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ANALYSIS OF DIFFERENT CATEGORIES OF INDUSTRIAL AND TECHNOLOGICAL  
INFORMATION USERS' NEEDS AS WELL AS SECTORAL INFORMATION NEEDS

Agriculture, Food Processing Sectors\*

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ADB	African Development Bank.
AISCO	Agricultural and Industrial Supplies Company.
CATA	Cashew Authority of Tanzania.
CAT	Coffee Authority of Tanzania.
CAMARTEC	Centre for Agricultural Mechanization and Rural Technology.
CRDB	Cooperative and Rural Development Bank
CIDA	Canadian International Development Agency.
DOWICO	Dodoma Wine Company.
GAPEX	General Agriculture Products Export Company.
IPI	Institute of Product Innovation.
LIDA	Livestock Development Authority.
MATIS	Ministry of Agriculture Training Institute.
MMMT	Mang'ula Mechanical and Machine Tools Company.
NMC	National Milling Corporation.
NAFCO	National Agriculture & Food Corporation.
NBC	National Bank of Commerce.
SUDECO	Sugar Development Corporation.
TCA	Tanzania Cotton Authority.
TBL	Tanzania Breweries Limited.
TDL	Tanzania Dairies Limited.
TAFICO	Tanzania Fishing Company.
TIB	Tanzania Investment Bank.
TPL	Tanganyika Packers Limited.
TSA	Tanzania Sical Authority.
TTA	Tanzania Tea Authority.
TAT	Tobacco Authority of Tanzania.
TBS.	Tanzania Bureau of Standards.
TFNC	Tanzania Food and Nutrition Centre.
UFI	Ubungo Farm Implements.

CONTENTS

<u>Part</u>		<u>Page</u>
1.	Introduction	1
2.	Outline on Industrial and Technological Information Needs	1
3.	Background to Study (Literature Review)	2
4.	Categories of Industrial and Technical Information Users in Agriculture and Food Processing	9
5.	Industrial and Technical Information Needs of Various Categories Identified Above	13
6.	Synthesis of Categories of Industrial and Technological Information Users' Needs Against the Type of Information	15
7.	Profile of a Country (Tanzania)	17
8.	Summary	23
	Conclusion	25
	Table 1	26 - 27
	Table 2	28 - 29
	Annex : Profile of a Farm Implement Production Factory: Uungo Farm Implements (UFI Dar es Salaam, Tanzania)	30 - 32
	References	33

ANALYSIS OF DIFFERENT CATEGORIES OF INDUSTRIAL  
AND TECHNOLOGICAL INFORMATION USERS' NEEDS  
AS WELL AS SECTORAL INFORMATION NEEDS  
(AGRICULTURE, FOOD PROCESSING) .

1. Introduction.

While there are vast quantities of Industrial and Technological information in the world in general, there are many in the developing countries who need this information for development of their infant Industries. It is gratifying to note that INTIB has become a permanent instrument through which both developed and developing countries can reliably route Industrial information. Efforts to ensure this Bank performs what it was expected to do when it was formed in 1977, should be made by all UNIDO members who will be either suppliers or recipients of the information.

2. Outline on Industrial & Technological Information Needs.

There are generally many areas in industrial and technological information which many developing countries would like to have access to;

- 2.1 Machinery and equipment - for developing of any industries the knowledge of machinery and equipment is a starting point. It is important that the manufacturing of any product should have machinery and/or equipment;
- 2.2 Investment, licensing, subcontracting and transfer of technology are important in utilising any machinery and equipment acquired outside. One has to know who will be willing to invest in manufacturing using machinery identified and whether the manufacturing will be done under license or subcontract system. In addition one needs to know the type and extent of transfer of technology that will be required in such manufacturing process. Otherwise permanent importation of manpower may be required.
- 2.3 Furthermore Industrial development depends on ability to acquire added knowledge on manufacturing processes, technological information and research and development so as to sustain the momentum of industrial development irrespective of sector;

- 2.4 For proper management of various industrial sectors, there is need for information on raw materials supply since any shortage may affect viability of the Industry. Sometimes there is need to know substitutes to raw materials in order to sustain production.
  - 2.5 Marketing, statistics and profiles of manufactured goods at country, regional or world basis, is important and economical/ industrial development depends on thorough knowledge of this;
  - 2.6 Appropriate Technology is important in many developing countries and there is proliferation of Institutions related to the same. These Institutions have gathered a lot of useful information which could be of great use to Industrial development.
3. Background to the Study.
    - 3.1 The categorization of various groups in the studies of industry is not a new subject. In many studies this is regarded as a convenient and most logical way of conducting any systematic study. The major problem that one faces always is that there are complex linkages in many cases which in some cases defy simple classification. This cannot be avoided especially when we know technical information knows no boundaries. What is special knowledge now will end up common knowledge discussed at family living room some years to come. What we can do is to make an attempt to categorize existing information to suit known categories of users in order to facilitate current information flow and change it when it tends to get obsolete.
    - 3.2 When one reviews literature pertaining agriculture food-processing by various authors writing for UNIDO one finds some system that classifies the food industries close to what ISIC classification presupposes.
      - 3.2.1 In the first study reviewed, a UNIDO consultant (Ref. 1) writing on intergrated food-processing industry in Africa, listed the most important industries as cereal processing and related products; sugar and sugar products; Animal products; Fish and Fish products; and liquid beverages. The above fit in the classification 3116 & 3117; 3118; 3111; 3112; and 3114; 3114;

of ISIC respectively. The same author indicated the priority trends as:-

- (i) Emphasis on processing local products using local resources - emphasis on basic industries;
- (ii) Developing scientific and technical education to satisfy scientific industrial needs of water, electricity, improved transport, communications, and storage; all being an essential in horizontal intergration in food-processing.
- (iii) Strengthening of work organization, discipline and related industries to improve production through effective production through effective control over all implementing agencies and people involved in using innovation and modern technology.
- (iv) Cereal milling and related products tended to be dominant activities of either big public corporations e.g. National Milling Corporation (NMC) in Tanzania and Ethiopia or big private firms with Government backing elsewhere.
- (v) Packaging using various containers metal cans, plastic containers, paper packaging, multi-walled polythene paper bags and curtons, sisal or kenaf bags, and glass-ware containers.

