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ERITREA

Human Resource for Sustainable Industrial Development

PART I

Situation analysis and policy recommendations

MINISTRY OF TRADE AND INDUSTRY

UNITED NATIONS DEVELOPMENT PROGRAMME

UNITED NATIONS INDSUTRIAL DEVELOPMENT ORGNIZATION

ERITREA

Human Resource for Sustainable Industrial Development

PART I

Situation analysis and policy recommendations

June 2003

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The United Nations Industrial Development Organization (UNIDO) was commissioned by the Ministry of Trade and Industry in consultation with United Nations Development Programme (UNDP) to undertake an industrial human resources survey.

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The situation analysis and policy recommendations were prepared by a core team of international and national experts through an interactive process involving the key stakeholders in Eritrea. Members of the core team include Amaha Kidani, Remie Toure, Berhane Girman, Kifleyesus Andemariam, Mengisteab Zerakristos-Bhargwandas, Teklemariam Ghebredergel, Victor Richardson, Rajibir S. Sangwan, Mesfin Tseggai, Sengal Woldetensse and Taddesse Woldeyonhannes.

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Executive summary

The availability of skilled human resources is one of the prerequisites for a competitive and sustainable industrial sector. The UNIDO Integrated Industrial Programme for Eritrea has as one of its components capacity building for industrial policy formulation and sustainable human resource development. Eritrea is a young state and a developing country faced with major problems and constraints, one of which is shortage of professional, skilled and semi-skilled human resources. In common with other developing countries, the Government is a major employer of highly skilled and educated manpower. The Government, however, recognises that the greatest bottleneck to Eritrea's development efforts is the severe shortage of appropriate human capital. It is worth noting here that according to a recent survey some 39% of those in the working age are unemployed.

While recognising that the country has a highly motivated, industrious and disciplined people, the Macro-Policy of the Government of Eritrea emphasises the low human capital and low and inadequate technological base. In pursuance of a competitive, vibrant and sustainable industrial sector therefore, tremendous efforts should be made to develop the human resource and technological base of the country, in particular, for industrial development. The Macro-Policy also puts emphasis on a private sector-led industrial development with a focus on agro-industries and export promotion.

A major Human Resource Development (HRD) exercise was funded by the World Bank in 1997. The Eritrea/World Bank project deals essentially with education and training for public servants and not with the supply and demand for essential skills needed for direct productive activities in the industrial sector and related fields. Consequently, the situation analysis on Industrial Human Resource Development (IHRD) presented here is intended to address that problem.

The analysis is made in seven chapters. Chapter 1, provides some background information, and outlines of the objectives of the IHRD survey, as well as a review of the existing situation in selected industrial sub-sectors.

In Chapter 2, the methodology used for the survey/analysis is presented. For the survey, 223 medium/large enterprises with 10 or more employees were targeted. Of the other 1707 existing enterprises with less than 10 employees, only 211 were selected for the analysis, making a total of 434 industrial establishments selected by stratified systematic random sampling. The information/data required for the analysis were collected through structured interviews by way of three questionnaires designed for (i) senior management, (ii) middle level management and (iii) operators. Quite apart from interviews with industries, open-ended questionnaires were also sent to and completed by government and non-governmental officers/institutions of relevance for the study. In addition, a national workshop on IHRD and policy implications was held in Asmara. MS Access Programming language and SPSS were used to enter and analyse the data. The analysis as presented is therefore quantitative as well as qualitative.

In Chapter 3, an attempt is made to review and assess existing policies at the macro and sectoral levels that would impact on IHRD. The role of government ministries and educational and training institutions are also assessed.

Chapter 4 provides an overview of industrial human resources based on the findings of the survey. The structure of industry is also analysed. The survey reveals that 69.3% of Eritrean enterprises are in sole proprietorship, 14.7% partnerships, 5.6% government owned, 5.6% public share holding, and 2.5% other types of joint ventures.

The enterprises selected account for some 11,803 employees of which 45% are female. This figure includes all temporary employees and those employees who are engaged in military service in the context of the war with Ethiopia. The survey also reveals that only about 18.4% of the employees have completed high school and another 2.5% have technical education. It is also worth noting that 5.7% have basic education with sectoral training. Some 32.5% have received basic education. There are about 14.4% of employees who can neither read nor write and some 23% that can read and write and have received on the job training. Only about 3.5% of employees have received university education.

As indicated earlier, some 11,803 employees are in the selected enterprises, of which 8,322 are permanent workers and 40% are considered non-skilled workers. Machine operators account for 39.5%, professional and managerial staff represent 2.4% and 2.3% respectively. Given that some of these enterprises have expansion plans, including the introduction on new production lines, but are currently constrained by the shortage of critical skills needed, these enterprises also indicate their human resource needs. Some 5,200 new employees are needed. The main requirements are technical skills including technicians and machine operators. The country is not in a position to train this number of technical and machine operators in the near future since the existing technical schools do not have the capacity to fill this gap.

Each of the industrial sub-sectors has specific needs. However, the need for technical skills for increased production is most apparent in the food processing, textiles, leather and leather product and footwear industries. It should be noted that employees categorised as technicians in the survey are those that are catered for in existing technical schools, while those classified as "others" are not catered for by the present education system.

The current system of education and training in Eritrea is not quite appropriate to meet the skill requirements of the various sub-sectors. Very few technical and vocational schools offer the type of training that is relevant for industry. Therefore industrial enterprises very often fill the gaps through on the job training and apprenticeship.

In Chapter 5, an assessment of human resource management is further explored in the context of existing HRD policies, strategies and the impact of population dynamics on the labour market, labour productivity and quality.

Although the country's Macro-Policy recognises the need for highly skilled manpower for the development and modernisation of Eritrea, the primary emphasis is on universal basic education with elements of selective higher-level education. However, it is observed that there is no central body to provide guidance for integrated human resource development. There is a need to establish such a body with the full support of the public and private sector stakeholders. The study also identifies other gaps. Although labour and employment statistics/data are very difficult to come by, Chapter 5 provides an analysis of the shortage and surplus of skilled workers in Eritrea focusing specifically on the various perceptions of shortages in the context of selected surveys.

In Chapter 6, an analysis is made of the specialist and training requirements of the crash programme for export take-off, which reflects the first phase of Eritrea's Export Development Strategy; the labour-intensive manufacture of footwear, knitted textiles and woven garments is also illustrated.

In Chapter 7, an attempt is made to address IHRD implications in the informal sector and within the framework of the programme in place for demobilised soldiers with special reference to female soldiers.

Chapter 8 addresses tertiary level workers, the university, and the civil service with a view to identifying shortage or surplus; the conditions of service and possible brain drain; the relevance of specialised tertiary level skills and the need to share costs of specialised education and training.

Chapter 9, with its curious heading of Uncertainty, Prices and IHRD Policy actually addresses the problem of how IHRD policy takes account of uncertainty in the labour market, the price of labour, the implications and possible reactions of employers and the government.

Chapter 10 succinctly reviews needs, including priority needs and specialised needs, vis-à-vis effective demand for products and skills. Realising that the most critical skills are missing in Eritrea, a recommendation is made to establish an institute for business and industrial studies. The experiences of other countries in IHRD development are assessed in this chapter.

The priority issues identified during the course of the IHRD survey, prioritised responses from both government sources and the private sector and industrial establishments in particular, as well as the government vision and programme for an export-driven competitive industrial sector and experiences from other countries have all influenced the proposed policy recommendations mentioned in Chapter 11 of this IHRD analysis.

Bearing in mind the main problems and constrains highlighted in the situation analysis on human resource for sustainable industrial development, as well as the potentials for industrial development in Eritrea, a number of programme ideas for possible technical assistance resources emerged. These programme ideas have been elaborated into realistic programme concepts for industrial human resource development.

1. Introduction

Eritrea is a young state which gained its independence from Ethiopia in 1993, after a fierce war of independence that lasted for three decades. It is situated along the Red Sea coast on the North Eastern part of the African continent and covers a land area of approximately 124,000 sq. km.

The country is endowed with abundant natural resources, ranging from marine resources, mineral resources, significant cultivable land for agriculture, a variety of agricultural produce and a beautiful national landscape with sea resorts and historical sites that augur well for the tourist industry.

According to the World Bank, World Development Report of 1998/1999[1], the Gross National Product is estimated at US$801 million, with a per capita income of US$210. The United Nations Human Development Report,[2] has also classified Eritrea as one of the countries with low human development record. Until very recently, only about 2% of GNP was spent on education. The adult literacy rate is estimated at 25%. According to the report, female administrators, managers, professional and technical workers constitute approximately 19.7% of the national total. Given the devastating border war with Ethiopia during 1998-2001, these indicators are unlikely to have been improved.

In an increasingly global economy, with emphasis on private sector-led development and competitiveness, there is a need for developing countries to take advantage of the challenges and opportunities of globalisation. The role of the government is to provide an enabling environment in which private initiative can flourish. In the case of Eritrea, its Macro Policy adopted in 1994 subscribes basically to the new approach of "market-led economic development". The Government has as one of its priorities the creation of a modern technologically advanced and internationally competitive economy, which inevitably implies human and capital formation.

The Ministry of Trade and Industry is expected to provide overall guidance, as well as fostering the enabling environment for export-led manufacturing. The Ministry should also be in a position to ensure that there is a well functioning system of incentives for the supply and demand of critical skills for industry. It should be noted that the Government has a major HRD initiative with the support of the World Bank. The World Bank programme foresees some 500 Eritreans in specialists field and the recruitment of 600 experts from other countries. Of these, 230 would fill key post in the various ministries where advanced training and experience in technical areas are required. These foreign experts will also fill posts in secondary, vocational and technical schools, the University of Asmara and the pre-university of Mendefera. In the area of industrial development, the Ministry of Trade and Industry in consultation with the Ministry of Education and Ministry of Labour and Human Welfare should initiate measures to ensure the availability of human capital. It is on this basis that the Ministry of Trade and Industry has commissioned UNIDO to assist in assessing the industrial human resource situation in Eritrea with a view to advancing some IHRD policy recommendations that would promote the development of critical skills.

It is also within this context that the Ministry of Trade and Industry is in the process of reviewing critical skills for sustainable industrial development. This does not mean that the other major

[1] World Bank, World Development Report for 1998/1999
[2] UNDP Publication 1999-2000

constraints to industrialisation are not acknowledged. For example, the low level of income limits the size of the domestic market; the low level of savings/investments inhibits the modernisation of industry; the lack of technological capabilities and the absence of a skilled labour force prohibit the existence of competitive modern industries. Having the right kind of human capital at hand is one of the necessary conditions for a competitive and sustainable industrial sector.

1.1 Objectives of the IHRD survey/study

The purpose of the study is to:

- Review and assess existing human resource policies and IHRD policy at the enterprise level;

- Conduct diagnosis on IHRD needs assessment;

- Assess industrial training infrastructure to support economic/sustainable industrial development;

- Assess government and private sector development plans/programmes, as well as investment opportunities with a view to determining IHRD needs and training.

The study is expected to provide assessed information on the existing status in the country, including human resource development plans within the manufacturing/industrial sector with a view to determining an appropriate IHRD policy framework for sustainable industrial development. The study also pays attention to other aspects that have a direct impact on the productivity of industrial labour, such as general education and training, specific skills acquisition, improved health and safety measures and incentives.

The overall objective of the industrial human resource survey is to provide adequate/assessed information on industrial human resource development, define an industrial human resource development policy that will contribute to the creation of a modern, technologically advanced and internationally competitive industrial sector in Eritrea, as well as increasing industry's contribution to economic growth and sustainable development.

1.2 An overview of industry

As early as the 1930s and 1940s, Eritrea had an industrial base established, primarily, by the Italians who, during the occupation of the country, developed the basic infrastructure, communication facilities and light consumer goods industries. The Italian authorities also exploited the mineral resources of the country, in particular, potash, magnesium, marble and copper, all of which were exported to Italy. It was estimated that there were about 1600 industrial enterprises in Eritrea during that period with capital investment of over 2000 million lires. Because of its geographical location by the Red Sea, the country played a major role in producing much-needed goods for the allied forces during the Second World War. These industries employed some 26,400 Eritreans and about 5,600 Europeans. Some 300 medium enterprises were engaged in producing a wide variety of light consumer goods, including consumer durables. These products were exported to, inter alia, Sudan, Egypt, Cyprus, Palestine,

Djibouti, Ethiopia and Yemen. By the 1950s and early 1960s, a good number of import substitution industries were established, for example, food processing, textiles, leather and leather goods industries.

The forced annexation of Eritrea by Ethiopia and the subsequent struggle for independence, involving long years of war with Ethiopia, devastated the economy, the infrastructure and the industrial base of Eritrea.

By 1987, there were about 95 industrial enterprises employing 10 or more employees, 48 of which were public enterprises and the remaining 47 being private enterprises. There were also about 526 smaller enterprises employing less than 10 persons. At the time of liberation, there were about 45 public industrial enterprises and well over 700 small and medium enterprises.

The industrial sector in Eritrea is still relatively small employing some 25,000 employees. The main industrial sub-sectors are the food processing industrial sub-sector, textiles, leather and footwear, metalworking and metal, as well as the non-metallic industrial sub-sectors. A limited range of intermediate goods has been introduced. However, small and medium enterprises continue to account for well over 45% of total industrial output.

According to the result of an industrial census conducted by the Ministry of Trade and Industry in 1998, there were 223 medium-large scale manufacturing establishments, with 10 or more employees, and 1,707 small-scale manufacturing establishments, unevenly distributed throughout the six regions of the country. However, the bulk of enterprises were (and still are) in the Asmara area. According to that census, 40% of the existing entrepreneurs were small-scale enterprises (with 5-10 employees); 40% were medium-scale enterprises (with 20-99 employees) and 20% were large enterprises (with 100 or more employees). The total working force of the industries surveyed was 15,000 of which 89% were Eritrean and 11% foreigners. The gender composition of the labour force was significant in that there were approximately 8,037 Eritrean males and 5,591 Eritrean females fully employed in the industrial sector. The same gender distribution was prevalent among the foreign workers; 987 males and 438 females. Women represented some 40% of the employees in the industrial sector.

Table 1.1 below illustrates the composition and regional distribution of industrial/ manufacturing enterprises in Eritrea. The food processing, beverage and tobacco industries account for some 790 enterprises – that is about 41% of the total number of enterprises. The furniture industry account for about 408 establishments (24%); pottery, bricks, glass & cement 193 establishments. Of the large enterprises, 30% are in food and beverage, 20.6% in pottery, bricks, glass and cement, 10.8% in leather and leather products, 9.4% in furniture, 8.5% in textile and clothing. The majority of large enterprises and a significant percentage of small enterprises are in the Maekel Region.

Table 1.1. Manufacturing enterprises by sub-sector in 1998

No.	Industrial sub-sector	ISIC Code	Maekel		Debub		Anseba		G. Barka		S.K.B.		D.K.B.		Total	
			L	S	L	S	L	S	L	S	L	S	L	S	L	S
1	Food, beverage and tobacco	1511-1600	46	140	10	174	6	146	2	188	1	66	2	9	67	723
2	Textiles and clothing	1712-1810	18	44	1	14									19	58
3	Leather & leather products	1911-1920	22	42	1						1				24	42
4	Paper, Printing & Publishing	2101-2221	9	13									1		10	13
5	Chemicals and Allied Products	2411-2520	14	11	2						4	2	1		21	13
6	Pottery, Bricks, Glass & Cement	2610-2696	34	58	3	47	4	9	-	24	5	8	-	1	46	147
7	Metal Manufacturing & Metal Products	2710-2919	9	10	-	1	-	4							9	15
8	Accumulators & Batteries	3140	1	1											1	1
9	Medical Goods & Drugs	3311-3312	2				1								3	
10	Manufacture of Motor Vehicle Bodies, Parts & Accessories	3420-3430	2												2	
11	Furniture	3610	19	292	1	96			-	28	1	25	-	3	21	444
12	Gold & Silver Works	3691	-	84	-	18	-	59	-	13	-	15	-	2		191
13	Others		-	44			-	16								60
	Total		**176**	**739**	**18**	**350**	**11**	**234**	**2**	**253**	**12**	**116**	**4**	**15**	**223**	**1707**

Source: Compiled from Ministry of Trade and Industry Records, 1998 (L= Large, S= Small).

The industrial sector is not export-oriented. Very few manufacturing enterprises are producing for the export market. The domestic focus of industrial enterprises has frustrated the marketing know-how of the manufacturing sector. Existing marketing strategies are not conducive to the challenges of a global competitive economy. Only a handful of the manufacturing entrepreneurs are complying with international standards e.g. ISO 9000. However, the Government recently introduced its Crash Programme for Export Take-off by Eritrea. The Crash Programme is a targeted, pro-active and market-driven strategy to promote Eritrean exports. The Crash Programme aims at assisting selected enterprises to become world-class producers and capable of penetrating the European and US markets the latter, more appropriately, within the framework of USA-Africa Growth and Opportunities Act 2000; (AGOA). In this context, Eritrea could export textiles/garments to the USA, free of duty and free of quota restrictions up to the year 2008.

The successful implementation of the Crash Programme would depend on the availability of the requisite skills and industrial human resource development. A considerable number of employees, those on board and new employees, would have to be trained in specific skill areas, such as quality control, repair and maintenance, machine operations and other technical areas.

The successful implementation of the Crash Programme and, for that matter, the promotion of a competitive industrial sector would depend not only on the availability of critical skills but also on the continuous training and upgrading of skills, the existence of a safe working environment, harmonious working relations, work ethics and job satisfaction. This industrial human resource development survey would, therefore, try to ascertain the nature and scope of human capital formation in the industrial sector.

2. Methodologies

The methodologies used are both theoretical and practical involving an assessment of human capital, education and training demand, specialised needs as well as the actual conduct of an IHRD Survey. Follow up consultations with key stakeholders were deemed necessary, as well as convening national workshops with a view to verifying problems and constraints and determining actual IHRD needs for sustainable development. The following is a brief description of the methodologies used for the study.

2.1. Primary sources

For the purpose of this study, all the medium/large enterprises (223) and about 10 % of the small enterprises (211) selected by systematic random sampling from various manufacturing sub-sectors are included. The study covers enterprises from the six Regions of Eritrea. To facilitate the work of the consulting team (University of Asmara), questionnaires were designed addressing three categories of employees as follows:

- Senior management of industrial enterprises
- Middle level management of industrial enterprises
- Industrial operators.

It was considered appropriate for the large enterprises to complete all three questionnaires listed above while the small enterprises concentrated only on the first questionnaire. Efforts were made to purposefully have a gender balance amongst the respondents of the questionnaires, including, in particular, middle level management and industrial operators.

Table 2.1 is an illustration of enterprise distributions in the six regions of Eritrea.

Table 2.1: Manufacturing enterprises in Eritrea in 1998

Region	*Small Enterprises*		*Large Enterprises*		*Total*	
	N	*S (100%)*	*N*	*S (100%)*	*N*	*S*
Maekel	739	93	182	182	921	275
Debub	350	39	17	17	367	56
Anseba	234	27	9	9	243	36
Gash Barka	253	29	2	2	255	31
Semwnawi K.Bahri	116	16	9	9	125	25
Debubawi K.Bahri	15	7	4	4	19	11
Total	**1,707**	**211**	**223**	**223**	**1,930**	**434**

Source: Compiled from Ministry of Trade and Industry Records, 1998. (N = number of enterprises, S= Sample)

The number of existing industries were further classified into various industrial sub-sectors as illustrated in Table 2.2 below. This classification reveals the imbalance in the distribution of industrial enterprises in the various regions.

Table 2.2: Classification of Eritrean Manufacturing Industrial Sub-sectors

No.	Industrial Sub-sector	ISIC Code	Maekel		Debub		Anseba		G.Barka		S.K.B.		D.K.B.		Total	
			N	S	N	S	N	S	N	S	N	S	N	S	N	S
1	Food, Beverage, and Tobacco	1511-1600	140	17	174	18	146	15	188	20	66	7	9	4	723	81
2	Textile & Clothing	1712-1810	44	5	14	2									58	7
3	Leather & Leather Products	1911-1920	42	6											42	6
4	Paper, Printing & Publishing	2101-2221	13	2											13	2
5	Chemicals and Allied Products	2411-2520	11	5							2	2			13	7
6	Pottery, Bricks, Glass & Cement	2610-2696	58	8	47	6	9	1	24	4	8	2	1	1	147	22
7	Metal Manufacturing & Metal Products	2710-2919	10	6	1	1	4	2							15	9
8	Accumulators & Batteries	3140	1	1											1	1
9	Medical Goods & Drugs	3311-3312														
10	Manufacture of Motor Vehicle Bodies, Parts & Accessories	3420-3430														
11	Furniture	3610	292	30	96	10			28	4	25	3	3	1	444	48
12	Gold & Silver Works	3691	84	9	18	2	59	7	13	1	15	2	2	1	191	22
13	Others		44	4			16	2							60	6
	Total		**739**	**93**	**350**	**39**	**234**	**27**	**253**	**29**	**116**	**16**	**15**	**7**	**1707**	**211**

N= Number of enterprises, S= Sample

In Eritrea, as in other developing countries, the Government is the major employer of highly skilled, skilled and educated manpower. The Government is fully aware of the problems of human resource development and has mentioned in various policy statements that the greatest bottleneck to development in Eritrea is the severe shortage of human capital. It was therefore considered appropriate to prepare questionnaires for government, as well as the organised private sector and other institutions of relevance to the study with a view to soliciting their own perception of the problems and possible policy actions. The following ministries and institutions were targeted:

- The Ministry of Trade and Industry
- The Ministry of Education
- The Ministry of Labour and Human Welfare
- The National Confederation of Eritrean Workers
- The Employers Federation
- Vocational and technical schools
- The University of Asmara

It should be noted, however, that asking employers/senior management about their needs while at the same time asking employees (middle level management) and operators about how they are utilised or the kind of work they do, does not necessarily represent an objective approach as the subjective views of those questioned could easily be reflected in their responses.

2.2 Secondary source

The Government being the major employer of human resource has initiated a major HRD programme which is being coordinated by the Office of the President. The US$62.5 million programme was approved by the World Bank in 1997. Other policy instruments and projects were also reviewed.

This IHRD analysis also addresses IHRD problem in Eritrea. The analysis is also focussed on shortages of the required skills for industrial development and the ways in which policy decision-makers, industrial employers and skilled professional manpower/students react to the issue of shortage of various types of skilled/trained manpower. The economic implications were also considered.

2.3 Assessment of human resource development institution

Education and training providers could be found in several areas. Apart from formal education provided under the Ministry of Education and the University, there are a number of specialised education providers of relevance for industrial development. These include the Asmara and Wina Technical Schools, Don Bosco and Pavoni Technical Institute, Mai Habar Technical School, Hagaz Junior Agricultural College and the Commercial College. An assessment of these institutions is necessary to determine whether the training being offered is appropriate and would meet the demand of a competitive industrial sector.

2.4 Data collection and analysis process

The study is based on the assumption that there is some kind of skill development system in a given country, regardless of whether it is effective, efficient and sustainable. Secondary and technical schools, training institutions, the universities and selected enterprises are continually producing various kinds of skills for the economy. However, it is important to have a clear indication of the various components/elements of the system, their interactions, outputs, synergies and contradictions. The outputs (highly skilled/trained and productive human resources), which inevitably reflect the capacity of the system, depend on existing government policies, the educational and training infrastructure, the quality of education and training, the adequacy of financial and technical resources of these institutions, the quality of social services (e.g. health, welfare and other benefits) and the capacity of the enterprises to motivate, develop and retain skilled human resources.

Given the share number of industries to be covered, 25 enumerators, (university graduates) were recruited for the survey. The consulting team developed a training manual that was used during a five-day induction for the enumerators. It also served as a guide to the enumerators during field assignments. The consulting team closely supervised and monitored the enumerators' field activities to ensure that the information collected are relevant for the analysis. Information/data collected were further reviewed for substance and completeness. To validate the authenticity of the information recorded, enumerators were required to get the questionnaires sealed by the respondent enterprises. In addition to ensuring authenticity and quality control, the consulting team prepared periodic progress reports at the end of information/data collection, during the analytical phase and on completion of the study. The reports also highlighted achievements and problems encountered, as well as steps taken to minimise the risks of not achieving the overall

objectives of the study. This involved consultations with the Ministry of Trade and Industry with a view to finding solutions to any problem.

The data entry function was carefully managed under the direct supervision of a statistician/industrial data analyst. Data was entered in the computer using the MS Access Programming Language. This was selected to enable better control of data entry. It has the capability of the visual basic programming function and can control and automatically reject faulty questionnaires. In addition, it is easy transferable to other softwares e.g. SPSS, Minitab, and MS Excel. The data was properly coded and transferred to SPSS, with which the analysis was done. To ensure consistency and quality, frequency analysis was done and some inconsistencies were corrected. Tables and graphs were generated, which have been analysed in line with the in-depth interviews and observations made by the consulting team.

The method of analysis is therefore partly descriptive and partly analytical. In the first part of the analysis, attention is focused primarily on the information obtained from the industries and from the institutions, putting into perspectives the variables for the study. Basic statistics, tabular and graphic presentations are also utilised. The information as they relate to the variables is cross-referenced with the variables used in the study. The analysis is based on the findings of the survey, identifying training needs and gaps, the implications for human capital formation in the industrial sector, as well as possible areas of intervention for training and development, both within and outside the enterprise level. Furthermore, the situation analysis also includes a critical assessment of the findings of the survey and the in-depth interviews with policy-makers and other stakeholders, on the basis of which some of the policy recommendations for human resource development are defined.

The various elements of the analysis are closely linked and inter-related and provide a framework for assessing the strength and weaknesses of the industrial sector, human capital formation and industrial human resource for sustainable development.

2.5 Public-private sector consultative workshops

On completion of the preliminary draft analysis, two workshops were convened to review the analysis, as well as IHRD policy recommendations.

A major reason for convening the public-private consultative workshops was to improve the efficacy and efficiency of the policy recommendations. By consulting the private sector on the IHRD policy initiatives, some contentious issues were deliberated and broad consensus reached.

3. Assessment of existing HRD policy institutions and policy elements

It is generally acknowledged that the availability of skilled manpower is a prerequisite for industrialisation, technology acquisition and industrial competitiveness. Regrettably, many African countries have failed to give due attention to human development. Helleiner (1992)[1] indicates that in spite of the fact that low wages should make African economies very competitive with potentially rich human resources, the people of Africa are relatively neglected, inappropriately educated, in poor health and their capacities are frequently under-utilised. Given actual global trends, should this scenario be allowed to continue, the continent will be on a sure path towards marginalisation.

Eritrea should avoid this path. However, one may ask what policies are in place to build human capital for a "modern technologically advanced and internationally competitive economy" as foreseen in the Macro Policy, 1994. In order to have a proper perspective of the country's human resource policies it is appropriate to review the Macro Policy (1994). The main objective of that Policy is people focused, ensuring that the population has the necessary skills, knowledge and economic management culture for a self-reliant, self-sustained and modern economy; to develop self-consciousness and self-motivation in the population to fight poverty, disease, and all the prevailing causes of backwardness and ignorance, as well as to provide basic education for all.

With regard to industrial development the Macro Policy endorses the development of the promotion of light consumer goods industries and other industries based on the country's agricultural resources initially, and thereafter, competitive high-tech industries and export-oriented industries. Industries so established should be designed to exploit the specific factor endowments of the country. The Macro-Policy also envisages the provision of knowledge and skills to improve the productivity of indigenous handcrafts and cottage industries.

The National Economic Policy Framework and Programme for 1998-2000 basically reiterates the same priorities/strategies: "Eritrea's industrial strategy is aimed at creating an environment that would facilitate the efficient expansion of manufacturing output in industries where Eritrea has comparative advantages. These industries include textiles and garments, leather products, general agro-processing, metal fabrication, plastic processing conversion, construction materials, and other resource based industries".[2] The National Economic Policy Framework and Programme also indicates that the Government will, in collaboration with the private sector, take measures to encourage the development of small and medium-scale enterprises through, inter alia, providing industrial support services, including adequately serviced industrial estates, business incubators, and other support measures, such as ensuring access to credit and training.

[1] Helleiner, G.K. (1992). The IMF, the World Bank and Africa's adjustment and external debt problems: An unofficial view, World Development, 20(1), pp.779-792.

[2] Government of the State of Eritrea, National Economic Policy Framework and Programme for 1998-2000, Asmara, March 1998, p. 25.

The National Economic Policy also defines a policy framework for human resource development as follows:

- *Universal primary education up to seven years will gradually be made available to all,*

- *Skilled manpower requirements of both the public and private sectors will be met by steadily increasing enrolments at the secondary, technical and vocational schools,*

- *Continuing education through formal and informal channels will be promoted to achieve higher literacy rates and technical competence,*

- *Tertiary education will be expanded selectively to meet the envisaged manpower requirements of the country. For diversified skill acquisition, this will be supplemented by utilising training opportunities afforded by the international community,*

- *The emphasis of technical/vocational training will be the imparting of multi-craft dexterity and skills that enhance the job adaptability and retraining potential of the student,*

- *The Government, the community and the direct beneficiaries will be made to contribute varying amounts towards financing educational costs. The Government may resort to levying surcharges to meet part of the costs of education,*

- *Official recognition and/or professional accreditation of skills and academic attainment will be awarded only after undergoing government established certification procedures,*

- *There will be no restraint on the provision of education by private sector,*

- *The standards of private schools will be maintained by curricula issued by the Ministry of Education. Private schools are expected to follow this curriculum but they will not be limited by its coverage,*

- *Non-secular schools will be given accreditation of professional competence (in non religious matters) only after completion of established national certification procedures.*

Given the above policy framework, concrete measures should be taken by the various implementing agents. However, it would appear that the general policy guidelines outlined in the National Economic Policy have not taken into consideration the assignment of specific roles for the implementing bodies in the public and private sectors. A major macro-level HRD initiative undertaken by the Government is embodied in the HRD project funded by the World Bank. This project covers not only personnel management but also good governance. Consequently it addresses, essentially, the education and training of public servants. Training is envisaged for some 500 Eritreans in specialised fields while at the same time about 600 experts from countries with surplus of skills, will be recruited to positions in Eritrea. The experts will also be assigned to educational, technical and vocational institutions including the University of Eritrea and the

Pre-University of Mendefera. In its capacity as a major employer and a public sector manager, the Government is taking steps to restructure the public service, ensuring that it has the appropriate capacities and capabilities for effective governance and economic management.

The restructuring exercise and refocusing of government's role in economic development culminated in a reduction of about a third of the civil servants. The capacity building aspects is based on the areas of focus in the National Human Resources Development Project.

