointing that the two project proposals submitted by the previous mission, in support of the pesticide factory project, have not received sufficiently effective follow-up. Consultations with appropriate Government Agencies and UNDP indicated strong and general support for both projects, still an aggressive follow-up would be required to assure an early approval.
6. Chapter 7, itself a set of recommendation, is addressed to problems and tasks immediately facing NCI, which require special attention during the next couple of months.
7. Updating the financial analysis and data sheets was included in the work of the mission at the explicit request of local authorities with the understanding that the rampant depreciation and inflation of the local currency may render it outdated in a relatively short time.

## 2) INTRODUCTION

This mission was undertaken as a follow-up to the one carried out by the same expert last April, with the purpose of ascertaining the progress in the implementation of the project and more specifically to provide advice and assistance to the national project management according to the terms of reference of the job description, as follows:-

1. Assist project authorities during discussions with their subcontractor to define the role and responsibilities of the two parties concerned.
2. Assist in the interpretation of the detailed civil and engineering design of the plant.
3. Draw up a work plan to get the site ready to receive and store equipment.
4. Assist in the inspection of major plant equipment at the subcontractor's premises.
5. Draw up a training programme, in consultation with the subcontractor, for project personnel to run and maintain the plant after commissioning.
6. Assist in the critical review of process know-how to be provided by the subcontractor with regard to quality control, according to international standards.
7. Prepare job description for civil engineer required during civil works.
8. Assist in supervising procurement of equipment, oversee the construction and commissioning phase of the plant.
9. Submit a report on the findings, work carried out, with recommendations.

It turned out that an overwhelming portion of these responsibilities and duties could not be delivered as they were out of step with the overall progress of the project implementation. The immediate causes for delays in this respect, may be looked for in the realm of monetary/financial uncertainties and changes experienced during recent times both on global and local scenes, i.e. the depreciation of US \$ against other leading currencies and the devaluation and rapid inflation of the Tanzanian shilling. A more detailed review of the events leading to this situation shall follow later.

Under these conditions the need for carrying out further work to update the financial and economic parameters of the project and for generating renewed interest in providing additional technical assistance to its implementation, through UNDP or on a bilateral basis, became highly evident.

On these grounds the Government requested the amendment of the terms of reference of the mission, as follows:-

1. Number 1., 2., 4., 5., and 6. duties in the original job description shall become part of the terms of reference of the consultant's next mission.
2. Full project documents shall be prepared for two projects in support of the establishment of the pesticide plant at Moshi, in consultation with NCI, as follows:-
  - a) Assistance in the Establishment, Start-up and Initial Operation of a Pesticide Plant in Moshi.
  - b) Establishment of an R + D Laboratory for Pesticide Formulation at the Tropical Pesticide Research Institute (TPRI), Arusha.
3. As the financing or co-financing of project a) by trust-funds may be possible, assist in the preparation of a standard PAL form.
4. Prepare job descriptions for the mission of civil engineer and the next follow up mission of the chemical engineer.
5. Review and update the financial evaluation section of the previously prepared feasibility studies, with particular reference to the TISCO report of 1984, based on data and information collected during the mission.

In view of the largely expanded scope of activities to be implemented by the mission, an official request for a three weeks extension has been submitted to UNDP/UNIDO (Annex ...1.....).

Official requests have also been sent to UNDP on the next missions of the civil engineer and chemical engineer, tentatively scheduled for the period of next May-June. (Annex ...2....). The exact timing shall be determined by NCI in due time.

The last section of the mission's report, dealing with the revised financial analysis and economic evaluation, shall be separately submitted upon completion and should be appended to the main body of this document.

### 3) REVIEW OF PROGRESS IN THE IMPLEMENTATION OF THE PROJECT.

This report covers the period from April 1986, the last mission's time, to January 1987, end of the current mission.

a) Italian Soft Loan and Contract with TECNIMONT

It is recalled that The Bank of Tanzania, The Central Bank of Italy (Medio Credito) and the Finance Ministries of both Governments signed the "Financing Convention" last March. In spite of this, mainly because of intricate administrative and bureaucratic procedures, the loan could not be used to make the 15% downpayment on plant and machinery, as envisaged by the contract between NCI and TECNIMONT, before early August, 1986. Actually the downpayment was effected by mid - August when the practical implementation of the project could have started in principle.

However, by then the contractor considered that the extension of his fix US Dollar offer of 20 December, 1984, was not anymore realistic and could not be further maintained in view of the severe depreciation of the dollar against the Italian currency. Therefore they demanded a price increase of 22% in consideration of the delays in receiving the downpayment and the unfavourable currency fluctuations.

The matter of the price revision was finally the subject of direct negotiations between NCI and TECNIMONT, at the first project coordination meeting in Milan, from 22 to 25 September, 1986. Two alternate proposals emerged at this meeting:

- a) Acceptance of a price increase from US \$ 12.38 million to US \$ 15,103,600, or
- b) Conversion of US \$ to ECU at the rate valid on the date of the signature of the contract, i.e. 20 December, 1984.