Further the author sites problems to food processing industry as follows:-

- (i) Raw material supply problems which include seasonality of supply (e.g. fruit canning) which is rainfall dependent, inadequate project planning and feasibility studies. Further the absence of guaranteed supply of raw material through contract with farmers;
- (ii) Limited technological capability on the use of imported technology equipment, machinery, chemicals and relevant inputs which results to below capacity utilization e.g. of sugar, vegetable & oil and fruit canning. This is further aggravated by inflation which has resulted to obsolete and inefficient machinery and equipment coupled with unreliability of essential utilities of water, electricity plus weak marketing institution and low labour productivity;

- (iii) Inadequate policies and guidelines which have stifled local production e.g. lack of standards, quality control, indiscriminate use of additives;
- (iv) Poor Backup Services: There is no updating of local processes to regional and even international standards. Also there is no manufacture of local equipment and machinery and poor maintenance of existing ones. In addition no new and modified products not considered;
- (v) Poor Research and Development which is not integrated enough for agro-industries. Lack of R & D hampers proper transfer and adaptation of technology, quality control, spare parts and manufacture standards.
- (vi) Manpower management and administration problem include genuine shortage of trained manpower, misallocation of existing trained manpower and limited apprenticeship which encourages use of expatriate with local counterpart, the latter being disadvantaged in that his learning depends on goodwill of the former.
- (vii) Finance and Investment problems include over dependence on foreign investment as the Government financing does not favour agro-industry. In the local scene problems include underproduction, thus lack of new investment, lack of local credit and poor supporting systems like marketing, transport and communication. While there is low income and hence low purchasing power, the imports that come in the country further stifle the market by competing with local products, as those with purchasing power tend to have more taste for imports.
- (viii) There are external barriers which include tariffs which prevent efficient export; food aids which cause complacency on local production system and transnational corporations which stifle any local efforts of expansion.
- (ix) There are constraints in marketing, technology, and Finance which include inadequate levels of marketing, high pressure salesmanship favours imported processed foods, shortage of free exchange of information and cooperation in R & D is



lacking of technical manpower and funds for promotion of international cooperation.

3.2.2 In another Regional Consultancy Report (Ref. 2) the authors writing on Agricultural Machinery in Africa with reference to Tanzania wrote that:-

- (i) For Factory production there are trends of moving from hand tools to animal and tractor drawn tools;
- (ii) There is increased dependence on local firms for supply of inputs (castings, forging and spare parts);
- (iii) Most of the hand tools were being produced by artisans and Blacksmiths. There were 4,000 Blacksmiths and 70 groups of about 25 people each with experience and skills in forging, trimming and finishing, their main input being steel scrap, charcoal and coal. These artisans work in free buildings working with hammers and tongs as their main tools;
- (iv) The large manufacturer was Ubungo Farm Implements (UFI) of Dar es Salaam, Mbeya Farm Implements (ZZK) and CAMARTEC - Arusha were operating at 50% of installed capacity and allowed 15 - 20% profit margin. While these received Foreign raw material from China, Japan, U.K., Sweden and India some raw material are locally produced by Mang'ula Mechanical and Machine Tools Company (MMMTCO), National Engineering Co. Ltd. (NECO) and Tanzania Spring and Autoparts Co. Ltd. (TASIA);
- (v) Tractor assembly of Kibaha which can assemble up to 1,500 tractors is a joint venture between Tanzania Government (Tanzania Motor Corporation) and Finland Valmet Company;
- (vi) Important problems that face these manufacturers of farm implements and machinery are identification of main markets relating to supply market (for raw materials, equipment and spare parts - which require exchange, labour market which includes technical personnel from outside; financial market (both internal or external) and sales market (also internal and external);
- (vii) Main consumers of agricultural implements and machinery were classified as villagers, state establishments, Agricultural Institutes and private farms. The main problem is the distribution cost which tends to be high due to poor accessibility to the areas where the implements are required.

- (viii) Analysing demand of agriculture machinery in the country the authors (in table 5) show that tractors of Horsepower 30 - 50 demand was 15%; for 30 - 75 H.P. was 30% and 75 - 110 was 66%.
- (ix) While size and ownership structure of farms varies from 3 acres for peasants and 10,000 acres for state farms; the means of land preparation (in table 8) shows that Tractor cultivation was 1.5 million acres, animal drawn plough 3.0 million acres and Hand tools 10.5 million acres. Due to inadequate technology on maintenance, tractor works 400 - 500 hours per annum instead of 1000 - 1500 hours per year which is considered economic;
- (x) On repair and maintenance the authors show that agromechanization centres, Rural Craft Workshops, Tanzania Sisal Authority (TSA), Tanzania Cotton Authority (TCA), National Agriculture and Food Corporation have workshops which perform various technologies and skills such as grinding, welding, casting spare parts, machining and black smithly to varying degrees;
- (xi) Regarding Institutional frame work and policy related to agricultural machinery industry:-
- (a) The Ministry of Industries and Trade issues the policy of development of agricultural machinery industry and coordinates activities of all bodies under it and
- (b) National Development Corporation (NDC) identifies projects, develops projects, reports implements approved projects, monitors operations of such units after commissioning. Also NDC carries out market studies. The following manufacturing and maintenance companies are under NDC: UFI (Dar es Salaam), ZZK (Mbeya), NECO (Dar es Salaam), MMTCO (Mang'ula), Kilimanjaro Machine Tools (Moshi);
- (c) Others are organizations that are more Research oriented but fall under the Ministry of Industries and Trade: Centre for Agricultural Mechanization and Rural Technology (CAMARTEC), Tanzania Industrial Studies and Consultancy Organization (TISCO), Small Industries Development Organization (SIDO), Tanzania Engineering and Manufacturing Design Organization (TEMDO) and Tanzania Bureau of Standards (TBS) all assist in ensuring balanced industrial growth;

- (xii) On Policy measures authors indicated that:-
- (a) While the Tanzanian Investment Bank (TIB) offers medium term loans for industrial development, cooperative and Rural Development Bank gives loans for purchase of machinery or equipment for rural areas;
  - (b) On Labour and Training, applied research and appropriate technology are encouraged while private support services are used on transfer of technology and financing;
  - (c) Government Protection is provided on locally produced items by banning, to some degree, import of products which are locally produced, farm implements and machinery;
  - (d) Ruralisation and small scale promotion is done by establishment of blacksmithy groups and promotion of development of new implements by SIDO and CAMARTEC respectively.