Table 3.1 and 3.2 illustrate skilled human resources needs of the public sector and envisaged training to be pursued abroad.

Table 3.1: Summary of Civil Service Vacancies by Qualification

FIELD	Ph.D,MD DVM	MSc/MA LLM	BSc/BA LLB	Diploma 12+3	Diploma 12+2	Certi-ficate 12+1	12th	Total
Agriculture Sciences	8	36	21	-	11	-	-	76
Business & Economics	15	57	226	4	236	-	351	889
Engineering	11	65	72	32	17	20	-	217
Health Sciences	15	18	6	11	7	-	-	57
Natural Sciences	40	129	39	-	9	-	46	263
Social Sciences	36	71	58	-	16	6	-	187
Total	**125**	**376**	**422**	**47**	**296**	**26**	**397**	**1689**

Source: Implementation Plan of the Eritrean Human Resource Development Project (1997), p. 8.

Table 3.2: Summary of training Abroad

FIELD	Ph.D/MD DVM	MSc/MA LLM	BSc/BA LLB	Total
Agriculture Sciences	8	36	-	44
Business & Economics	15	57	4	76
Engineering	11	65	72	148
Health Sciences	15	18	3	36
Natural Sciences	40	129	5	174
Social Sciences	36	71	-	107
Total	125	376	84	585

Source: Implementation Plan of the Eritrean Human Resource Development Project (1997), p. 10.

The HRD project funded by the World Bank does not take into consideration the important role being given to the private sector to promote economic development and industrial development. The private sector does not benefit directly from this project and the views of the private sector stakeholders were not solicited, especially in terms of the focus of education and training at the university, technical and vocational levels. The project is a specific public sector focused project, designed to build the capacities of government institutions for better governance.

There is a need to address HRD at the national level, as well as the production levels. The decision of the Ministry of International Cooperation, Macro Policy and Economic Coordination to endorse an IHRD policy assessment was therefore a step in the right direction.

Eritrea being a young nation with a relatively weak private sector, the Government should assume some responsibilities in industrial human resource policy formulation, implementation and monitoring. Given the Government's position as a major employer of highly skilled and educated industrial human resources, as well as a social decision-maker, the Government has a vested interest in ensuring that the available/existing skills are used optimally, including adoption of policy options or employment practices that will ensure that skilled human resources are also available for private sector development.

The following sections will review selected policy institutions and policy elements aimed at improving human resource development that could impact on sustainable industrial development.

3.1. Ministry of Education

The Ministry of Education is responsible for the overall educational policy and monitoring of the educational system as a whole. The Ministry is at the apex of the educational system and plays a key role in the provision of education and training.

Although there is no clearly defined integrated educational policy, the Ministry provided a definition of its policies and strategies at a seminar on the "Integration of Social Sector Strategy in Eritrea" held in Massawa, 11-13 May 2000 as follows:

Policies*

- ☛ To promote the provision of pre-school education
- ☛ To provide free and compulsory basic education
- ☛ To fulfill the education needs of children with learning difficulties
- ☛ To increase enrolments at secondary, technical and vocational schools steadily in order to meet the skilled manpower requirements of both the public and private sectors
- ☛ To strengthen the role of communities in the development, management and financing of education
- ☛ To expand tertiary education selectively to meet the envisaged manpower needs of the country
- ☛ To eradicate illiteracy
- ☛ To provide continuing education through formal and non-formal channels to achieve higher literacy rates and enhanced competence
- ☛ To promote the use of the mother-tongue as the medium of instruction at the primary level and English at higher levels
- ☛ To encourage the participation of the private sector in education
- ☛ To promote the development of arts, culture and sports.

* Ministry of Education, Paper presented for the Seminar on the Integration of Social Sector Strategy in Eritrea, Massawa, May 11-13, 2000, p.12.

Strategies*

- ☛ Extend basic education opportunities in urban and rural areas through the opening of new schools, with particular emphasis on areas that have been marginalised by geographic isolation, backward tradition or poverty
- ☛ Renovate and rehabilitate war damaged and other school buildings
- ☛ Strengthen the educational support system
- ☛ Launch nation-wide literacy and community development programmes and improve curricula at all levels
- ☛ Upgrade the quality of existing teachers, and train new ones to meet the demand
- ☛ Overcome the severe shortage of school supplies and educational materials
- ☛ Adopt alternative educational approaches to provide continuing education opportunities
- ☛ Provide technical education and vocational training closely related to the needs of self-employment and the private/public, industrial, manufacturing and service sectors
- ☛ Improve the quality of education through curricular reviews
- ☛ Conduct students' summer work programmes
- ☛ Promote popular participation and professional training in the fields of arts and sports.

* *Ministry of Education, Paper presented for the Seminar on the Integration of Social Sector Strategy in Eritrea, Massawa, May 11-13, 2000, p.12.*

The Ministry of Education is the main provider of formal education at the pre-school, elementary, secondary and technical school levels, as well as in adult literacy in some 1,140 such institutions/centres throughout the country. It is estimated that the system has about 9,000 teachers. It should be noted that about 81% of the above-mentioned institutions are government owned. In 1998/99, it was estimated that 52.2% of male and 47.9% of female children of school going age were enrolled in elementary schools; 40.1% of male and 36.5% of female at the middle level; 17.4% and 13.4% respectively at the secondary level.

For technical education and vocational training (TVET), it was estimated that in the year 2000 there were six institutions focusing on industry and manufacturing related subjects, two in agriculture, and one in commerce – at the basic level. At the intermediate level, four institutions were industry specific, two in agriculture, and one in commerce. Only three such institutions provided educational training at the college level – one in industry and two in commerce. Students at the fifth or seventh grade could enrol for the basic level training for 6-10 months.[1] Students who have completed the ninth grade could enrol at the intermediate level for 2-3 years training. At the advanced level students who have completed secondary school could train for a period of 2-3 years.

It should be noted also that a new technical and commercial school, funded by the Danish Authorities is being built at Massawa.

[1] Ministry of Education, Department of Technical adn Adult Education, A Workshop on Technical Education and Vocational Training Policy Framework, Massawa 12-13 October 2000, Eritrea, p. 5.

The essential economic fact about all these institutions is that they provide a national service – education, on a non-competitive basis to a captive market. Their services are rationed by academic merit i.e. the ability to pass competitive exams. But as with all service or product produced that have a monopoly, there is little incentive to change the way in which the service is delivered; nor is there any mechanism to promote flexibility. As a result, there is a very limited choice on curricula modules/contents and limited flexibility between institutions/departments. Of the total graduates from these institutions only 4% are in technical areas with the remaining 96% in various non-technical areas. The main focus in the technical areas are mechanics, electricity, electronics, woodworking, construction, metalworking and machine shops. The training given is not directly functional to the structure of existing industries in Eritrea. Specific training in textiles, food processing, leather and leather products are not available in the country at the institutional level. These types of training are usually provided on the job by the enterprises themselves and, in the case of cloth making and tailoring by small private schools.

Table 3.3 below gives an indication of the pattern of enrolment at the various levels of the education system. The Government is the main provider of education in the country. Private institutions account for less than 15% of enrolment at any level. For instance, at the elementary level, it is about 10%, middle level 8%; secondary level some 4.4% in 1998/99. During the same academic year, 49,627 secondary students specialised in non-technical fields. Technical students were only 908 representing a ratio of 55:1.

Table 3.3: Enrolment by level 1991/92-1998/99

Year	Level											
	Elementary			Middle			Secondary			Technical		
	Gov.	*Private*	*Total*	*Gov.*	*Private*	*Total*	*Gov.*	*Private*	*Total*	*Gov.*	*Private*	*Total*
1991/92	150,982	33,377	184,359	27,917	4,788	32,705	27,627	794	28,421	480	-	480
1992/93	184,656	31,513	216,169	28,431	5,174	33,605	31,531	1,740	33,271	537	-	537
1993/94	208,199	31,766	239,965	32,781	5,203	37,984	32,756	1,984	34,740	589	-	580
1994/95	224,287	30,398	254,685	34,995	4,992	39,987	36,728	2,530	39,258	546	-	546
1995/96	241,725	30,650	272,375	39,751	5,385	45,136	39,151	3,514	42,665	536	-	536
1996/97	240,737	29,578	270,315	47,460	5,841	53,301	40,594	3,313	43,907	546	-	546
1997/98	247,499	27,292	274,791	57,152	5,401	62,553	41,615	2,634	44,249	406	-	406
1998/99	261,963	29,153	291,116	67,021	5,417	72,438	47,533	2,094	49,627	839	66	908

Source: *Compiled from Basic Education Statistics 1998/99, Ministry of Education, November 1999.*

In that same year, about 10,441 students took the Eritrean Secondary Education Certificate examination of which 2,040 were admitted to the University of Asmara and other post-secondary institutions. The remaining 8,401 students were therefore available for employment in the labour market. However, most of them did not have any vocational and technical skills to ensure easy absorption in the productive sectors. It is recognised that the level of the development in the country and the rate of industrialisation could not permit the absorption of such graduates. In any case the continuing production of unspecialised and unskilled labour would aggravate the fragile situation in the long run. In its efforts to rapidly transform the country's educational system, the Ministry of Education has recently launched a programme which aims at preparing students for employment. A national policy framework for technical education and vocational training is also envisaged.

3.2. The University of Asmara

The University is the only university in the country. It is owned by the Government. Established in 1958, it actually became a chartered university in 1968. The years of hostilities with Ethiopia had some severe consequences on the administration and staff structure, as well as the role of the university in the whole development process.

In 1999, the University was revitalised with enrolment of 1,000 new students. There were basically thirteen departments which over the years were restructured and expanded, resulting in 29 departments by 2001. The number of students grew from 1,683 in 1991 to 4,600 in 2001. The number of staff also increased from 67 to 250. Within the framework of the government HRD programme, about 200 academic staff are currently on study leave pursuing post graduate degrees and other specialised training.

The objectives of the University are as follows:

- Contribute to national reconstruction and economic development by training people who have the requisite competence and by contributing innovation and knowledge that can serve as a basis for national development;
- Disseminate higher education through day and evening programmes, as well as distance education and make such training available as widely as possible;
- Collaborate with institutions abroad in developing relevant academic programmes and conducting basic and applied research;
- Offer short intensive courses to improve the administrative, managerial and technical skills in the country; and
- Help to rehabilitate and conserve Eritrea's natural resources and environment by conducting agricultural and ecological studies.

The overall policy guidelines of the University could be summarised as follows:

- To be open to all Eritrean nationals depending on the institution's capacity to grow in relation to national requirements;
- To seek to maintain balanced development that permit women and other disadvantaged groups to take part fully in higher education;
- To uphold academic freedom in research, teaching, and publication; and
- To maintain a close working relationship with private and public institutions.

Strategies

As the University strives to become a centre of academic, research and specialised knowledge and a centre of excellence, the University will require substantial financial, technical and human resource support from the Government, as well as external support. It is desirable to establish strategic and sustained relationship with the public and private sectors and other universities at the global level. The University will also establish close working relationship with key stakeholders in specific sectors to produce value added services to such stakeholders in the

context of the university's academic/specific programme. In doing so, the University will ensure that its academic programme is functional and of relevance for the overall development objective, including the industrial objectives of the country.

In 2001 for example, the Faculty of Engineering of the University successfully turned out its first graduates of about 80 young civil, electrical and mechanical engineers. These engineers will definitely have an impact on the labour market. In the year 2000, the University also produced some 371 graduates in other fields, about 176 diploma holders and 106 special certificate holders. The year 2001 also witnessed some 550 first-degree holders. Although these new graduates do not have working experience, their university training offers them the opportunity to be fully productive in the economy within a relatively short time.

There are indications though that because of the poor salary structure and limited incentives to pursue individual research, as well as the rising cost of living, it is very likely that the University will subsequently succumb to the brain drain that is quite common in many African countries. It is believed that expatriate staff recruited in the education institutions and, indeed, in government industries earn much more than Eritreans in similar positions. Graduates who have established consultancy services are earning ten times as much as university lecturers. In such situations, the University would not be able to hold on to its qualified staff.

It is estimated that in any given African developing country, it is desirable to have, as a minimum requirement, some 2000 scientists and engineers per million inhabitants.[1] The minimum requirement was set some 26 years ago by the Dakar Declaration (1974). At that time, the focus was not even on creating competitive production sectors within a global economy. The current situation in Eritrea is that only about 1.5 per 1,000 of population are enrolled for higher education. In the last 10 years only 3,055 first-degree graduates were produced by the University, of which 34% are in business and economics, 17.4% in arts and social sciences, 25 % in natural science and 2.5% in engineering fields. Women represent only about 12.8%. Assuming that second-degree holders are required for any serious scientific research in Eritrea, then the potential is very limited, as the University of Asmara is only now preparing to launch the first post-graduate programmes.

Table 3.4: University graduates 1991- 2001

Colleges	Degree			Diploma			Certificate			Grand total	
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Total	%
Natural Science	686	79	765	-	-	-	20	2	22	787	16.6
Health Science	66	17	83	34	4	38	--	-	-	121	2.6
Arts & Social Science	462	64	526	164	42	206	105	33	138	870	18.4
Business, Economics	882	156	1,038	290	164	454	262	77	339	1,831	38.7
Education	85	15	100	212	15	227	-	-	-	327	6.9
Agriculture & Aquatic Science	407	59	466	11	4	15	-	-	-	481	10.2
Engineering	75	2	77	228	14	242	-	-	-	319	6.7
Total %	2,663 87.2	392 12.8	3,055 100	939 79.4	243 20.6	1,182 100	387 77.6	112 22.4	499 100	4,736	100

Source: Compiled from University statistics.

[1] Ferje, J. W. (1993). The role and effectiveness of national science and technology policy-making bodies in Africa. in A. Ahmed ed. *Science and technology policy for economic development in Africa.* E.J.Brill: Leiden, New York, Koln.

The challenge

In terms of industrial development and competitiveness, it is unlikely that Eritrea is in a position to meet the basic factors or provide the drivers of competitiveness. Innovation and research capabilities are one of the prerequisites for industrial competitiveness. If the country is to succeed in establishing competitive export-oriented industries, it must embark on industrial research and technological capacity building. The University could spearhead industrial technology development/research in the country with the full participation of the key players in the manufacturing sector. There is no indication that this trend will be pursued in the near future. Success will depend on the availability of a critical mass of industrial engineers, technologists, managers, industrial economists, etc. The engineering faculty of the University was only recently established and is not in a position to play this leading role just yet. The engineering students number about 319 of which only 77, approximately 24% are pursuing the five-year degree programme, the rest are in the three-year diploma course. As the engineering faculty is absorbed with day-to-day administration, management, upgrading of its diploma programme and academic curricula, there is hardly any thought being given to the need for an industrial technology unit.

The manufacturing enterprises should take major initiatives in promoting industrial research and technology development. In some countries, the manufacturing sector is at the forefront of industrial technology research and development. However, the whole issue is one of industrial human resources for meaningful competitive and sustainable industrial development that is private sector-led. Therefore, priority should be given to industrial technical skills development. As already indicated above, the institutional and policy framework to foster industrial skills development are lacking. The traditional approach of having technical and vocational education that is not effectively linked to the industrial sector should be revisited with a view to ensuring a more technical and vocational education that is functional and capable of satisfying the human resource needs of the industrial sector.

The University was established to serve the needs of Eritrea in terms of generating and disseminating knowledge, including technological knowledge and R&D. The University has been quite successful in disseminating knowledge. However, the emphasis on research of relevance to Eritrea's industrial development is carried out in an academic setting, undertaken by the university teaching staff using the established university criteria. Therefore, such research is not demand driven. It has no bearing to the market and does not respond to market signals. Given the level of industrial development and taking into consideration the large-scale recruitment of industrial labour to serve at the war front against Ethiopia, what industry need most is business and professional services to help industry overcome the constraints to production. Such services could be provided by the specialised staff of the University under institutional contracting arrangements with the University.

3.3 Eritrean Institute of Management

The Institute was established in 1995 on the basis of a manpower needs assessment sponsored by UNDP in 1994. That assessment highlighted, inter alia, shortage of secretarial, technical and managerial capabilities in the civil service. The Institute is an integral part of the University of Asmara and is managed by a Director who is accountable to the President of the University. The Institute concentrates on short-term training (4-8 weeks) for government officials in various fields such as, accounting, finance, human resources development and project management. A

course on small-scale business management was introduced in 2001. There are plans to upgrade and intensify the various courses to a one-year certificate programme.

This initiative is seen as a move to transform the Institute into a community college in the near future. Since its inception in 1996, the Institute has trained about 1,628 civil servants and 17 trainees from the private sector. The programme of the Institute has created greater awareness of the importance of specialised training in various aspects of management of the civil service.

3.4 Ministry of Trade and Industry

The Ministry of Trade and Industry has as one of its mandates the promotion of industrial skills to ensure that adequate and critical skills are available for industry. The Ministry's main task is to foster an enabling environment for export-led industrial development, as well as formulating industrial policies and strategies to achieve sustainable industrial development A critical mass of qualified, trained and experienced human resources is a major prerequisite for such development. With the assistance of Eritrea's cooperating partners, in particular, UNDP and UNIDO, the Ministry has developed a programme aimed specifically at addressing capacity building for industrial policy formulation and sustainable human resource development.

The Ministry carried out an analysis of its structure, objectives and functions in 1995[1], and highlighted the following as some of its objectives/functions:

- ☛ To expand access to sources of raw materials, technology and expertise;
- ☛ To remove domestic market limitations for marketing of outputs;
- ☛ To improve employment opportunities in industry and trade;
- ☛ To enhance efficiency in production and competitiveness of products in terms of quality, prices and services;
- ☛ To promote regional co-operation and economic integration;
- ☛ To promote the development of capital and knowledge-intensive, export-oriented industries and services;
- ☛ To promote balanced nation wide development.

To be able to achieve the above-mentioned objectives or carry out such functions, the Ministry itself should have the capacity and requisite capabilities to guide the industrialisation process in Eritrea. The Department, of Industry and the Department of Trade recognise the significance of their role in providing or ensuring training for commercial and industrial activities throughout the country.

In this regard, the Ministry is not expected to establish training units to address the various shortages of IHR in Eritrea. What is expected of the Ministry is to conduct IHRD needs assessment and define programmes and projects, which will help industrial operators and entrepreneurs improve on production and marketing of their products. With the assistance of the UN organisations, UNIDO and UNDP, in particular, the Ministry has endorsed and carried out in cooperation with the counterpart institutions in Eritrea seminars and training workshops aimed at

[1] Ministry of Trade and Industry: Strategic Analysis 1995, (Volume I), December 1995, Asmara, Eritrea, p. 41-42.

increasing skills and strengthening capabilities. Examples of such training are entrepreneurship development, information technology, training of trainers in various aspects of leather and leather goods production. Specialised training for semi-skilled and skilled workers in the various industrial sub-sectors are coordinated by the enterprises themselves (on the job training) and by the technical schools. The following is an indication of some of the training available.

Table 3.5: Institutions generating technical skills for industry

No.	Industrial sub-sector	ISIC code	Institutions generating skills
1	Food, Beverage, and Tobacco	1511-1600	Apprenticeship and on-the-job training Technical schools for maintenance people
2	Textile & Clothing	1712-1810	Traditional private schools, NGOs, Church organizations Apprenticeship and on-the-job training Technical schools for maintenance people
3	Leather & Leather Products	1911-1920	Apprenticeship and on-the-job training Technical schools for maintenance people
4	Paper, Printing & Publishing	2101-2221	Apprenticeship and on-the-job training One printing school (Francescana Printing School)
5	Chemicals and Allied Products	2411-2520	Apprenticeship and on-the-job training
6	Pottery, Bricks, Glass, Marble & Cement	2610-2696	Apprenticeship and on-the-job training
7	Metal Manufacturing & Metal Products	2710-2919	Apprenticeship and on-the-job training, Technical schools
8	Accumulators & Batteries	3140	Apprenticeship and on-the-job training
9	Medical Goods & Drugs	3311-3312	Apprenticeship and on-the-job training, Dept. of pharmacy
10	Manufacture Motor Vehicle Bodies, Parts & Accessories	3420-3430	Apprenticeship and on-the-job training, Technical schools
11	Furniture	3610	Apprenticeship and on-the-job training, Technical schools
12	Gold & Silver Works	3691	Apprenticeship and on-the-job training
13	Others		Apprenticeship and on-the-job training

Many of the manufacturing industry depend on apprenticeship and on-the-job training for their skills requirements. However, as stated earlier they do not provide the exact needs of the manufacturing sectors.

3.4.1 Role of the Ministry in skills development

With regard to future industrial development needs and the implications for industrial skills requirement, a preliminary analysis of the existing industrial situation in terms of investment potentials was conducted by the Ministry of Trade and Industry, in particular, the Department of Industry. It is estimated that an average of 35 new enterprises are established every year throughout the country. Most of these industries are SMEs and not necessarily export-oriented. There has been an upsurge in industrial production and growth of food processing, metal work, wood, non-metallic and mineral based industries. The general implication is that the demand for specific skills is apparent, namely, industrial technologists, food technologists, textile designers, chemical engineers, technologists, manufacturers etc. As these industries grow so would the demand for specialised skills.

As already observed, the University turns out graduates in biology, engineering and science etc. However, these graduates need industry specific short-term training. As there are no appropriate institution in the country to provide such specific training, the Ministry of Trade and Industry in cooperation with multilateral organizations like UNIDO, and the UNDP could organise tailor-made training programmes or alternatively request the University of Asmara to consider

introducing into its curricula short courses on industrial engineering with definite linkages to industrial operations in the country.

In addition, the Ministry now firmly believes that technical schools should produce more technicians for general maintenance and metal working with a focus on modern technology. For the priority sub-sectors such as food processing, textile and garments, leather and leather products (potential foreign exchange earners), the Ministry of Trade and Industry could solicit the support of its international cooperating partners in establishing specialised institutions or training centres that will be responsible for the training of technicians and other operators.

Apprenticeship and on-the-job training in technical areas will continue to be a very important source of skills, in particular for the micro and small enterprises. As the SME sector expands, entrepreneurs and industrial operators will require training in enterprise development, business management, marketing, export marketing, negotiating skills, accounting, quality management etc.

Some manufacturing enterprises, in particular, public enterprises and large private firms, are better placed to utilise the services of few university graduates in management, finance and accounting, engineering and quality control. However, given that the majority of industrial entrepreneurs are SMEs, it is unlikely that they would hire or make use of the services of university or technical school graduates. Small consulting firms in management, marketing, accounting/auditing, communications and computer technology or engineering on the other hand do make use of university graduates.

The training support Eritrean manufacturers require cannot be divorced from entrepreneurial skill development. At the moment, the technical schools do not provide that kind of training. Any institutional training in support of entrepreneurial development should be spearheaded by the Ministry of Trade and Industry. This is a new approach in education and training. However, skills development for industry should be followed by development in other areas such as the development of other services in finance, marketing and consulting services.

The Export-oriented strategy embraced by Eritrea is quite appropriate in today's global economy characterised by opportunities and challenges, increased competitiveness and trade liberalisation. However, according to the World Bank "Current levels of private investments are insufficient to underpin the country's development aspirations".[1] One of the main reasons for this is the large demand for foreign exchange to finance exports manufacturing. Foreign exchange could be made available through appropriate policies to enable industrial operators to improve on production processes, thereby, improving the quality of their products for an export market. The country could therefore exploit the export potentials in textiles/garments, leather and leather products, including footwear, fisheries and minerals. Skilled labour is very much needed if the country is to fulfil its export potentials. Detailed sub-sectoral analysis may be required to address the issue and define specific strategies for the development of the sub-sectors. It is envisaged that the Ministry of Trade and Industry will carry out such sub-sectoral assessment and define specific framework for the development/acquisition of the requisite skills.

[1] World Bank, Eritrea: Export Development Strategy (Draft), January 23, 2000, p.66.

3.5 Ministry of Labour and Human Welfare

In common with other ministries, the Ministry of Labour and Human Welfare is undergoing some form of restructuring. Although there is no clearly defined integrated, human resource development policy, the Ministry has articulated its labour and welfare policies which could be summarised as follows: [1]

Labour policies

To undertake measures to facilitate gainful employment for all citizens; expand employment opportunities for youth, disabled persons and disadvantaged groups; promote peaceful labour relation through the work of government, labour unions, and employers associations; take necessary measures to protect the safety and health of workers; promote the development of the informal sector, in particular, in rural areas, for employment creation; eliminate child and forced labour; promote labour productivity; ratified and implement international labour conventions.

Welfare policies

To introduce social security schemes phase by phase for all workers; promote and work for the care and protection of the most vulnerable groups in the country through the involvement of communities; promote, through appropriate programmes, the culture of work and responsibility among the youth, in particular, install in them the nobility and dignity of all types of work without distinction; ensure the protection of the right of children, senior citizens and disabled persons; work for their rehabilitation and integration in the society through appropriate programmes; support and strengthen family ties and responsibilities as a safety network; prevent and combat social problems such as prostitution, street children, alcoholism and drug addiction and work for their rehabilitation through appropriate programmes; ensure the implementation of the ratified international conventions of the rights of children and disabled persons.

Strategies

To develop skills based on labour market information; provide employment services to match labour demand and supply; provide legal framework within which private employment service agencies could work; work with relevant ministries in introducing occupational skill standards, testing and certification; work in co-operation with other relevant ministries in the expansion of relevant technical and vocational schools to ensure the production of employable skills; create a labour market database and information; develop industrial safety rules and regulations and implement it through appropriate inspection mechanism and the industrial accidents investigations and documentation; identify and educate poor communities to combat their social problems from within; provide counseling for families suffering from HIV/AIDS and other chronic diseases; resettle displaced and street children, and rehabilitate juvenile offenders through community based rehabilitation schemes; introduce a comprehensive social security system.

[1] Paper presented by the Ministry of Labour and Human Welfare in the Seminar on the Integration of Social Sector Strategy in Eritrea, Massawa, May 11-13, 2000, p. 47

The Ministry of Labour and Human Welfare is also restructuring its role in the development process. At a workshop organised by the Ministry, 26 February – 2 March and 6-7 March 2002; the role of the Ministry in the areas of certification and accreditation, poverty reduction, employment creation and skills development was discussed. One of the main observations was that there was a missing link between the Macro Policy (1994) and the specific policies, strategies and roles of the implementing organs of government. Coordination of policies in particular, in terms of skills development was also considered a major problem.

The Ministry of Labour and Human Welfare is responsible for employment creation and alleviating/addressing various social problems. These focus areas have both education and training elements for the beneficiaries. The issue is, coordination of its policies with those of Ministry of Education and Ministry of Trade and Industry? In its effort to reduce unemployment and poverty, the Ministry of Labour and Human Welfare should work closely with other ministries, in particular, the Ministry of Education and Ministry of Trade and Industry. Their respective policies should be coordinated or harmonized. For example, the Ministry of Trade and Industry should be in a position to buy in the policy options of the Ministry of Labour and Human Welfare and vice versa.

The historical development of labour law and the employment system has had tremendous influence on the present scenario of the labour market. The employment system in Eritrea was first introduced by the Italian Authorities to be later modified by the British Administration and, subsequently under Ethiopian rule. After the liberation of the country, the Eritrean Government restructured the labour administration system through the Transitional Labour Law of 1991 with a view to providing better services. Although the objectives and targets are admirable, the existing facilities and manpower capabilities cannot adequately accomplish the desired tasks.[1] Realising that there are inadequacies, the Ministry of Labour and Human Welfare is already toiling with the idea of encouraging the establishment of private employment agencies. Labour movement emanating from the civil service is controlled. Public servants are not easily released by the Government to pursue other careers of their choice. Part time jobs are not encouraged. However, the Government has the right to lay off employees if it considers it to be of the best interest of the state. A healthy competition for the best in the labour market for the public and private sectors is highly desirable, as it would lead to better human resource management. With the right legal framework, it is expected that a conducive atmosphere would emerge in the labour market.

The Ministry of Labour and Human Welfare had worked closely with the Workers Federation of Eritrea and the Employers Association on a new labour law. At the Workshop on Policy Formulation for Industrial Human Resources Development (Asmara, May 31-June 1, 2001) to review some elements of the IHRD Survey, participants indicated that the new labour law would ensure a good working environment in the country. The labour law is expected to completely change the labour market in the country and create a conducive work environment. The main concerns of participants were the free movement of workers and the establishment of more employment agencies in Eritrea. The labour law was subsequently endorsed and published as Proclamation No. 118/2001 (November 15, 2001).

[1] GEM Information Management, Proposal for Upgrading the Employment System in Eritrea (Draft Document) , Asmara, March 2000.

3.6 Other line Ministries

Although the training provided by other ministries may or may not be of relevance for the IHRD survey and policy recommendations, it is desirable that some such training providers are assessed, as the key stakeholders in industry have expressed interest in the development of certain skills being provided by these ministries. As an example, the Ministry of Agriculture offers training in food processing and meat inspections which are of relevance for the quality of meat products used in industry.

3.6.1 Ministry of Health

The Ministry of Health is responsible for the formulation of a national framework to train and develop capabilities of health personnel and to ensure the optimal use of skills, experience and expertise of health personnel while at the same time ensuring, cost effectiveness and quality health care.[1] The Ministry organises a number of programmes and offers its workers distance learning opportunities and specialised training abroad. The Ministry has, as one of its policies, to establish a system of certification, registration and re-certification by assessing credentials and methods by a certification and accreditation committee.

Most of the training and skills development take place in the Nursing & Midwifery School and the Institute of Medical Technology owned by the Ministry of Health. In recent years, the Ministry has played a crucial role in the retraining of demobilised soldiers by engaging in the upgrading of skills of ex-combatant health personnel in the field of nursing, laboratory technology/operations. Some employees were even sent abroad to pursue post-graduate degrees in public health.

It should be noted, however, that the University of Asmara has recently established a College of Health Sciences. There are definite signs of duplication in training focus, which call for coordination arrangements to be established between the Ministry and the University. Most likely, the University will confine itself to degree programmes. The Ministry of Health could continue with the training of nurses and laboratory technicians at diploma and certificate levels.

3.6.2 Ministry of Agriculture

The Ministry of Agriculture is active in training for its own needs. It has a training centre in Villagio with a well functioning laboratory. The training centre offers certificate courses of 6-12 month duration, depending on the skills requirement and particular job in question. It also offers a diploma programme of one to two years duration. Entry requirement is completion of the tenth grade and long years of work experience. The main areas of focus are in veterinary science, meat inspection, home economics and general agriculture. Since 1991, the centre has trained well over 600 staff or new recruits.[2] The veterinary diploma programme is recognised by the University of Asmara, and there is some form of coordination between the Ministry and the University.