After consultation with relevant Government Authorities NCI opted for alternatives (b) and proposed a meeting with TECNIMONT in Dar es Salaam to finalize the appropriate amendment of the contract and to forward it to the relevant government authorities on both sides for approval. According to this agreement NCI will have the option to make payment on the contract either in ECU or DM, whichever they choose. The Italian party rescinded all rights to raise again the question, should further important currency fluctuation take place during the period of the project implementation. The final seal and approval on this agreement was given by the Arusha Meeting of November 1986, between Messrs. Mario Raffaelli, Minister of Italian Foreign Aid and C.D. Msuya, Minister of Finance of Tanzania.

b) Components Locally Financed

As regards local costs, the original investment cost estimates (TISCO Report, 1984) have also been



invalidated by long delays in the implementation of the project and the recent devaluation and the continuous and rather substantial inflation of the Tanzanian shilling. NCI has accordingly requested UNIDO to make available the expert already assigned to assist in the implementation of the project (on split missions) in order to help updating the financial section of the feasibility study in collaboration with NCI staff. The corresponding official request (Annex ..?) was sent to UNDP, Dar es Salaam, on the 20th of October 1986, however, it has not reached UNIDO before the fielding of this mission (16 December 1986), and this explains why the terms of reference of the mission had to be so substantially modified as indicated in the introduction.

As the local inputs of the project have not been changed the new cost figures will primarily reflect the effect of the quick inflation of the shilling. However as concerns imports, for the procurement of which foreign currency would be required, the capital requirements will be drastically altered by the recent devaluation of the shilling against the US Dollar and other foreign currencies.

In addition to the cost of the plant, another substantial obligation to be covered by NCI in foreign currencies, consists of the cost and transport of imported raw materials, to be made available by NCI for the plant start-up and commissioning operations. The intricacies involved in organizing the timely arrival of about 3 dozens of chemicals in grossly variable quantities (see Annex 3A of the TISCO report), of different origin and from so many sources, represent a tremendous task as already pointed out in the report of the previous mission (P.16-17). Therefore, it has been suggested that NCI should try to contractually enlist Tecnimont's cooperation in implementing this task. Should this be impossible to secure, TECNIMONT should provide a list of best known sources of all raw materials to be imported, compiled by the suppliers of production/formulation know-how.

In the absence of any contractual arrangement as outlined above, the timely availability of convertible funds for raw material imports becomes an utmost priority and liability. In view of this every effort has to be made without any delay to ascertain the availability and suitability of local raw materials to substitute for imports. Full advantage is to be taken of Tecnimont's cooperation in studying and solving this problem, with the help of their know-how suppliers.

Concerning the cost of imports for a continuous plant operation it is to remember that the foreign currency requirements should and will be substantially lower than if formulated end-products were imported, as is the case today.

c) Progress in Site Preparation and Construction

Due to the delays and their causes dealt with in chapter 2/a these works have also suffered postponements. The basic site-preparation was completed early 1986, (e.g. clearing done, water connected to the site, brick work and wall construction for staff houses in progress, etc) but nothing more could be done concerning construction work related to the plant itself in the absence of the basic civil engineering design which was to be prepared and submitted by Tecnimont. According to the latest schedule and estimates, this document will become available by next March or early April.

Based on this tenders will be invited for preparing the detailed civil designs and carrying out the construction work. The fielding of the civil engineer expert should be scheduled so to enable him to assist in the final evaluation of the tenders and advise the subcontractor on the preparation of the detailed plans. This should also preferably overlap at least partly with the next mission of the Chemical Engineer.

Meanwhile, the time was not entirely lost in the advancement of the construction works. A contract valued at shilling 14,692,149 has been awarded to M/S Lucas Construction Company of Moshi, for building four staff dwellings, including fencing of the housing plots and external works. The houses will on average include 3 bedrooms, and all comfort facilities.

The contractor was handed over the site on 19 Sept. 1986 and is expected to complete the work on or before 22 June 1987, just in time for accommodating the engineers who will be arriving to take charge of the erection works of the Plant. The contract calls for the erection of altogether 13 housing units and the rest shall follow later.

More importantly it is NCI's responsibility to "arrange for and have ready adequate facilities" at the site to receive "packages" (i.e. equipments and supplies). To avoid a potential controversy about the adequacy of the future storage facilities, TCM should be asked to prepare specifications or at least guidelines for these facilities and structures.

4) FIRST COORDINATION MEETING WITH TECNIMONT

According to the NCI/TECNIMONT contract coordination meetings should periodically be held in order to review the progress of and prepare detailed designs for the project implementation as a whole and its important elements. The first such meeting was held from 22 to 25 September 1986 in Milan.

The delegations were headed by M. M. Paresoi General Manager of NCI and Mr. M. E. Massara, Project Manager at TECNIMONT. The general scope of the meeting was to define all organizational criteria relevant to the implementation of the project. Concerning the relationship between NCI and TECNIMONT special responsibilities were redefined, as follows:-

NCI:-

- i) General coordination of the project
- ii) Design and realization of civil works
- iii) Materials transport from Italy to site in Moshi including equipments and all other materials

TECNIMONT (TCM):-

- i) Planning and coordination of all activities related to the realization of the plant, according to the new time schedule (Annex.4..).
- ii) Technical coordination of the project
- iii) Procurement of all materials and equipment
- iv) Inspection, testing, certification and delivery of above to sea port of embarkation
- v) Detailed engineering designs, except civil works
- vi) Plant erection
- vii) Start-up and commissioning
- viii) Training of NCI personnel, including a quality control technician, in addition to the personnel specified in the original contract.

TCM disclosed a comprehensive list of potential equipment suppliers entitled "TCM - Procurement Vendor's and Subcontractor's List" and committed themselves to give 30 days advance notice to NCI on equipments ready for testing and inspection, should NCI want to exercise, directly or by proxy his rights in this respect.

However they failed to provide the same on know-how suppliers, which in the opinion of the mission, would have been more important. Inspecting individual pieces of equipment may have some limited importance but the inspection and evaluation of the functional systems and units based on which the factory will be designed, is considered by far more important. Information on this point is currently being sought by NCI with the intention to carry out inspections and evaluations of the know-how and their suppliers as soon as possible.