3.2.3 In another study by ILO (Ref. 3), the synthesis of 5 countries studied in Africa shows that local manufacture is constrained by:-

- (i) Shortage of raw material (steel), correct implement profiles and spares;
- (ii) There is a strong bias towards capital intensive technologies (tractors for example) despite official circulars concurrence with research on usefulness of small scale and low cost technologies;
- (iii) Requirement for adequate and timely supply of right quality of raw material and spares and environment that will encourage local manufacture e.g. ensure locally manufactured implements of high calibre and fair price;
- (iv) Need to ensure efficient marketing, extension and credit which will involve both private and public sector;
- (v) Need to strengthen artisans and blacksmiths;
- (vi) Need to have followup services of repair, maintenance and training for village level artisans;
- (vii) Problem of small farmers who were limited in their purchasing power;

- (viii) Need to intergrate farm equipment research and development, local manufacture and marketing rather than each taking independent route;
- (ix) Little is known on size of intra-regional market, instead local concentration dominates;
- (x) Need to have Regional Market Survey which could include information on comparative advantages in production of various equipment and implements, movement of equipment from one country to another, freight charges, quantitative and non-quantitative trade barriers, rates of adoption and level of equipment innovation for small holders.

3.2.4 In another Sectoral Study of UNIDO on vegetable oils and fats (Ref. 4) there is an indication on the linkages that exist in processing of oil seeds which show how complex the agroindustrial system can be. All agricultural inputs which go into production of the seed and all which assist in the extraction of the oil and hence its derivatives should be taken into account when one wants to study seed oil production. Therefore it is important:-

- (i) To understand that the raw material supply i.e. seed competes with other crops for inputs (for fertilizer, pesticides agriculture machinery);
- (ii) That linkages between production and processing take into account quality and quantity by bringing producer of raw material to economic circuit when considering marketing and price.
- (iii) That in the processing the main product (say oil) and other by products e.g. meal or cake and other derivatives all should be considered as part and parcel of output and be given appropriate attention;
- (iv) In addition required are supporting policies that ensure support for the industry;

(v) That there should be marketing agreements and joint ventures whenever possible and

(vi) Finally it is important that some intergrated development should be looking more at the system as a whole.

3.3 It is obvious from the above reviews that the needs of the various categories of industrial and Technical information users will be based on the practical problems that they face. While we can give the whole spectrum of possible types of needed information, in the final analysis, every region, country and plant for the same sector will have to sort out what is best for its particular firm. We will review few specific studies to show what we mean.

3.3.1 In Tanzania a Consulting Organization (TISCO) made a feasibility study (Ref. 5) for a Fruit and vegetable processing plant and in the study they specified studies made on market, plant capacity, raw materials, utilities and services, manpower requirement and Financial analysis. For this particular study specifying the location of the plant was left to the owners.

3.3.2 While making a similar study elsewhere (TISCO) on remodelling of an existing canning unit (Ref. 6) they included in their study raw materials and inputs, location and site, operation and technology, manpower and training required.

3.3.3 In another feasibility study TISCO (Ref. 7) on a Farm Implement plant they considered items as capacity, market expected, production process and machinery, raw materials, land and buildings, manpower, investment, financing and profitability.

#### 4. CATEGORIES OF INDUSTRIAL AND TECHNICAL INFORMATION USERS IN AGRICULTURE AND FOOD PPOCESSING.

At this juncture, we are in a position to suggest categories of industrial and technical information users in agriculture and food processing in order to facilitate analysing their needs and information needs.

- 4.1 In agriculture most logical categories that can lend easy analysis could be as follows:-
- 4.1.1 Manufacturers of agricultural/machinery and implements and tool:-
- (a) Large manufacturers of both tractors and accompanying equipment;
  - (b) Medium scale manufacturers - those who assemble tractors and those who manufacture ox-drawn equipment and human powered implements;
  - (c) Small scale manufacturers - those who deal with the manufacture to a limited extent ox-drawn and human powered implements and tools;
  - (d) Artisans who deal mainly with forging and blacksmithy related to hand tools and parts of ox-drawn tools.
- 4.1.2 Users of Agricultural machinery, implements and tools has three major subcategories which are:-
- (a) Large scale farms (Private, public or cooperatively owned usually acreage runs from several hundred hectares to some thousands of hectares. These always require full mechanisation for most operation;
  - (b) Medium scale farms which for many countries are from around 50 hectares to around 150 hectares where tractor use is desirable to operate the farm though purchase of tractor may be questionable unless it is partly for hire. Usually such farms can depend on tractor hire service.
  - (c) The last and probably most important in this category are small farms and peasant farms which are below 50 hectares, and above one hectare respectively. Usually it is economical to use either hired tractors or ox-drawn equipment or hands depending on the level of development of the country, type of crop to be cultivated and state of economy of the farm;

4.1.3 Units servicing agriculture machinery and implements include the following:-

- (a) Big spare part dealers;
- (b) Repair workshops;
- (c) Machinery hire Centres.

4.1.4 Research Institutions which include:-

- (a) Research and Development Institutions;
- (b) Consultancy organizations;
- (c) University Research branches dealing with agriculture engineering.

4.1.5 Training Institutions which include:-

- (a) University level agriculture & mechanical engineering;
- (b) Intermediate (Diploma) level training in agriculture and mechanical engineering;
- (c) General agriculture training.

4.1.6 Planners and Administration groups:-

- (a) Government Industrial planners from various departments (ministries);
- (b) Financiers - local and foreign credit and aid agencies;
- (c) Professional groups with diversified specific interests.

4.1.7 Marketing Institutions (Private & Public).

4.2 In Food Processing, as mentioned in our earlier review, that it is much more logical to categorise users based on type of product. While in dealing with agricultural machinery and implements it is possible to produce several lines of farm implements as most are metal based, in food processing the groups are distinct and cannot be mixed. There are bound to more categories as follows:-

- 4.2.1 Manufacturers of various Food products (basing on the main or primary product):-
- (a) Animal processing industries - beef, mutton, pork, poultry, milk products;
  - (b) Fish processing - frozen, salted, smoked, tinned;
  - (c) Cereal products - wheat, maize, sorghum, rice, barley, bakers wares;
  - (d) Sugar products - raw sugar, refined sugar, sugar confectionery;
  - (e) Beverages - coffee, tea, cocoa, liquid beverages - (beer, wine, alcohol, soft drinks);
  - (f) Feeds - processed animal feeds;
  - (g) Fruit and vegetable processing and preservation;
  - (h) Vegetable oils from various crops.
- 4.2.2 Users of various food products processed constitute a unique category and these include:-
- (a) Those consumers who directly consume the food constitute the majority;
  - (b) Consumer protection groups - private or public;
  - (c) Those who perform secondary processing of the foods to produce other derivatives.
- 4.2.3 Standards and food quality control groups include:-
- (a) Private consultancy organizations;
  - (b) Public standards and quality control groups;
  - (c) Food law enforcement agencies of government.
- 4.2.4 Exporters and Importers constitute a category in the food processing industry. For developing countries their exports are oil seeds, canned meat, refined sugar etc while they import milk or milk products, baby foods, refined oils, cereals etc.
- 4.2.5 Research and Training Institutions dealing with Food Science and Technology.
- 4.2.6 Planners of Government (Food processing Industrial plans): Agriculture and livestock experts (Government and private) professionals and politicians have a big role as a category in food-processing industry.