[1] Ministry of Health, Paper presented for the Seminar on the Integration of Social Sector Strategy in Eritrea, Massawa, May 11-13, 2000, p. 12-13.

[2] Modern Consultancy Service Asmara, Occupational Skill Standards, Testing and Certification in Eritrea, Asmara , March 2000, p. 30.

3.6.3 Ministry of Fisheries

The Ministry has established a training centre at Hirgigo, which came into full operation in 1998. Courses range from a three-month to two-year programme. The centre trains laboratory technicians, fish stock assessment experts, fish preservation experts, experts in taxonomy and in the use of preservatives. Training is also given in ecosystem management, fish and seaweed farming, use of fish gear, fishery biology, fishing techniques, and database/GIS information management. The centre has trained about 500 so far.[1]

3.6.4 Ministry of Tourism

The Ministry of Tourism has established its own Hotel and Tourism Training Centre (HTTC). The Centre offers basic level three to six months training in Eritrean studies, food and beverage services, housekeeping, front office service management, including reception and guest relations, travel agency services, and food preparation. The Centre trains, on average a year, some 70 students. It has trained 350 hotel and tourism workers at the basic level. The Centre provides value added training services for the tourist industry.

3.6.5 Other Ministries

Most of the ministries have their own research and training units, which usually organise short-term training for their staff. The development of skilled human resources, as a priority area, is clearly stated in sectoral objectives of ministries. This is because Eritrea, as a newly established country recovering from a long war of liberation, has a critical shortage of skilled manpower in all sectors. As a result, every ministry is desirous to solve the problem by training and skills upgrading to meet basic HRD needs.

3.6.6 Observations

From the above analysis, it is quite obvious that there is very little interaction or integration of key policy decision-makers for IHRD policy/training at the national level. This IHRD survey/ assessment gives a clearer perception of the industrial skills available in the country, as well as future needs with a view to defining policies for industrial human resource development. Hopefully, this will contribute immensely to human resource planning, development and utilisation.

[1] Ibid., p. 34

4. Industrial skills assessment

In this section, the study focuses on the assessment of the existing conditions of the manufacturing industry in Eritrea. The main starting point is from the records of the Ministry of Trade and Industry. According to a survey by the Ministry, there were 1,707 small manufacturing enterprises (with less than 10 employees) and 223 large manufacturing enterprises (with 10 employees or more). All of the large enterprises were included in the sample, whereas only one out of every ten of the small enterprises was covered. Efforts were made to include representatives of each sub-sector even if they employ less than ten employees. As a result of this sampling method, the final number was about 12 % of the total number of small enterprises.

Three types of questionnaires were distributed for higher, middle level management and industrial operators. Four hundred and thirty four (434) were targeted at the higher level, two hundred and twenty three (223) at the middle level and the same 223 for the operators. The response rate was about 74% higher-level management, 60% for middle level management, and 63% of the operators.

4.1. Manufacturing enterprises by ownership, capital and number of employees

Of the 319 enterprises that respond to the higher management level questionnaires, it is noted that 69.3% are proprietorship, 14.7% partnership, 5.6% government owned, 5.6% public shareholding, and 2.5% others such as joint ventures. Those with a capital of more than US$50,000 are 56.4%, 19.4% have between US$10,000 – 50,000, 8.5% have capital below US$10,000. The remaining 15.7% do not disclose their capital. It is most likely that the respondents have listed the original capital of their enterprises at the time they were established. Should this be the case, the figures should be adjusted to reflect inflation and the change in capital over time. To adjust for inflation, the given figures could be doubled or tripled. Furthermore, the change in capital over time should be added. However, the figures given are very low by international standards. Eritrean manufacturing enterprises are generally very small, a factor that could limit their capacity to attract investment and to be internationally competitive. A more detailed analysis on capital structures, credit facilities and other financial support services could determine whether, indeed, some of these enterprises could be competitive.

Table 4.1: Number of employees of surveyed manufacturing firms

Gender	Permanent		Temporary		Total	
	Number	%	Number	%	Number	%
Male	5,249	55	1,203	55	6,452	55
Female	4,369	45	982	45	5,351	45
Total	**9,618**	**100**	**2,185**	**100**	**11,803**	**100**

The manufacturing enterprises surveyed consist of 11,803 employees of which 45% are female workers and 18.5% are temporary workers. These figures include those who were recruited for military service and family members working in businesses (Table 4.1). Of these about 14.4% are illiterate, 23% can read and write with some on-the job training, 32.5% have basic education; 5.7% have basic education and some vocational training. Those with high school education

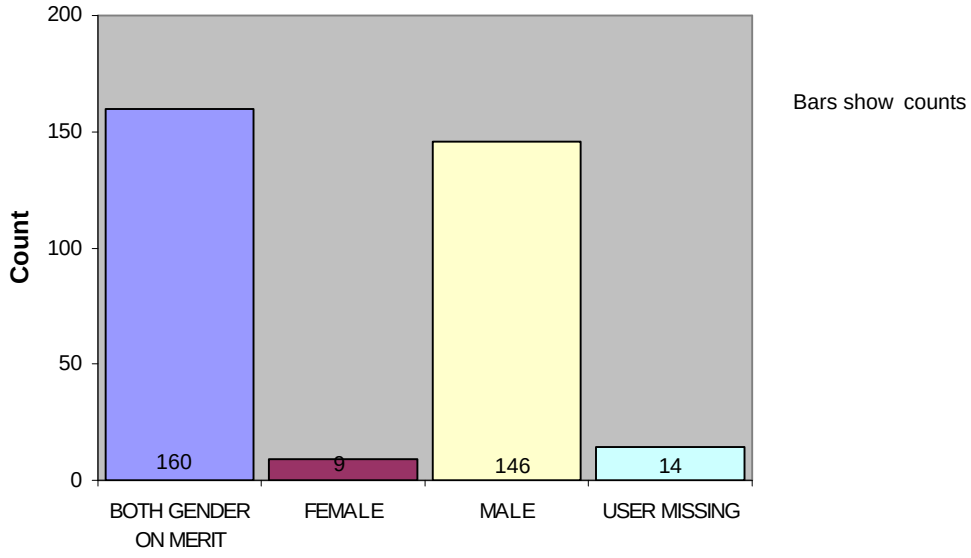
represent 18.4%, 2.5% have received some technical high school education, 3% hold BA/BSc degrees or college diplomas and only about 0.5% have higher degrees (see Table 4.2).

Table 4.2: employees by education and skill

Level of education	Number	%
Unable to read and write.....	1,700	14.4
Can read and write plus on-the-job training.....	2,714	23.0
Basic education (1-7 years).....	3,835	32.5
Basic education and some vocational training.....	672	5.7
High school education: academic (8-12 years).....	2,171	18.4
High school education: technical (8-12 years).....	295	2.5
12th plus 2-3 years of technical college.....	118	1.0
12th plus 2-3 years of non-technical college.....	118	1.0
University education: BA/Bsc.....	118	1.0
MA/Msc.....	12	0.1
Ph.D.....	3	0.0
Others.....	47	0.4
Total	1,803	100.0

With regard to gender preference in employment, around 46% of the enterprises prefer to employ male workers, while only 3% prefer female workers, and some 47% do not have any particular gender preference. The latter employ both male and female on merit. Mainstreaming gender in industrial development is a critical factor for sustainable industrial development and it is desirable that training workshops be held on this issue with participants drawn from both the public and private sectors.

Graph 1: Gender preference in employment



4.2. Employee profile by skill

The total number of skilled and non-skilled permanent workers in employment at the time of data collection in the sample enterprises is 8,377. The number does not include those who were on national service. Of these 3,342 (40%) are classified as non-skilled; 753 (9%) skilled technicians; 3,308 (39.5%) skilled machine operators; 662 (8%) skilled clerks; 121 (1.4%) professional workers, and 191 (2.3%) managerial staff (see Table 4.3).

Table 4.3: Present and additional employees needed by skill

Skill	Present Employees		Average Employee per Enterprise	Additional Workers Needed in 5 years	
	Number	%		Number	%
Non-skilled	3,342	40.0	10.5	624	31.7
Technicians	753	9.0	2.4	249	12.6
Machine operators	3,308	39.5	10.4	887	45.0
Clerical	662	8.0	2.1	117	6.0
Professional	121	1.4	0.4	40	2.0
Managerial	191	2.3	0.6	54	2.7
Total	**8,377**	**00.0**	**26.3**	**1,971**	**100.0**

About 41% of the enterprises, in the sample, state that they are in need of more employees, while 54% indicated that they have adequate number of employees for production. The remaining 5% do not have any preference and could not say if they need more workers or not. If one is to compare the number of workers needed to those engaged in industry, the difference is quite significant (see table 4.3).

On the basis of the sample results, it is possible to extrapolate to arrive at an estimate of the population. Table 4.4 illustrates present estimate of employees by skill, in both the small and large manufacturing enterprises. Accordingly, it is estimated that there are about 18,000 employees, of which, 41% are unskilled, 47.6% are technicians and machine operators, about 8% clerical workers, while 3.5% are professional and managerial staff.

Table 4.4: Present employees by skill, sample and population estimate

Employees	Small		Large		Total	
	Sample	Est. Pop	Sample	Est. Pop.	Sample	Est. Pop.
Unskilled	248	2,255	3,094	5,157	3,342	7,412
Technicians	46	418	707	1,178	753	1,596
Mach. operators	202	1,836	3,106	5,177	3,308	7,013
Clerical	44	400	618	1,030	662	1,430
Professional	2	18	119	198	121	216
Managerial	14	127	177	295	191	422
Total	**556**	**5,054**	**7,821**	**13,035**	**8,377**	**18,089**

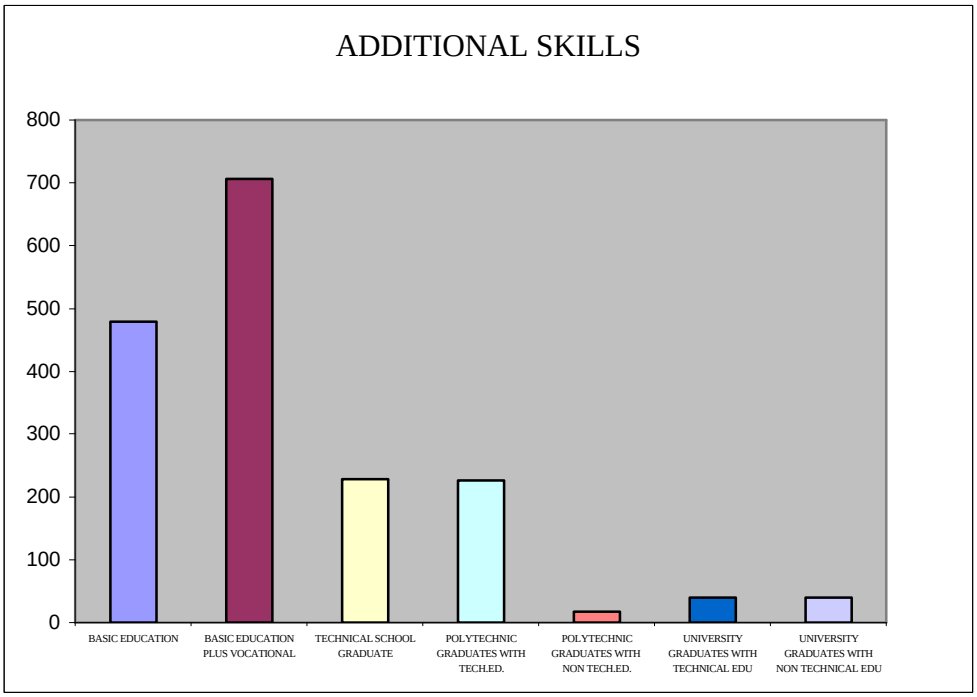
Table 4.5: Employees needed in coming 5-yr by skill, sample and population estimate

Employees	Small		Large		Total	
	Sample	Est. Pop.	Sample	Est. Pop.	Sample	Est. Pop.
Unskilled	84	764	540	900	624	1,664
Technicians	31	282	218	363	249	645
Mach. oper.	128	1,164	759	1,265	887	2,429
Clerical	8	73	109	181	117	254
Professional	5	45	35	58	40	103
Managerial	5	45	49	82	54	127
Total	**261**	**2,373**	**1,710**	**2,849**	**1,971**	**5,222**

Table 4.5 gives an indication of the population of workers needed in the coming five years. It is estimated that, in both small and large manufacturing enterprises, a total of 5,200 additional staff will be required of which some 32% are unskilled, about 59% should be technicians and machine operators, 5% clerical, and the remaining 4.4% professional and managerial staff. The challenge is enormous and major initiatives/measures should be in place in the near future to address IHRD needs.

Many enterprises, some 63 %, believe that they could get the skilled labour needed from the labour market within the country, while 13% indicate that they would not get the required skills from within the country, as they are not available. (A more comprehensive analysis of sub-sectoral IHRD needs may be appropriate in due course.) The remaining 22.6% ignore the question. This could be interpreted as not being sure of what is needed or, perhaps, they are in a position to do the training themselves irrespective of whether skills are or are not readily available in the labour market. Of those who could not find the required skills from the labour market, 52.4% believe that there is always a need to train hired labour. On the other hand, 21.4% are convinced that they could not get from the labour market all the skills that are required because the available skills do not match their specific needs. It is also revealed that around 52% of the enterprises have plans to expand production capacities in the future. The expansion of production capacities, utilising modern technologies implies the availability of skilled labour. In the next five years, some of these enterprises have indicated that about 500 new employees with basic education may be required; another 700 with basic education and vocational training/skills; 250 intermediate technical school graduates would also be needed; 230 graduates from technical colleges or polytechnics are required; 40 graduates from engineering fields and 60 graduates from other non-technical fields. The following graph is an illustration of additional skills that may be required.

Graph 2: Additional workers required by education and skill



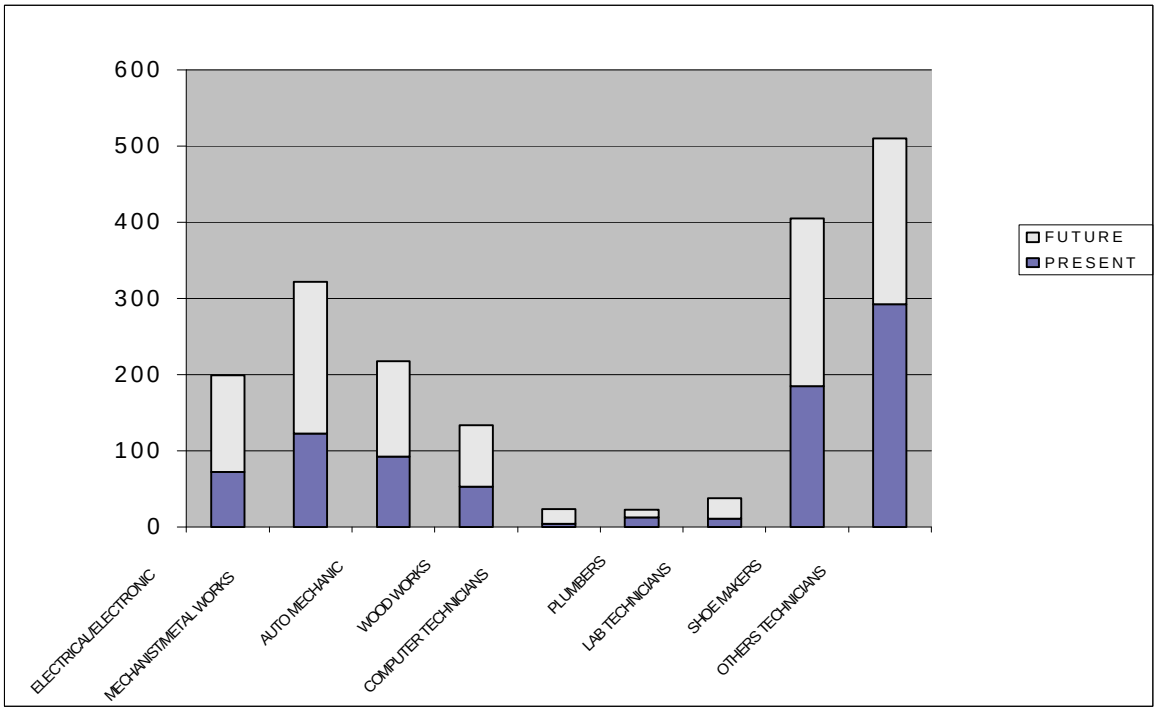
The specific skills requirements are illustrated in Table 4.6 and Graph 3 below. Presently there are 843 employed technicians in the enterprises survey, of which 14.5% are mechanists/metal workers, 10.9% auto mechanics, 8.5% electrical/electronic, 6.3% wood workers, 1.4% plumbers, 1.3% technicians and 0.4% computer technicians. The remaining workers some 56.6% consist of various other types of technicians.

The expected demand for technicians in the future is also an indication of the potentials for IHRD development. Of the 1,207 technicians that would be required, 19.5% are mechanists/metal workers, 12.4% with skills in electrical/electronics, 12.3% auto mechanics; 7.8% wood workers, 2.6% laboratory technicians, 1.8% computer technicians, 0.9% plumbers. The remaining 42.6% represent other types of technicians. Given that the existing technical schools offer courses mainly in electricity, electronics, mechinery, metal/wood works, auto-mechanics, computer, plumbing, surveying, drafting and laboratory techniques, it could be assumed that most of the remaining 56.6% technicians should be trianed under apprenticeship or on-the-job.

Table 4.6: Present and Future needs of technicians

Technician type	Present (%)	Future (%)	Total (%)
Electrical/Electronic	72 (8.5)	127 (12.4)	199 (10.6)
Mechanist/Metal Works	122 (14.5)	200 (19.5)	322 (17.2)
Auto-mechanic	92 (10.9)	126 (12.3)	218 (11.7)
Wood Works	53 (6.3)	80 (7.8)	133 (7.1)
Computer	4 (0.4)	19 (1.8)	23 (1.2)
Plumbers	12 (1.4)	10 (0.9)	22 (1.2)
Lab Technician	11 (1.3)	27 (2.6)	38 (2.0)
Other technicians	477 (56..6)	438 (42.6)	915 (49.0)
Total	**843 (100)**	**1027 (100)**	**1870 (100)**

Graph 3: Present and future needs of technicians



4.3 Recruitment, selection and promotion practice

It is clear that each enterprise has its own criteria for selecting and promoting employees especially for middle level management positions. The response of middle managers on how they were promoted indicate that about 49% of them got promotion directly from management without any kind of competition, test or appraisal by their immediate supervisors. Those who got promoted on the basis of supervisor's appraisal are 12% and those based on special tests are only 3%. For higher-level or senior management, the general view is that the criteria is basically "merit, skill and qualifications" "Merit" is considered to be the most significant factor slightly ahead of "skill with qualification". But there is a clear indication that enterprises do not value qualification per se. In most cases, enterprises pay more attention to merit and the contributions an individual can make to the enterprises. Here again, one could argue that management does not have a clearly defined methodology to assess merit and skills of their employees and, as there are no clear guidelines on competencies, some selections could be based on personal preferences and, therefore, biased. It is likely that there could be a few cases of nepotism and less professionalism, resulting in the inefficient use of human resources.

The situation is aggravated by the fact that 75% of the enterprises surveyed do not have personnel departments/units, especially the small private enterprises whose owners/managers also do function as personnel managers. Only about 20% of those surveyed have personnel department/units and the main functions/activities of such personnel services are recruitment, wage and salary administration and relations with labour unions.

It is also noted that 53% of the workers were recruited through recommendation of friends and through unsolicited applications by potential candidates. None of the employees and only about 4% of middle management interviewed have been recruited through competition for an advertised post. The same trend is observed in the response of operators who were selected through unsolicited application and by people they know. Filling of vacant posts through advertisement represent only 6%. This shows that an aggressive search for the best candidates is not practised. This could be explained by the fact that labour supply is very high compared to demand. Another possible explanation is the absence of competition on the basis of quality of products, which could have forced employers to hunt for the best people available in the labour market. There is a prevailing attitude of producing only “for today” which actually frustrates competition and the country’s ability to produce for the global market.

Before the War, Eritrean enterprises were exporting to Ethiopia, (still a potential market), as well as producing for the domestic market both of which were not sophisticated in terms of consumer’s taste. Hostilities between the two countries virtually crippled industrial production – Eritrean products could not easily find new market. To prepare for tomorrow’s industry requires creative minds, skilled workers who are ready to meet the challenge. These categories of workers should be identified, recruited and retrained – a very worthwhile investment in human capital. The situation in the country is different and efforts should be made to identify, develop and maintain the right skills.

4.4 Training and development

The survey reveals that of the enterprises surveyed, 53% offer training to their employees. According to middle managers, the employees under their immediate supervision (some 52%)

have very little skill deficiencies and as a result, firms do not feel compelled to given them on-the-job training. The question is whether the work is in fact unskilled type of work, or may be a culture of training has not been developed and policy-makers need to take note of the implications thereof. Manufacturers need to be made aware of the importance of training and training should be on integral part of enterprise development.

The kind of training given in most Eritrean manufacturing enterprises is basically on-the-job training. There are exceptions though, as seven enterprises have indicated that they have their own training centres. This fact can be linked to the absence of training budgets in most of the enterprises; 80% of the enterprises surveyed do not have training budgets. The type of training given is on-the-job which is considered to be an integral part of the operational cost. Nine enterprises, however, have training budgets. One of them actually have training budget as a fixed percentage of the annual revenue. Four enterprises have estimated training costs and three enterprises decide on training budgets at random.

Table 4.7: Managers opinion about the match between education and industrial needs

Education	No-response	Response	Yes		No	
			Number	%	Number	%
Vocational	162	157	118	76	39	24
Technical	155	164	129	79	35	21
Colleges	187	132	98	74	34	26
University	193	126	100	79	26	21

Managers when asked to evaluate whether the education received in academic and technical institutions in Eritrea corresponds to the needs of industry, are not too keen to share their experiences. Only about 40-50% (depending on type of training) are willing to share experiences. Most of them give positive answers (74-79%) (see Table 4.7). But this is an inconclusive evidence that needs further study.

Employees in the sample enterprises on national duties are about 1,769. Those who left for personal reasons were 724, and those fired by the firms are 603. The number of those who left for national duties compared to those present accounts for 21% – a significant number that has crippled many enterprises in recent times. Until their employees recruited to serve at the war front are released they might not be in a position to recover past production levels.

Sixty two per cent of enterprises do not make regular training needs assessment. Middle management is involved in training needs assessment but only 47% of those questioned indicate that they are definitely involved. On the question of how training needs are identified and initiated, only 130, (41%) of the total enterprises survey provided an answer. Of these 48.5% say that it is done on an ad hoc basis, especially when employees are being recruited or new machinery is being introduced. Those who have introduced new machinery recently represent about 30% and those who plan to invest in new machinery within the coming five years are about 33%. Of the enterprises willing to invest in new machinery, only about 23% have considered including training as an integral part of the new technology package. When asked about who identifies needs, 50% of operators could not answer to the question, which is a clear indication that they do not know or are scared to reveal too much. Some 28% indicate that the manager is responsible; 13.5% mention the supervisor, and only 2% of state that it is through the workers'

suggestion. This does suggest that workers are not basically involved in the training needs assessment, which is deemed desirable for better results.
According to the middle managers, the majority of newly employed, 36.4 %, who come directly from schools need additional training, as should be expected. Those who need complete retraining represent 22.7%. This goes to show that the education system is not functional to the production needs of the country.

The operators questioned also recognise the limitations of their education. Some 38% point out that they are applying the knowledge gained at school while those who apply only a part of such knowledge are about 16%. Twenty two percent indicate that they are not applying such knowledge. This corresponds with the response of middle managers, 22.7% of whom needed extra training.

The operators that have never received training for the tasks they perform at work and those who do not receive training are almost in the ratio of 1:1. From those who have received training, 77% were trained within the enterprise itself, such training were carried out by senior operators co-workers, or by the managers themselves

According to middle level managers, some enterprises training programmes are based on training needs assessment. The core training programmes are in-factory training programmes with very little training being carried outside the enterprises. The general belief is that there is no such training institution that can cater for all the skills that are required. Middle level managers do not consider the university training programme completely suitable for their training needs. Of those interviewed/questioned, only 3% believe that the university education and training is appropriate for their needs. Another 7% consider technical and vocational schools quite capable of meeting training needs. It is generally recognised, however, that there is a big gap between demand and supply for specialised training for the key manufacturing sub-sectors and that neither the university nor the vocational or technical schools could adequately meet the demand.

5. Shortages and surplus of skilled workers in Eritrea's labour market

Under this section, a brief assessment will be made on other HRD surveys conducted in Eritrea, as well as the shortcomings of the IHRD survey by the Ministry of Trade and Industry/University. It should be noted that estimates of total employment in the manufacturing sector of Eritrea are somewhat unreliable. Fisseha estimates put the figure at 37,000 employees in 1996.[1] The manufacturing census of 1998 estimates 20,000 probably because only licensed enterprises, which by definition exclude the informal sector, were surveyed. The Tracer and Enterprise surveys estimate a total of 31,792 for those employed in manufacturing, construction and utilities in firms of over 20 employees; excluding construction and utilities, the estimates for manufacturing is about 11,000 employees. These figures are shown in table 5.1 below. The figures from the manufacturing census indicate that there were 223 large manufacturing enterprises, providing employment for 15,420 persons, with 1,700 small enterprises (i.e. less than 10 persons) employing some 4,800 employees. Women accounted for about one-third of the labour force, which is a high proportion compared to other African states. It is a proportion corresponding to the literacy rates of women.

Table 5.1: Distribution of employment by sector

Economic sector	Large enterprises		Small enterprises	
	%		%	
Textiles	14	(43.9)	7	(23)
Food	2	(707)	22	(70)
Building	59	(18,837)	39	(121)
Wood and iron works	3	(963)	7	(22)
Chemicals	4	(1,374)	4	(14)
Mineral products	1	(268)	-	-
Electricity	2	(789)	-	-
Leather and shoes	5	(1,412)	5	(18)
Beverages and alcohol	3	(871)	-	-
Paper and printing	0	(119)	5	(16)
Vehicle repairs/garage	3	(834)	11	(36)
Others	4	(1,269)	-	-
TOTAL	**100**	**(31,792)**	**100**	**(320)**

Source: Tracer/Enterprise Surveys, op.cit.

The Ministry of Trade and Industry/University survey conducted in 2000/2001 covered all manufacturing establishments with more than 10 employees, and about 12% of establishments with less than 10 employees, the enterprises responding to the survey employed only about 12,000 employees.[2] It is therefore difficult to estimate total employment in manufacturing, including sub-sectoral categorisation.

[1] See Yacob Fisseha, A study of the private sector of Eritrea, Ministry of Finance, Asmara, 1996.
[2] See: Statistical Report 1998, Report of the census of manufacturing establishments, Ministry of Trade and Industry, Dec. 1999.

All the numbers above, from Fisseha, Ministry of Trade and Industry, the Tracer and Enterprise surveys and the university team indicate that considerable uncertainty surrounds the numbers of those currently employed in the manufacturing sector; this uncertainty makes any estimates of vacancies, short-term forecasts of employment, shortages of skilled worker etc more tenuous than is usually the case. In addition, however, the current state of the relatively small Eritrean manufacturing sector is highly unstable. Tables 5.2 and 5.3 below give indication of the impact of the border conflict. Even if there was no uncertainty associated with the statistical structure of employment in the manufacturing sector at the present time, the loss of domestic/export markets especially Ethiopia, the call-up for national service of some 21% of their work force and the departure of an unknown number of workers to Ethiopia, together with 'weaknesses' in enterprise management, all combine to make definite judgements about current vacancy rates for skilled workers and technicians, and about future employment opportunities, extremely tentative.

Table 5.2: Effect of border conflict by enterprise category

Indicators	Categories				TOTAL
	Micro	Small	Medium	Large	
Loss of skilled manpower	60%	78%	87%	86%	73%
Loss of market/sale	62%	57%	47%	44%	55%
Lack of raw materials/parts	35%	30%	30%	45%	36%
Destruction of property	15%	9%	7%	15%	13%

Source: DRP Survey, op.cit.

Table 5.3: Effect of border conflict by sub-sector

Type of enterprises	Indicators			
	Loss of skilled manpower	Loss of market/sale	Lack of raw materials/parts	Destruction of property
Manufacturing	71%	58%	35%	9%
Trade/commerce	57%	62%	19%	12%
Services	73%	55%	45%	15%
Transport	100%	50%	83%	17%
Construction	83%	42%	75%	17%
Fishing	92%	42%	17%	8%
Modern farming	88%	29%	35%	41%

Source: DRP Survey, op.cit. Note: Only of the firms surveyed.

5.1 Shortage of workers

In the DRP Survey[1], as shown in Table 5.4 below, enterprises (in manufacturing, trade/commerce, services, etc.) employed some 10,378 workers on a permanent basis, and as a result of national service, some 1,954 – about 20% of new employees are employed on a contractual basis. However, it should be noted that the DRP Survey was not confined to the manufacturing sector. In the DRP Survey, the observation was made that many firms recruited

[1] See, p.18, Eritrea – Demobilization and Reintegration Programme (DRP), Technical Note Reintegration of demobilized soldiers: prepared by World Bank Consultants, J. Billetoft, L. Ellegaard and Tesfa Mariam Tekie, May 2001.

new workers on temporary contracts as shown in Table 5.4 and that these new workers were largely unskilled. Furthermore, it was suggested that the firms seemed to be waiting for the return of those full-time workers sent to the front, since it was mandatory that jobs are kept for those in the national defence.[1] It should also be noted that the percentage of temporary workers identified by the survey conducted by the university team, namely, 18.5% of this sample of only manufacturing firms corresponds with the findings of the DRP Survey, as shown in Table 5.5 below.

Table 5.4: Number of full-time workers at present and those recruited in the last six months

Category	Full-time workers at present (permanent)			Workers employed in the last 6 months (contracted)		
	Male	Female	Total	Male	Female	Total
Large	9,025	401	9,426	1,231	580	1,811
Medium	220	15	234	3	10	13
Small	250	-	250	12	25	37
Micro	467	-	25	12	25	37
TOTAL	**9,962**	**416**	**10,378**	**1,288**	**666**	**1,954**

Source: DRP Survey, op.cit. Note that the DRP survey estimates shown in the table above were for the surveyed firms only, i.e. 64 firms with more than 25 employees etc. see DRP Survey for details.

Table 5.5: Number of employees of surveyed manufacturing firms

Gender	Permanent		Temporary		TOTAL	
	Number	Percent	Number	Percent	Number	Percent
Male	5,249	55	1.203	55	6,452	55
Female	4,369	45	982	45	5,351	45
TOTAL	**9,618**	**100**	**2,185**	**100**	**11,803**	**100**

Source: University Survey, op.cit.