Several technical topics have also been discussed belonging to the following general areas:-

- 1) Civil Engineering
- 2) Transportation
- 3) Procedures
- 4) Local Raw Materials
- 5) Processes
- 6) Design Criteria
- 7) Visits

The mission could not obtain meaningful technical information on these subjects since no technical specialist participated on behalf of NCI at this meeting. The list of the "agreements", which was appended to the protocol of the meeting as attachment, is therefore simply attached to this report as Annex...5.....

One point of agreement under the heading of Processes seems to deserve particularly close attention because it deals with the testing and development work to be carried out by TCM as regards the use of local raw materials such as kaolin and bentonite. According to the agreement NCI should have sent appropriate samples to TCM by December 1986 for testing. The mission tried to expedite the implementation of this provision of the agreement and suggested to include other potentially suitable local mineral carriers, such as lime stone, diatomaceous earth and sand, in the evaluation programme to be undertaken by TCM, who seem to be in no hurry to act on this subject. It has been gratifying to note that many of the recommendations of the first mission (e.g. inclusion of a quality control staff in the training programme, development work to be undertaken by TCM on the utilization of local raw materials, etc.) have been adopted by the meeting.

A third section of the meetings, the most elaborate one, deals with legal articles interpreting the major provisions of the contract between NCI and TCM, however this would not seem to require any further commenting by the mission.

#### 5) REVISED SCHEDULE FOR THE IMPLEMENTATION OF THE PROJECT

With the downpayment on the contract made last August the contractor could have earnestly started the practical work. However, for reasons referred to in chapter 2/a, delays continued to accumulate till late November, 1986, when the Arusha meeting opened the way for the implementation.

TCM presented an implementation schedule to the first coordination meeting in September 1986 (Annex ..4...) as

well as detailed PERT schedules for each phase of the activities, on the assumption that work could immediately start once the downpayment was made. As this was not the case, the schedule lost unfortunately its validity,

To arrive at more realistic delivery deadlines it is suggested to add 3 to 4 months to all deadlines, included in the TCM schedule prepared last August - September. By this method the major activities would probably be completed by TCM according to the following timetable:-

<u>Activity</u>	<u>Delivery Deadline</u>
Basic Civil Design	March 1987
Know-how Documentation	Feb-Nov. 1987
Detailed Engineering	Nov-Dec. 1987
Equipment	Aug. 1988
Installation	Feb. 1989
Trial Operations	April 1989
Commissioning	May-Aug. 1989

The deadlines relevant to the obligations of NCI, shall in this context be modified as follows:-

Civil Engineering	March - Nov. 1987
Transport to Site	Jan - July 1988
Civil Works	Aug. 87 - March. 1989
Procurement of Raw Materials	March. 1988 - Feb. 1989

The procedure of procurement of import raw materials for the trial runs and commissioning of the plant should preferably be revised so that TECNIMONT, having a much better geographic position and closer contacts with appropriate know-how and supply sources, should accept a more direct involvement and responsibility in this respect.

#### 6) UNDP/UNIDO ASSISTANCE

During the preparatory phase of the project UNDP/UNIDO technical assistance, in the form of short term consultant assignments, was channelled through two SIS projects: SI/URT/84/801 and SI/URT/86/075. The second one is still under active implementation. The two large scale projects proposed by the previous mission have been officially requested by NCI with the support of the Ministry of Agriculture (Annex 8 ).

a) SI/URT/86/075

In addition to the current mission, further assignments of the chemical engineer consultant and a post for a civil engineer has been envisaged by the project document.

The chemical engineer shall further assist NCI in ascertaining the suitability of the know-how offered by TCM, in following up the progress of the development work on local raw materials to be undertaken by TCM in cooperation with their know-how suppliers and in a general advisory role concerning matters related to the implementation of the project and the subcontract covering it.

He shall also assist the civil engineer in delivering his duties concerning the preparation of the detailed civil works designs by a local construction firm. Job descriptions for the next assignment of the chemical engineer (SI/URT/86/075/11-03) as well as for that of the civil engineer (SI/URT/86/075/11-02) have been prepared by the mission in consultation with NCI and appended to this report as Annex ...6... and Annex ..7... These assignments were officially requested and the appropriate job descriptions, drafted by this mission, submitted to UNDP, Dar es Salaam by NCI on 14 January, 1987, (Annex ..2... )

During the current consultations it has also surfaced that a study tour by the principal technical development officer of NCI, Mrs. E. Undiri, in charge of all technical aspects of the pesticide factory project, to visit and inspect the reference units of TCM, would be not only justified but highly desirable. A request to UNIDO for financial assistance in organizing such a study tour as soon as possible has been initiated and shall be processed on a priority basis and submitted in accordance with the appropriate regulations.

b) Further SIS Assistance

At the request of UNDP and NCI the mission drafted two project documents for substantial technical assistance programmes to be potentially included in the next IPF cycle, beginning February 1987. However, the implementation of these projects shall begin only around the middle of 1988. It is quite likely that NCI may need additional stop-gap technical assistance until the above mentioned projects take off. Should need arise for this, an early indication of the need and submission of an appropriate official request by NCI would be required by UNIDO for a timely processing of the request.

c) Long Range UNDP/UNIDO Assistance to the Pesticide Plant in Moshi:

Although the NCI - TCM contract provides for training key technical staff, neither the duration nor the conditions of such training programmes seem to be adequate to prepare and

enable the staff for taking over the plant immediately upon commissioning. It should certainly require a more prolonged training and adjustment experience until the local staff will be able to absorb and deliver all managerial qualities and responsibilities involved in the continuous and effective operation of a chemical plant of the given complexity. To bridge this gap in the safe and effective management and operation of the plant, a project document was drafted by this mission on a technical assistance programme considered appropriate for inclusion in the new UNDP IPF cycle, which begins February 1987. Since consultations with UNDP revealed that seeking and obtaining trust fund contributions towards the implementation of this project from potential donors (e.g. Italian Government) may financially help to expand the scope of assistance, a draft PAL document (Annex.9.) including a short history of the project was also prepared for potential circulation. (Annex 10.)

d) Establishment of an R + D Laboratory for Pesticide Formulation at the Tropical Pesticide Research Institute (TPRI), Arusha.