- 4.2.7 Producers of raw materials for the food industry constitute one of the most important category that often is neglected but has big leverage in determining whether a particular food-processing industry collapses or not. These are the many livestock keepers & peasant farmers.
- 4.2.8 Marketing Institutions - (Private or Public) are very important in processed food distribution. All food crop purchasing authorities, transporters, godown keepers and whole & retail merchants dealing with raw & processed foods are in this category.
- 4.2.9 The final group that is important is the financing category which includes banks (national and international), Aid agencies and private money lenders and investors.

5. INDUSTRIAL AND TECHNICAL INFORMATION NEEDS OF VARIOUS CATEGORIES IDENTIFIED ABOVE.

The several categories identified above require information to varying degrees and in the limited space one can just point only extreme cases, though various categories may require some information more than others. Certainly there is a range of information that can provide a choice for the categories. The following outline will provide this range of information from which we can work out matrix of category against type of information required.

- 5.1 Raw materials: For all types of manufacturing industry this is one of the most important items is that one has to know where to get raw material supply, at what price and reliability of supply and production profiles from the source(s). New sources of raw materials and any variation in quality are definitely of interest. Of much interest to the manufacturer, the supplier of raw materials of raw foods have interest in knowing the needs of the manufacturer so as to know how best they can maximize profits by giving them what the manufacturer wants at the same time avoiding oversupply.
- 5.2 Manufacturing process: For all manufacturing institutions this is important as changes may involve either increasing or reducing costs, at the same time quality of product may vary which will affect distributors and users.

- 5.3 Technical Information is of great importance to the manufacturers, consultants, researchers, planners, professionals. Innovation takes place in all fields; agriculture and food industries are no exception. Unless the manufacturing industries keep abreast of several technological developments they may find themselves remaining with outdated technologies and obsolete machinery and equipment.
- 5.4 Management Information: It is required that statistics and profiles affecting the industry locally, regionally and internationally are up to date always so that proper projection for planning are made. Short of this a lot of industries will find themselves either bankrupt because of overproducing or losing profits because of not utilising the potential they have to invest more for producing more to meet demand.
- 5.5 Marketing, Promotion and Patents: Information for products is an important aspect in production. Information on the total marketing route & promotion efforts of one's product from factory outlet to consumer is very important to ascertain performance of one's product in comparison with others nationally, regionally & internationally. It is imperative that one keeps this at his finger tips. In addition patents documents for such products provide quite substantial information should be known by relevant people in both agriculture and food processing Industries.
- 5.6 Research and Development in the field that one deals with in Agriculture industry or food processing is important. There are several Research and Development efforts that are bearing fruit. One needs to be informed to know how long it will be before his machinery or equipment and manufacturing process need to be changed. This will enable Investment efforts to be directed towards the right direction to meet future changes. This is more important especially for developing countries which are likely to be 'dumping ground' for obsolete machinery and equipment due to lagging behind in acquainting themselves with most up to date R & D efforts in their respective fields.
- 5.7 Appropriate Technology search should go along with R & D efforts in various industries. Several times imported and sophisticated technologies have failed in some developing countries because manpower could not cope with it in terms of maintenance and

spare parts due to limitation in skilled manpower and foreign exchange. Fortunately appropriate technology has advanced so much and a lot of literature is available and appropriate technology institutions are expanding. One just needs to keep oneself informed so that the appropriate technology is available when the time comes.

- 5.8 Machinery and Equipment for all industries are the basic items that one needs to produce. Full knowledge of the various makes and spares and changes needs to be at the fingertips of all agricultural industrial Planners and plant owners lest they become victims of obsolescence. Modification of machinery and equipment can be done if one keeps abreast of the market.
- 5.9 Tools and Implements are manufactured by Industries for millions of users in agriculture industry. There are several new designs that come-up in the market to improve efficiency. The industrial developers need to know the supply and demand profile of these in time and space in order to invest in factories which are useful to the community. All available information should be scrutinized to ensure that what is projected for production is still relevant to the market.
- 5.10 Sources of Funds are important for people interested in industrial production. It is important that those interested are well informed on sources of funding both local and foreign to ensure they can cope with demand in quality or quantity, since there is always a possibility of saving ones capital when one has knowledge on where to get funds for new investment.

6. SYNTHESIS OF CATEGORIES OF INDUSTRIAL AND TECHNOLOGICAL INFORMATION USERS' NEEDS AGAINST THE TYPE OF INFORMATION.

In order to bring the analysis of the various categories of Industrial and Information Users' Analysed above, it is important that we should attempt a synthesis of some kind. We think a matrix indicating categories of information user against type of information required will provide an idea of what each one category may require.

6.1 Use of Matrix.

Table 1 and Table II are two tables which one can use in attempting to analyse any category. Take an example Table I we have Large scale manufacturer of Farm Implement say

Ubungo Farm Implements (UFI) of Dar es Salaam in Tanzania. The manufacture has a range of items such as shown in Annex I 1. They may have High rate of information requirement and problems relating to (1) raw materials (2) manufacturing process (3) technical information (4) statistics and profiles (5) machinery and equipment (6) patents (7) Research and Development and probably skilled manpower. Appropriate Technology may not be so such an important item in their information requirement since they are large scale manufacturers already and National in scope and may not anticipate to switch to a lower technology. Maybe they could require information on appropriate technology say in part when manufacturing a hand hoe. Thus their information requirement is rated as low.

On the other hand they need feedback on farm tools and implements as these are in their production line. They need feedback say on the performance of new products, say tested performance by a farm implement testing authority e.g. (CAMARTEC). Therefore their information requirement is rated medium.

On the other hand if we take the extreme case of artisans in the villages producing the same item (a hand hoe say) as UFI in the same country, their information requirements are extremely low say in raw materials and manufacturing process funding or R and D. All they need is to get to know where the scrap metal is that is suitable and start using their forges using a known process. In few cases innovations in improving Forges can be brought about by Small Industries Development Organization (SIDO) hence the rating of some low information requirement for appropriate technology and funding and R & D both which could be a result of SIDO or CAMARTEC efforts or Government agencies. On the other hand the artisans may not need any technological information on metal properties or statistics or marketing as their market is limited to the local area.