The DRP Survey tried to emphasise the high degree of uncertainty associated with labour market forecasting in general, and, in particular, such forecasting in Eritrea, which it characterised as having "a vulnerable post-conflict economy". Stressing the need to update such forecasts periodically, it provided some "guestimates" of new employment opportunities up to one year ahead. These numbers are shown in table 5.6 and 5.7 below – a total of about 4,800 new jobs, of which about 1,900 are already skilled – for all the sectors in their sample (manufactures, construction etc.).

[1] See, p.17-18, DRP Survey, op.cit.

Table 5.6: Number of employees to be hired in the next 12 months by skilled level

		Category				Total
		Micro	Small	Medium	Large	
Semi-skilled	No of enterprises	117	46	30	62	255
	Aver. # of employees	1	2	4	42	12
	Total # of employees	147	84	122	2,604	2,957
Already skilled	No of enterprises	117	46	30	62	255
	Aver. # of employees	1	1	1	28	7
	Total # of employees	69	43	43	1,724	1,879
Total employees	No of enterprises	117	46	3	62	255
	Aver. # of employees	2	3	6	70	19
	Total # of employees	216	127	165	4,328	4,836

Source: DRP Survey, op.cit. Note: Only of the firms surveyed.

On the basis of the data in table 5.6, and bearing in mind the uncertainty surrounding estimates of total employment in manufacturing, the DRP Survey finding was that there were job opportunities for unskilled and semi-skilled workers.[1] In the 126 manufacturing enterprises surveyed, employers reckoned that they could recruit up to 1,270 unskilled and semi-skilled workers in the next 12 months and approximately 470 skilled workers (craftsmen and administrative staff) as shown in table 5.7 below. The DRP Survey extrapolated these findings to the national level to find that potentially, 7,000 – 8,000 jobs could be created in the following year for unskilled and semi-skilled workers, with a corresponding figure for skilled workers being approximately 3,000 in the manufacturing sector; this latter figure is reckoned to include administrative positions. In the technical occupations, the DRP Survey highlighted the high demand for technicians and machine operators.

Table 5.7: Number of new employees expected to be hired in the next 12 months by sub-sector

		Sector/sub-sector							Total
		Manuf.	Trade	Services	Transp.	Constr.	Fishing	Modern farming	
Semi-skilled	No of enterprises	126	42	40	30	12	12	17	255
	Av. # of employees	10	2	2	4	22	37	45	12
	Total # of employees	1,273	94	85	122	261	44	764	2,957
Already skilled	No of enterprises	126	42	40	30	12	12	17	255
	Av. # of employees	4		2	1	15	3	54	7
	Total # of employees	471	59	69	43	178	41	922	1,879
Total employees	No of enterprises	126	42	40	3	12	12	17	255
	Av. # of employees	14	4	4	6	37	40	99	19
	Total # of employees	1,744	153	154	165	439	481	1,687	4,836

Source: DRP Survey, op.cit.

However, the DRP Survey estimated some 30,000 in total employment in manufacturing. Whereas the Ministry of Trade and Industry surveys presented an estimate of 20,000. In the circumstances it is deemed necessary to adjust the figures downwards. If such an adjustment is made, then one assume that the resulting job increases could be in the range of 4,600 – 5,300 unskilled and semi-skilled workers and some 2,000 skilled and administrative workers.

[1] See, pp.26, DRP Survey, ibid.

As already illustrated above this Ministry of Trade and Industry/University Survey also attempted to present an estimate of the number and type of workers needed in the future. The survey covered all firms with more than 10 employees but only 12% of firms with less than 10 employees. Therefore, although attempts are made to extrapolate for the manufacturing sector in this analysis, these forecasts should be regarded as tentative.

5.2 Other perceptions of shortage

The Tracer/Enterprise Surveys also examined the issue of the shortage of skilled workers in 1996. It was observed that 58% of large enterprises surveyed (in manufacturing, construction etc) and 21% of small enterprises declared having suffered from shortages in 1996. Among large companies, the most critical areas of shortage appeared to be of auto mechanics, electrical, energy and surveying. The perception of the Tracer/Enterprise Surveys was that such shortage was due to a qualitative mismatch between unemployed Technical School (TS) graduates of Asmara/Wina and the demand for specific posts or a failure in the functioning of the labour market. However, despite the employers' perceptions of shortage, their concerns were not translated into action, in particular, into training strategies and programme.

The available information on two of the three occupations identified above is also examined, in considering the above perceptions of shortage. Thus, with respect to auto mechanics, the major source of employment is presumed to be in vehicle repairs and garages, and in transport undertakings. This kind of operation is very easy to set up and usually less than 5 persons are involved. The investment requirements are relatively modest. The skills involved are general skills and not specific to a particular manufacturing process. Perhaps the employers judged that if they provided in-plant training of a formal or informal type in auto-mechanics, there was the risk that their trained workers might leave, after receiving training; in the case of small enterprises the trained ex-employee might compete for garage service sales. For general skills which are easily portable or mobile, employers will tend to provide less training than for those skills which are specific.

These conclusions illustrate the necessity in normal times of the utility of collecting and analysing such labour market data 'Normal times' is emphasised, because 2001 was hardly normal with 250,000 employees at the front, there was certainly a shortage of skilled workers. The analysis above also reveals something else. The Tracer/Enterprise Surveys were carried out for the Ministry of Education. Its overall objective was to contribute to the evaluation of the effectiveness and relevance of technical education and in this it was successful. It collected very valuable information on the labour market, in pursuit of that objective. It was an effective piece of professional work. But the analysis of the results of the surveys did not deal with issues of shortage and surplus of 'needs' and 'requirements' for skilled workers, except incidentally. Nor was there any attempt made to link, systematically, the costs of education and training to the returns thereof. Its findings, essentially, as presented at a Ministry of Education seminar, were that the technical education at Asmara and Wina technical schools, was effective and relevant, but that there was some doubt about the vocational training provided by the skill development centers (SDCs) to ex-fighters, returning refugees etc. notably, at this seminar, officers from the Ministry of Trade and Industry and the Department of Labour and Social Welfare were not present.[1]

[1] See Appendix 4, Ministry of Education Seminar: programme and list of participants, Tracer/Enterprise Surveys, op.cit.

5.3 Disadvantaged groups in the work force

Table 5.8 below provides some basic data on education in Eritrea. It shows that illiteracy is relatively high in the country. The table also illustrates that, in 1995, at both the primary school level and the secondary school level, the percentage of girls in schools was slightly below the percentage of boys.

Table 5.8: Illiteracy, enrolment school

	1995	1998	1999
Illiteracy rate, male (% males 15+)	37.0	34.3	33.5
Illiteracy rate, female (% female 15+)	65.9	61.8	60.6
School enrolment, primary (% cohort)	30.8	-	-
School enrolment, secondary (% cohort)	14.3	-	-
School enrolment, primary, female (%cohort)	29.3	-	-
School enrolment, secondary, female (% cohort)	13.4	-	-
Urban population (% of total)	17.1	18.1	18.4

Source: Eritrea Data Profile, the World Bank, 2001.

Although the proportion of girls obtaining primary and secondary education were roughly similar to that of boys, the same did not hold at the level of the technical schools, or the university. In the Tracer/Enterprise Survey covering the technical school graduating classes from 1991 to 1994, women accounted for 18.5 per cent of the group; whereas, at the University of Asmara, women accounted for just over one-tenth of the student body. It should be stressed, however, that entrance to these institutions is by public examination, and it is extremely competitive. Moreover, whereas the proportion of women full-time students at the University was approximately 11.5 % of all students in 1991/92, this figure had increased to 13.5 % in 1998/99. Among the academic staff at the University, the proportion of women academics had correspondingly increased from 4.7% in 1991/92 to 10.7% in 1998/99. It should be noted that as about 82% of the population live in rural areas, there could have been some unwillingness by rural parents to allow female family members to go to urban areas for higher education.

What is perhaps most striking, however, about graduates from the technical schools is that some 60 per cent had an urban background; while only about 18 per cent of Eritrea's population lived in urban areas. Thus, while Eritrea rations tertiary education by merit (through competitive exams), and this education is free, there is some bias towards urban areas. Moreover, the scarcity of primary and secondary education in the country demands that great caution should be exercised in any proposals for new facilities at the tertiary level. This is especially the case since such new facilities – for technical schools, for example, would be located in urban areas.

It has been said about statistical data that there are 'lies, damned lies and statistics'. The Ministry of Trade and Industry census reported that about one-third of the workforce in manufacturing in 1998, was female. Yet, in the DRP Survey in 2001, the proportion of women in manufacturing, trade/commerce, services, transport etc. (see table 5.4 above), was about 4 per cent. Of the 1,954 workers employed on temporary contract in the previous 6 months, about one-third were female. It is difficult to explain the estimates for permanently employed women in 2001. What is notable, however, is that among contractual workers, the proportion of women employed

corresponds roughly to their proportion in the work force according to the Ministry of Trade and Industry survey of manufactures in 1998, and it also corresponds roughly to the literacy rate for women in the population as a whole. Perhaps one can speculate that this suggests that at 'normal' times, when the economy is operating 'normally' as in early 1998, the proportion of women employed in the productive sector is indeed about one-third. As adverse change begins to occur in the sector – privatisation etc, the proportion of women falls. This is because, as the disadvantaged group, they are the first to be laid off. However, when a general mobilisation (1998) occurs and a disproportionate number of men are called up, the proportion of the women filling vacancies occurring as a result of the mobilisation reverts to the previous figure – about one-third of the temporary employees.

The Ministry of Trade and Industry/University Survey, focussed solely on manufacturing as it was in 2001. As table 5.5 above shows, in 2001, 45% of the permanent workforce in manufacturing were female. Assuming that all the temporary workers – 2,185 in all – were replacing men called to the war front, the percentage of women in manufacturing before the general mobilisation was indeed about 37% – a proportion which is slightly above the Ministry's survey of 1998. Furthermore, it would appear that within the DRP Survey of the directly productive sector generally, there was indeed a bias against the employment of women – but such bias was very much less pronounced in the manufacturing sector, and very much more pronounced in construction, transport, fishing, garages etc.

This observation puts into perspective the findings of the Ministry of Trade and Industry/University Survey regarding gender preferences among employers in manufacturing, namely, that 46% of enterprises prefer to employ male workers. However, what is more important than managers' preferences is what they actually do. In manufacturing, currently about 45% of employees are female. Before the war emergency, perhaps some 37%. This means that there has been an increase in female employment between 1998 and 2001. It is a significant progress in three years. Outside manufacturing, in other directly productive employment, there is probably much greater cause for complaint regarding discrimination directed against women. In general, however, one point should be emphasised. In research regarding employment/education what matters are economic data – numbers, wages etc. Similarly on gender issues it is not so much a matter, for example, of whether employers are for/against the employment or promotion of women. What matters is what they do, how much they pay for the services of female workers.

It should be noted also that in the crash programme for export take-off described below, it is female workers who will obtain the greatest employment benefits accruing from the programme. To be sure, most of this employment will be at the lower end of Eritrea's income scale – low wage employment in the textile and garment trades. It should be recalled that in the years following the emergence of Mauritius as a major garment/textile exporter, there was considerable domestic controversy in the country because women could find employment so much more easily than men – in the garment trades. It is possible that cultural factors played a role in employer's preference for women in Mauritius, but certain that wage rates also played a role. However, Eritrea has the possibility of avoiding this controversy. This is because of the indirect benefits which will come from Eritrea's determination to find employment for its many soldiers about to be demobilized, and, in particular, for its disabled ex-combatants. All these will be provided with post-conflict counselling.[1] Such personal counselling should include advice on gender issues and

[1] See: pp.31-33, DRP Survey, op.cit. and pp. 7-9, Eritrea Demobilization and Reintegration Programme, Report No. PID 10371, The World Bank, April 2001.

should recall the important role women played in Eritrea's long liberation struggle. Many of the jobs which will become available through the crash programme will be suitable for many of these ex-combatants. In the multipurpose machine operators training school described in Part-II of this study, entrance/exits should be made suitable for the disabled, and similar provisions can be made, relatively easy, in many of the existing textile/garment factories, and potentials ones to be established.

5.4 Some perceptions of the quality of skills in Eritrea

Many analysts have reported adversely on the quality of skills possessed by the labour force in Eritrea. Some of these findings are examined below. However, it should be remembered, always, that employers invariably prefer to have more skilled employees than less skilled employees and that in many cases the quality of an employee's skills is dependant on the incentives offered to the employee. Star footballers are offered large sums of money for scoring winning goals.

It should be noted, also, that there is an understandable confusion between a gap/shortage in the workforce for a particular skill and a post, which is filled by a worker not fully proficient.

5.4.1 The Tracer/Enterprise Surveys

The Tracer/Enterprise surveys found that the available supply of workforce on the labour market did not adequately correspond to the needs of enterprises: 58% of large enterprises and 21% of small ones declared having suffered from shortages of skilled workers in 1996. Many large enterprises considered that the lack of skilled workers was a serious obstacle to their activities. However, these surveys also found that despite employers perception of lack of skills, it was not reflected in their training policy.[1] Only 37% of large enterprises had a training plan and less than a quarter of enterprises organised in 1996 company-based training or sent workers to outside training programmes. Employers opinion on technical school (TS) graduates and skill development centre (SDC) graduates is shown in table 5.9 below.

Table 5.9: Employers opinions concerning the time required to become productive (in months)

	Large firms	Small firms
TS graduates	9 months	6 months
SDC graduates	14 months	12 months
Recruitment with no training	20 months	8 months

Source: P.67 Tracer/Enterprise Surveys, op.cit.

The main findings of that part of the Tracer/Enterprise surveys which focused on SDC graduates (for the most part ex-soldiers and returnees following 6 months courses in various skills) was that there was a major problem of unemployment, as reflected in a 65 % unemployment rate, as against a 35 % unemployment rate for the control group. The surveys concluded that their level of general education, which was above that of the majority of ex-fighters and returnees, should have placed them in a relatively favourable situation on the labour market. This, however, did

[1] See: p.65, Tracer/Enterprise Surveys, op.cit.

not occur. It directed attention towards the SDC graduates accepting drastic changes in their life styles, work habits and social status. Psychological needs may also be important. However, the survey also noted that matters of quality such as course content, training methods, duration of training, instructors' qualifications and training facilities deserve special attention.[1] The findings are acceptable and, in fact, one would go further in putting these issues in an economic context: there was an inadequacy of social resources devoted to this vulnerable group. Perhaps the most important element missing was simple programmes of intensive help with searching for jobs.

5.4.2 The MoTI/University survey

In the MoTI/University Survey, 13% of the firms polled reply that they could not get the required skills from the labour market; of these more than half have to provide further training to skilled employees for their work place needs. Of the remainder of the 13% of firms, about one-fifth (i.e. about 3%) could not get these skills at all. As indicated earlier, just over half of firms gave primarily on-the-job training; exceptions were the seven enterprises that have their own training centres. On the quality of workers skills, Table 4.7 above gives the opinion of firm managers about the match between education and industrial needs. The findings in Table 4.7 are broadly in line with the findings of the Tracer/Enterprise surveys.

Regarding too theoretical training and lack of linkage with industry, it is certainly desirable that there should be a full or part time member of the staff, of each education/training institution, who is in close touch with owners/personnel managers of large industrial firms. Equally desirable would be periodic reports both to school managements and students regarding employment opportunities for particular skills. However, the adverse comments of firms may simply reveal an unwillingness to provide training i.e. to bear the costs of training. 'Too theoretical' education/training provides a base on which more skills can be build. A general medical practitioner can go on to become a specialist in many disciplines; so can a general mechanical engineer, who could become a designer of mechanical systems, a jig and tool specialist, a refrigeration engineer, a specialist in lubrication or planned preventative maintenance etc. On the other hand, an engineer narrowly trained in refrigeration would have great difficulty (without on-the-job training) to become a jig and tool designer.

The MoTI/University Survey was concerned about quality while recognising the importance of quantity in skill production. However, too much emphasis on quality may result in less quantity, and vice versa. Given the level of development in the country and the need to create employment, policy-makers may opt for more quantity. The reasons are quite simple. A greater quantity of lesser skilled workers would fill more posts: training in whatever lesser form, would be provided by firms depending on their cost structures. But more important, education/training is rationed in Eritrea by the ability to pass exams and to have better quality would increase the ration going to fewer people. This would be inequitable and undesirable; and it would probably bring lower overall social returns.

5.4.3 The DRP Survey

The DRP Survey on the other hand was different from the MoTI/University Survey in that its prime focus was on the labour market and the opportunities offered for the re-integration of demobilised soldiers; i.e. what should be done to find work for demobilised soldiers. The

[1] See: p.71 Tracer/Enterprise Surveys, op.cit.

Tracer/Enterprise survey on SDC graduates approached this matter indirectly, admitting that issues of quality were somewhat outside the scope of the survey.

The DRP Survey found that employers considered writing skills and previous work experience as relevant for their employees. This is taken into account on recruitment. For micro, small and medium enterprises (overall, less than 25 employees), ability to negotiate with suppliers or customers was also considered relevant.

On the other hand, the DRP Survey also noted that these same employers seemingly had little interest in the ability of employees to use calculators, obtain/manage credit, present/market products, and to develop new products. The survey hazards the judgement that this perception of employers reflected little delegation of management functions in smaller enterprises (>25 employees), but also that these skills were perhaps not necessarily vital for the operation of enterprises.

The above-mentioned findings of the DRP Survey are acceptable, particularly, its conclusion regarding delegation of management functions. However, it should be noted that these owner/manager perceptions also reflect a half-way stage in coming to terms with an economic environment based on initiative, flexibility and the rise of the private sector.

5.4.4. Quality of skills and the export development strategy

This is dealt with in detail in Chapter 6 covering the quality of skills required both in the short-term, as well as in the medium-term in the three product areas targeted in the crash programme, i.e. leather and leather product, textiles and garments. These skills primarily encompass machine operators sewing skills, the skills of key workers in cutting, quality control and machine maintenance and business skills which have to be developed as Eritrea becomes a successful exporter.

Within the manufacturing sector, the hides and skins sub-sector can be expected to make considerable contributions to exports. The Ministry of Trade and Industry census in 1998 identified four large state owned tanneries, with an average employment of 140 workers, together with some 14 smaller private tanneries, average employment 30.

According to the World Bank report[1] there has been little effort to train tannery workers in the larger tanneries with few actually understanding the very basic principles of tanning: most workers are unskilled. Moreover marketing was handled externally in Addis Ababa. Since the country's liberation in 1991, there has been little investment in either equipment or training. The report notes however that some of the smaller tanneries, privately owned, have begun to show (in 1998) modest signs of recovery, with some investment in new equipment and marketing. All in all however, there is a need for significant investment in "**know-how catch-up**", particularly in these key tannery jobs: laboratory chemists, production supervisors and equipment maintenance engineers, with all these skills requiring a mixture of formal classroom training, plus on-the-job training within the tanneries. The report also notes that building up the know-how of laboratory chemists will be a key task, as will that of tannery production supervisors who have not been exposed to developments in modern tannery chemicals. Such inputs will have to be acquired externally through consultancy arrangements or through up-to-date tannery management.

[1] See: pp108-111, Eritrea: Export Development Strategy, pp. 108-111, op.cit.

6. The crash programme for export take-off and IHRD

6.1 Background: export strategy

Eritrea has adopted a two-pronged strategy to develop its export base along two separate tracks. The first central task will be to develop labour-intensive manufactured exports based on its abundant supply of relatively low-paid skilled and professional workers. Expansion of low-skilled manufactured exports will target industries with especially low skill and low capital requirements, in particular, labour-intensive sewing and assembly of garments made of textile and leather, production of knitwear made from textile yarn, and footwear for export. This initial thrust into export markets is based on the fact that textiles and other similar labour-intensive industries with low capital investment requirements can grow very rapidly under international sub-contract arrangements, where Eritrean partners have easy access to inputs and finance at world prices. Moreover, such arrangements provide for quick transfer of technology and know-how, as well as ready export markets for the finished products. It is expected that sub-contracting arrangements will play an important role in providing the initial thrust towards jump-starting its exports.

The second thrust of the export strategy will take advantage of Eritrea's modest population density and its varied climate and natural resources to develop exports based on livestock, agriculture, horticulture, mining, fisheries and forest products. These activities currently produce most of Eritrea's exports, headed by semi-processed hides and skins, live sheep and goats, cotton, sesame and fisheries products. But expansion is limited by the biologically grown supply and climatic factors, as well as, for the most part, peasant farming techniques of small-scale production. Exports of these products cannot be expected to increase nearly as rapidly as labour-intensive manufactured exports.

There has been a recognition that the two-track approach of developing natural resource-based and manufactured exports separately has been adopted with great success in Western Europe, Asia and the Americas. In Central and Eastern Europe, the best-managed and most successful economies, such as Poland, are currently following the same strategy. While some economies in East and Southeast Asia (e.g. Japan, South Korea, Hong Kong (China) and Singapore) are so resource-poor that they have had to rely solely on manufactured exports. Other countries of the region which have substantial resource-based exports have deliberately chosen a two-track strategy e.g. Taiwan (China), Malaysia and Thailand. In Eritrea, there has above all been a recognition that a strategy based mainly on natural resource exports is extremely unlikely to sustain the objectivities of achieving annual growth of at least 15 per cent for exports and 7 to 10 per cent for GDP. This is due to the limited opportunities in the world market to absorb natural resource-based exports (with the exception of oil and gas). In contrast, the world market for manufactured exports, in some of which Eritrea has a dynamic comparative advantage, is large.[1]

The Government of Eritrea has based its policy-making and implementation on the principles of international integration and trade.[2] It has rejected a strategy that has had its adherents in some of the centrally planned economies and which has turned out not to be the right strategy; that

[1] See: Eritrea: Export Development Strategy, Report no. 19451, World Bank, January 23, 2000.

[2] Macro Policy, Office of the President, 1994 and National Economic Policy Framework and Programme (NEPFP) for 1998-2000, Office of the President, 1998.

strategy calls for maximising value added to the country's own resources by developing every processing stage. This strategy of "maximising value addition" does not maximise export potential because it too often leads towards very capital-intensive and technology-intensive processes in which Eritrea has no comparative advantage.

6.2 The crash programme[1]

Eritrea is unique in Africa in that it has a tradition and a skill base in key sewing-based industries, namely shoes, woven-cloth garments plus sweaters and hosiery. When these industries were set up more than 50 years ago they served primarily the captive Ethiopian market. At the end of the Second World War, industrial progress was further advanced than any other country south of the Sahara with the exception of South Africa. Although these industries were badly neglected in the period before Eritrea's independence, the skill base and know-how is still remembered, and can be build upon. The rebuilding process has started, but it has been interrupted by the war and the loss of the Ethiopian market.

Under the Lomé Convention, African countries have preferential access to the European Union market. Apart from Mauritius and Tunisia, other African countries have not yet been able to utilise this valuable preferential access. Similarly, Eritrea is a listed beneficiary country under the USA's Africa Growth and Opportunities Act, 2000 (AGOA). This act enables Eritrea to export garments to the USA free of duty, and free of quota restrictions up to the year 2008; moreover for the first four years, Eritrea is not restricted to the use of US-made cloth. AGOA is probably the most significant preference ever offered to African exporters, but so far only Mauritius and Kenya have moved to take advantage of this opportunity. There is the potential for Eritrea to become a world-class supplier to the enormous US market for garments.

The crash programme is a deliberately targeted, pro-active and market-driven strategy to take Eritrea's export earnings from the current negligible level, perhaps around $12 million to a total of $200 million within five years. The objective is to make a start, and to demonstrate that export success can be achieved: it is intended through tight initial targeting to achieve real results as quickly as possible.

The Eritrean Government has laid the groundwork to make exporting a success – much attention and policy measures have been put in place to create an enabling environment in which the private sector can play its dynamic role, in leading the development thrust. But an enabling environment is somewhat passive. Pushing on one end of a string is not enough, if results are required in the short-term. First of all, the workings of the enabling environment have to be tested in practice. There will be bottlenecks, and these will have to be unblocked; moreover this "unblocking" will have to be monitored in the initial stages of the crash programme. But in addition to this, the crash programme is designed to apply some tension to the string in pulling forward those Eritrean firms determined to break into high-price export markets.

Needless to emphasise, this crash programme, if successful, will not merely have a significant impact on Eritrea's export earnings, but equally important will have a significant impact in creating employment on a substantial scale, particularly for women. The focus of the crash programme will be on the EU and the USA.

[1] See: The crash programme for Export Take Off by Eritrea, by Andrew Singer, Eritrea National Chamber of Commerce, May 2001.

6.3 Sub-contracting vs. foreign direct investment (FDI)

What Eritrea has is labour, plus some skills, some know-how and an industrial culture. It does not have good contacts with potential buyers in the EU and USA; skills to create the designs which can be sold in these markets; up-to-date production and management know-how needed to convert those designs into actual production for Europe and the USA. Foreign partners will be required to contribute these vital missing links in the supply chain.

FDI can be viewed as the ideal arrangement to supply these missing links, from Eritrea's point of view. Typically however, FDI is not the ideal from the viewpoint of foreign firms which have these missing links: they can choose to source from many countries, and see no need in risking their own capital. What these firms much prefer to do is to engage in arrangements, in these product sectors, known as cross-border sub-contracting. With these arrangements, the sourcing of materials, designs and markets is done by a foreign intermediary.

In these sub-contracting arrangements the return to the Eritrean supplier in the early stages is typically low. But the supplier offers little except the factory building, some sewing machines and some operatives with basic sewing skills. In return, he gets low returns, but in addition he gains experience and know-how, he learns the realities of the market, the technique needed to produce what far-off customers demand. After a start has been made, the Eritrean supplier can gradually move up market, obtaining better and better returns on labour. Similarly, as experience builds up after the initial stages, when all material inputs are imported, local suppliers of leather and cloth will develop the required capabilities to meet foreign customer requirements for raw materials, at first with the simpler inputs, such as lining leather and lining cloths.

One of the goals of the crash programme is to assist 3 to 10 Eritrean firms in the shoes industry (uppers and complete shoes), 3 to 10 firms in sweaters and hosiery, and 2 to 5 firms in the garments industry. This will be done by a series of activities encompassing:

- Actions to meet purely physical requirements of export take off (land and factory space for expansion)

- Actions to meet funding requirements (credit and the monitoring of credit applications) finance for the purchase of sewing machines, access to foreign exchange etc.)

- Actions to meet regulatory requirements (access to imported inputs, loss of key employees to military services etc.)

- Actions to locate and attract the right partners.

With regard to the last activity identified above, the first step would be to locate, for example, current importers of shoe uppers in two or three EU markets, known to have a substantial import demand for such products. Similarly, to locate exporters in countries currently facing quota problems for garment exports into the USA market.

Thus, a critical element of the crash programme will consist of the location and identification of potential foreign intermediaries, and for each of the three product groups covered to persuade them to visit Asmara, with the maximum possible assistance provided before, during and after

visits to Asmara. The crash programme will have the objective of achieving initial trial orders to the start of regular ongoing production and export. Assistance will need to be provided to overcome any problem the foreign customer or local supplier encounters.

6.4 IHRD implications of the crash programme

These implications fall into three categories:

(a) The training of considerable numbers of new workers in the use of various types of specialised industrial knitting and sewing machines.

(b) The training of relatively few key workers in intermediate/highly skilled operations, e.g. quality controllers, cutters, maintenance personnel etc.

(c) The lack of experience and training in the specifics of exporting via the cross-border sub-contract arrangements among most owner-managers in the three product lines identified. This is also closely related to inexperience in managing considerable increases in personnel and financial resources employed, making considerable financial commitments in the purchase of new machinery, raw materials, work-in-progress, finished goods etc. In addition to this, measures need to be put in place to make the crash programme more or less permanent. This will require capability building of owner-managers, management staff, domestic consultants and other specialists who have the basic educational background and the necessary experience to make them the key agents in Eritrea's drive towards export transformation.

The crash programme envisages an increase in total output of textile, garments and footwear. The basic skill required in these sectors are machine operator skills – in operating knitting machines, industrial sewing machines etc. It is likely that those enterprises, which are successful in obtaining cross-border subcontracts will have competent core staff in these product areas. But there will be the need for great expansion in staff numbers, and there may also be the need for some re-training of core staff. Although the basic skills of these core staff will remain highly relevant, the mature technologies and machines employed have been improved somewhat since the 1950s. The problem, however, is that it is not known how many more staff with machine operators' skills will be required, nor precisely which new machines, in whatever numbers, will be required. The reason for this lack of knowledge is quite straightforward. The product markets/locations chosen for exports will welcome Eritrea's products, but one cannot be certain, and cannot forecast the volume of the products.

In this situation two employment/training strategies could be adopted. One strategy will simply be to poach machine operators from domestic firms by offering them improved wages; the wage incentive is in most cases powerful. However, there is obviously a barrier as to how far this incentive can be taken. As indicated earlier, although high price markets will be targeted, margins will be thin because of the need to use intermediaries to gain market access. Still, this should allow some room for competing with domestic firms for semi-skilled employees, since these domestic firms serve primarily the low price domestic market. The other employment/training strategy will be to construct a multipurpose training school (MTS), where workers can be educated and trained/retrained over a period of from 2 weeks to three months in the operation of new machines.

This multipurpose training school should be constructed on simple workshop lines, perhaps 60 x 40 square metres, with flexible modular power supplies, so that various types of industrial knitting and sewing machines can be rapidly installed and un-installed. These machines would be the property of the firms requiring training for their employees, and the tuition provided in the multi-purpose training school would primarily be the responsibility of the private firm and its foreign equipment supplier/partner. The flexible design of the multi-purpose training school would be crucial in allowing it to be used for the training of machine operators across the three product lines. This on-the-site training will be provided to employees in near factory conditions; but within a formal training setting. In addition it is envisaged that after some years, depending on the success of the crash programme, the multi-purpose training school could be sold or leased for pure production operations.

6.5 Technicians and other intermediate workers

As noted above, relatively few of these will be required.

Given the increases in numbers of machines, and the tight financial conditions in which the firms will operate, i.e. the thin margins between cost of production and sales prices, owners/managers will have to ensure that this level of staff performs optimally. Management will therefore be pressed to ensure that these workers are not only competent and well trained, but also have the incentives to perform their critical tasks. Among quality controllers, for example, mistakes can have a direct impact on the bottom line. Management will not only themselves be under considerable pressure to perform, but they will transmit this pressure particularly to these key workers.