The previous mission has already identified the necessity and the opportunity to establish a pesticide formulation R + D unit at TPRI in support of and cooperation with the Pesticide Plant of Moshi. This plant will have no R + D facilities, only a quality control laboratory to monitor the manufacturing processes and the quality of the products. The production programme proposed for the pesticide plant seems to be adequate for the current needs of the agriculture. However, pest control requirements show an ever changing pattern, which may render the products of the plant out-of-step with demand in a few years. The proposed TPRI laboratory shall undertake, in cooperation with the pesticide factory in Moshi, the continuous development of new pesticide compositions and formulations best fitting the needs of the agriculture and the conditions in Tanzania. The large scale production of these new formulations then would be carried out at the plant at Moshi.

This scheme of development and cooperation received strong support from all authorities concerned, thus it was rather disappointing to learn, that most likely by an oversight, this project has not been included in the next UNDP country programme. Fortunately it is still not too late for rectifying this failure. The mission drafted a project document on this subject, too, and it is hoped that by a concerted effort and support by the appropriate Ministries (Industry, Agriculture and Finance) and UN Agencies (UNDP and UNIDO) the project will be approved and implemented as envisaged by the draft document.

7) IMPORTANT URGENT TASKS AHEAD OF NCI

In order to avoid any further slips in the timetable of the implementation NCI has several urgent tasks to deal with.

A second coordination meeting with TCM is coming up this spring possibly as early as March. At this meeting answers will have to be found to several questions of cardinal importance, such as follows:-

- a) Work programme to develop formulations based on local mineral carriers.
- b) TCM's participation in securing the import raw materials for plant start-up and commissioning.
- c) The scope of training programmes and the placement of staff to be trained.
- d) Specifications of storage facilities for plant equipment.

To be in a comfortable position in and well prepared for these negotiations it is suggested that a number of preparations be made:-

- a) The mechanism of the local financing of domestic and import (raw materials) inputs has to be clearly established and funds allocated.
- b) Tendering the civil works subcontract to be well prepared and expedited.
- c) A list of potential candidates for staff posts to receive in-plant training in Italy has to be compiled as soon as possible.
- d) Vigorous pursuit is to be given to the nomination of Mrs. Undiri for a study tour of the TCM reference plants.
- e) Effective follow-up of the two project proposals drafted by the mission is necessary, both with local authorities and UNDP, to assure their approval and inclusion in the next cycle of the country programme.
- f) Maintaining frequent contacts with UNDP and indicating well ahead of time need for the services of UNIDO technical advisers.

8) UPDATED FINANCIAL ANALYSIS

The revision of the financial and economic analysis of the TISCO report, requested by NCI from this mission, would seem to be a correct and positive exercise in the above context. However, attention has been drawn to the fact that because



of the quickened inflation and depreciation of the Tanzanian shilling against other currencies, the updated information could have only very short lived and limited practical value and usefulness. In spite of this, local authorities, including the lender banks, considered it as a precondition to establishing the framework and mechanism of the financial management of the project.

LIST OF OFFICIALS CONSULTED

1. Mr. W. L. Nyacnia - Director of Investment and Implementation; Ministry of Industries and Trade.
2. Dr. H. M. Rwehumbiza - Assistant Commissioner of Planning and Marketing, Ministry of Agriculture.
3. Mr. M. P. Ole Paresoi - General Manager - NCI.
4. Mr. H. M. Kitilya - Director of Development and Finance NCI.
5. Mr. G. S. Msangi - Pesticide Project Manager - NCI.
6. Mrs. E. Undiri - Principal Development Officer - NCI.
7. Mr. D. N. Maeda - Research Chemist - TPRI.
8. Mr. Mario Vitali - Managing Director - Tecnimont, East Africa.
9. Mrs. M. Chinery-Hesse - Resident Representative UNDP.
10. Mr. T. Kikuchi - SIDFA - UNDP/UNIDO.



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# NATIONAL CHEMICAL INDUSTRIES

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OUR REF: NCI/DDF/h/11/87

DATE: 2/1/1987.....

The Resident Representative,  
P.O. Box 9182,  
Dar es Salaam. - Att: Mr. R. Church

Dear Sir,

Re: PESTICIDES PROJECT

As indicated during our visit with Mr. Kikuchi on 23rd December, 1986, we would like to request Mr. Szabo's services to be extended by 3 weeks to enable him to revise and update the financial evaluation section of the previously prepared feasibility studies with due attention to the effects of the devaluation and inflation of the Tanzanian shilling.

As the (physical) inputs and outputs of the project remain unchanged, Mr. Szabo will be expected to base his work on the data and information included in the TISCO report of 1984, using updated financial (cost and revenue) figures to be collected and provided by NCI during his current stay in Tanzania.

For reasons of expediency, better working conditions and other considerations we suggest that he carry out this additional work in Vienna, Austria, at his home base.