6.2 Limitation of Use of Matrix.

The limitation of the matrix is that its range of items both categories and types of information and rating could be limited to what was reviewed by the authors and more, so when one considers developing countries. However, one can add any category in both tables or add other type of information which has been left out. Similarly the rating can be changed depending on country or region and level of development of the industrial sectors in question.

6.3 Need for Survey.

The limitation of the matrix calls for some survey at plant or Institutional level to determine exactly the kind of information that each requires. Even from these specifics some generalisation at country and especially regional level will be required. Suffice it by saying we believe the generalisation has been made by intuition, review and knowledge of both plant and sectoral level for country and regional level. We believe as a starting point a successful survey may reveal a useful pattern on which information gathering and distribution system can follow.

7. PROFILE OF A COUNTRY (TANZANIA).

It is important that we give a countries' profile on the items that we have mentioned especially categories of Information users, though type of information will remain the same. We have chosen Tanzania as this country is the one we are most familiar with.

7.1 In Tanzania the categories of the various Agricultural Industrial Information users according to the system, we suggested are:-

7.1.1 Manufacturers of machinery, Equipment and Tools:-

- Large scale - Ubungo Farm Implements (Dar es Salaam).
- Zana za Kilimo Mbeya (Mbeya).
- Tractor and Motor Assembly Company (TRAMA - Kibaha).

- Medium scale - Centre for Agricultural Mechanization and Rural Technology (CAMARTEC - Arusha).
- Small scale - Rural Craft Workshops (In 8 locations of Tanzania mainland).
- Private Engineering Workshops.
- Artisans - Blacksmithy Groups and individuals - In many parts of Rural Tanzania.

7.1.2 Users of Agricultural Machinery & Implements & Tools.

- Large scale - National Food Agriculture Corporation (NAFCO). (Food producing Farms all over the country).
- Sugar Development Corporation (SUDECO). (4 big Sugar Estates).
- Tanzania Sisal Authority (TSA). (Sisal Estate in 3 regions).
- Ministry of Agriculture. (Several seed Farms).
- Private Crop Estates (Sisal, Coffee, Cereals). All over the country.
  
- Medium Scale Farms:
  - Cooperatively owned Village Farms (All over the country).
  - Privately owned Commercial Farms. - do -
  - Research & Training Institutional Farms. - (In many zones of the country).
  - National Service and Prisons Department. - (All over the country).
  - Small Scale/and Peasant. - (All over the country).

7.1.3 Servicing Units.

- Spare Part Dealers for Agricultural Machinery and Equipment (AISCO & Other Spare part dealers & Tractor Assembling Plants e.g. TRAMA).
  
- Large Commercial Workshops - MMT Co. (Mang'ula) National Engineering Company, (NECO), Tanzania Spring & Autoparts Co. Ltd.
  
- Agricultural Parastatal Organizations (TCA, TSA, NAFCO etc) Workshops.
- Agricultural Mechanization Centres (All over the regions).
- Private Repair Workshops (Mainly urban based).
- Small Repair Workshops:
  - Government Institutions.
  - Rural Craft Workshops.

7.1.4 Research Institutions:

- Research & Development Institutions - (CAMARTEC) Arusha, (TIRDO) Dar es Salaam, (TEMDO) Arusha, (UTAFITI, TARO, TALIRO) - Dar es Salaam.
  
- Consultancy Organizations - TISCO - Dar es Salaam. (Public and Private) Agriconsult (DSM).
  
- University Research - Sokoine University of Agriculture Morogoro, I.P.I. Dar es Salaam.

7.1.5 Training Institutions.

- University - University of Dar es Salaam Sokoine University of Agriculture.
  
- Diploma Institutes - MATIS and Technical Colleges.
  
- General Agriculture Training - MATIS and Farm Schools.

7.1.6 Planners & Administration Groups.

- Ministry of Industries and Trade.
- Ministry of Economic Development and Planning.

- financiers - Banks (TIB, CRDB, NBC, ADB) and other Foreign Aid Agencies e.g. USAID, SUDA, CIDA, GTZ etc.
- Professional Groups - Tanzania Society of Agriculture Engineers.

7.1.7 Marketing Institutions.

- Public - Board of External Trade.
  - Board of Internal Trade.
  - Regional Trading Companies.
- Private - Importers and Exporters.
- Importers & Exporters (UFI, TSA, TCA, CATA, TAT, TTA).

7.2 In the Food Processing Sector the categories of Information users according to system suggested earlier are:-

7.2.1 Manufacturers of various food products:

- Animal Processing: - Beef (Tanganyika Packers Ltd) Dar es Salaam.
- Pork, Mutton, Poultry (Mainly local and cold chain company).
  - Milk (Tanzania Dairies Ltd).
  - Fish (Mainly local but TAFICO and Cold Chain Company).
  - Livestock Feeds - (National Milling Corporation).
  - Cereals - (National Milling Corporation and Private Mills).
  - Sugar Products - (SUDECO Sugar Estate Factories and Private Confectionery Company).
  - Beverages - Coffee Authority of Tanzania (CAT).
    - Cashew Authority of Tanzania (CATA).
    - Tanzania Tea Authority (TTA).
    - Tanzania Breweries Ltd (TBL).
    - Tanzania Distilleries Ltd (TDL).
    - Dodoma Wine Company (DOWICO).
    - Private Soft Drink Bottling Companies.



- Fruit & Vegetable - National Milling, Tangold Products.
  - Dabaga Fruit & Vegetable Co.
- Vegetable Oils - TCA Cotton Seed Oil Pressing Mills.
  - Vegetable Oils Co. (Mwanza).
  - MOPROCO, Rajan Oil and others.

7.2.2 Users.

- Whole Population consuming products in Tanzania & all (residents) and to those countries products are exported.
- Consumer Protection Groups:-
  - Doctors, Health Officers, Police.
- Bakeries, Baby Food Companies, Spice Companies, Instant foods etc.

7.2.3 Standards and food quality control groups:-

- Government Laboratories;
- Tanzania Food & Nutrition Centre;
- Tanzania Bureau of Standards;
- Crop Inspection Unit (Ministry of Agriculture).

7.2.4 Exporters and Importers:

- Exporters - GAPEX, TCA, CATA, CAT, TTA, Tanganyika Packers, Private Businessmen.
- Importers - National Milling Corporation;
  - Ministry of Agriculture;
  - Refugee organizations;
  - Religious organizations;
  - Embassies;
  - Individuals (Private Businessmen).