Firms which are successful in winning international sub-contracts will have many of these key staff already on their books, but will also recognise the importance of having back-up staff so that the successful operation of their production processes is not jeopardised by loss of these critical workers. Moreover, whereas past production operations may have required only one or two of these highly specialised workers – perhaps a single person dealing with maintenance or with quality control – in the new conditions consideration will need to be given by management to maintenance and quality control units or departments. The retention and recruitment of staff will become more firmly grounded on management perceptions (or even measurement) of performance and potential performance. As indicated earlier, the training or retraining of those key staff would most likely be done on-the-job by specialists supplied by equipment makers or the production management provided under the terms of the international sub-contracts. Eritrean management will therefore take great care to ensure that their counterpart staff in certain key intermediate categories have the capacity to absorb training. Thus, their existing key staff or new staff, in addition to having had adequate job related experience, would also be expected to have a good general education.

As Eritrea's manufacturers gain in know-how, confidence in supplying foreign markets etc, they will gradually move up the supply chain – first by cutting out the intermediary and dealing with the final buyer direct, and then by having influence on the final buyer's designs, specifications etc. As this process unfolds, domestic suppliers of materials, intermediate inputs such as lining leather, buttons, fasteners, zippers etc will have the opportunity of joining the international supply chain, via the main Eritrean sub-contractor. There will be the opportunity also, as these main sub-contractors gain in strength, for work to be sub-subcontracted further to the smaller less sophisticated domestic manufacturers and workshop owners, and perhaps also to cottage industry

operators, i.e. micro-enterprises and home workers. These last arrangements have been important in the past in countries and regions as diverse as Italy and South East Asia.

It should also be noted that currently one or two of the most dynamic Eritrean firms have gone some way down the road described above. Thus, the World Bank[1] has reported on one sweater manufacturer who plans to bring in Italian and French designs to help expand exports to the EU, another who would like to expand production from 22 machines to 100 machines, and yet another who was buying new 1.8 metre wide looms to replace old one-metre ones that produced fabric unsuitable for most clothing industries. As the crash programme gets under way and export take off occurs, some 4 or 5 years down the line more opportunities will arise for the most dynamic firms to increase their value-added and a demand will be born for a small number of domestic designers and other specialist skills in these sub-sectors.

6.6 The owner-manager

Despite the spots of dynamism described above, Eritrean management is weak. The most serious, although not the only weakness is in the area of export marketing: firms know little about export markets; what they demand from suppliers; how they select suppliers; the types of collaboration and sub-contracting arrangements that operate in various product lines; what matters is keeping customers content, etc. More generally, there is an absence of a well-developed body of professional and advanced technical support services to exporters and the private sector in general. Reportedly, although some 100 individual consultants are registered, most of their experience consists of non-analytic preparations of feasibility studies or donor-based consultancy experience. Of equal seriousness, the private sector's resource base, and its awareness of the need to use external professional and technical service is also limited.[2] Thus, an essential element in the range of learning opportunities available to firms in other countries is not available in Eritrea.

Some of these weaknesses will be overcome by the services provided in the crash programme. In addition, developing essential support services will be one of the components of the reconstruction credit being prepared by the Eritrean Government and the World Bank.[3] One component of this credit will be a matching grant facility that is demand driven which will co-finance private sector initiatives. The facility will introduce firms to the benefits of using international business services, and start the process of developing a local market of international business support services to complement and compete with those from overseas. Thus this facility will provide a powerful incentive for domestic consultants to shape up.

6.7 Other sources of talent

Apart from Eritrea's domestic consultants, there is another source of domestic talent with the specialist educational background required to provide most of the business services and this source is virtually untapped: namely, the staff of the University of Asmara. This is not to say that either the domestic consultants or the university staff are currently in a position to offer the required services. But with the powerful incentive of a domestic market for their services, they will soon shape up. They will learn what is required, and by whom. And they will learn the

[1] See: Chapter II, „Clothing made from textiles and other textile products", in Eritrea: Export Development, op.cit.
[2] See: p.14, Eritrea: Export Development, op.cit.
[3] ibid.

techniques and tricks of the business and professional services trade – on their own accord. In the year 2001 information sources etc are available over the Internet, much of it for free. It is not necessary in 2002 that groups of these consultants and university staff be sent abroad to do degrees in a subject, say for example, "export marketing", in order to deliver the required business services. What is necessary is that members of these groups seize the initiative to teach themselves what is required via the Internet, i.e. which are the critical modules of some on-line university course that they need to follow, which websites could provide critical data on sales of a product or customs/tax regulations etc. They also need to know what is required of business services professionals. They can gain all these experiences through 'on-the-job' training by associating themselves with foreign services professionals.[1]

In addition, many owner-managers will themselves seize this opportunity to build their capability, and to discover precisely where – in what technical or professional area – they need outside help. This will vary as the owner-managers in the shoes, textiles and knitted garments sectors have disparate backgrounds. A very few have either mastered all aspects of their industry or know precisely where outside professional assistance is required. More generally, however, owner-managers across the whole of Eritrea manufacturing for the most part need the same sort of assistance as their colleagues in the three product sectors of shoes, textiles and knitted garments: little knowledge of export marketing, little familiarity of the need to use professional and technical business services, e.g. services in such areas as finance, shipping and trading. This issue is explored in a later section dealing with the export potential of Eritrea's natural resource based industries. However, in order to strengthen the capabilities of both management and the potential providers of business and industrial services, which is the weakest part of the human fabric of Eritrean manufacturing, it is suggested that an Eritrean Institute for Business and Industrial Services (EIBIS) be established. The modalities of its operation, financing etc are described in Part II of this IHRD study (Programme concepts for IHRD). Basically and bearing in mind the objective of strengthening the management capabilities of Eritrean manufacturing and business, the institute will carry out the following functions:

(i) Mount an annual series of evening courses, 1, 2 and 3-day seminars/workshops, some built on the modular principle so as to target well defined problem areas confronting Eritrean management. Thus modules will be provided on, for example:

- Controlling cash flow and working capital
- Risk and return in sub-contracting
- Subcontracting: the legal issues
- Performance evaluation of staff
- Financing micro- and small enterprises
- Technology choice in the garment and knitted goods sector

The reason why these modular courses should be part-time is that they will target owner-managers, managers, middle management, the consulting community and government officers. The focus should not be on staff that require paper qualifications. It is assumed that this target group is fully employed in the day, and that most in the target group will

[1] Example: The two excellent reports produced by Tesfa Mariam Tekie: Report of the Tracer/Enterprises Surveys (with David Atchoarena), for IIEP/UNESCO and MOE and the Eritrea – Demobilization and Reintegration Programme: labour market trends 2001 (with J. Billetoft and L. Ellegaard) for the World Bank.

not have the need to attend all modules. These modules will also provide the opportunity for life-long learning and skill upgrading which management needs no less than technicians and machine operators.

(ii) The commissioning of research and business development reports from the Eritrean consulting community on some of the critical problems facing industry and business in Eritrea. It is expected that some of this R&D can be transformed into case studies which can be used in the modular courses described above. Examples of some research topics which might be approached are the following:

- Wage incentives and performance among machine operators;
- Risk and return in cash flow management;
- The impact of various types of tax incentives and disincentives;
- Successful optimisation of work-in-progress, in the garment industry;
- Personnel management techniques for the work-place integration of the war-disabled;
- Successes and failures in micro-credit arrangements etc.

(iii) The funding and publication of a periodic journal dealing with the problems of Eritrean business and industrial management; the journal could have a title such as Journal of Eritrean Management, or Business and Industry in Eritrea etc. The journal would aim for a mix of long and short articles dealing with some of the recurrent issues facing the business community.

(iv) Each year, the institute could offer a series of evening and one to three day seminars on topics of vital interest to the business community. In this way, the business capability of owners, managers etc can be strengthened. The first seminar could be a 3-day workshop dealing with export marketing and sub-contracting, together with the sources of relevant information on the Internet. This workshop could be timed to take place concurrently with the initial phases of the crash programme for an export take-off.

7. Micro-enterprises, informal sector and demobilised soldiers

7.1 Micro-enterprises and informal sector

The Tracer/Enterprise Surveys did not deal with this important sector of manufacturing, since its client's principal focus was on the technical schools providing formal instruction.

However, reportedly,[1] the Fisseha Survey, conducted in 1995, estimated that about 22,000 people were employed in manufacturing enterprises employing less than 10 workers (including the owner). Some 31% of workers in the mini-manufacturing units were women. The survey reported that most enterprise owners (85%) acquired their skills through watching others work or through trial and error on their own, whereas 10% were trained by working in other mini enterprises. Only 1 % had received professional and technical training. Some 30% of the mini-enterprises were located in rural areas (a fact which lends a particular focus to the MSME and rural development elements of the UNIDO Integrated Industrial Programme for Eritrea which encompasses rural manufacturing, the informal sector and MSMEs).

What is important here with regard to IHRD policy is that it is likely that both the social rates of return, as well as the private rates of return to investment in this area are likely to be high, thus giving priority to social investment in training in this area. Social and private rates of return to investment in primary schooling in Eritrea are also likely to be high, and this investment is rationed. Nevertheless, it does suggest that some priority should be given by the Eritrean Government to investment in training in this area, perhaps a priority slightly below investment in primary schooling.

The final manufacturing output justifying such investment will be, primarily, for the domestic market (except for example, cut flowers, and for handicrafts aimed at the tourism market). Also, quality may be low. In general, such social investment would be justified, with owners of enterprises bearing the private and part of the social costs of education/training by income forgone during instruction. Here also, social and private costs can be minimised by providing for instruction during out-of-working time periods, namely. part-time. This is the cost-effective imperative. Furthermore, just as primary education is free in Eritrea, the same economic rationale should persuade social decision makers to provide for instruction free of tuition cost to micro-entrepreneurs.

7.2 Demobilised soldiers

In the special case of demobilised soldiers, reportedly special provisions will be made as part of the demobilisation and re-integration programme (DRP) to provide financing for self- and family-support for a limited period.[2] This programme stresses the importance of an integrated set of coordinated activities, including personal counselling, training, the provision of micro-credit facilities etc. In addition, emphasis is placed on the coherence of policy and technical advice provided by different organisations participating in the demobilisation and re-integration process.

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[1] See: pp. 20-21, ER-DRP, op.cit. Micro and small enterprises were defined in the Survey as having 10 or fewer employees.
[2] See: p.3, PID 10371, The World Bank, op.cit.

7.3 Lessons learnt

Reportedly, among the lessons learnt in Eritrea with regard to the demobilisation and re-integration process in the past are that: (i) despite their rural background some 80 % of ex-fighters ended up in urban areas in search of training or jobs; (ii) although 89% of ex-fighters aimed at up-grading their education, only about 15% managed to do so; (iii) many ex-fighters faced difficulty handling the credit they received because of their inexperience.[1]

With regard to personal counselling, it has been indicated already that this should include advice related to male/female occupational categorisation because of jobs which should become available through the crash programme. The DRP indicated that 26% of soldiers require information on employment opportunities, and many required information on access to land, housing and education.

7.4 Female soldiers

Some 8,000 of those soldiers that will be demobilised are women. Skills already possessed include driving, secretarial, medical and other skills, (8%, 11%, 27% and 29%, respectively). In general, it appears that female soldiers are better educated than their male counterparts, and more women include higher education (30%) or training (18%) as part of their future plans. Moreover, only 12% of women plan to go back to their old jobs.

7.5 Concluding remarks on the informal sector and demobilised soldiers

It is likely that apart from those ex-soldiers who go back to their old jobs, many more will find self-employment in the micro and informal sector, or on the land, while a minority, (in which women are well represented), will aim for further education and training.

It is desirable that a voucher system be introduced for the provision of both further education/training, as well as for the basic education and skills which will be required for success in the informal and micro-enterprise sectors. The number of vouchers and the value of each voucher to be supplied, together with the criteria for the provision of vouchers, will be decided upon by the National Commission for the Demobilisation and Reintegration Programme (NCDRP).

It will be the task of the NCDRP, the Ministry of Trade and Industry, and the Ministry of Education, to persuade the various existing education and training providers, and new providers, to accept ex-soldiers for education/training. New providers are emphasised for two reasons. Firstly, a few large enterprises may be persuaded to allow the use of their existing training facilities. It is believed that some enterprises (large and small) may be persuaded to allow part of their premises and equipment to be so used, either in out-of-working-time periods, or perhaps even during working hours, depending on the type of production etc. In addition it may be necessary, in some cases, to allow for a voucher to be divided between the provider of premises/equipment, and the provider of instruction. In some trades, for example, auto-mechanics, a garage owner may be willing to allow an ex-soldier to work as an unpaid trainee or helper. In the after work period, formal instruction could be provided to the trainee in school halls, community centres, etc by freelance teachers, drawn from the regular teaching staff/service,

[1] See: pp.4,5, PID 10351, The World Bank, op.cit.

institutions etc., as well as from among the ranks of the particularly skilled and educated in paid employment, or self-employment, e.g. in firms, the civil service etc. Flexibility in seeking solutions to practical problems will be required by all the actors identified above.

For those trainees that have a strong determination to succeed as proprietors in the micro and informal sectors, and for those that have their own assets (land, in particular), it is suggested that courses in basic business operations, including how to market a product be provided as part of the instruction package. An outline of a technical assistance programme, addressing the points made above, is presented in Part II of this IHRD study. Another technical assistance programme focuses on capacity building of disabled ex-soldiers in the context of the crash programme.

8. Tertiary level workers, the university, and the civil service

8.1 Tertiary level workers: shortage or surplus?

The number of graduates from the University of Asmara between 1996 and 2001 is illustrated below. Table 8.1 shows in detail those that have gained first degrees.

Table 8.1: Output of University

	1996	1997	1998	1999	2000	2001
Degree	423	402	325	554	371	595
Diploma & Certif.	95	116	125	239	282	318
TOTAL	518	518	450	793	653	913

Source: 1996-1999, University of Asmara, 30th Commencement, Sept. 23, 2000; 2000-2001, and A Proposal for the limited restructuring of the EHRDP, PCU of the University of Asmara.

In 1996, the Government of Eritrea estimated that there were 1686 vacancies in the civil service, of which about 600 could be filled by foreign recruitment, and the remainder through output from the University[1] as shown in table 8.2 below. These figures excluded the Ministry of Defence, the Ministry of the Interior, and the six regional administrations. Some 500 post graduate students would be sent for training abroad, since facilities were not available at the University; subsequently the postgraduate student number was increased to 760.[2]

[1] See: p.2, The World Bank, PIC 5207, op.cit.
[2] See: p.25, PCU paper, op.cit.

Table 8.2: UoA produced skilled manpower, degree graduates

Field of specialization	Year					
	1998	1999	2000	NS 2000	TOTAL	Beneficiaries*
Animal science		20	14	11	45	MOA
Marine biology		14	6	10	30	MOF
Plant science	25	26	17	15	83	MOA/MLWE
Soil & water cons.	26	16	13	12	67	MOA/MOLWE
Archaeology				10	10	MOL/MOT/UOA
English	30	40	36	27	133	MOE/MOI
Geography		6	26	17	49	MOE/MOL/WF/MOL/MOA
History		1	2	9	12	MOE/MOT/MOFA
Law	27	36	18	15	96	MOJ/MOLHW/SNA
Journalism			2	8	10	MOI/ALL
Political science			2	16	18	MOFA
Sociology & anth	2	32	11	10	55	MOLHW/MOH
Statistics						
Accounting	44	87	35	18	184	MPF/MITO/BANKS/ALL
Economics	36	55	31	19	141	MOF/MOTI/ALL
Management	35	105	30	19	189	MOF/MOTI/ALL
Educational adm.		2		14	16	MOE/MOLHW
Educational psy.						
Biology SST						
Chemistry SST			1	5	6	MOE
Maths SST			1	8	9	MOE
Physics SST			1	5	6	MOE
English SST				6	6	MOE
Geography SST				8	8	MOE
History SST				10	10	MOE
Public health			28	20	48	MOH
Biology	25	26	17	10	78	MOE/MOH/MOF
Chemistry	35	28	16	13	92	MOE/MOH/MOEM
Geology		3	22	18	43	MOEM/MOPW/MOIA
Mathematics	37	36	24	8	105	MOE/NSO/ALL
Physics	22	15	17	12	66	MOE/MOEM/ALL
TOTAL	**344**	**548**	**371**	**362**	**1625**	

* NS = National/Internship Service
Beneficiaries are the various Ministries.
Source: EHRDP, op.cit.

Many experts have been recruited, 320 Eritreans expelled from Ethiopia, returnees etc. and 257 foreign experts as shown in table 8.3 below.

Table 8.3: Recruitment: Internal, External, Experts as of December 2000

SN	Ministry/Institution	Internally recruited	Foreign experts (December 2000)	TOTAL
1	Education	196	132	328
2	Agriculture	27	25*	52
3	Fisheries	4	4	8
4	Health	25	6	31
5	Labour & human w.	3	3	6
6	Land water & env.	4	3	7
7	Public works	1	9	10
8	Tourism	2	4	6
9	Trade & industry	6	6	12
10	Local government		6	6
11	Finance & financial sec	12		12
12	Justice	2		2
13	Information	2		2
14	Transport & comm	13		13
15	Energy & mines			
16	Foreign affairs			
17	University of Asmara	21	59	80
18	Office of the President	2		2
	TOTAL	**320**	**257**	**577**

* 24 of these are recruited by the tripartite agreement between the Government of Eritrea, Government of Indian and FAO.
Source: EHRDP, op.cit.

No data exists on the number of vacancies in manufacturing, construction, the services sector and public utilities, but in 1997, large enterprises (with over 20 workers) in these sectors employed about 640 workers with post-secondary/university qualifications.[1]

Since 1996, the supply of tertiary manpower from the University, shown in table 8.1 above, amounted to 3,845 first degree, diploma and certificate graduates in the 1996-2001 period. To this number should be added about 100 technical diploma holders graduating from Pavoni Technical Institute from 1999, and in the near future a similar number from the Don Boseo Technical Institute. A third technical institute is under construction in Massawa.

Table 8.4 below illustrates data on university students who were completing their courses in 2001.

[1] See: p62-63, Tracer Enterprise Surveys.

Table 8.4: Students completing their degree programmes in July 2001

Fields of specialization	Degree	Diploma	Certificate
Animal science	19		
Marine biology	13		
Plant science	15		
Soil & water cons.	17		
Archaeology	11		
English	14		
Geography	43		
History	13		
Law	22		
Journalism	10		
Political science	9		16
Statistics	30		
Sociology & anth	14		
Accounting	33		16
Economics	22		26
Management	18		
Public administration	13		107
Library & Inf. Studies			27
Educational adm.	16		
Educational psy.	10		
Biology SST	18		
Chemistry SST	17		
Maths SST	12	18	
Physics SST	10		
English SST	19	26	
Geography SST	16	39	
History SST	32	36	
Electrical engineering	32		
Civil engineering	42		
Mechanical engineering	23		
Public health	21		
MLT		10	
Biology	21		
Chemistry	25		
Geology	22		
Mathematics	20		
Physics	14		
TOTAL	595	129	189

Source: EHRDP, op.cit.

The major employers of first-degree graduates in the civil service are the Ministry of Education, the Ministry of Health and the Ministry of Agriculture; at the post graduate degree level, the major employers are the same ministries and the University.

It is desirable to bring together fragments of information shown above, namely, the supply of tertiary educated skills amounts to about 4,000 (1996-2001); the level of known civil service vacancies about 1,700 in 1996; the total size of tertiary level staff in the directly productive sectors (in 1996) about 640; and an unknown number of vacancies, staff needs etc in the security services and regional administrations. From this information it is difficult to know whether there is a surplus or shortage of employees with tertiary level education. However, assuming there were 640 staff vacancies in the directly productive sectors in 1996 (i.e. the same number as were

then employed), together with 1,700 staff vacancies in the civil service (in 1996), this would bring the total vacancies up to 2,340 in 1996. But the supply of people with tertiary level skills is about 4,000 in 2001. Could the security services and regional administrations, and the small-scale sectors of the economy (enterprises with less than 20 employees), have provided employment for the difference between vacancy numbers and supply? Some 1,500 people with tertiary level education are employed elsewhere.

But since about 1,100 people with tertiary level education (from the University, Pavoni, Don Bosco) will join the labour force each year, it is difficulty to conclude that there is a serious shortage of skills i.e. post graduate skills, at this tertiary level of education. Above this level there is a shortage of highly specialised skills, but the solution of this shortage seems to be well in hand.

8.2 A possible brain drain

In the civil service, first degree graduates start at a salary of about US$150 per month and at the university, lecturers, assistant professors, associate professors, and professors start at US $200, US$250, US$315, US$360 and US$500 per month respectively, with the top salary being US$600/month. In 1996, as table 8.5 shows, the maximum salary in the private sector amounted to approximately US $360 per month.

Table 8.5: Monthly salary levels by economic sector (average values – in Birrs)

Economic sector	Large enterprises			Small enterprises		
	Average	Highest	Lowest	Average	Highest	Lowest
Textile	380	1502	215	293	553	203
Food	439	1461	259*	201*	246	158
Building	597	2072	292	636	1305	418
Wood & ironworks	607	1770	251	448	725	285
Chemicals	839	2302	284	235	360	135
Mineral products	469	1685	273	-	-	-
Electricity	430	435	429	-	-	-
Leather & shoes	384	1174	199	250	650	15
Beverages & alcohol	565	1502	295	-	-	-
Paper & printing	508	1186	224	48	458	246
Vehicle repairs, garages	638	1531	213	593	1140	323
Others	574	1767	303	-	-	-
All sectors	**551**	**1714**	**259**	**414**	**754**	**272**

Source: Tracer/Enterprise Surveys, op.cit.

In general, university graduates do not have tied employment, other than the requirement for both male and female graduates to do one-year national service. After having accepted civil service employment, it is reportedly difficult to leave. For graduates studying abroad on postgraduate programmes, there is a commitment to serve in the sponsoring government department for two years for every one-year of study.

Income tax rates range from 17% at the 1200 NKF/month level in steps to 38% at over 8,000 NKF/month level (In 2001, at the time of the survey, the exchange rate was about 10 NKF per

US dollar). In addition, there have been surcharges on income since the start of the conflict with Ethiopia.

There is also a large Eritrean Diaspora in the EU, US, and the Middle East, including Saudi Arabia. Very many Eritreans have relatives in these countries, and about half of the population speaks Arabic. The Eritrean Diaspora has supplied a considerable flow of finance foreign exchange as a result of the conflict, estimated at US$400 m in 1999.[1]

With about 1100 new graduates entering the labour market each year, and with teaching salaries in the range of US$100 to $600 per month, there is considerable risk of a significant brain drain, especially from the schools, university and civil service, and also from those that choose not to work in these institutions. Despite the recognition by the President of the University and the emphasis being given on the necessity of avoiding brain drain,[2] this can be expected to increase in the near future. Significant increases in teaching salaries should not be expected in a country with a per capita income of US$200/per year.

It should be emphasised that it is not at all obvious that a Brain Drain from Eritrea is to be deplored.

8.3 The University

8.3.1 Flexibility and quality

The mission statement of the University of Asmara emphasises the discovery, generation and dissemination of knowledge in the service of society. Both in its mission statement and in the statement of its President, emphasis is placed also on serving the needs of Eritrea. It was granted a Government Charter in 1992 guaranteeing its autonomy and academic freedom.

One major problem for the University of Asmara, as for universities the world over, is resource allocation between discovery/generation of knowledge on one hand and dissemination on the other. It has been successful in emphasising dissemination of knowledge, as demonstrated by the increase of its output from 1996 to 2001. Moreover, it has done so by being flexible, since over the years the proportion of certificate and diploma students has increased. However, from another view point, it has become less flexible since the number of evening students has steadily fallen since 1991/1992, from 1,259 to 130 in 1998/99, to nil in 2001.[3] Its expansion of output has come primarily through increasing the number of subjects offered, hence the increase in the number of staff over 1991/1992 – 1998/99 from 62 to 223 respectively. But over this same period, the ratio of all students to academic staff fell from 48:1 to 18:1, and for full time students only the ratio fell from 27:1 to 17:1, suggesting that the quality of instruction has increased over the period, since staff deal with fewer students on average.

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1 Economist Intelligent Unit Report.

2 See: volume V – Plenary, World Conference on Higher Education, Statement by Wolde-Abyisak, President, University of Asmara, UNESCO, October 1998. Available on UNESCO WebSite. We would add, however, that analysis of the economics of the brain drain is a complex matter and beyond the scope of this UNIDO Consultant's Report. See: „The International flow of human capital", by Herbert G. Gruel and A.D. Scott, American Economic Review, May 1966; „A measurement of demand for Professional Engineers", British Journal of Industrial Relations, by V.A. Richardson, March 1969. It would take into account, for example, that Eritreans in the Diaspora contributed US$400 million to that country's defense effort in 1999.

3 Commencement, op.cit. for 1991/92-1998/99; Communication from the University for 2001.

This increase in quality, however, appears to have come at the price of a loss of flexibility. In the teaching service, salaries are tied to formal qualification: the link between certificate, diploma, bachelors degree, masters degree etc is rigid – indeed as the experience in many countries has shown, there is great resistance to reward teaching performance in contrast to teaching qualification, with increased incomes. Yet, without access to part-time courses, primary and secondary school teachers are unlikely to increase their career prospects and presumably their performance, i.e. quality of their instruction.

8.3.2 Research, business and development services

The University emphasises the discovery and generation of knowledge, as well as its dissemination. So far it has given priority to the latter, as undoubtedly this fits in with the current priorities of Eritrea.

But in spite of the emphasis on research of relevance to Eritrea's problems, including industrial problems, this research work is seen in an academic setting – necessarily, since it is based in a university and carried out by university staff, using university criteria. The essential point is that it is not demand led. It does not respond to market signals. It is not cost-effective, flexible and incentive driven. Undoubtedly the university, as an institution can make a contribution by developing relevant research. But can an institution, constrained by its major activity – instruction – and comfortable in its position as a monopoly supplier of services to a market where access is rational by academic merit, change to respond to market demand? This immediate market demand will not be for research, but for development and business/professional services. The market for these services will be subject to commercial discipline: where a service provider does not perform, it goes out of business. There is competition – not to publish or perish as in this and many universities – but to satisfy the private sector customer. For example, the customer expects services to be delivered in contract specified time – not in academic time. The customer – not a committee – usually expects individual satisfaction; part of this satisfaction may be that results are kept secret. Moreover, the customer usually needs to be sought out and convinced: professional and business services have to be marketed and sold. However, a university is not a professional and business services firm.

What the University does have is the largest pool of talent in Eritrea. Some of this talent has the capability and personality to provide business and professional services on an individual basis – as partners and associates to Eritrea's still small and weak domestic service providers. These will have to confront the competition from foreign firms as Eritrea's export take-off gets underway. What is required is not merely that the University permits individual academics to offer professional and business services as individuals i.e. individual consultants, but that the University promotes what its academics can provide on an individual basis, taking full professional responsibility. To give some examples: the owner of an enterprise producing garments decides to enter into an international subcontract with an intermediary to assemble and supply a large order and the owner may well need legal advice. One source might be from an academic lawyer. Maybe services could be obtained from an Eritrean lawyer in private practice, but international subcontracting in the garment industry is a fairly specialised activity. The academic lawyer is unlikely to be able to give competent advice without special preparation; maybe taking one or two modules in a legal course on the internet, almost certainly looking at past legal decisions in this area, the past decisions of the International Chamber of Commerce, the advice of WTO, UNCTAD, the World Bank etc on these matters. It will require considerable preparation and perhaps expense on top of the base of existing but non-specialist legal talent.

Such an academic would be encouraged to do all these things by direct incentives. Such activity is unlikely to result in something which could be turned into an academic paper. Similar examples can be found throughout the range of professional disciplines.

On the above remarks regarding the brain drain, it is anticipated that this would happen in the near future. Its impact on the academic staff could become acute: the country's resources make significant salary increases difficult. Moreover the four or six years during which the academic is in tied employment soon passes. Research on the brain drain has shown that it is not the unemployed professional who emigrates. It is the employed, very often the most competent.[1]

The burden of these remarks, and recommendations, is not to put in a special plea that academics be allowed to undertake individual consultancy. It is to emphasise two points: the power of incentives, and the necessity to make full use of Eritrea's existing human resources as it confronts the problems and opportunities offered by the export of manufactures in general, and the crash programme for export take-off, in particular.

8.4 Specialised tertiary level skills

These are skills which are built usually on the basis of a bachelor's degree or on many years experience or both in specialised areas. Some examples would include: international subcontracting built on a first law degree plus some years of experience on domestic subcontracting; international marketing built either on a first degree in marketing or many years of experience in domestic marketing; marketing built on a first degree in business management or economics or several years experience in the more subordinate positions of a sales organisation/department plus formal or informal on the job training; laboratory chemist in many fields, built on a first degree or diploma in chemistry plus experience of the material or process being tested and so on.

The question arises: how can people with a basic education for the specialised task at hand up-grade themselves? There are many avenues through which this can be accomplished. If there are personal incentives for upgrading, it can be by full time or part-time education; distance learning e.g. correspondence courses, or lectures and specialised notes via the Internet etc. It may be by leaving work for 3 months, 6 months, a year, three years etc and paying the required tuition fees and living expenses. Any choice made depends on the incentives and disincentives, i.e. the personal costs and benefits. Employers can influence choice; so can the state. Both can provide incentives and disincentives. Employers can bear all or part of total costs, promotion etc and their converse. The state can provide subsidies and levy taxes.

Where employers wish to have existing staff become more competent, they have to provide incentives. In activities, better qualifications may be a pre-requisite for competence, but competence is not the same thing as performance and, it is performance that all employers, particularly private sector employers require. Many government employees, the world over, are well qualified and potentially competent. But the dismissal of government employees rarely occurs for reasons of lack of performance; the incentives and disincentives are usually weak.

[1] See: Harry G. Johnson, „The Economics of the Brain Drain, the Canadian Case", Minerva, Spring 1965, and W. Lee Hansen, "The economies of scientific engineering manpower", The Journal of Human Resources, Spring, 1967. A major part of the discussion among economists has taken place in the pages of Minerva, 1965 to 1968.

Private sector employers are more willing to bear the costs of specialised training where they have confidence that the benefits of this specialised training will stay with their firms. Indeed, the greater this confidence, the larger the share of the costs they will be willing to bear. Hence, in small firms, the preference for the family member. Or alternatively, the employer may reckon that the specialised training can be of use only to his/her own firm, and so may be quite willing to bear a high share of the costs. Conversely, if the specialised training is widely used, say across the whole industrial sector, the employer may reckon that little or no benefit may accrue to his/her own firm.