Thanking you,

Yours faithfully,  
NATIONAL CHEMICAL INDUSTRIES

*M. P. O. Paresoi*  
M.P. OLE PARESOI  
GENERAL MANAGER

REC'D - 6 JAN 1987			
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MR		<input checked="" type="checkbox"/>	
PROJECT			
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ACC (A)			
SIG	<input checked="" type="checkbox"/>		
WFP			
UNFP			
BNV			
AC	<input type="checkbox"/>	AP	<input checked="" type="checkbox"/>



# NATIONAL CHEMICAL INDUSTRIES

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OUR REF: NCI/DDF/h/87

DATE: 11th Jan. 1987

The Resident Representative of  
the UNDP,  
DAR ES SALAAM.

RE: SI/URT/56/075 - ESTABLISHMENT OF A PESTICIDE PLANT AT MOSHI.

Attached herewith we are submitting a request and the terms of reference for two UNIDO expert missions to be carried out within the scope of the above approved project:-

SI/URT/56/075/11-02, Civil Engineer Expert, one month, and

SI/URT/56/075/11-03, Expert in Engineering, Construction and Commissioning of Chemical Plants, split mission, one month duration.

The exact timing of these two missions will be confirmed by NCI in due time.

Your kind forwarding these requests to UNIDO shall be appreciated.

Yours faithfully.

H. H. KMIYA  
DIRECTOR OF DEVELOPMENT AND FINANCE





ATTACHMENT 1

1) CIVIL ENGINEERING

. NCI communicate the following general informations:

- Height of ceilings of building has to be not less than 2.70 m
- Roofs are never flat but have to be designed with double slope
- Orientation of building has to be east/west

Surfaces of building floors have to be designed according to normal possibility of personnel movement and work

NCI and TCM agree on the following:

a) GATE BUILDING

- General dimensions 30 + 40 m<sup>2</sup>  
with 2 watch men foreseen  
with sanitary  
with waiting room
- gate positioned on the secondary road on the side of the site area
- independent entry flows for vehicles and people
- weightbridge positioned not on the vehicles entry flow

b) OFFICES

- one floor
- 5 single rooms
- indoor open space for 70% of the whole surface
- services according to the italian laws

c) CANTEEN, LOCKERS, SHOWERS

- TCM will indicate only the overall external dimensions

d) WORKSHOP

- The indoor partition will have closed sections for tools security problems

e) WAREHOUSE

- There will be an open "warehouse" for local raw materials expected to come at site in bulk (1 month storage time)
- The closed warehouse will contain imported raw materials (3 months storage time) and final products (1 month storage time)
- TCM will define the means to transport bulk raw materials from storage site to production units

f) VASTE WATER BASIN

- it will be dimensioned only for the actual plant.

g) ROADS

- the road will be divided into main roads (to be paved) and secondary road.
- TCM will give indication of the two different classification on the general plot plan of the plant



h) VARIOUS

- TCM will indicate on the civil dwg position for safety showers
- NCI will supply a water storage tank with a capacity sufficient for 3 days
- TCM will confirm, after new check, the total water daily need
- TCM will locate such tank on general plot plan dwg
- TCM will give details for the installation of a tower for lightning conductor equipment on the highest building
- TCM will give details on water collecting system till the battery limits of the plant
- NCI communicate that max rain fall to be assumed is 100 mm/hour
- Position and size of the elevator will be considered part of the basic civil engineering and will be communicate to NCI in accordance to that
- NCI will communicate within end of Oct.80 to TCM coordinates of perimeter points of the area shown on the planimetry delivered to TCM
- TCM will confirm or correct weights of main item as per telex sent to TCM by MBECA MELVIN COMPANY on 18th of October 1985

2) TRANSPORTATION

- NCI communicate out of gauge limits for railway transport as:
  - height 3048 mm
  - width 3000 mm
  - weight 36 tons
  - length as per wagons length
- NCI will communicate to TCM particular markings to be shown on cases indicating Tanzania as destination country

### 3) PROCEDURES

- TCM deliver to NCI the here enclosed procurement procedure, amended as per common finalization (see ANNEX 1)
- TCM deliver to NCI the here enclosed coordination procedure, amended as per common finalization (see ANNEX 2)
- TCM deliver to NCI a preliminary copy of the Vendor list (see ANNEX 3)
- TCM will deliver to NCI the final issue of the Vendor list during the meeting already scheduled at the 7th month

### 4) LOCAL RAW MATERIALS

NCI and TCM agree on the following:

- NCI will supply to TCM new water analysis within
- TCM delivers to NCI a questionnaire on electrical topics
- NCI will send said questionnaire completely filled within December 86
- Without new information TCM will assume, for electrical design, as stated in the contract, two independent sources (380 and 6.0 KV) and 4000 A.

### 5) PROCESS

- NCI will send to TCM within december 86 samples of kaolin and bentonite for chemical analysis. The results of abovesaid analysis will be communicated to NCI with TCM comments regarding their suitability for use in pesticides plant. TCM will make trial in case new materials are found suitable.
- NCI will communicate to TCM value of local atmospherical pressure within december 86
- NCI will send to TCM within december 86 complete analysis of the salt to be used for HCl production
- NCI communicates that fuel has to be assumed probably BUNKER C type. NCI will give definite confirmation within 15th of October 86

- NCI will communicate to TCM within december 86 dimensions of copper bars to be used for copper oxiclouide plant
- NCI communicates to TCM that copper stripes will be used in all the quantity available in Tanzania
- TCM agrees on the standardization of the packaging of final products in 2 sizes: one for all liquid products and one for products in powder. Packaging units will however be designed to pack various sizes of packages.

#### 6) DESIGN CRITERIA

General description of DESIGN CRITERIA adopted by TCM in the development of the Project has been performed by the TCM technicians belonging to different departments.