7.2.5 Research and Training Institutions:

- Sokoine University of Agriculture (Department of Food Science & Technology);
- Uyoile Agriculture Centre, MATI - Ilonga;
- Buhare Home Economics Institute;
- Tanzania Food & Nutrition Centre (TFNC).

7.2.6 Planners:-

- Ministry of Agriculture & Livestock Development, TFNC;
- National Milling Corporation;
- Ministry of Planning & Economic Development.

7.2.7 Producers of Raw Food Stuffs.

- Peasants;
- NAFCO;
- Livestock Keepers;
- SUDECO Sugar Estates;
- Ranches;
- Fishermen & TAFICO.

7.2.8 Marketing Institutions.

- National Milling Corporation;
- Regional Trading Corporation;
- Regional Cooperative Unions;
- Tanzania Dairies Company (TDC);
- Livestock Development Authority;
- Regional Transport Companies;
- Private Transporters.

7.2.9 Financing Institutions.

- National Bank of Commerce;
- Cooperative and Rural Development Bank;
- World Food Programme.

7.3 It will be noted that in the countries profile it has been possible at least in each category, to pick a group of users who fit. However, some Institutions like the National Milling Corporation of the country appears as both in the marketing category, in the processing and in the planning. This is because of the countries Policy where some public Institutions are given multidisciplinary role of functions.

It will be noted that the role of Food quality control is not strong since there is not as yet a strong consumer protection group through TBS and TFNC could probably do it. The multiple function the institutions have to perform does not really make them the best choice. Besides the

limited number of food scientists makes it difficult to really control all quality. Most is left to the food processing firm to ensure food processed is of acceptable quality i.e. it is the Consumer who eventually will reject or accept it.

SUMMARY:

This paper for discussion introduces the Theme Analysis of Different Categories of Industrial and Technological Information Users' Needs; as well as Sectoral Information needs (agriculture and food processing sectors).

First the paper in part 2 introduces the categories of information that may be required generally by various industrial and technological information users. Broadly it lays the needed information which could include:

- (i) Machinery and Equipment;
- (ii) Investment, licensing, subcontracting and transfer of technology;
- (iii) Manufacturing process;
- (iv) Technological information;
- (v) Research and Development;
- (vi) Management;
- (vii) Marketing statistics and profiles and finally
- (viii) Appropriate Technology.

Further the paper in part 3 presents about seven reviews. Three are feasibility studies within Tanzania and four are other studies for UNIDO, ILO which centre in Agriculture machinery, farm implements and Tools and food processing mainly in developing countries. These reviews aim at showing the cross-section of the variety of problems for which information may be required for either existing industries in the sectors under study (i.e. agriculture and food processing) or industries that need to be developed. Irrespective of sector, the problems indicated information could be required in the areas or categories stated above.

Then in part 4 attempt was made in categorizing industrial and technological information users in agriculture and food processing which were categorised as:-

- (i) Manufacturers: For agriculture there are four sub-categories ranging from large scale manufacturers of equipment to artisans and for food processing there were 8 subcategories dealing with various types of food e.g. animal processing, fish, fruits & vegetable and beverages.
- (ii) Users of products for both sectors - three in each sector: For agriculture sector large, medium and peasant farmers while in food processing consumers, consumer protection groups and secondary products processing firms (derivative processing) were the three subcategories.
- (iii) Research and Training Institutions were found to be important in both agriculture and food processing sectors. In this category Research and Development Institutions are included.
- (iv) Marketing Institutions are also important in both sectors.
- (v) Planners which include Government Departments, Financing Institutions (Banks, Aid agencies) and professionals need some information from both sectors.
- (vi) Extra categories in food processing are producers of raw materials i.e. farmers and livestock keepers (small scale and large scale) and in agriculture are servicing units for agricultural machinery and equipment.

Then the general Industrial needs stated earlier are further amplified in part 5 of the paper. Later in part 6 attempts have been made to synthesize the Industrial and Technological Information Users' needs against the type of information using a table. The aim here is to suggest that if the two are matched for a particular industry or geographical area, it may be possible to get the qualitative magnitude of industrial information requirement. In our case we suggested the information needs rating could be a simple five step scale of high medium, low, variable or not needed. This method will make it possible to study various categories needs at any level i.e. plant level,

provincial, national, regional or international. In other words the need for a survey is really urgent if the bank is to be able to understand who needs what information.

Finally, we presented the profile of a developing country which, simple as it is, has all the categories of users which we have mentioned earlier in the agriculture and food processing sectors. Also present and future plans of agricultural equipment and Tools (UFI) of Tanzania, has been given (see Annex) to show the type of information that could be needed in production firms of same kind.

#### Conclusion.

In conclusion we can say that INTIB should emphasize the importance of Information in the sectors of agriculture and food processing since:-

- (i) It will shorten the time of technology transfer thus accelerate rate of industrial development in these sectors;
- (ii) There will be an increase and improvement of design and production capabilities of developing countries;
- (iii) The information available will assist in training young industrialists and development of young industries;
- (iv) It will provide a rich exchange medium between developers of technology and users of technology;
- (v) Avoid unnecessary duplication of activities thus save time and money and
- (vi) By providing technology and devices for better human welfare i.e. increased production of agriculture and quality food and higher income it will make technology be felt as a necessary element for development.

AGRICULTURE INDUSTRIAL AND TECHNICAL INFORMATION NEEDS  
BY VARIOUS CATEGORIES OF USERS

TABLE 1.

(Type of Information VS Category of User)\*

(Degree of Requirements are rated as high (H) Medium (M) Low (L) Variable (V) or Not Needed (NN)

CATEGORY OF USERS	TYPE OF INFORMATION												COMMENTS ON SCOPE OF OPERATION ETC.	
	RAW MATERIALS	MANUFACTURING PROCESS.	TECHNICAL INFORMATION	MANAGEMENT (STATISTICS PROFILE).	MARKETING PROMOTION	APPROPRIATE TECHNOLOGY	MACHINERY & EQUIPMENT	TOOLS AND IMPLEMENTS	SOURCES OF FUNDS.	PATENTS.	R & D	SKILLED MANPOWER		
Manufacturers of machinery equipment and Tools														Most are well established and in Developed countries
- Large scale	H	H	H	H	H	L	H	M	L	H	H	H		
- Medium scale	H	M	M	H	H	M	M	H	M	M	H	H	Mostly National Industries of developing countries	
- Small scale	M	L	L	L	NN	H	M	H	H	NN	M	M		
- Artisans	L	L	NN	NN	NN	L	NN	NN	L	NN	L	NN	These are usually rural based.	
Users of agricultural machinery & Implements														Most of these farms have qualified management.
Large scale Farms (150 ha and above)	LL	L	M	M	L	L	H	L	M	NN	M	M		
Medium scale farms (750 - 150)	L	NN	L	L	NN	M	M	M	H	NN	L	L	Medium level management for privately or cooperatively or public owned farms.	
Small scale and peasant farms (Below 50 ha).	L	NN	NN	NN	NN	H	L	H	L	NN	NN	NN	By far the commonest size of farms in developing countries.	
Servicing Units														Usually these service National or Regional level.
- Spare Dealers for agricultural machinery & equipment.	L	NN	M	L	H	L	H	M	M	M	H	M		
- Large Repair Workshops	M	L	H	M	L	M	H	L	M	L	M	H	These play an important role in ensuring agric. mach. & impls. work within the country.	