Where specialised training is useful to firms only in a particular sub-sector, it may be sensible for these firms to finance a significant proportion of a training course collectively.[1] The World Bank has identified those key tannery jobs where upgrading is required: production supervisor, lab chemist and equipment maintenance engineers. A mix of formal classroom instruction, plus on-the-job training within the enterprises would be required. The Bank also recognised the need for a basic understanding of the tannery process among the majority of semi-skilled tannery workers; this could best be provided, cost-effectively, by upgrading the capabilities of laboratory chemists, production supervisors and maintenance engineers. For these reasons, a tannery training programme is recommended in Part-II of this study is deemed appropriate, the costs of which should be jointly borne by tannery owners and the World Bank as well as its cost-sharing grant scheme. In addition, it is essential that this programme should take place as part of a wider programme of public education via the media, radio etc., designed to improve the quality of raw hides and skins.

It is also essential that the programme takes place in a wider commercially oriented, capital investment programme aimed a strengthening the tannery industry – all 18 tanneries. This is because owners will benefit directly from the training programme; re-equipment of the 18 tanneries will identify new technology etc. which inevitably implies training. Since plant level consulting will be required in addition to training, the training component could best be provided, probably, as part of consulting assignments which will support the capital investment programme.

8.5 Sharing of the costs of specialised education/training

The joint sharing of costs mentioned above is justified because private sector tannery owners directly benefit. It would be unjustified for the Government to bear the full cost since the social return to alternative education investment, e.g. in primary education is almost certainly higher. A similar justification can be found in the suggestion for an institute for business and industrial services, which is oriented towards providing education and training, particularly to owners and enterprise managers, in general, across sectors of manufacturing, and is demand-led, i.e. responsive to what they are willing to pay for.

It should be noted that in branches of the private sector that sell principally to the domestic market, but with the capacity to sell to extend markets, premium prices can be charged by manufacturers for high quality knitted garments, clothing, shoes, and leather.

For other manufacturing sub-sectors, at the present time, suggestions have been made regarding how the up-grading of skills should be encouraged over time, with the Ministry of Trade and

[1] See: p.108-109, Export Development Strategy, op.cit.

Industry playing a key role as persuader – and in the de-bottlenecking of rigid educational and training structures, the introduction of incentives etc. For example, in 1996, the Tracer/Enterprise Survey indicated that employers when asked about shortages, found the most serious shortages among auto-mechanics;[1] this was despite unemployment of TS graduates reaching 12 per cent in this area of skills. The solution here is for these employers to raise wages, or to encourage some of their employees to train as auto mechanics, perhaps by paying part of the tuition costs for out-of-work-time training. Auto-mechanics is a highly portable skill in which the competent can move to the competition and it also offers the possibility of self-employment.

The State, however, should not finance special courses in auto mechanics and similar areas at the cost of fewer children in primary and secondary schools. To put the issue in another way, direct subsidies to training in these sectors are no doubt justified, but far more justified is extension of education at the primary and secondary school level. An exception is for the special case of demobilised soldiers, particularly disabled ex-soldiers; the social rates of return in this case probably justify such investment (see Part II of this study for special interventions targeted for such groups).

8.6 Flexibility in the civil service

It should also be noted that in addition to the pool of specialised talent at the post-graduate level at the University, there is another large pool of talent within the civil service itself. There are many officers with post-graduate qualifications and/or specialised expertise and experience. It is fully recognised that civil service regulations do not permit these officers to undertake assignments outside of their official duties, and it would be highly improper for these officers to offer paid advisory services – on an individual basis – to the private sector. Nevertheless, to the extent that Eritrea suffers from a shortage of specialised expertise, these specialist officers should be free to offer their expertise in teaching assignments for which they could be given additional allowances (in particular, to the institute of business and industrial studies). It should be emphasised that it is not cost-effective for Eritrea not to use whatever resources it has to the maximum: whether human resources, or physical resources at the University or technical institutes and schools. Moreover, it seems to be accepted in the Ministry of Education that teachers can accept tuition fees for evening classes at secondary schools, so that there should be no issue, in principle, why this should not be extended to civil servants who are invited to teach at high levels. Lastly, attention has been drawn to the risks of the brain drain. Flexibility in civil service regulations governing teaching assignments in out-of-working-time arrangements, might provide that small additional income to government officers, which might – at the margin – counter some of the attractions of becoming part of the brain drain.

In most developed and developing countries, teaching assignments are permitted by the rules governing employment outside the civil service.

[1] See P.65, Tracer/Enterprise, op.cit.

9. Uncertainty, prices and IHRD policy

As emphasised elsewhere in this study, the circumstances surrounding the private sector in Eritrea especially the manufacturing sector, face triply magnified uncertainty. How should IHRD policy take account of this uncertainty? In facing and dealing with uncertainty the role of information is critical. Any increase in information about the factors causing uncertainty will tend to reduce it. The second critical factor is flexibility – among enterprises, individuals, institutions, ministries etc; to be flexible is the rational response to change brought about by uncertainty.

9.1 Information

A significant amount of information is provided by the price of a product or service, including labour services i.e. work – whether done by one man firms (e.g. barber shops) or by the price of labour in firms: how much private firms pay various types of workers: unskilled, semi-skilled, skilled, technicians, engineers, various types of sales personnel, specialised managers and so on. Normally, in the private sector, when there is a shortage, the price tends to rise. Thus, if a certain type of technicians is hard to find, firms tend to raise wages in the hope that this will attract the same type of technicians working for other firms to leave and to join their own firms. They may also reckon that this increase will tend to attract those skilled workers who are unemployed or considering the attractions of alternatives (say, careers via the university), to seek employment with them. If firms make the fact that they are increasing the wage for a particular type of skill public, this fact will tend to encourage various workers to acquire this skill.

A major task of many ministries in Eritrea is to create and foster an enabling environment for the growth of the private sector. Part of this enabling environment is to ensure that adequate skills are available. Adequate skills will tend to become available if sufficient numbers of workers acquire the required skills. Thus, in fulfilling their tasks on an enabling environment, a central requirement is the collection of information about wage rates, and the movement of these wage rates, for various skills. There are various means by which ministries can obtain information about wage rates, about current vacancies, about vacancies in the near future etc. and also, about surplus in particular skills – i.e. unemployment in various skill categories. This is best done by setting up a relatively simple labour market information system (LMIS) to provide basic information on a periodic basis on wages, labour demand and employment opportunities. Similarly enterprise surveys and guidance by employer-ministry export panels can provide information about the current market situation and about the expected situation in the immediate future.

This type of short-term monitoring can be used for predicting the demand for various types of workers – skilled, semi-skilled etc and can also be used to identify specific skills and qualifications of certain categories of workers. Short-term forecasts for skilled workers are provided in the following chapter. It should be remarked that it is necessary to continuously update such forecasts, since they rapidly become obsolete. It should also be noted that it is not merely a question of collecting and analysing information, updating it periodically through short-term monitoring etc. Such labour market information needs to be disseminated among those who can use it: potential employees and employers, the careers officers of technical schools and training and personnel managers, institutions etc.

9.2 Flexibility

Flexibility is the ability to react to changing circumstances. As remarked above, workers – including skilled workers and technicians in Eritrea – can react by moving from one firm to another if offered better wages, or working conditions e.g. holidays, training opportunities, health benefits etc. Similarly, the Tracer Survey found that some unemployed skilled workers would be attracted by better wage rates. But workers without the required skills, even if provided with necessary information, are seemingly not well placed to react in Eritrea. This is because if a worker is currently employed, facilities do not seem to exist at present whereby the worker's capabilities can be strengthened.

9.3 Lack of flexibility in institutions

It is striking that many secondary schools in Eritrea operate part-time classes where workers pay for "general education" The technical schools and institutes, and the University, which provide full-time specialised education and have the equipment required for specialised training, do not offer much in this area. Moreover, some workers who are currently unemployed, or potential students who have failed to gain entry through the highly competitive exam to enter these institutions, do not have the possibility of obtaining a measure of skill by paying for and obtaining instruction in skills which may be urgently required by the private sector. Thus, it is not only workers or potential workers in Eritrea who need to be flexible. Flexibility also needs to extend to the particular institutions which provide professional, technician and other skills.

9.4 Employers flexibility

Employers also need to be flexible. Many employers have complained in various surveys about lack of skilled workers, or of having employees with inadequate skills. Are they prepared to share part of the costs of part-time training? If an employee is prepared to be trained or have skills enhanced in the evening, or at weekends, will the employer be flexible enough to pay the training costs? Are employers prepared to increase wages to attract a particular type of skilled workers? When an employer faces a new product market, rather than the old one, flexibility will be very important for success. Could the problem be that managers may have become accustomed to working under the old central planning system of Ethiopia? Sales were guaranteed, perhaps even such matters as the training of workers was organised by the State, where indeed the system governing transactions was planned. Owners and managers may need to become more aware that in a market based economy incentives and flexibility, i.e. the ability to react to change, are crucial imperatives.

Furthermore, managers need to be flexible enough to recognise that they themselves may need special education and training. Certain decisions which they made in the past themselves may now – in the changed market circumstances – require skills which they do not have. In such circumstances, e.g. in the decision to sell their products in new markets, say in East Africa or in Europe, they may need either to buy these skills in from business services providers, i.e. consulting firms, or to develop the required skills themselves. But since they are operating their firms on a daily basis, the opportunity to learn new skills would need to be provided through short (2-3 day) intensive training courses, or part-time study in the evening, or at weekends.

9.5 Information an element of IHRD policy

Information and flexibility are two of the key mechanisms that lie at the heart of an IHRD policy. Whereas in the past, the main task of certain ministries was to command, operate and plan a range of enterprises, changed government policies now emphasise the creation of an enabling environment in which the private sector does the commanding, and operating. An important part of that enabling environment is the collection, analysis and dissemination of information about the state of the labour market for a variety of skills and the fostering of flexibility and of the institutional changes which make flexibility possible. A major aim of IHRD policy must be to continuously push education and training systems in directions where they become more flexible and responsive to the labour market for skilled manpower of various types. The provision of information about the current state of the labour market, and expected short-term change in market conditions will be helpful to employers planning expansion or the creation of new enterprises and in their reaction to and perception of changes in product markets. Such information will also be essential to the providers of education and training facilities. In Eritrea, these providers face a market – a market for specialised education and training – where extreme rationing occurs. To the extent possible, flexibility must be built into this market/system.

9.6 Special provisions

Where flexibility proves to be limited and when the education system slowly reacts to change, as appears to be the case in Eritrea, government ministries whose prime responsibility is the creation and maintenance of an enabling environment for the private sector, have a duty to step in and to persuade, and in special cases, make short-term provision for specialised education and training. These provisions should be regarded as temporary: as the private sector matures and grows in confidence it can be expected, hopefully, that the education and training system will itself become more responsive to change. In addition, any necessary special provisions such as the operation of an Eritrean institute of business and industrial studies (EBIS) and a multipurpose training school (MTS) will be made by the private sector itself.

The types of special and perhaps temporary provisions envisaged are outlined in programme concepts described in the Part II of this IHRD study. Thus, the foundation of the Eritrean institute for business and industrial services (EIBIS) is essential to provide among other things, business education and training to owners, managers etc. This is because it is in this area of specialised education and training that there is the greatest need, and it is in this area that the greatest benefits will flow to Eritrea. It is envisaged that in due course the EIBIS will become largely self-financing.

It is also deemed necessary to establish a multipurpose training school (MTS), where workers will be trained/retrained in the efficient operation of modern industrial sewing and knitting machines. This suggestion is made because in the relatively near future some 500 to 5,000 new workers will be required with these skills. But bearing in mind the essential need to be flexible and cost effective, it is believed that the MTS should be so designed in such a way that is say, 4 or 5 years time, it can find alternative use as industrial premises.

Another issue that should be considered relates to the skills required in the manufacture of better quality products destined principally for domestic markets. The value added by producing goods of higher rather than lower quality can result in a selling price that the ordinary Eritrean

consumer cannot afford because of low purchasing power. It is always easy to recommend that the quality of a product or service should be increased; invariably such an increase requires the producer to install better equipment and/or to train employees to operate equipment more effectively. It is up to the producer to decide whether these two increases in costs can be offset by sales prices. The intended market in Eritrea is based on a per capita income of about US$200 per year. It can be rational from an economic viewpoint for a producer to supply a low-income market with less sophisticated goods than to supply better high quality goods that consumers cannot afford.

10. Need versus demand

It is indicated earlier in this analysis that some skepticism should be shown when employers perceive shortage of skilled workers. It may be that they prefer to reduce their costs by employing workers, who become productive in a shorter period of time, as shown in the Tracer/Enterprise surveys, or reduce their costs by adjusting wages downwards in selecting already productive workers who are unemployed and competing for employment.

10.1 Effective demand

There may be other reasons in addition to the above. This reason can be found in considering the difference between 'need' and 'demand', or more precisely effective demand. During the nineteenth century, after the techniques of gas liquefaction had been discovered, there was recognition of the need for liquid air by the medical profession. Unfortunately no one was prepared to pay for liquid air and the relatively capital intensive process required to produce it. In short the need was not an effective demand. It was only towards the end of the century when the steel industry started demanding tonnage quantities of oxygen that gas liquefaction took off – and the medical profession was able to buy the relatively small quantities required for its use.

In the shoe industry in Eritrea, shoe manufacturers perceive a need for all sorts of specialised skills e.g. marketing skills, shoe designing skills, technological skills in choosing the best leather for a particular design etc. The situation is much the same in the woven garments industry. With better design, it is clear that producers of both shoes and woven garments would get better prices for their goods. The question is how should the Ministry of Trade and Industry (MTI) react to a shortage of a particular skill or skills? Should the Ministry send student abroad to be qualified in various aspects of shoe and garment production? Should they be abroad for 2 or 3 years and should they also specialise in export marketing? On returning to Eritrea, will they be highly skilled public servants? Would their advice be taken seriously? For the manufacturer, taking advice based on experiences elsewhere would entail investments in production process, including procurement of new machines or perhaps the construction of a larger factory. Therefore, until someone comes along who will be in a position to share in the financial risk and can guarantee some access to export markets, the manufacturer will continue to produce to meet the basic priority needs of the Eritreans.

10.2 Priority needs

There is also the important issue of the priority to be given to the various needs identified by the manufacturer. The question is which has the higher priority – design or export marketing? Indeed, in these two product markets can they be considered separately? At the top end of the market, design and marketing go together, e.g. Gucci in shoes, Channel in garments. Even lower down the market the same holds, for example, Bally in shoes, Benetton in garments.

How can this need be transformed into effective demand? In the example given, a supply of liquid air became available to the medical profession as a by-product of the massive demand from the steel industry. This massive demand prompted the construction of factories to supply the steel industry, and the need of the medical world for liquid air was transformed into effective demand. Therefore, a certain threshold of needs should arise so that it can be transformed into

effective demand. This demand will be met eventually by the establishment of services firms which have the capabilities to provide this advice.

One alternative to the above is to obtain these important skills – export marketing, design, choice of materials, quality standards for a particular market segment etc as part of an international subcontract package. When manufacturers gain confidence and become experienced in supplying particular export product markets, they are usually in a much better position to accept, reject or modify the specifics of detailed advice offered to them by specialised third parties. Indeed, manufacturers may feel sufficiently confident enough to purchase this advice from Eritrean firms offering this specialist advice. If they are sufficiently confident and operate on a large enough scale they may deem it worth-while to employ a specialist in-house, as a staff member, or more likely to arrange a member of the family to have specialist training. The manufacturers will be in a position also to move up the value chain, as they gain experience and the confidence of foreign buyers: initially with choice of some materials, including the domestic sourcing of inputs, design modification etc. Later, a few of the most successful firms may well decide to devote part of their operations to product lines that they market in their own name, through their own efforts.

10.3 Other specialised needs

The product lines identified above were chosen because they represent sectors with higher potential for spear-heading Eritrea's drive into high-priced export markets. So too does the manufacture of knitted garments. But these industries also suffer from the constraints which face the whole of Eritrean manufacturing for export markets, namely, equipment that were commissioned over 50 years ago, out of date production techniques, weak management know-how, etc. All of these constraints have their human resource dimensions.

In replacing out of date equipment, skills are required to determine choice of new equipment, as well as in the upgrading of production techniques. For example, in the case of shoes, there are many small workshops, which will have the possibility eventually to be transformed into shoe factories using modern automated flow-line systems that could be viable internationally. Specialist technical skills will be required to do this production planning and the laying down of production facilities.

Management also confronts two specific weaknesses. Many firms have new owners as a result of privatisation, but many of these owners are inexperienced. In addition, where managers of formerly state-owned enterprises have been retained, although their technical abilities are often very impressive, their experience has been gained in production operations in a command economy. Management in a competitive market economy, where even the domestic market is insecure because of competition from imports, is somewhat different. To be sure, these problems are not unique to Eritrea. Central Europe and the countries of the former Soviet Union have similar problems. However, management in Eritrea have a major advantage of operating in a corruption-free environment that is almost unique. A major problem which both types of managers have to face is to know where their weaknesses lie, and to know when to buy-in advisory services that are not available internally to their firms. Many of the most crucial management decisions need specialist knowledge: new types of equipment, new production techniques, new products, new markets, new types of contractual arrangements with suppliers, purchasers, the development of incentive systems, etc.

10.4 Eritrean institute for business and industrial services (EIBIS)

In order to supply some of these missing skills, it is deemed necessary to establish an Eritrean institute for business and industrial services (EIBIS) to be jointly funded by bilateral and/or multilateral development agencies and the Government. Apart from directly supplying specialist training, the institute would also have the following objectives: to promote and foster the growth of domestic firms supplying industrial and commercial services; to commission on a demand-led basis applied research and to disseminate this research and business information generally in printed form, via the Internet, and through mass media.

10.5 The phasing of investment in human capital

Some participants at the IHRD workshop in Asmara held in mid-June 2001 urged the example of Singapore as a useful model which Eritrea might follow. This could be of relevance, up to a point. Singapore has been, above all rational and clear-sighted, not allowing various passing fashions to deter it from its development objectives.

The Government of Singapore has played a vigorous entrepreneurial role in successfully developing its economy. The Government follows the common traits of entrepreneurs: the pursuit of opportunity, determination, the measured taking of risks, and a willingness to innovate.[1] The Government concentrated on building up its infrastructure, developing its human resources, and attracting and gaining the confidence of domestic and foreign investors with innovative and pragmatic policies. Depending on the opportunities, the Government was prepared to invest its scarce resources in strategic industries. It set up the Singapore Development Bank, which was so well run and so successful that in 2001 the majority of its equity shareholding is held by international investors – though the bank remains essentially Singaporean and managed by Singapore nationals. Table 3.1 below summarizes the strategic moves by the Government of Singapore.

Table 10.1: Summary of strategic moves by Singapore

Time frame	Opportunities/problems	Response
2nd half of 1960s	Excess of low-skilled labour, lack of industrial heritage, political uncertainty in Hong Kong and Taiwan over China.	Drew in MNCs which were searching for labour-intensive operation bases.
Late 1960s	Pullout of British military bases, boom in shipping passing Singapore, start of oil exploration in South-East Asia.	Established shipyards, and defence industry, attracted petroleum-related companies.
Late 1970s	Acute labour shortage, low productivity and low value-added.	10-year economic upgrading plan, rapid expansion of technical tertiary education.
Early 1980s	World-recession, non-competitive factories closing down or shifting out.	Pulled in MNCs in new growth industries.
1986 to now	Other NIEs catching up in industrialization and technology development, China, India, Vietnam opening up, economic boom in Asia.	Encourage entrepreneurship, overseas ventures and MNCs to use Singapore as regional hub. Push for R&D and innovation. Economic alliances to capitalise on the boom in Asia.

Source: H.K. Tang and K.T. Yeo (1995), ,Technology, entrepreneurship and national development: lessons from Singapore', International Journal of Technology Management, vol. 10, Nos 7/8, pp.797-814.
Source: Taken from op.56, Kifleyesus, op.cit.

[1] See: p.55, Information technology policy and management in developing countries, by Kifleysus Andemariam, University of Groningen, 1999.

What should be emphasised is that during the 1980s – when the time was ripe – Singapore established nine research institutions, in electronics, information technology and biotechnology all considered fundamental for future economic growth. In 1991 the National Science and Technology Board published the National Technology Plan.[1] In table 3.1 above, the timing for the introduction of new policies was critical. Singapore is free market oriented. Its government is accused by some of being autocratic. Thus for example in the late 1980s it made the decision to move out of cut flowers. Not any old cut flowers – this is Singapore – but out of Orchids – the top end of the cut flower market. The decision was made on the grounds of both labour-productivity – the production is relatively labour intensive – and because orchid growing requires a relatively high quantity of water since the plants require high humidity. So Singapore sold off its orchid plants to foreign buyers and ceased production. It has to be recognised however that this government, considered by others as embodying 'Asian values' in its development policies, can employ senior civil servants and academics at salaries above those ruling in similar areas in the U.K. and other parts of the EU (international job advertisements in various issues of The Economist, first half of 2001). Singapore reckons it needs the best, and it is in a position to effectively demand the best.

In contrast, Hong Kong followed a laissez-faire approach to technological development. It was behind Taiwan (China), South Korea and Singapore. While these countries upgraded their applied research, development and industrial technology, Hong Kong after the opening up of China in 1980 expanded into China to exploit the low-wage advantage based on labour-intensive simple technology that China offered, while at the same time – based on its laissez-faire approach, building up financial and trade enterprises of international class.[2] It should be emphasised that Hong Kong started its export led growth in the early 1960s in an even more simple form of manufacture than garments, textiles and shoes. It started with artificial flowers and toys.[3]

Up to the 1990s, both Brazil and India followed an import substitution strategy for the development of their industries. In contrast, Hong Kong, Singapore, South Korea and Taiwan (China) followed export-led strategies: they learnt how to compete with the outside world[4]. In 1960, India and especially Brazil, had higher per capita incomes than any of the Asian tigers. In 2001, the tigers rank as rich OECD countries, Brazil is middle income, firmly stuck with a host of other developing countries, while India slowly pulls itself out of the ranks of the low-income group of countries as it slowly opens up its markets, frees its entrepreneurs and belatedly profits from its premature investment in information technology – an investment which would almost certainly have brought greater private and social returns if made in primary and secondary education for the many, rather than tertiary/university education for the few.[5]

The fact of the matter is that there is no single best approach to IHRD policy, or to industrial development policy. Countries clearly have a number of possible policy choices. Countries have to identify policies that suit their particular socio-economic, political, and natural endowments, at a particular point in time. As Table 10.1 above show, Singapore was rational in facing the policy

[1] P.56, Kifleysus, op.cit.
[2] P.57, Kifleysus, op.cit.
[3] W. Arthur Lewis, The Industrialization of the British West Indies, Social and Economic Studies, U.C.W.I, 1969 and Economic Development, by W. Arthur Lewis, op.cit.
[4] P.57, Kifleysus, op.cit
[5] Chapter 2, Industrial prospects, productivity and policy issues in major regions, with emphasis on human skills, by Youngil Lim, Industry and Development: Global Report 1992/93, UNIDO, 1993.

choices with which it was confronted in the early 60s, late 60s, late 70s, early 80s and the late 80s to the present time. State intervention has to be well informed, and the free market must be allowed to work; a major task of governments is to remove barriers to the working of the market, whether monopoly – a single supplier or monopoly – a single purchaser. In poor countries, with distorted markets, such as in Eritrea, government has a particular duty to create an enabling environment and to promote activities, which lead to more efficient markets.

11. Industrial human resource – policy options and recommendations

Eritrea's National Economic Policy provides a broad framework for the country's socio-economic development, including, inter alia, human resource development. However, it is desirable for a developing country like Eritrea to define sectoral policies, which will address among other thing, especially in the case of industry, factor correlations such as human resources.

Human resources as a labour force could be defined as a statistical concept comprising demographic characteristic such as total population with its breakdown into economically active population, urban working and rural working population, the unemployed, under employed and the economically active population.

The country's population is estimated at about 3.6 million with an annual growth rate of 2.5%. The active population (15-64 years old) is estimated at 1.8 million of which some 361,500 are in the urban area. It is, however, quite apparent that the labour force does not have the attributes to be classified as advanced or appropriate for a competitive economy because of the level of education, availability of industry specific skills, level of productivity work morale etc. As discussed earlier, one of the major constraints to industrial development is the shortage of skills – from the managerial level to the artisanal level. Technical and marketing skills are also inadequate. The shortage of skills is aggravated by limited training facilities, the dual nature of technology in the formal and informal sectors, production patterns in rural and urban areas, as well as the structure of the education system.

An IHRD policy should therefore recognise these shortcomings and address them by

- ☛ Introducing training initiatives for skilled professionals, industrial engineers, technologists and technicians;
- ☛ Ensuring that on the job training is an integral part of the manpower element of all existing and potential industries;
- ☛ Promoting the development of engineering industries and apprenticeship system for technical training;
- ☛ Introducing measures to motivate workers and establish meaningful career development paths within each factory/industry/firm;
- ☛ Ensuring that a critical mass of both professional and highly skilled labour force is available, emphasis should be given to vocational and technical training. In this regard it is also desirable that for the definition of any educational policy or plan, industry should be consulted and be involved in developing a board base skills development curricula.

11.1 Policy options: technology, labour vs capital-intensive

To ensure optimum utilisation of the labour force, the Government over the years have opted for labour-intensive technology. However, in a competitive global economy, the preferred approach is to modernise production patterns and processes, which will involve replacing labour-intensive technologies with capital-intensive technologies. With the threat of HIV/AIDS in Sub-Saharan

African, industries in the sub-region are indeed opting for capital-intensive production while at the same time opening the way for specialised consultancy and related services.

Given the high unemployment rate in Eritrea, the low level of education and high illiteracy rate, the economic and social implications of capital-intensive technology should be carefully studied and measures should be in place to link large capital-intensive industries with SMEs throughout the country.

11.2 Legal framework and collective organisation of the labour force

What happens in the work place actually determines productivity. Limited understanding of workers rights, autocratic management styles, poor work conditions, work organisation and limited forum or channel through which workers can expose their fears or frustrations, as well as ambitions could impact negatively on productivity. In short there should be clearly defined laws reflecting the interests of the employers and employees.

During the conduct of the IHRD survey, a new labour law was being defined. The Draft that was submitted for enactment by the legislative arm of government is believed to contain positive features that could revitalise labour productivity, the organisation of the labour force and management responsibilities.

In today's global economy, the labour force is not confined to one country per se. Highly skilled labour, in particular, is mobile and the competitiveness for such labour among countries is on the upsurge. Germany and Great Britain are encouraging the recruitment of highly skilled labour in IT and other disciplines from developing countries – thus perpetuating the brain drain. The shortage of critical skills will always encourage the import of skills from elsewhere. In Eritrea, certain types of skills are being imported. Measures should be in place to encourage upward mobility for indigenous workers within firms.

11.3 Central human resource agency

In their quest for a self-reliant and self-sustaining socio-economic system, African countries adopted the Lagos Plan of Action in 1980. Among others, the Lagos Plan of Action foresees the establishment of a central body in each country that would be responsible for human resources planning, development and utilisation with definite strategic measures and appropriate institutions at the sectoral and sub-sectoral levels. The objectives and functions of the central human resource body were subsequently outlined in the Handbook for Manpower Planning in Africa published by the United Nations Economic Commission for Africa.[1] In general the central planning body is expected to carry out the following functions.

- ☛ Initiate, formulate and administer manpower policies within the framework of national development policies;
- ☛ Identify, analyse and specify manpower development and utilisation problems, objectives and alternative programme and strategies;
- ☛ Coordinate, monitor and evaluate the execution of adopted measures to ensure optimum results and consistency; and

[1] UNECA, "Handbook for Manpower Planning in Africa", ECA/PHSD/HRP/89/26

- ☛ Prepare manpower development and utilisation plans that would synchronise labour supply and demand targets in conformity with overall national development objectives.

The idea of having such a body in Eritrea was discussed with stakeholders all of whom subscribed to its establishment.

It is recommended that the central organ be composed of representatives of government, business, including labour, management and institutions of learning and its functions be confined to high-level policy decision. The need for a central organ was also identified by industrial operators in Eritrea, during the conduct of the IHRD survey.

In keeping with the approach of interactive policy formulation, a national workshop was convened to review some of the findings and conclusions of the IHRD survey. In particular, the proposal for the establishment of a national/central body for human resource development and planning. It was generally agreed that such a body should be established and the recommendation is reiterated herein.

The national/central human resource development and planning agency will be responsible for defining a macro level IHRD policy framework and programme, as well as formulating strategies for human resource development and utilisation in the country. It should consists of representatives from government, private sector, employers associations, labour unions/workers associations and the university/educational institutions. The actual structure, objectives and functions of the central human resource development and planning agency will be determined in due course once the idea is accepted by all the key decision-makers at the highest level.

11.4 Sub-sectoral skills requirement

There is a need to identify specific skill requirements for each of the industrial sub-sectors, in particular, the key sub-sectors of leather and footware, textiles and garments, food and beverages, fisheries, chemical and allied products, metal and metal working sub-sectors. The proposed central human resource development planning agency should consolidate the findings and recommendations and integrate the requisite skills demand in its planning/programmes for industrial human resource development.

11.5 University industry linkage

The university or training institution/industry linkage should be encouraged not only for skills development but for research and development and possible consultancies for on the spot and much value added services to industry.

In this regard, it is recommended that the costs of training be shared by both the government and the private sector.

11.6 Training to meet specific identified needs

The Ministry of Trade and Industry should consider establishing a multi-purpose training institution to provide short-term training in specific priority areas identified and agreed upon by

both the public and private sector stakeholders. Quite apart from this specialised training centre, private institutions should be encouraged to play an increasing role in industrial human resource development and planning. Groups of enterprises could also pool resources together to establish training programmes in their own training centres, where applicable, or in established institutions in the country. In addition, technical schools and vocational training institutions should be encouraged to make full use of their training facilities/capabilities by introducing flexible training courses at weekends, in the evenings on a part time basis.

11.7 Ensuring awareness of priorities

At the institutional level, it is also recommended that mechanisms are in place to ensure that universities, colleges, training institutions/centres are aware of the country's priorities for industrial human resource development and that key stakeholders are consulted for the design of curricula. Such curricula should be flexible to accommodate changes reflecting the existing realities in industry, in particular, skills requirement. Where feasible, custom-made training programmes could be introduced for specific industries or end users.

11.8 Strengthening industry specific training facilities

It is recommended that priority be given to the establishment or strengthening of industry specific training institutions/facilities. This will ensure that the requisite skills are available and will inevitably impact directly and positively on the unit cost of labour and productivity of employees in industrial establishments/firms throughout the country. This recommendation is closely linked to 11.4 above relating to the identification and determination of actual skill needs of the various industrial sub-sectors, in particular, the priority sub-sectors identified in the crash programme for export promotion.