#### 7) VISITS

During the meeting two visits have been performed:

- at the Baslini factory an existing plant of pesticides formulation for liquid flowable and granular products have been seen.  
The granular line has been deeply examined in respect to the line designed for NCI plant
- at the De Nora factory electrolytic cells of HCl plants have been presented under design point of view and have been physically seen in different stages of construction

**JOB DESCRIPTION**

- 24 -

Annex 6

SI/URT/86/075/11-02/32.1.G.

**Post Triste:** Civil Engineer,

**Duration :** One month

**Date Required:** April - June 1987.

**Duty Station:** Dar es Salaam and Moshi (Arusha), Tanzania.

**Purpose of Project:** To assist the Government of Tanzania (National Chemical Industries, NCI) in the establishment of a pesticide manufacturing plant under an Italian Soft Loan Agreement. The plant is being erected in cooperation with an Italian contractor (TECNIMONT) and the suppliers of process technology and know-how.

**Duties:** The expert, in consultation with the project management (both local and contractor) and the local subcontractor executing the civil works, shall review the relevant designs and advise on the works to be undertaken, as follows:-

- (1) Site preparation including grading and draining.
- (2) Utility connections (electric: high/low tension, water: drinking/process, communication, roads, railway siding.)
- (3) Temporary work for plant construction.
- (4) Buildings and structural finishing.
- (5) Technical installations/equipment, air conditioning, ventilation, steam, hot/cold water, waste disposal, emergency power plants, storage tanks, fuel filling station, fire fighting, etc.
- (6) Special problems (eg. pile foundations, ground water table, ramps, foundations for heavy equipment, etc.
- (7) Submit a report of the findings and recommendations.

**Qualifications:** Civil Engineer with extensive experience in designing and constructing chemical plants.

**Language :** English.

**Background :**

**Information :** The Government of Tanzania gives high priority to the reconstruction of the agricultural sector. Following this aim a soft loan agreement was reached with the Italian government to finance the establishment of a pesticide manufacturing / formulation plant to produce 3,000 tons/year copper oxychloride and 6,500 tons/year pesticide formulations of various compositions. The equipment and process know-how is to be supplied by TECNIMONT, Italy, on a turn key basis. However the civil works will be carried out by local construction firms based on a general civil design to be supplied by TECNIMONT. The local constructor (s) shall be selected by tender. As the plant will be a first of its kind in Tanzania there is great need for advice from an independent expert concerning the civil works required.

**SEEN:**

**NATIONAL CHEMICAL INDUSTRIES,  
P. O. Box 9643,  
DAR ES SALAAM.**

5th January, 1987

JOB DESCRIPTION

Annex 7

SI/URT/86/075/11-03/32.1.G.

POST TITLE: Expert in Engineering, Construction and Commissioning of Chemical Plants.

DURATION: One month (split mission).

DATE REQUIRED: May 1987.

DUTY STATION: Milan with potential travel in Italy (two weeks) - Dar es Salaam and Moshi, Tanzania (two weeks).

PURPOSE OF THE

PROJECT:

To assist the Government of Tanzania (National Chemical Industries, NCI) in the establishment of a pesticide manufacturing/formulation plant under an Italian Soft Loan Agreement. The plant is being erected with the cooperation and a contract with an Italian firm (TECNIMONT) and Italian suppliers of process technology and know-how.

DUTIES:

The expert shall review and evaluate the know-how and facilities of the contractor and ascertain their standards and the progress made in the implementation of the project and report on its findings, as follows:-

- 1) Review and assess the know-how and the facilities of the suppliers, offered by the contractor.
- 2) Ascertain the suitability of the know-how and technologies to produce all types of products included in the project in conformity with international standards and to possess multipurpose flexibility required from the formulation plant.
- 3) Evaluate the work programme and progress of suppliers as regards the use of Tanzanian raw materials in the formulation of the end products.
- 4) Draw up a training programme with the subcontractor for project personnel to run and maintain the plant.
- 5) Assist in reviewing the civil engineering designs in consultation with the UNIDO civil engineering expert.
- 6) Submit a report on findings and recommendations.

LANGUAGE: English.

BACKGROUND:

INFORMATION:

The Government of Tanzania, in its aim to reconstruct and develop the agricultural sector on a priority basis, has secured a soft loan from the Italian Government to establish a pesticide manufacturing/formulation plant at Moshi. The plant shall produce 3000 tons/yr copper oxychloride, needed for the protection of coffee crops and 6500 tons/yr various pesticide formulations. Tecnimont, a reputable Italian engineering and construction firm has been selected as contractor for the implementation of the project on a semi-turnkey basis.

The basic civil works design shall also be supplied by Tecnimont. NCI wishes to obtain advice and a critical evaluation of the quality of designs and supplies offered, as well as the progress made by the contractor in the implementation of the project.

KS/jsk



Assistance is being sought in the establishment of a Research and Development Laboratory at the Tropical Pesticides Research Institute at Arusha, where it will serve the purpose of checking and monitoring the quality and effectiveness of the products to be manufactured by the Moshi Plant, besides carrying on research on the development of new products and the use of locally available raw materials.

In view of the foregoing the Ministry of Industries and Trade formally requests UNDP/UNIDO to assist in the above mentioned areas by providing Technical Assistance, in line with the recommendations put forward by the Consultant after consultations with NCI.

Looking forward for your favourable response.

Yours faithfully,

*E. E. Mangesho*  
for (E. E. Mangesho (Mrs))  
PRINCIPAL SECRETARY

c.c.:- The General Manager,  
National Chemicals Industries,  
DAR ES SALAAM.



## Establishment of a Pesticide Plant at Moshi, Tanzania

### 1. Scope of Project

To provide advice and technical assistance to the National Chemical Industries (NCI) during the erection, start-up and initial operation of a pesticide production and formulation plant in Moshi, to be constructed by TECNIMONT, Italy, as sub-contractor.