Table 1 Continued

- Small Repair Workshops	L	NN	M	NN	NN	H	L	L	L	NN	L	M	These are usually private or firm based but several
Research Institutions													
- Research & Dev. Institute	H	H	R	M	L	H	H	H	M	H	H	H	These are usually National or International in scope.
- Consultancy organizations	H	H	H	H	H	H	H	H	H	H	H	H	Depends on type of consultancy all types of information may be needed.
University Research	H	H	H	H	H	H	H	H	H	H	H	H	Also have their interest on information depends on type of research.
Training Institutions													
- University (Degree Level)	L	M	H	F	L	V	L	L	V	V	H	H	A lot depends on the interest of the faculty staff.
- Intermediate (Diploma Level)	V	L	N	L	L	N	L	N	V	L	M	M	Usually these cater for National level interests
- General Agriculture Training	L	L	L	L	L	H	V	H	V	NN	L	L	These though National in scope they are meant to produce non specialists for agriculture extension.
Planners and Administration Groups:													
- Government Industrial Repts.	H	M	M	H	L	H	H	H	H	H	M	H	Being National Industrial Planners most information interests this category.
- Financiers													
Banks, Aid agencies, private promoters	H	M	M	H	H	M	H	M	H	H	M	H	Financiers have several information requirements to ascertain their money is well invested.
Professional Groups	M	H	H	H	L	H	M	M	L	M	H	H	Professionals have varied but specific interest which cross National boundaries.
Marketing Institutions													
- Public	H	M	M	H	H	M	M	M	M	M	L	M	Main interest is to ensure wide public satisfaction on products
- Private	H	M	M	M	H	M	H	M	H	M	L	NN	Main interest is profit maximisation.
- Importers/Exporters	H	M	M	H	H	L	H	M	H	H	M	L	They are interested more in international trade for profit.

ntution of what the authors feel concerning the type and extent of information required by various categories. his may vary from country to country.

FOOD PROCESSING INDUSTRIAL AND TECHNICAL INFORMATION NEEDS BY VARIOUS CATEGORIES OF USERS  
 (Degree of Information required is rated as High (H), Medium (M), Low (L), Variable (V), and Not Needed (NN))

TABLE II.

TYPES OF INFORMATION  CATEGORIES OF USERS.	MACHINERY & EQUIPMENT.	RAW MATERIALS.	MANUFACTURING PROCESS.	TECHNICAL INFORMATION	MANAGEMENT (STATISTICS & PROFILES	MARKETING INFORMATION	APPROPRIATE TECHNOLOGY	SOURCE OF FUNDS	PATENTS	R & D	TRAINED AND SKILLED MANPOWER	QUALITY STANDARDS	FOOD LAWS	LANGUAGES & INTERGRATION	COMMENTS ON SCOPE OPERATIONAL AREA ETC.
1. Manufacturers of products based on various sources: - Meat processing industries (beef, mutton, port, poultry)	H	H	H	H	H	H	M	L	H	H	H	H	H	M	For Developing countries as the type of food is perishable and expensive it requires National plants to handle.
- Milk Processing Plants	H	M	M	H	M	M	M	M	M	H	H	H	H	M	Most of the equipment is specialized and developing countries use imported technology.
- Fish processing: Frozen, salted, smoked	H	M	M	H	M	M	H	H	L	H	H	L	M	L	Though a specialized industry technology on it is variable lowest to sophisticated.
- Cereal products: Wheat, maize, rice, sorghum, barley and others	H	L	M	M	H	H	H	H	L	M	M	M	H	H	Probably the most wide spread processing industry with technology from most primitive to advanced.
- Sugar products: (raw, refined and confectionery)	H	H	H	H	H	H	M	M	H	M	M	H	M	H	Most wide spread and popular industry and specialized technology required.
- Beverages: Coffee, cocoa, and liquid beverages (beer, wine, alcohol and soft drinks)	H	M	H	H	H	H	M	H	H	H	H	H	H	H	The beverage manufacturing is so wide spread and one needs to be up to date on most information.
- Fruit and vegetable processing and preservation	H	M	H	H	H	H	H	H	M	M	M	H	H	M	Most of these are local based due to perishable nature of the product.



TABLE II Continued.

Vegetable Oils & fats	H	M	H	H	M	M	M	M	M	M	H	H	H	H	Linked to soap industry and livestock feed.
Livestock feeds	H	H	H	H	M	L	L	M	H	H	H	H	H	H	Many by products from other industries so location diversified.
Users of processed foods															
- Consumers	NN	M	L	NN	NN	L	M	NN	NN	L	NN	H	M	NN	What interests most consumers is type and quality.
- Consumer protection groups	M	H	M	M	L	M	H	M	L	M	M	H	H	M	These local groups are interested more on consumer getting what he should get.
Standard & Quality Control Groups:															
- Private consultancy organizations	H	H	H	H	H	H	M	M	H	H	H	H	H	H	While there are various organizations they are national in scope to provide food of acceptance quality.
- Public groups	M	H	H	M	M	M	M	H	L	L	M	H	H	H	
- Food law enforcement agencies	H	H	H	L	M	M	M	M	H	L	M	H	H	M	
Exporters and Importers	H	H	L	L	H	H	L	H	H	NN	M	M	H	M	These are National in Scope.
Research and Training Institutions dealing with Food Science and Technology	M	M	M	H	H	M	H	L	M	H	H	H	M	H	Main interest is to keep abreast on most information on processing.
Planners.															
- Government Industrial planners	M	H	M	H	H	H	M	H	H	M	H	M	H	H	Planners require various types of information at different stages of planning.
- Financiers: (Banks, Aid Agencies)	H	H	M	M	H	H	M	H	H	M	H	M	H	H	
Marketing agencies:															
- Food distributing agencies	NN	M	L	L	H	H	NN	M	L	NN	M	M	M	M	Main interest is to get raw materials and products to where they are needed.
- Transporters of food industry input & products	NN	H	NN	L	NN	H	NN	M	NN	NN	L	L	M	L	
Producers of various raw food materials	NN	H	L	L	M	H	M	H	NN	L	L	M	L	L	Producers have to produce what the consumer will take at local national or international level.