11.9 Eritrea institute of business and industrial services (EIBIS)

At a much higher level it is being recommended that an institute for business and industrial services be established. The institute will focus on educational and other activities carried out by owner/manager and professional service providers (details of this proposal are contained in Part II of this IHRD study).

11.10 Monitoring industrial trends and change in the labour market

The Ministry of Trade and Industry with the assistance of UNDP/UNIDO hopes to strengthen its capacity and capabilities to conduct periodic more specific annual or biannual industrial trends analysis, including an analysis of trade performance. The trends analysis covering macro-economic features, commodities; employment, capacity utilisation, investment, import-export and trading partners could provide assessed information that could impact on policy decisions. Similarly, information on industrial labour would help the Ministry to monitor change in the labour market. This would involve the establishment of a data collection system for industrial labour. (Details of this proposal are contained in Part II of this study.)

11.11 Buy-in from other ministries/stakeholders

A major task of the Ministry of Trade and Industry in its efforts to ensure a conducive environment for export-led manufacturing is that of persuasion and information collection, analysis and dissemination. Incentives and flexibility are critical elements of this environment. In this connection, the Ministry should also be able to persuade the other main actors in IHRD to put in place incentives, which foster the flexible growth/development of needed skills and the upgrading and strengthening of existing skills on the basis of cost effectiveness. For example, the tax system can provide some of those incentives both to individual undergoing specialised training, as well as to enterprises supporting such training. Similarly, significant cost effective benefits flow from the use of the Internet and modern telecommunications, in general. These areas fall under the responsibilities of other ministries. The Ministry of Trade and Industry should be able to convince other ministries, as well as the private sector to buy into the proposed IHRD policy to ensure effectiveness in implementation. They should be convinced of the benefits, outcome and macro-economic impact, as well as social implications of such policy.

ANNEXES

SURVEY ON INDUSTRIAL HUMAN RESOURCE DEVELOPMENT

QUESTIONNAIRES

The questionnaire consists of four sections specifically addressing different cadre of employees as follows:

Annex I	Government and non-governmental officers
Annex II	Senior management in industry
Annex III	Middle level management and supervisors in industries
Annex IV	Operators in industries

ANNEX I

Government and Non-Governmental Officers

The University of Asmara is conducting a survey on Industrial Human Resource Development, on behalf of the Ministry of Trade and Industry in Eritrea. Your co-operation is solicited to respond to the questions to enable the Ministry to achieve its objectives.

Institution/Department……..

Position……..

Gender Male ☐ Female ☐

Date…….……..……

1. What policies for human resource management and development do you have?
2. When was it last reviewed?
3. Do you think the current policies and strategies are working well?
4. Which particular policy or strategy was found to be of hindrance in the past five years?
5. The government is emphasising education/training at all levels, what is the logic behind it
6. Do you think that the Eritrean educational system does have a good foundation in science and technology to prepare the future Labour force to sustain a technologically advanced industrial complex?
7. Does our human resource development policy give priorities to certain skills? Why
8. What is the strategy followed by the Eritrean government in the sharing of education, training costs with the trainees and the enterprises?
9. The institutions that are producing technical skills are small in number and capacity in relation to the demand of the country, what plans does the Government have expand them during the next five years?
10. What mechanism is there to ensure the relevance to industry of the curriculum of the Eritrean technical schools, colleges and university?
11. Small and medium enterprises usually use the apprenticeship type of training. What could be the positive and negative aspects of it?
12. Small and medium enterprises cannot afford to engage in formal and structured training of workers. What needs to be done to increase the skills of the workforce?

13. Are there incentives given to the private sector to engage in industrial training?
14. How are the different training institutions under the various ministries co-ordinated and linked to the efforts and policies of the Ministry of Education?
15. Are there any established standards for industrial production?
16. What are your views in relation to the export of goods produced in Eritrea bearing in mind the aggressive international competition and technological change?
17. There is one school of thought that believes that the government should set up a national institution to train operators and technicians for the local industries, whilst another school of thought is of the opinion that training should be done in line with the needs of the industry. What are your views and why?
18. New management practices are advocating for joint planning and problem solving strategies between management and non-management staff. What are your views on this concept within the state of Eritrea?
19. Do you know of any document related to national human resource development plan? Do you believe it can lead the country towards filling the gap of skilled manpower existing in the country in all the sectors?
20. What is your vision for human resource development in the industrial sector during the next five years?

ANNEX II

QUESTIONNAIRE FOR SENIOR MANAGEMENT

The University of Asmara is conducting a survey on Industrial Human Resource Development on behalf of the Ministry of Trade and Industry in Eritrea. Your co-operation is highly solicited to assist the enumerators by providing answers to the questions in this questionnaire.

Name of enumerator……..……..….

Starting time……..……..……...…

Ending time……..……..……..……

Date:……..…

Signature of the enumerator……....……

Seal of the establishment ……

THESE QUESTIONS ARE FOR OFFICIALS IN THE SENIOR MANAGEMENT CADRE

REGION……...…….

ORGANISATIONAL ANALYSIS

1. Name of establishment…….….

2. Industry……...……..

3. Type of enterprise?
   - 3.1. Proprietorship
   - 3.2. Partnership
   - 3.3. Public share holding
   - 3.4. Government
   - 3.5. Other

4. Size of capital ……..……..

5. How many employees……..
   - 5.1. Males……Permanent……Temporary……...….
   - 5.2. Females……Permanent……..Temporary……...

6. Please classify your employees by skills and gender with their respective numbers as below?

Type		Male	Female
6.1. Unable to read and write			
6.2. Can read and write with skills acquired through experience and on-the-job training			
6.3. Basic education only (01-07 years)			
6.4. Basic education and some vocational training			
6.5. High school education: academic (08-12 years)			
6.6. High school education: technical (08-12 years)			
6.7. 12th grade plus 2 -3 years of technical college education.			
6.8. 12th grade plus 1-3 years of non technical college education			
6.9. University education			
	6.9.1. BA/Bsc.		
	6.9.2. MA/Msc.		
	6.9.3. Ph.D.		
	6.9.4. Other		

7. Distribution of skills by departments?

Departments	7.1 Non-skilled	7.2. skilled			7.3. Managerial/ professional	
		7.2.1 Technicians	7.2.2 Operators	7.2.3 Clerical	7.3.1 Top Mgt	7.3.2 Profes.

8. Do you need more employees than you currently have?

8.1. Yes 8.2. No

9. If yes, what kind of skills do you require?

Departments	9.1. Non-skilled	9.2. Skilled			093. Managerial/ professional	
		9.2.1 Technicians	9.2.2 Operators	9.2.3 Clerical	9.3.1 Top Mgt	9.3.2 Profes.

10. Give details and numbers of the technicians you have in relation to your future needs in the following table:

Breakdown of Technicians	Present	Future
10.1. Electrical/Electronic	1011	1012
10.2 Mechanist/Metal works	1021	1022
10.3 Auto mechanic	1031	1032
10.4 Wood works	1041	1042
10.5 Computer technicians	1051	1052
10.6 Plumbers	1061	1062
10.7 Lab technicians	1071	1072
10.8 Shoe makers	1081	1082
10.9 Others …… …… ……	1091	1092

11. Can you get these skilled people from the local labour market?

11.1: Yes 11.2: No 11.3. Other _____

12. If no, why?

    12.1. Totally don't match our needs

    12.2. We need to further train them before using them

    12.3. Other reasons (specify) _____

13. Do you have any plans to expand your production capacity?

    131: Yes 132: No

14. If yes, in the next five years what kind of additional skills in each of the following categories do you require?

Educational requirements	**Next five years**
14.1. Basic Education	
14.2. Basic Education plus vocational	
14.3. Technical school graduates	
14.4. Polytechnic Graduates with technical Education	
14.5. Polytechnic graduates with non-technical Education	
14.6. University graduates with technical education	
14.7. University graduates with non- technical Education	

15. In which markets do you sell your products?

    15.1. In local markets only

    15.2. In local and foreign markets

    15.3. In foreign markets only

16. If you produce for export, what additional skilled manpower do you require? (more than one answer is possible)

    16.1 Skilled quality control staff

    16.2 International marketing skills

    16.3 Communication skills

    16.4 Skilled in new production techniques/technologies

    16.5 Others (specify) _____

17. How acute is the problem of absenteeism in your establishment?

    17.1 We don't have a problem

    17.2 We do have a mild problem

    17.3 We have a considerable problem

    17.4 We do have a very serious problem

18. Would you please give the approximate average days of absenteeism per person per year.

18.1	0-5 days	18.4	16-20 days
18.2	6-10 days	18.5	Above 20 days
18.3	11-15 days		

19. How acute is the problem of Labour turnover (employees leaving the organisation) in your enterprise?

19.1	No problem	19.3	Considerable
19.2	Mild problem	19.4	Very serious

20. If the answer is that there is considerable or very serious labour turnover, in which category of employees is this mainly happening?

20.1	Unskilled	20.2.	Skilled

21. Give an average of the number of employees that have left your enterprise during the last twelve months?

20.1 For national duties_____

20.2 For other reasons of their own_____

20.3 Fired by the organisation _____

EMPLOYMENT CRITERIA

22. Do you have a personnel department?

22.1. Yes 22.2. No

23. If yes, which functions does it perform? (more than one answer is possible)

23.1 Recruitment and selection

23.2 Wages and salary administration

23.3 Liaising with the Labour unions

23.4 Any other (specify) _____

24. How do you recruit your employees? (more than one answer is possible)

24.1 Through the Labour office

24.2 Through advertisement

24.3 Through recommendation from friends

24.4 By attracting skilled and experienced people from other organizations

24.5 Through application of potential candidates themselves

24.6 Through private employment agencies

24.7 Others (specify) _____

25. What are the minimum qualifications/experience requirement do you look for?

25.1 Technicians_____

25.2 Machine operators_____

25.3 Clerks_____

25.4 Professionals_____

25.5 Managerial_____

26. From your experience, does the education received in our academic and technical institutions match with the needs of the industry?

Type of institution	Yes	No
26.1. Vocational	2611	2612
26.2. Technical	2621	2622
26.3. Colleges	2631	2632
26.4. University	2641	2642

27. Why do you think that the education received in our academic and technical institutions does not match the needs of our industries? (more than one answer is possible)

27.1 What they learn is too theoretical. The institutions don't have linkage with the industry, therefore, cannot understand the needs of the industry.

27.2 The institutions are not able to produce quality graduates

27.3 The facilities in the institutions is inadequate

27.4 Any other (specify) _____

28. Have you ever been asked to be a member of the board or steering committees of any institution of learning?

28.1: Yes 28.2: No

29. If yes, in which institution or school have you been asked to be a member of the board or steering committee?

29.1 University of Asmara

29.2 Commercial College

29.3 Pavoni Technical School

29.4 Technical College of Don Bosco

29.5 Asmara Technical School

29.6 Wina Technical school

30. Have you ever been asked to be involved in revising the curriculum of any educational/technical institution?

30.1: Yes 30.2: No

31. If yes, in which institution or school have you been asked to be involved in revising the curriculum?

31.1. University of Asmara

31.2. Commercial College

31.3. Pavoni Technical School

31.4. Technical College of Don Bosco

31.5. Asmara Technical School

31.6. Wina Technical School

31.7. Other _____

32. Whom do you preferably employ?

32.1. Males

32.2. Females

32.3. Both gender on merit

33. Why do you have this particular preference?

_____

_____

_____

34. What is your criteria for selecting and promoting a worker to middle level management position? (more than one answer is possible)

34.1 Skills

34.2 Skills and qualifications

34.3 Merit

34.4 Experience

34.5 Any other (specify) _____

EMPLOYEE DEVELOPMENT

35. Do you train your workers?

35.1. Yes 35.2. No

36. If yes, where do you train them? (more than one answer is possible)

36.1 We have our own training centre

36.2 We send them to training institutions available in the country

36.3 We send them outside the country

36.4 We ask training institutions or consultants to organise training based on our needs

36.5 We provide on the job training

36.6 Others (specify) _____

37. How many people have you trained during the past two years?

Year	Department	37.1 Type of training	Duration weeks	37.1.1 Male	37.1.2 Female

38. Do you have a yearly training and development budget?

381. Yes

382. No

39. How do you determine the training budget?

39.1. Based on the revenue of the establishment (as its percentage)

39.2. Based on expected training needs

39.3. Randomly

39.4. Other (specify)_____

40. Do you make regular training needs assessment?

40.1. Yes 40.2. No

41. How is training needs identified and initiated? (more than one answer is possible)

41.1 When production targets are not met

41.2 When the product quality decreases

41.3 Whenever new employees are recruited

41.4 When there is a change in machinery

41.5 When competitors do it

41.6 When the ministry requires it

41.7 Any other (specify) _____

42. What is your plan for training and developing the staff during the next three years?

……

……

……..

MACHINERY AND EQUIPMENT USED

43. When did you install your last core machinery?
(calendar year)_____

44. Do you have a maintenance unit?

44.1. Yes 44.2. No

45. Do you have a preventive maintenance programme?
45.1. Yes 45.2. No

46. Did you invest in new machines and equipment recently?
46.1. Yes 46.2. No

47. If yes, how recent?
(calendar year) _____

48 If no, do you plan to invest in new machines and equipment within the next five years?

48.1. Yes 48.2. No

49. If yes, have you thought about training as a package with the new technology?

49.1. Yes No

JOB ANALYSIS AND JOB DESIGN

50. How did you design the factory jobs?

501. Based on specialisation (each worker specialises in one skill)

502. Based on multiple skills (each worker should know at least two or more skills)

503. Based on knowledge of the whole process (each worker is made to get the skills necessary to make the product from start to finish, or all skills at a particular stage of the production process).

504. Any other (specify) _____

51. Who is responsible for quality?

51.1. The worker is responsible

51.2. The supervisors or inspectors

51.3. Both sides

51.4. Other (Specify)_____

OCCUPATIONAL HEALTH AND SAFETY

52. Do you have safety rules and regulation approved by the government?

    52.1. Yes 52.2. No

53. If yes, is it enforced?

    531. Yes 53.2. No

54. Are your workers insured for accidents?

    54.1. Yes 54.2. No

55. If a worker is injured, for how long do you pay his salary?

    55.1 For 1 month

    55.2 For 2 months

    55.3 For 3 moths

    55.4 Other (specify) _____

56. Have you ever encountered major industrial accidents?

    56.1. Yes 56.2. No

57. If yes, what was the effect to the production and business in general?

……

……

……

58. What kind of medical benefits do you have for your employees?

    58.1 100% Health insurance

    58.2 50% medical expenses

    58.3 Other (specify)_____

ON BEHALF OF THE DIRECTOR GENERAL OF THE DEPARTMENT OF INDUSTRY AND THE UNIVERSITY OF ASMARA, WE WISH TO THANK YOU FOR SPARING YOUR TIME TO FILL OUT THIS QUESTIONNAIRE.

ANNEX III

Middle level/Manager and Supervisors in the industries

The University of Asmara is conducting a survey on Industrial Human Resource Development on behalf of the Ministry of Trade and Industry in Eritrea. Your co-operation is highly solicited to assist the enumerators by providing answers to the questions in this questionnaire.

Name of enumerator……..

Starting time……..……

Ending time……..……

Date:……..……

Signature of the enumerator……

Seal of the establishment _____

THESE QUESTIONS ARE FOR EMPLOYEES WHO ARE MIDDLE LEVEL MANAGERS/SUPERVISORS IN THE INDUSTRIES

GENERAL

1. Name of establishment ……
2. Region …….
3. Type of industry ……..
4. Gender 4.1. Male 4.2. Female

RECRUITMENT AND SELECTION

5. How long have you been in this position in the establishment?…….…….
6. By what means were you recruited to this establishment
   - 6.1. Through the Labour office
   - 6.2. Sent in an unsolicited application
   - 6.3. Responded to an advertisement
   - 6.4. Somebody told me about it
   - 6.5. Any other…….
7. What is your educational qualification?
   - 7.1. Less than 8^{th} grade
   - 7.2. High school - 8^{th} - 12^{th} grade
   - 7.3. High school (complete – non technical)
   - 7.4. High school (complete – Technical)
   - 7.5. College certificate/diploma (non technical)
   - 7.6. College certificate/diploma (technical)
   - 7.7. University
   - 7.8. Any other?……
8. How were you appointed/selected to join the middle management team?
   - 8.1. The position was advertised and I applied
   - 8.2. The management appointed me directly
   - 8.3. Took special tests
   - 8.4. Supervisor recommended me based on my appraisal
   - 8.5. Any other ……..……

9. What is the educational background of the employees that you supervise?
   9.1. Less than 8th grade
   9.2. High school 8th - 12th grade
   9.3. High school (complete – non technical)
   9.4. High school (complete – Technical)
   9.5. College certificate/diploma (non technical)
   9.6. College certificate/diploma (technical)
   9.7. University
   9.8. Any other?……
10. How do you assess the performance of the workers that have joined immediately after school/graduation without any training?
   10.1. Adequate
   10.2. Need some more training
   10.3. Needs retraining
   10.4. The job does not require any skills

TRAINING AND DEVELOPMENT

11. Before joining this establishment, did you have similar responsibilities elsewhere?
   11.1: Yes 11.2: No

12. What is your assessment about skill deficiencies amongst the people you supervise?
   121. There is not much skill deficiency
   122. There is some skill deficiency
   123. There is a considerable skill deficiency
   124. There is very high skill deficiency

13. Do you do training needs analysis for the people under your supervision?
   13.1: Yes 13.2: No

14. If yes, have you conducted any training as a result of the need analysis?
   14.1. Yes 14.2. No

15. If yes, are you involved in the training?
   15.1: Yes 15.2: No

16. Where do you normally conduct your training?
   16.1 Within the training complex of the establishment
   16.2 On-the-job
   16.3 Outside the enterprise

17. Do outside trainers participate in your training activities?

    17.1: Yes 17.2: No

18. If yes, why do you involve outsiders in your training activities?

    18.1 When we don't have all the expertise to do it on our own
    18.2 When we want to introduce new skills
    18.3 When we introduce new technologies
    18.4 Other (specify) _____

19. Are there institutions that cater for your training needs?

    19.1: Yes 19.2: No

20. If yes, which institutions?

    20.1 University of Asmara
    20.2 Existing technical and vocational schools in the country
    20.3 In institutions out of the country
    20.4 Any other (specify) _____

21. If you make use of institutions outside the country please specify.

    Country _____

    Institution's name _____

    Duration _____

    Number of people trained _____

22. Give reasons for the choice(s) you have made in question 20 above.

……
……
……
……

CAREER PROJECTIONS

23. What are your personal career goals for the next five years?

……
……
……..

24. What recommendations would you make to senior management to upgrade the work related skills and knowledge of:

    24.1. Yourself.

……
……
……
……..……

24.2. The workers that you supervise.

……
……
……
……

ON BEHALF OF THE DIRECTOR GENERAL OF THE DEPARTMENT OF INDUSTRY AND THE UNIVERSITY OF ASMARA, WE WISH TO THANK YOU FOR SPARING YOUR TIME TO PROVIDE ANSWERS TO THE QUESTIONS.

ANNEX IV

QUESTIONNAIRE FOR OPERATORS IN INDUSTRIES

The University of Asmara is conducting a survey on Industrial Human Resource Development on behalf of the Ministry of Trade and Industry in Eritrea. Your co-operation is highly solicited to assist the enumerators by providing answers to the questions in this questionnaire.

Name of enumerator……..…..

Starting time……...…

Ending time…….……

Date:……

Signature of the enumerator…….……..

Seal of the establishment_____

THESE QUESTIONS ARE FOR EMPLOYEES WHO ARE OPERATORS IN THE INDUSTRIES.

GENERAL

1. Name of establishment……..……..……
2. Region :…….……
3. Type of industry :…….
4. Gender 4.1: Male 4.2: Female

RECRUITMENT AND SELECTION

5. What is your educational qualification?
   - 5.1. Less than 8^{th} grade
   - 5.2. High school - 8^{th} - 12^{th} grade
   - 5.3. High school (complete – non technical)
   - 5.4. High school (complete – Technical)
   - 5.5. College certificate/diploma (non technical)
   - 5.6. College certificate/diploma (technical)
   - 5.7. University
   - 5.8. Any other (specify)……

6. By what means did you come to know about the job?
   - 6.1. Through the Labour office
   - 6.2. Sent in an unsolicited application
   - 6.3. Responded to an advert
   - 6.4. Somebody told me about it
   - 6.5. It is our property
   - 6.6. Any other (specify)…….

7. When did you start work in this establishment?
   Calendar year _____

8. Before joining this establishment, did you have any work experience?
   - 8.1. Yes 8.2. No

9. Are you able to apply the knowledge gained in school to your present work?
   9.1. Yes, I am applying it
   9.2. I am applying only a small part of it
   9.3. I don't apply it at all
   9.4. Other (specify) _____

10. If you are not applying it, why?
   10.1 My training at school and the work I am doing are not related
   10.2 The technology we use at work is totally different from what we learned at school
   10.3 The technology we learned at school is very advanced while that at work is very old and they are not related
   10.4 Other (specify) _____

TRAINING AND DEVELOPMENT

11. Have you ever received training for the tasks you now perform?
   11.1. Yes 11.2. No

12. If yes, where did the training take place?
   12.1 Within the establishment
   12.2 In training institutions outside the organisation
   12.3 Other (specify)_____

13. Who was/were your trainer(s)
   13.1. The manager
   13.2. Your Supervisor
   13.3. Co-worker(s)
   13.4. The staff of the training institution(s)
   13.5. Other(s) specify_____

14. How many times have you undergone training to do the job since you joined this establishment?
   14.1. I never got a training
   14.2. Only once
   14.3. Two times
   14.4. More than two times

15. Who identified your training needs?

    15.1 The manager

    15.2 Your supervisor

    15.3 Yourself, but told your supervisor about it

    15.4 Other (specify) _____

CAREER DEVELOPMENT

16. What are your career goals for the next five years?

……
……
……

17. What recommendations will you make to your supervisor/senior management to upgrade your skills and knowledge on the job?

……

……

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……

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……

……

……

ON BEHALF OF THE DIRECTOR GENERAL OF THE DEPARTMENT OF INDUSTRY AND THE UNIVERSITY OF ASMARA, WE WISH TO THANK YOU FOR SPARING YOUR TIME TO PROVIDE ANSWERS TO THE QUESTIONS.

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NOTE

MOE- Ministry of Education
MTI- Ministry of Trade and Industry
UOA- University of Asmara

ERITREA

Human Resource for Sustainable Industrial Development

PART II

Programme concepts for industrial human resource development

MINISTRY OF TRADE AND INDUSTRY

UNITED NATIONS DEVELOPMENT PROGRAMME

UNITED NATIONS INDSUTRIAL DEVELOPMENT ORGNIZATION

Contents

Introduction

The eight programme concepts, which comprise Part II of this study on Human Resource for Sustainable Industrial Development, are considered relevant to the realisation of the objective of building human resource capabilities for a competitive industrial sector in Eritrea. The areas of concentration and problems to be addressed were identified by the government and the private sector. Basically, the programmes are primarily standard technical assistance programme. However, some of the programmes would involve high investment components for which bilateral assistance would be required.

The proposed programmes are not necessarily programmes that will be implemented by UNDP/UNIDO per se. Eritrea's cooperating partners at the bilateral and multilateral levels including international NGOs could also provide financial and technical support for the implementation of the proposed programmes.

It is therefore recommended that the situation analysis and programme concepts be discussed with the donor community with a view to mobilising resources for the implementation of the programmes.

This document has not been formally edited.

Programme Concept 1

Title: Establishment of an Institute for Business and Industrial Services (IBIS)

Background and justification

Because of Eritrea's long war of independence and the collectivisation for some 30 years of its considerable industrial capacity by the Derg Regime in Ethiopia, Eritrea's capacity as a manufacturer, and especially an exporter of manufactured goods is currently weak. Manufacturing was badly served by the regime in Addis Ababa, since the preference was to concentrate manufacturing in Addis Ababa, rather than build on the significant manufacturing base in Eritrea. In 1950, the development of manufacturing in sub-Saharan Africa was highest in Eritrea, if South Africa is excepted. After the Derg seized power in Ethiopia, all significant manufacturing in Ethiopia/Eritrea was nationalised and in most cases run into the ground.

However, since 1995, most major manufacturing in Eritrea has been privatised. Virtually many new owners are Eritreans, with most of them from among the competent in the large Eritrean Diaspora.

Eritrea's industrial owners/managers are in general competent with expertise in one or two areas of management - very often in production management. The most serious constraint is that of export marketing and management in this area is extremely weak. This need not be a problem if there is a well-developed body in the country that could provide such export support services to the private sector. Although there are consultants registered as providing private sector support services in various areas, the reality is that their experience in the real operations of the market economy and conducting comprehensive investment studies is extremely weak. The wide range of learning opportunities available in Europe and Asia is lacking. It is therefore desirable to establish an institution that is capable of providing such nascent professional services while at the same time strengthening the capabilities of management

With the overall objective of strengthening management capabilities of Eritrean business, the proposed institute will carry out a range of activities and functions directed towards owners, managers and their potential advisers. This focus group does not need paper qualifications: they are owners, and already have paper qualifications. The focus of the institute should not be on those who wish to learn 'business management' (that is done in the University). The focus should be much more vocational and demand-oriented. Training should be provided for a limited time period, including evening programmes for clients/customers who could also bear part of the costs of such programmes. It is expected that all activities will be presented in a modular form, e.g. three evenings per week over 2 weeks, or two day seminar/workshops etc.

Other activities could include the commissioning and publication of research from the Eritrea consulting community; in this connection, there is a lack of information and analysis of the business environment, problems and constraints to be overcome in Eritrea, which demand-led applied research could illuminate. Private business at present is financially weak to do this type of research. The Eritrean institute of business and industrial services (EBIS or IBIS) to be established, will provide information facilities (e.g. computers, internet connections, business library etc.) to be made available to its customers/clients. It could also accept new

graduates, sponsored by the organised private sector for periods of up to six months, for on-the-job training.
It is by now fairly well recognised in Eritrea that marketing is important, primarily because of the collapse of trade with Ethiopia. What is not quite so well recognised is that industrialisation under globally linked production and trade entails expertise not only in production, and the management of production, but also in finance, shipping and trade. Building competence, in these areas, together with competence in marketing, is a major justification for the foundation for the EIBIS.

Examples of workshop modules, which could be offered, include the following:

Financial aspects of serving foreign markets; sources and costs of sub-contracting; links in the supply chain from Eritrean producer to foreign consumer; market related information on the Internet; controlling cash flow and working capital; risk and return in domestic and international sub-contracting; incentives for domestic and international trade; performance evaluation of staff; insurance and financing of in transit goods; financing the informal sector; trading networks and trade information; technology choice; technology choice in the crash programme sectors; facing competition in the delivery of professional business services.

Research and business development

Research and business development services provided by the domestic consulting community could be transformed into case studies, which could be used in some of the modular seminars/workshops described above.

A few areas of focus worth considering are:

- Wage incentives and performance among machine operators
- Risk and return in cash flow management
- The impact of floating exchange rates on Eritrean subcontractors
- Tax incentives and disincentives and the impact on product sub-sectors
- Apprenticeship systems in the garment, knitted textiles and shoes industries of Eritrea: a comparative analysis.

Development objective

To create a modern technologically advanced and internationally competitive economy and to increase industry's contribution to economic growth and sustainable development.

Programme objective

To build up competence of owners and managers of industrial enterprises, as well as professionals engaged in the delivery of industrial and business services, thereby, contributing to the effective implementation of the crash programme for export take-off.

Outputs

(i) An established business and industrial services training facility capable of providing demand driven/business and industrial information.

(ii) An estimated 70-150 managers or industrial entrepreneurs/owners trained annually with increased capabilities/skills in critical core areas of management of industrial enterprises.

(iii) At least 5-10 demand driven consultancies involving R&D of relevance to improving business and industrial operations in Eritrea.

(iv) A cadre of consulting firms (at least 7) strengthened/restructured (through services offered by EIBIS) to provide competitive business/industrial services.

Estimated programme inputs

The programme as envisaged calls for a preparatory phase which will actually determine the actual structure of EIBIS and the nature and scope of its activities. The ideal structure would be that seed financing be provided by Eritrea's development partners at the initial stage. EIBIS will take the form of a commercial development and training institution with funds provided by both the government and the private sector. From its initiation, clients/customers should be expected to pay for part of the operating costs of EIBIS as the training programmes will be on a fee for services basis.

A. Preparatory phase (tentative)

(i)	International consultants	2 w/m	=	US$ 30,000
(ii)	National consultants (2)	4 w/m (each)	=	US$ 24,000
(iii)	Miscellaneous including printing of report etc.		=	US$ 5,000
		Total	**=**	**US$ 59,000**

B. Programme implementation phase (tentative)

			US$
-	International consultants – split assignments	4.0 w/m	60,000
-	Secretarial and administrative support staff (3)	72.0 w/m	72,000
-	Programme travel		15,000
-	National Director	36.0 w/m	108,000
-	National Instructors/trainers (4)	96.0 w/m	192,000
-	Fellowship and study tours	20.0w/m	40,000
-	Training workshop/seminars		80,000
-	Equipment – hardware and software including project vehicle, library and documentation facilities		18,000
-	Miscellaneous component		
-	Total	228.0w/m	585,000

Programme Concept 2

Title: Establishment of a Multi-Purpose Training School

Background and justification

The crash programme for export take-off focuses on production in shoes, knitted textiles and garments exported under international subcontract to markets in the EU and USA. It is expected that factories in the three sub-sectors above will gear up to increase their output many times their current levels over a short period of time. In so doing, their workforce of semi-skilled machine operators will be greatly expanded.

This programme foresees the construction of a training facility where employees can learn/re-learn machine operator skills. It is envisaged that periods of hands-on-training from about two weeks to about three months will be necessary, in near factory condition. Training will be provided by experienced operators employed by the manufacturers, on machines provided, on a temporary basis, by the manufacturers.

As this facility is a training-cum-production facility, the envisaged premise should also have adequate space for use as meeting rooms, raw material/finished good storage facility, small offices and sanitary facilities. The most important provisions in the 'training-cum-production' area should be flexible power facilities and flexible provision for fixing machines to the floor. Also, there will be the need to provide electrical switchgear etc. that provides for security against power fluctuation. However, stand-by power provision should not be necessary.

This training facility will assist in meeting the skills requirement of owners and operators of factories. Therefore part of the capital should be borne by the private sector.

Development objective

To create a modern technologically advanced and internationally competitive economy and to increase industry's contribution to economic growth and sustainable development.

Programme objective

To ensure that adequate number of semi-skilled employees are available for the successful implementation of Eritrea's crash programme for export take-off.