### 2. Government Executing Agency

National Chemical Industries (NCI)  
Ministry of Industries and Trade.

### 3. Total Costs

The convertible currency component of the technical assistance project amounts to US\$856,000. For securing all import raw materials required for the start-up and initial operations, for at least three months, another US\$2,000,000 is needed.

### 4. Background and Objectives of Project.

On recognizing the current dangerous decline in agricultural productivity and output the Government of Tanzania assigned highest priority to the rehabilitation and development of this economic sector. It has been realized that one of the basic deficiencies resulting in the low level of effectiveness of farming is the lack and poor quality of the physical inputs, among them plant protection materials, available to farmers. Guided by this realization the Government initiated a programme to rectify the situation. At the request of the Government UNIDO and other consulting agencies have carried out several techno-economic studies on the feasibility of the establishment of a pesticide industry which could heed the true needs of the agriculture in Tanzania and cater the most important and suitable products to the farmers. Based on these studies the Government of Tanzania secured a soft loan of US\$.12.4 million from the Italian Government, which covers the foreign currency requirement of setting up the pesticide plant, as recommended by the above studies. The proposed pesticide production facilities represent a rather complex operation. A reputable Italian company, Tecnimont the engineering branch of Montedison, has been selected as a contractor to supply the technology and erect the plant on a turn-key basis. The commissioning of the plant is expected around the end of 1988. The plant shall produce 300 tons of copper oxychloride, used for the protection of the coffee crop, and 6500 tons of various formulations yearly, a substantial portion of which could be exported to neighbouring countries, generating substantial foreign currency earnings. In view of the scope, importance and expected impact of this new industry on the national economy, an extensive and effective technical assistance by UNDP to help a successful start-up and operation of it, seems to be utmost justified.

a) Development Objectives

Assistance to the country's effort to start production of pesticides and accelerate the rehabilitation and modernization of the agricultural production through the use of the pesticide locally produced.

b) Immediate Objectives

i) Assistance in the Orderly start-up and operation of the pesticide production plant in Moshi.

ii) Training national staff in the art of plant operation and management.

iii) Achievement of international standards in the quality of products, that would be comparable to that of products formerly imported.

iv) Sustaining/production levels near rated capacity making possible substantial exports and foreign currency earnings.

5. Project Outputs

The project will result in:

- a smooth start-up and operation of the new pesticide plant
- the production of high and controlled quality of products
- plant production to reach and stay at full capacity level, providing also products for export
- a proper training of the national technical managerial staff enabling them to take over the operation at the end of the project.

PESTICIDES PROJECT1. Project background (History):

The project's feasibility study was prepared way back in 1979/80 by two experts from UNIDO following a request from the government of Tanzania.

The feasibility study recommended the establishment of a pesticides complex for formulating/manufacturing the following products:

- Copper Oxychloride: 3000 Tons/year
- Wettable powders: 3000 Tons/year
- Granules: 2000 Tons/year
- Herbicide flowables: 1500 Tons/year

The products are intended to cater for the domestic market and to some extent for export to the neighbouring East and Central African Countries. The estimated cost for the project then (1980) was shs.126.97 million of which shs.60.34 million would have been in foreign current.

Soon after the project's feasibility study was completed an investment proposal was prepared and approved by the NDC Board for implementation. Efforts to secure foreign financing were made through TIB and the World Bank which approved an application for said funds. However before all formalities were completed to secure the pledged funds the World Bank withdrew their offer. Effort to find alternative sources of foreign funds succeeded in 1984 when the Italian Government offered to extend a soft loan to the Tanzanian Government for financing the project. By the time the Italian Government loan was offered the project's feasibility study was already out of date and it was decided to update it in order to work out realistic cost estimates. The work of updating the study was given to M/s. TISCO. Investment cost estimates given in the updated feasibility study which was completed in the same year were as follows:-

	<u>(in Million T.shs.)</u>		
	<u>FC</u>	<u>LC</u>	<u>TOTAL</u>
- Plant and equipment	191.76	43.15	234.91
- Erection & Engineering Services	57.60	8.70	66.30
- Civil Works	-	118.00	118.00
- Vehicles	4.93	-	4.93
- Furniture and Fittings	-	0.75	0.75
- Pre-operational expenses	-	19.18	19.18
Installed Cost	<u>254.29</u>	<u>189.78</u>	<u>444.07</u>
	*****	*****	*****
Working Capital	-	123.49	567.63

The proposed financing pattern was as follows:-

Equity	208.50
Long term loan	266.44
Bank Overdraft	92.62
Total	<u>567.56</u>
	=====

Soon after the re-appraisal, tenders were invited for the supply of machinery and know how services. M/s. TECNIMONT of Italy were selected out of the tenders and detailed negotiations leading to the signing of a contract were held between them and NCI assisted by experts from TISCO towards the end of 1984. The total contract price for plant and equipment including know-how services was US\$12.38 million. However first the Italian Government has offered an amount of US\$.7.5 million for meeting the project's foreign costs. There was therefore a foreign financing gap of US\$.4.9 million. An application for additional foreign funds was therefore made through the Ministry of Finance to the Italian Government.