PROFILE OF A FARM IMPLEMENT PRODUCTION FACTORY  
UPUNGO FARM IMPLEMENTS (UFI DAR ES SALAAM, TANZANIA).

Ownership: UFI Company operating under the National Development Corporation (a Government parastatal).

Finance: Built through Technical assistance from Peoples Republic of China.

Production: Commercial production started in 1970.

ACTUAL AND PROJECTED PRODUCTION.

ITEM	UNIT	1983			PLAN				
		PLAN	ACTUAL	% VAR	1984	1985	1986	1987	1988
Hoes	Pcs '000	1360	1300	(4)	1660	1675	1682	1709	1776
Ploughs	"	20	20	(-)	20	21	21	21	21
Glass Slashers	"	60	-	(100)	60	62	62	63	65
Flat/Upset shares	"	200	175	(13)	200	203	205	207	210
Railing Hoops	Tonnes	280	8	(98)	-	-	-	-	-
Plough Shares	Pcs '000	15	50	232	106	107	108	109	116
<b>TOTAL</b>									
PRODUCTION	Tonnes	3181	2791	(12)	3414	3471	3500	3527	3564
=====									
<b>CAPACITY</b>									
UTILIZATION		86%	75%		93%	93%	94%	95%	97%
<b>SHIFTS WORKED</b>									
		2	2	-	2	2	2	2	2

Source: - UFI Production Plan Documents.

According to UFI Plans.

1. Demand for hoes and ploughs in the country stands at 47 mi. and 0.126 mi. pieces respectively.
2. There is need to expand hoe production capacity.
3. Procurement of necessary machinery solely for production of ox-ploughs.
4. Addition of one more production line for hoes.
5. Provision for separate lines for production of other products.

UFI Purchase Plan.

In order to meet its production plans UFI has to make purchases. The following are Actual/Planned Purchases for the same period:-

ACTUAL/PLANNED PURCHASES TSHS. MI.

ITEM	1983			PLANNED				
	Plan	Actual	% Var	1984	1985	1986	1987	1988
<b>Raw materials</b>								
Local	-	-	-	18.3	7.5	8.5	9.5	10.0
Import	70.1	78.6	12	44.0	85.0	100.0	110.0	120.0
Spares-local	1.3	0.5	(62)	0.5	0.6	0.7	0.8	0.9
Imports	3.7	4.2	14	2.0	3.0	4.0	5.0	6.0
<b>Finished Goods</b>								
<b>(Foreign)</b>								
- Hoes	45.8	33.7	(26)	30.8	76.0	86.0	96.0	98.0
- Ploughs	28.4	14.0	(49)	31.1	17.8	18.8	19.8	20.8
- Flat Shares	3.3	4.4	33	3.2	8.0	9.0	10.0	11.0
- Pangas & Axes	-	-	-	9.5	18.0	20.0	22.0	24.0
- Bailing Hoops	3.8	-	-	-	-	-	-	-
<b>Total Imports</b>	<b>151.9</b>	<b>134.9</b>	<b>(11)</b>	<b>170.6</b>	<b>217.8</b>	<b>237.8</b>	<b>262.8</b>	<b>279.8</b>
<b>Total Local</b>	<b>1.3</b>	<b>0.5</b>	<b>(38)</b>	<b>18.7</b>	<b>8.1</b>	<b>9.2</b>	<b>10.3</b>	<b>10.9</b>
<b>Total Purchases</b>	<b>153.2</b>	<b>135.4</b>	<b>(12)</b>	<b>189.3</b>	<b>225.9</b>	<b>247.0</b>	<b>273.0</b>	<b>280.7</b>
<b>Growth</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>39.8</b>	<b>19.3</b>	<b>9.3</b>	<b>10.6</b>	<b>6.4</b>

Source: UFI Production Plan Documents.

Capital Expenditure.

Actual Investment for 1983 and projected plans for 1984/88 period are as follows:-

SHS. MILLION

ITEM	1983			PLAN				
	Plan	Actual	% Var	1984	1985	1986	1987	1988
<u>Expenditure.</u>								
Land and Buildings	7.5	4.2	(44)	16.8	16.0	16.0	16.0	16.0
Plant and Machinery	7.1	2.6	(63)	1.9	39.9	13.6	20.7	0.7
Motor Vehicles	3.9	2.5	(36)	3.3	4.6	-	-	-
Others	0.3	0.2	(33)	1.0	-	-	-	-
<b>TOTAL CAPITAL EXPENDITURE</b>	<b>18.8</b>	<b>9.5</b>	<b>(49)</b>	<b>23.0</b>	<b>60.5</b>	<b>29.6</b>	<b>36.7</b>	<b>16.7</b>
<u>SOURCE OF FUNDS.</u>								
Equity	3.4	3.4	-	-	-	-	-	-
Loans - Foreign	7.1	-	(100)	1.9	39.9	16.0	20.7	0.7
- Local	7.1	0.7	(90)	17.3	20.0	13.6	16.0	16.0
Self-Generated Fund	1.3	5.4	315	3.8	0.6	-	-	-
<b>TOTAL FUNDS AVAILABLE</b>	<b>18.9</b>	<b>9.5</b>	<b>(49)</b>	<b>23.0</b>	<b>60.5</b>	<b>29.6</b>	<b>36.7</b>	<b>16.7</b>

Source: UFI Production Plan Document.

Manpower Plans.

In order to meet targets the manpower requirements 1983/1988 are as follows:-

ITEM	1983			PLANNED				
	Plan	Actual	% Var	1984	1985	1986	1987	1988
Senior Managers	6	4	(33)	6	9	6	7	7
Middle Managers	16	16	-	12	14	16	17	20
Supervisors	1426	26	86	3	41	44	46	43
Clerical	58	87	50	87	87	92	94	92
Skilled Manual	340	320	(6)	325	328	342	363	377
Unskilled Manual	255	169	(34)	172	162	153	140	126
<b>TOTAL</b>	<b>689</b>	<b>622</b>	<b>(10)</b>	<b>636</b>	<b>638</b>	<b>651</b>	<b>667</b>	<b>665</b>
<b>GROWTH</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>2.3</b>	<b>0.3</b>	<b>2.0</b>	<b>2.5</b>	<b>(0.3)</b>

Source: UFI Production Plan Document.

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