Outputs

i) A multi-purpose training facility with the basic infrastructure (power, storage, space etc) for semi-skilled training;

ii) At least 300-500 trained technicians with upgraded skills in various areas of textile and garment production, as well as in footwear production;

iii) Hands on formal on-the-job training of employees, some of whom need to be retrained, some trained, in the efficient operation of industrial sewing and knitting machines, of the type used in modern garment, knitted textile and shoe production.

Estimated programme inputs

This programme foresees a preparatory assistance phase. The nature and scope of the Multi-purpose training school will be determined after consultations with the stakeholders.

The estimated cost of the preparatory phase is approximately US$75,000.

The Programme phase could cost as much as US$500,000 – US$700,000 (yet to be determined).

Programme Concept 3

Title: Multi-Purpose Training Centre for the Disabled (MTCD) – Training-cum-Production

Background and justification

The main issues being addressed here are

- Employment creation for disabled ex-combatants
- Sustainable employment for disabled ex-combatants in the priority sub-sectors for the crash programme for an export take-off.

The purpose of this facility is to carry out exactly the same training activities envisaged in programme concept 2, but on a smaller scale – perhaps one-third to one half of the scale of the MTS, with different financing arrangements, and with a different phasing/time schedule.

The phasing/time schedule for this training centre is dependent entirely on the success of the MTS and on the Crash Programme. It is envisaged that MTCD will begin its training activities only after the garment enterprise owners have obtained repeat orders and the export drive is well in place. By that time, it is also expected that the first training facility, the multi-purpose training school (MTS) would have been in operation for some time and would have already trained many groups of workers, all of whom would be in guaranteed employment.

The focus of training in the semi-skilled trades taught in MTCD – garment machine operators carrying out stitching/garment assembly – will be primarily disabled ex-soldiers.

Although experience in the proposed MTS will inevitably confirm that ex-soldiers could also be competent and productive machine operators; a few of these ex-soldiers will be disabled and in employment, there are various degrees of incapacitation as a result of the more severe injuries. However, employers face strong demand for their output, and should be willing to take the risk of employing disabled ex-soldiers, especially those who have already been trained to a standard of competence equivalent to the trainees of the MTS. It should also be noted that all ex-combatants will need to receive personal counselling as part of the re-integration process. Part of this counselling particularly for the disabled, should address the cultural aspect of what is mens' work and womens' work, to enable men ex-combatants to work as industrial sewing machine operators for example.
Training could be provided free to groups of the handicapped for periods somewhat longer than the course in the MTS, at the cost of the state. Apart from the capital costs of the training premises, there will also be the capital costs of industrial sewing machines; the operating costs of training would need to cover support costs for the trainees, the costs of an instructor and of a social worker specially trained to provide support to the disabled, the costs of training materials, machine maintenance and utilities.

It is suggested that the MTCD be operated by an Eritrean NGO perhaps the Eritrean War-Disabled Fighters Assn. (EWDFA), through a manager who might be himself an ex-soldier, perhaps also disabled. Funding could be provided by the National Commission for the Demobilisation and Reintegration Programme preferably from the proceeds of the World Bank loan to Eritrea.[1] Policy advice should be provided through a committee representing the

[1] See: World Bank Report PID 10371, op.cit.

National Commission and the Ministry of Trade and Industry, through its close involvement with the crash programme, the Chamber of Commerce and employers benefiting from the crash programme will have useful employment related contacts with owners in the garment industry.

It should be emphasised that the feasibility and sustainability of this programme is entirely dependant on the success of the crash programme. The disabled who will receive training will not become independent tailors per se but will be industrial sewing machine operators in established enterprises. Their source of employment will be enterprise owners who have international subcontracts for the supply of garments, to contract specification, to foreign lawyers.

The training element of the programme will be done in three phases.

Firstly, training of industrial sewing machine operators using bought in materials;

Secondly, after having trained 2-3 groups of ex-soldiers with trial runs using bought in materials, as well as garment pieces, contracted for with owners of enterprises, which are assembled to owner's specification.

Thirdly, the spinning-off by an NGO of groups of trainees not only into employment with the larger enterprises but also into self-employment in mall workshops, which could be linked to enterprises on sub-contractual arrangements.

The Ministry of Trade and Industry should be able to provide business advice to these small scale operators.

Development objective

Within the framework of the overall development objective of creating a modern and internationally competitive industrial sector, to create employment and income generating opportunities.

Programme objective

To create employment opportunities for ex-soldiers who are differently abled.

Outputs

i) A well established and operated multi-purpose training center for the disabled with production facilities for income generation;

ii) At least 200-300 well trained and skilled differently abled operators in the garment and footwear industries

Estimated inputs

		US$
- International experts (2) with experience in working with differently abled persons (split mission)	6.0 w/m	90,000
- National coordinator (Training Centre)	36 w/m	72,000
- National instructors in industrials sewing operations (3)	36 w/m	54,000
- National social worker (split assignment)	18.0w/m	36,000
- National small business development adviser (split assignment)	12.0w/m	36,000
- Training in-service/workshops, fairs and study tours	10.0w/m	40,000
- Equipment and premises, training workshop facilities for at least 30 disabled trainees, plus storage, small office on specialised equipment (to be determined) etc. programme vehicle		70,000
- Office equipment: training materials; utilities, maintenance of machines transport/vehicles, incidentals		25,000
- Miscellaneous component		15,000
- Total	118.0w/m	438,000

Programme Concept 4

Title: Education and Training for Demobilised Soldiers

Background and justification

Some 200,000 soldiers will be demobilised over the years 2001-2005 in a phased process. This programme provides for the needs of these soldiers for education and training. The population of 200,000 soldiers is divided broadly into three groups:

i) A relatively small group (in which women are over represented) in need of further education and training;

ii) A group of about one-half the total, in need of education and training in order to seek employment, or self-employment in the micro-enterprise and informal sectors;

iii) Another small group, who have access to land, or wish to have such access, and whose competence should be strengthened in agro-related activities, e.g. food processing, packaging etc.

This programme should establish close coordination/be integrated with all other activities which address the demobilisation and re-integration of ex-soldiers, and within the scope of the NCDRP.

For group (i) above, the education/training should be intense and accelerated so as to achieve levels envisaged prior to their recruitment in the army. Thereafter, they would be expected to compete for entrance to the formal education institutions, or to find employment. Career guidance and intensive job search would be necessary here. It may be necessary to provide short training courses, perhaps of up to 1-week duration, to the teachers of these young adults.

For group (ii) above, the focus is on-the-job internships, supplemented by the provision of instruction in the following areas: basic auto-mechanics; masonry; building and construction; carpentry; food processing; retail trading; basic preparation, handling and sale of bakery products; basic animal slaughter and small abattoir practices; basic secretarial and foreign language skills; computer operation; basic computer repair skills.

For group (iii) above, training should be seen in the context of the proposed programme under programme concept 8 below, which deals with the agro-industrial sector. Training will be provided in the following areas: basic food processing; the handling, preservation and packaging of processed foods; basic techniques of floriculture; basic techniques in harvesting and transport of cut flowers; the storage, handling and transportation of agricultural products; the storage, handling, transport and sale of fish and seafood.

Development objective

Within the framework of the overall development objective of creating a modern and internationally competitive industrial sector, to create employment and income generation opportunities with a view to contributing to poverty alleviation.

Programme objective

To increase the number of semi-skilled workers in Eritrea through re-integration of ex-soldiers into civil society and the world of work.

Expected output

- At least 3,000-5,000 ex-soldiers with basic skills for employment in industrial operations;
- Some 5,000-6,000 ex-soldiers in self-employment in the micro/informal sector;
- 4,000 in self-employment in agriculture, and fish related activities, together with a significant contribution to Eritrea's food security.

Envisaged inputs

The financial implications will be determined, in due course, by a preparatory assistance mission, in consultation with the stakeholders. Quite apart from the usual cost of international and national experts, training and equipment cost, incentives will have to be taken into consideration, especially as these are demobilised soldiers.

Programme Concept 5

Title: Upgrading the Capacity and Capabilities of Barka Canneries to meet the needs of Domestic and Export Markets

Background and justification

This enterprise was established by Italian investors in the early 1960s for the production primarily of processed meat products. It was nationalised in 1975 and, reportedly until 1986, served both domestic and export markets. After 1986, its products went mainly to the Army, and its main sole customer is the Eritrea Ministry of Defence.

Currently, production takes place in three locations. Barka 1 and Barka 2 are processing plants, and Barka 3 is an abattoir.

At the present time, the industry employs 653 people of whom about 75 per cent are women working in four main departments, namely, finance and administration, marketing and procurement, production and maintenance, and quality control. The total production in 2000 amounted to about 26 million cans of various preparations: meat and lentils, vegetable soup, meat and beans and beans, together with small amounts of tomato paste in larger cans.

The machinery is semi-automatic and the production operation involves the manual feeding of cooked products. It is not known with certainty, but reportedly the production process is near to full capacity, single shift operation.

Sanitary standards at the plant are fair, but quality control (QC) measures and adherence to HACCP (the international standard) from the slaughterhouses to processed meat products are virtually non-existent.

Reportedly, management is of the view that demand in the domestic market for canned food is weak, because of the availability of fresh raw materials and of labour used in the preparation of meals. Moreover, prior to 1991, the domestic/export market included Ethiopia with its very many, albeit low income, consumers. Management feels that currently its production facilities are outdated and inadequate, and that there is a need to introduce new production processes, new machinery and technology, updated quality control systems, the training and re-training of staff etc.

Experience in other countries

Other countries, in particular the formerly centrally planned countries of Central and Eastern Europe, and the countries of the former Soviet Union, faced and still face very similar problems. This is because their product markets, and in particular their domestic markets could survive only behind protectionist and other trade barriers. In some markets technological change had transformed the nature of the market e.g. 78 RPM gramophones records, and in others the production process actually subtracted value from the raw materials going into the process, i.e. the production process was value destroying, e.g. canning some fresh fruit versus the export of these fruits fresh.
The section below describes in some detail the steps which should be taken if Barka is to operate as a competitive private enterprise. This is done for two reasons. The first is that each step illustrates the use of specialist skills in the business and professional services area. The second is that it is important that Barka canneries be carefully assessed as it involves

significant backward linkages with some of the poorest segments of Eritrea's population, i.e. it may increase the incomes of the poor and has some potential in contributing towards Eritrea's food security.

There are a number of steps, to upgrade the capacity and capabilities of Barka Canneries with a view to establishing critical backward linkages to the agricultural sector and alleviating poverty.

- The current cost of production of, at least three of the main products should be established (e.g. canned meat, canned meat and lentils, and canned beans);
- A domestic market testing exercise should be carried out, to determine very roughly the price at which these three products can be sold in different locations in Eritrea, e.g. Asmara, Massawa or Assab, and elsewhere bearing in mind income levels.
- A market analysis should be carried out for these three products in perhaps 6 nearby countries, in sub-Saharan Africa and the Middle East. In this connection, as precisely the same products may not be currently available in particular markets, the cif price of close substitutes, perhaps say Argentine canned beef ('corned' beef or 'bully' beef) and of similar preparations produced in Egypt or Syria, should be used.
- Based on the results obtained from the analysis, an informed judgement can be made of the sales margin, above the cost of production. This margin will give an indication, i.e. provide a minimum ceiling, of the maximum amount that can be spent on new equipment. The usefulness of this exercise is two-fold, since in addition it will provide the authorities charged with the privatisation of Barka a useful benchmark in setting the selling price.
- An examination, by a non-specialist but experienced mechanical/production engineer, of the existing plant and equipment together with non-detailed estimates of basic replacement costs, as well as the above-mentioned assessed information would provide an indication of Barka's financial viability.

Development objective

To create a modern technologically advanced and internationally competitive economy and to increase industry's contribution to economic growth and sustainable development.

Programme objective

To assess the viability of Barka canneries with a view to improving production capacities and export potentials.

Output

1. Pre-investment study upgrading the production facilities of Barka Canneries, including market analysis for both domestic and export markets.
2. A study on human resources and skills requirement for upgrading the capacity and capabilities of Barka Canneries.

Estimated programme input

			US$
-	Economist/International consultant	1.5 w/m	22.500
-	Market analyst	1.5 w/m	22,500
-	Food technologist/specialist in cannery	1.0 w/m	15,000
-	Human resource expert	1.0 w/m	15,000
-	Subcontract to local consulting firm involved in pre-investment and market analysis (to be determined)	3.0 w/m	40,000
-	Equipment (raw material testing equipment etc.)		5,000
-	Miscellaneous component		5,000
-	Total	8.0w/m	125,000

Programme Concept 6

Title: Pilot Workshop on Computer Maintenance and Repair

Background and justification

In common with other developing countries, PC use increased dramatically in Eritrea as the Twentieth Century drew to a close. Recently the Internet has been introduced. Repair services have grown to about 30 small workshops, mostly initiated by Eritreans from the Diaspora. It is expected that as a result of appeals to the same Diaspora, the number of used computers in use will accelerate. But above all, the wide use of computers and the Internet in Eritrea has very considerable potential as an educational tool at the skilled worker, technician, tertiary and post-tertiary educational levels. There is also a small domestic market for new machines.

At present, technicians for the maintenance of computer hardware are in short supply and lack some of the necessary skills. The major problem is lack of systematically provided instruction in this skill area. Potential repair services operators can be provided with the appropriate training in the pilot workshop.

Development Objective

To create a modern technologically advanced and internationally competitive economy and to increase industry's contribution to economic growth and sustainable development.

Programme objective

To upgrade skills in computer maintenance and repair to ensure that computers are kept operational. (PCs have a very high potential in expanding education and training at various levels in Eritrea.)

Outputs

1. ***Pilot workshop for the maintenance and repair of computers in association with existing technical institutes;***
2. ***A core of 80-120 competent/trained computer hardware assembly and repair technicians every year;***

Envisaged input

- International experts (2)	6.0 w/m	90,000
- Administrative support staff	6.0 w/m	12,000
- National experts (4)	48.0 w/m	96,000
- Training workshop (to be determined)		30,000
- Equipment (to be determined)		60,000
- Miscellaneous component (to be determined)		20,000
- Total	60.0 w/m	308,000

Programme Concept 7

Title: Integrated Programme for the Development of Food Processing and Agro-industries in Eritrea

This Integrated Programme will consist of ten components as described below:

Component 1. Capacity building in food safety and quality assurance, marketing, upgrading and diversification of existing food processing technologies

Component 2. Strengthening of food safety and food control system in Eritrea

Background and justification

The food quality is synonymous with food safety, which is not just a priority but also an important requirement. For compliance with increasingly demanding health standards in the food industry, the HACCPs approach represents a genuine zero risk culture. The microbial processes involved in the agro-food sectors are subjected to particular strict rules and if these rules are not respected there would be serious even fatal consequences e.g. contamination with bacteria. The food industry, therefore, has direct responsibility for the health and safety of consumers

However, the existing food control system including the food safety and quality control procedures and laws are inadequate to address the many present and future needs of Eritrea. In particular, for export oriented food products, the food quality control needs strengthening in terms of upgrading skills/ training, equipment and adequate laws. At present there is no systematic food quality control measures in real terms, with such activities spread over different ministries (health, agriculture, fishing industries etc.), Only basic food control measures are practiced.

Since the Eritrean Government has given priority to both local consumption and exports of processed food products, if the industry is to compete globally, quality control measures, certification and the crosschecking of certification are essential.

In order to address the poor food inspection system and product quality and to strengthen the regulatory framework, the Eritrean Standards Institution (ESI) was established in the year 1995, the objective of ESI is to promote standardization, quality assurance and metrology activities throughout the country. The various ministries (Ministry of Health, Ministry of Agriculture and Ministry of Fisheries) have their own food control activities. However, the effective management of food control activities requires co-ordination of all these activities. ESI has produced standards for a much broader food control function. Thus ESI has the potential to significantly implement food control activities in Eritrea, providing the direction and leadership necessary to sustain progress and further build and strengthen the quality of food to sustain progress and for export and domestic consumption. These circumstances make it imperative to establish efficient food laboratories so as to safeguard public health and enhance economic growth by making food exports more competitive.

It should be noted, however, that there is no internationally accredited certification body at present in Eritrea.

The proposed programme therefore envisages the training of laboratory/industry personnel in food analysis and testing procedures e.g. inspectional sampling, microbial/ chemical analyses, good laboratory procedures and practice etc. Also foreseen is training of food inspectors in sampling of food stuff from different food outlets e.g. food processing units, hotels, restaurants, wholesalers and retailers with respect to both imported and local food stuffs.

In collaboration with agricultural (food/ fish research) and training institutions/ laboratories and support service organisations, the training programme/workshop will be organised to create a pool of qualified trainers in the field of food safety and quality assurance e.g. the GMP, GHP and HACCPs approaches (also a linkage with Component II of the UNIDO Integrated Programme).

The rehabilitation of food laboratories including provision for equipment and chemicals and in-house training is also envisaged.

Development objective

To create a modern technologically advanced and internationally competitive economy and to increase industry's contribution to economic growth and sustainable development (with special reference to food safety and public health).

Component objectives

- To upgrade the skills of food control personnel, through training of laboratory personnel, health, customs, agriculture and municipality officers and inspectors, concerning food safety and quality control measurements.
- To develop an effective industry/university linkage (with the University of Asmara) for sustainable training of laboratory personnel.

Outputs

1. ***Food processing industries capable of manufacturing safe and good quality food products.***
2. ***A number of food laboratories/inspectors with increased capabilities to perform food safety measures and analyses effectively.***
3. ***Food laboratories accredited.***

Estimated inputs (To be determined)

Component 3. Institutional support service for the development of marketing skills

Background and justification

The commercial success of the product of the food processing industry, in both domestic and export markets is closely linked with product quality, conformity to standards, packaging, marketing techniques. It is recommended that enterprises should therefore pay greater attention to marketing techniques in areas such as advertising and promotion, market research and intelligence.

In general, individual enterprises, specifically SME's, lack financial resources and technical expertise for promotional activities in domestic, as well as export markets. There is therefore, a need for institutional support to develop marketing and sales promotion strategies and schemes, to collect and analyse market information in domestic and export markets and to make necessary business contacts by incurring promotional expenditures. In this context, creation of an *Export Promotion Council* with the objective of providing information on international export markets, up-to-date import-export statistics, market intelligence to the exporters and to solve other problems of the exporters is considered desirable. There is also a need for developing/ strengthening of a technical cell within MTI/DOI to promote and support the entrepreneurs in identification and support services for the use of appropriate food technologies

Most of the enterprises in Eritrea are weak in marketing techniques e.g. in the areas of advertising and promotion, market research and intelligence. Moreover, there is no institutional support to help enterprises in developing the necessary marketing and sales promotion strategies and schemes, collection, analysis and dissemination of market information with respect to domestic and export markets and to make necessary business contacts. There is also a need to train producers along the same line. The following are foreseen: The training on different issues in export, as well as domestic marketing; training on use of Internet for accessing global electronic databases for market information; training of trainers (TOT) and also the necessary personnel from the food industries on different issues in export, as well as domestic marketing; training in export quality packaging of different food items; in design/development/ strengthening of a technical cell within MTI/DOI to promote and support entrepreneurs in the identification and support services for the use of appropriate food technologies.

Development objective

To create a modern technologically advanced and internationally competitive economy and to increase industry's contribution to economic growth and sustainable development.

Component objective

To develop capabilities of marketing techniques and sales promotion in industrial enterprises.

Output

Train personnel (100-150) with industrial capabilities in marketing and sales promotion.

Estimated inputs (To be determined)

Component 4. Gradation and diversification of existing food processing technologies in priority food sub-sectors, including packaging

Component 4. Gradation and diversification of existing food processing technologies in priority food sub-sectors, including packaging

Background and justification

Historically, modern industrial enterprises in Eritrea began with the advent of Italian colonialism. However, the economy as a whole and the condition of the industrial sector in particular, started deteriorating and entered into a phase of long-term decline, during Ethiopian rule. This was mainly due to nationalisation of industrial enterprises by the military regime in Ethiopia which adopted a command economy policy - a policy that discouraged the expansion of investment in the industrial sector by private entrepreneurs; and the intensification of war of independence for the last three decades.

As a result, the level of manufacturing output fell drastically and some manufacturing units became non-operational. It is recognised that the existing structure calls for a comprehensive programme of modernisation, introduction of latest technologies full utilisation of capacities and possible diversification of the existing food processing industry.

There is an urgent need for upgradation/modernisation and introduction of clean technology in processing in all food sub-sectors. In horticulture, fish and meat, processing this is absolutely necessary. Introduction of modern technology will increase productivity, facilitate value addition and reduce the burden in the creation of infrastructure for post harvest and storage facilities. The processing technology should be such that the product manufactured is of good quality and cost effective so that it can compete in the international market. The role of R&D in the development of food processing sector is important. One of the key areas of research and development is the adaptation of imported technologies to suit the local conditions and needs.

Development objective

To create a modern technologically advanced and internationally competitive economy and to increase industry's contribution to economic growth and sustainable development.

Component objective

To increase capacity in the adaptation of modern technology in food processing including R&D infrastructure for the adaptation of such technologies.

Outputs

1. Report/analysis on possible upgrading/diversification of food processing technologies.
2. A core of highly skilled personnel in various aspects of utilising clear technologies in different food processing priority sub-sectors (through workshops, study tours and placement programme).
3. A core of production technicians and managers with increased awareness on the use of food processing technologies.

Estimated inputs (to be determined)

Component 5. Strengthening of existing fish laboratories and training in food safety and quality assurance

Background and justification

Eritrea is rich in marine resources, with tremendous economic and social potentials. Fisheries provide much needed foreign exchange. The current catch is, however, just 5 to 10% of the total potential. With over 1200 Km long coastline, this sub-sector could develop as one of the main sources of foreign exchange earnings for the country. The maximum sustainable yield of all these resources has been estimated at around 79,000 tons. As far as processing is concerned, only a few companies are currently involved in various fisheries activities. Because fish is perishable, all fish and seafood products need to be produced in healthy and safe conditions and to cater for the demand of the foreign market. Therefore, positive steps should be taken to strengthen the inspection system in order to have good quality products for consumers.

Fish inspection system in Eritrea is inefficient. The major problem is the lack of adequate laboratory facilities (in-plant or national) and trained manpower to carry out food safety and quality control activities in this sub-sector.

Basically the programme will focus on providing training advice mainly to those engaged in fish processing, storage, handling and transport of fish and seafood from the time of catch to the time of retail and processing. Also envisaged are training programmes for fish inspectors for sampling, microbiological/chemical analyses of fish and seafood products.

In collaboration with the Ministry of Agriculture, other food/fish research and training institutions/laboratories and support service organisations, training programmes/workshops will be organised to create a pool of qualified trainers and trainees in the field of food safety and quality assurance e.g. the HACCPS, GMP, GHP approaches. An assessment and strengthening of the existing fish laboratories (private and government) will be done focussing on equipment, chemical facilities etc. to carry out the required fish safety and quality assurance analyses.

Development objective

To create a modern technologically advanced and internationally competitive economy and to increase industry's contribution to economic growth and sustainable development.

Component objective

To establish a reliable fish inspection system and accreditation of fish laboratory in Massawa and to train inspectors in fish safety and quality assurance.

Outputs

i) Fish processing units capable of producing fish and seafood products of international/ export quality.

ii) A core of fish inspectors trained.

iii) Fish laboratories accredited

Estimated inputs (To be determined)

Component 6. Pilot Project on multi-purpose fruits and vegetables processing in the Agriculture Research Centre, Halhale

Background and justification

According to estimates (1997-98), about 20,000 tons of fruits (comprising of bananas, citrus fruits, guava, melon, mango, papaya and 28,000 tons of vegetables such as cabbage, tomato, onion, potato, green chilli) are grown in the country annually. However, as much as a substantial 30-40% post-harvest losses occur for horticultural crops, fruits and vegetables, causing great concern in terms of food security in Eritrea. Soil and climatic conditions in Eritrea are suited for the cultivation of fruits and vegetables. But full potential is yet to be exploited.

Processing is also limited to a few small and medium scale units, which process tomato puree/pastes, vegetable soup, dry peas, beans etc. There are no significant manufacturing units in the fruit processing sector. The level of technology is also quite low. There is a need to provide technical assistance and training in upgrading skills and introducing clean processing technologies in the fruits and vegetables processing sub-sector. A multipurpose pilot plant can provide the necessary support in this respect. Potential entrepreneurs can be trained in established pilot plant, which would encourage them to set up their own units, in future. This will also help in creation of self-employment in the country, particularly in rural areas.

Development objective

To create a modern technologically advanced and internationally competitive economy and to increase industry's contribution to economic growth and sustainable development.

Component objective

To increase capabilities through training of potential entrepreneurs in food processing, including the maintenance of plant and machinery.

Outputs

1. ***An established multi-purpose pilot plant for fruits and vegetables processing.***
2. ***About 200-250 potential entrepreneurs identified and trained annually in various aspects of fruits and vegetables processing and business management.***

Envisaged inputs

-	International experts (3)	9.0 w/m	135.000
-	Administrative support staff (4)	36.0 w/m	36,000
-	National experts (5)	60.0 w/m	150,000
-	Training workshop, study tours		60,000
-	Equipment		70,000
-	Miscellaneous component		20,000
-	Total	105.0 w/m	471,000

Component 7. Development of floriculture in rural areas

Background and justification

Eritrea has a great potential to grow a variety of flowers, with tremendous demand in the international market. Export of cut-flower could provide the much needed foreign exchange for the country. However, it is desirable to develop floriculture in an organised and commercial way using modern techniques in farming, processing and packaging.

Floriculture in Eritrea is a very young industry and should be developed in terms of introducing modern farming techniques, training of farmers in scientific and commercial farming, processing, packaging and marketing.

The proposed programme foresees the identification of suitable areas and crop (flowers) to be cultivated, depending on the local climatic conditions and export demand; training of farmers in modern farming technology in floriculture; training in harvesting, processing and packaging technologies; training in all aspects of marketing of cut flowers; training of core teams in the production of good quality seedlings, multiplication, harvesting, packaging and marketing.

Development objective

To create a modern technologically advanced and internationally competitive economy and to increase industry's contribution to economic growth and sustainable development.

Component objective

To introduce/develop floriculture and processing technologies in Eritrea with a view to developing skills, creating employment and generating incomes in the rural areas.

Outputs

1. ***Modern floriculture technology introduced in Eritrea.***
2. ***At least 400-600 persons trained in various aspects of floriculture.***
3. ***Strengthening the production and processing facilities of one or two floricultural enterprises***

Estimated inputs (to be determined)

Component 8. Food safety and quality assurance in meat processing and meat products

Background and justification

Meat processing is a traditional industry in Eritrea. The country is endowed with livestock, namely, cows, sheep, goats, and camel. While the livestock population is well distributed among all the regions, there is a need to increase the number to ensure a steady and sustained supply to the processing industry. Presently, processed meat products are not exported, as there is a high domestic demand by the Ministry of Defense. The plant and machinery need to be modernised if the country is to top the large export potential in the sub-region and introduce new production lines. The whole processing technology should meet international standards.

The existing food control system, including the food safety and quality control procedures as well existing laws are inadequate to address the many present and future needs of Eritrea. In particular, for export oriented food products, the food quality control needs strengthening in terms of upgrading skills/ training and equipment. At present there is no systematic food quality control measures in real terms, with such activities spread over different ministries (health, agriculture, fishing industries etc.), Only basic food control measures are practiced.

The Meat inspection system is also flawed. A major problem being the lack of adequate laboratory facilities and skilled/trained manpower to carry out food safety and quality control activities.

The programme will focus on the following:

- Training and advice mainly to abattoir personnel on the storage, handling and transportation of meat from the slaughterhouses to the retail outlets and processing units;
- Assessment and strengthening of the existing in-plant laboratories in terms of necessary equipment, chemicals etc. to carry out the required meat safety and quality assurance analyses;
- Training programme for the meat processing industry personnel in the field of food safety and quality control measures, e.g. GHP/ GMP, HACCPs programme;
- Upgrading the skill of laboratory personnel/ technicians for meat analyses e.g. micro-biological/chemical analyses, good laboratory procedures and practices etc;
- Training programme for meat inspectors covering sampling, microbiological/chemical analyses, of meat and meat products from abattoirs, various food outlets, meat processing units and retailers;
- In collaboration with the Ministry of Agriculture food/ research and training institutions/laboratories and support service organisations, training programme/workshop will be organised to create a pool of qualified trainers in the field of food safety and quality assurance e.g. the GMP, GHP and HACCPs approaches.

Development objective

To create a modern technologically advanced and internationally competitive economy and to increase industry's contribution to economic growth and sustainable development.

Component objectives

- To upgrade laboratory facilities for meat processing;
- To develop critical skills in meat processing through training of laboratory personnel, technicians and food safety, quality control personnel.

Outputs

1. ***Upgraded Meat processing units capable of producing meat and meat products of international/ export quality.***
2. ***Fully accredited laboratory.***
3. ***A core of trained personnel in various aspects of meat processing.***

Estimated inputs (to be determined)

Programme Concept 8

Title: Upgrading of the Labour Market Information System with a focus on Industry

Background and justification

A labour market information system (LMIS) has been established for the National Commission for the Demobilisation and Reintegration Programme (NCDRP). That LMIS aims at the compilation of basic information on labour demand and employment opportunities, but its focus will be primarily on opportunities for demobilised soldiers. It will be necessary to modify this system so that data collection can also respond to the needs of the Ministry of Trade and Industry/industrial operators in the country.

It is envisaged that a modified LMIS will collect information on employment in the manufacturing sub-sectors, disaggregated into groups such as machine operators, quality controllers, laboratory chemists etc., together with data on length and type of education and training, qualification or part qualification, past experience. Whereas the existing LMIS will have a relatively short-term focus, the proposed initiative will be for a relatively longer term.

The information system will, for example, provide data on wage movements classified by occupation at groups and categories of skills, on the basis of which the Ministry of Trade and Industry, employers, employees and training/education providers can base policy decision and take action to improve the performance of the industrial sector.

Development objective

To create a modern technologically advanced and internationally competitive economy and to increase industry's contribution to economic growth and sustainable development.

Component objectives

To provide early warning to the Ministry of Trade and Industry of relative shortage/surplus in various occupational groups with a view to matching education/training provision with labour market requirements.

Output

An established labour information system, with corresponding capabilities to process and disseminate information on industrial human resources.

Envisaged input (actual cost to be determined)

-	International experts (3)	4.0 w/m	60,000
-	Administrative/secretarial support staff	24.0 w/m	24,000
-	National experts (4)	60.0 w/m	120,000
-	Training/work placement		30,000
-	Equipment		25,000
-	Miscellaneous component		15,000
-	Total	88.0 w/m	274,000