In July 1985 during Tanzania/Italian Governments joint Commission consultations the Italian Government agreed to provide the additional amount. Arrangements to finalize all necessary procedures to facilitate utilisation of the pledged loan funds commenced soon after the joint Commission Consultations (i.e. July 1985). The Bank of Tanzania, Central Bank of Italy (Medio-Credito) and the Finance Ministries of both Governments signed the "Financing Convention" in March 1986. It had been expected that after this stage it would be possible to start utilising the money at least for effecting the 20% downpayment on plant and machinery. It was however learn that there were still lengthy procedures to be completed between the Italian Government, Medio Credito Centrale and Bank of Tanzania and therefore the funds could not be disbursed straightaway. The said procedures were completed in early August, 1986 and the 20% downpayment was made at the middle of the same month. Due to delays in completing necessary procedures and effecting downpayment the machinery supply contract signed on 20th December 1984 had to be extended for 1½ years i.e. these extensions facilitated keeping prices fixed from December, 1984 to 30th March, 1986. As mentioned above, the Technical Collaborators received the 20% downpayment in August, 1986 - about five months from the contract's validity date.

The collaborators therefore demanded a price increase of 22% to compensate the financial loss due to delays in receiving the downpayment and also the loss in view of the current unfavourable exchange rate between the Dollar and Italian Lira. The main factor emphasized in their claim for price revision was the unfavourable exchange rate between the dollar (which is the unit of payment) and their local currency.

In a meeting held in Milan between NCI, TISCO, Mbaga Melvin (consulting Engineers) and TECNIMONT from 22nd - 25th September, 1986 to discuss and work out the project's implementation schedule the issue of price revision was discussed at length and two alternatives were proposed to resolve the issue:-

- a) Acceptance of a price increase from US\$12.38 million to US\$15,103,600. If this option were to be adopted the Italian Government would have to be requested by the Tanzanian Government to give an additional loan to finance the gap.
- b) Conversion of US\$ to ECU at the rate valid on the date of contract signature i.e. 20th December, 1984.

After Consultation with relevant Government Authorities NCI has decided to opt for alternative (b) alone. Instances of this nature are not new to Tanzania as a number of projects which are financed by the Italian Government have faced the same situation:-

A meeting has been proposed to be held with TECNIMONT in Dar es Salaam before end of October or in the first week of November to discuss on implementation of alternative (b) above so that the addendum to the contract can be forwarded to the relevant government authorities to finalize the process with the Italian government and allow work to start without further delay. Based on the recommendations of those negotiations, the Arusha Meeting of late last November between the Italian Government Delegation headed by Minister of Foreign Aid, Mr. Raffaelli and the Tanzanian Delegation led by Minister of Finance, Mr. C. Msuya gave the green light to the implementation of the project. In order to reduce variations in the cost of foreign currency (FC) requirements it was agreed to apply ECU or DM basis, whichever was more advantageous to Tanzania.

With regard to local costs obviously the original investment cost estimates have been invalidated by long delays in implementation of the project and the recent devaluation of the Tanzanian shilling. NCI has therefore requested UNIDO to make available the expert who had been provided to assist in the implementation of the project on split missions to assist in updating the feasibility study with the assistance of NCI staff. The expert is expected to be available the second week of November, 1986. After establishing current investment cost estimates effort will be made to mobilise necessary local funds to bridge financing gaps.

Implementation Progress todate

Besides the above reported progress the following has been initiated/accomplished:-

- Contract valued at shs.14,692,149 has been awarded to M/s. Lucas Construction Company of Moshi for building 4 staff houses including fencing of the housing plots, and external works.
- The contractor was handed over the site on 19<sup>th</sup> September, 1986 and is expected to complete the work on or before 12<sup>th</sup> June, 1987. It is intended to complete construction of the houses early enough to accommodate Engineers who will come for erection of the plant.
- Following the meeting held in Milan between NCI, Consultants and TECNIMONT the project's implementation programme was worked out and became effective within the Arusha Agreement. Tentatively it planned to complete civil design work by March 1987 after which tendering for civil works will follow. Construction contract is expected to be completed in 19 months. Machinery shipments will commence in late 1987 and erection of machinery is planned to begin in 1988. Commissioning of the plant is expected to be done at the end of 1988 or early 1989.

GSM/em

AMENDMENT NO. 3

CONTRACT FOR TECHNICAL KNOW-HOW AND MACHINE SUPPLY DATED 20TH DECEMBER, 1984; ENTERED INTO BY AND BETWEEN NATIONAL CHEMICAL INDUSTRIES (TANZANIA) AND TECNIMONT S.P.A. (ITALY) AS MODIFIED BY AMENDMENTS NO.1 AND NO.2 DATED 29TH JUNE, 1985 AND 16TH JANUARY 1986, RESPECTIVELY.

WHEREAS the coming into force of the CONTRACT has not taken place within 31st March, 1986 as provided for in Amendment No. 2 to the CONTRACT due to the fact that the down payment of US \$ 1,482,000 as provided for in Clause 15.9.1 was not received within such date.

WHEREAS on 22nd August, 1986 CONTRACTOR received such down payment through CONTRACTOR'S BANK; Whereas all the conditions of determining the effective date of the Contract have been fulfilled as per Article 7.

WHEREAS Considering the fluctuations of the currency i.e. USD against the Italian Lira, the Parties have agreed to change the unit of payment under the Contract from USD to ECU in order to reduce as much as possible the negative consequences for both Parties connected with the fluctuation of such currencies.

NOW THEREFORE it is hereby agreed by and between the Parties as follows:

A: The structure of the portion of CONTRACT price denominated in US \$ and mentioned in Clause 15.1 of the CONTRACT, i.e. US \$ 12,380,000 has to be considered as follows:

- US \$ 1,482,000 corresponding to the amount of the down payment (as per Clause 15.9.1) already cashed by CONTRACTOR, plus
- ECU 15,209,248 corresponding to US \$ 10,898,000 converted at the rate of exchange prevailing on 20th December, 1984 (date of signature of the CONTRACT), i.e. US \$ 1 = ECU 1.29560.